Supplemental Materials for "Spin Space Groups: Full Classification and Applications"

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A. REPRESENTATION THEORY FOR SPACE GROUPS

Three types of irreducible representations

An irreducible representation (irrep) $D(g)$ of a group G must fall under one of the following categories: real irreps, complex irreps, and pseudo-real irreps. $D(g)$ is a real irrep, if $D(g)$ is equivalent to its complex conjugate, given by

$$D(g)^* = \mathcal{V} D(g) \mathcal{V}^\dagger \,, \tag{S1}$$

and the unitary matrix $\mathcal{V}$ satisfies $\mathcal{V} = \mathcal{V}^T$. If $\mathcal{V}$ is a symmetric matrix, $(\mathcal{V}^{-1/2})$ is also a symmetric matrix. By performing a unitary transformation with $(\mathcal{V}^{-1/2})^*$, we find that $D'(g) = (\mathcal{V}^{-1/2})^* D(g) (\mathcal{V}^{-1/2})^T$ satisfy that

$$\begin{aligned} D'(g)^* &= \mathcal{V}^{-1/2} D(g)^* (\mathcal{V}^{-1/2})^\dagger \\ &= (\mathcal{V}^{-1/2}) \mathcal{V} D(g) \mathcal{V}^\dagger (\mathcal{V}^{-1/2})^\dagger \\ &= (\mathcal{V}^{-1/2}) \mathcal{V} (\mathcal{V}^{-1/2})^T D'(g) (\mathcal{V}^{-1/2})^* \mathcal{V}^\dagger (\mathcal{V}^{-1/2})^\dagger \\ &= D'(g) \quad \forall g \in G \end{aligned} \tag{S2}$$

This implies that all elements of the real irrep can be made real by properly choosing a basis. $D(g)$ is a pesudo-real irrep, if $D(g)^* = \mathcal{V} D(g) \mathcal{V}^\dagger$, and $\mathcal{V}$ satisfies $\mathcal{V} = -\mathcal{V}^T$. As $\mathcal{V}$ is an anti-symmetric matrix, its dimension must be even, and consequently, the dimension of $D(g)$ must be even. (Suppose the dimension of $\mathcal{V}$ is odd, then $\mathcal{V} = -\mathcal{V}^T$ leads to $\det V = -\det V$ and hence $\det \mathcal{V} = 0$, contradicts with the unitary condition of $\mathcal{V}$.) Note that $\mathcal{V}^{1/2}$ is neither symmetric nor anti-symmetric. If $\mathcal{V}^{1/2}$ was symmetric or anti-symmetric, $\mathcal{V} = \mathcal{V}^{1/2} \mathcal{V}^{1/2}$ should be symmetric, which leads to a contradiction. Thus, we cannot choose a basis in which all elements of $D(g)$ are real as in Eq. (S2), even though $D(g)$ is equivalent to its complex conjugate. If $D(g)$ is not equivalent to its complex conjugate, it is a complex irrep. Under any basis, some elements of $D(g)$ must be complex.

A direct sum of an irrep and its complex conjugate can be made real. Let $D_{ir}(g)$ be a complex or pseudo-real irrep, and let $D_r(g)$ be the direct sum of $D_{ir}(g)$ and its complex conjugate:

$$D_r(g) = \begin{pmatrix} D_{ir}(g) & 0 \\ 0 & D_{ir}(g)^* \end{pmatrix} . \tag{S3}$$

Note that if $D_{ir}(g)$ is pseudo-real, $D_r(g)$ is a direct sum of two equivalent pseudo-real irreps. The matrix $D_r(g)$ satisfies that

$$D_r(g)^* = \sigma_x D_r(g) \sigma_x \, \forall g \in G \,, \tag{S4}$$

and σ_x is a symmetric matrix. Thus, with unitary transformation $\sigma_x^{1/2}$, we can make $D_r(g)$ a real matrix as in Eq. (S2).

We have shown that the representation matrices of a single complex irrep or a single pseudo-real irrep are necessarily complex in any basis, while the representation matrices of a conjugate pair of complex irreps or a pair of equivalent pseudo-real irreps can be made real. In summary, a real representation must be decomposed into real irreps, conjugate pairs of complex irreps, or pairs of equivalent pseudo-real irreps.

Irreducible representations of the little groups of space groups

To study the irreps of a space group P, we first consider its translation subgroup T, given as

$$T = \left\{ \{1|\boldsymbol{v}\} \middle| \{1|\boldsymbol{v}\} \in P \right\} , \tag{S5}$$

and irreps of T. Since T is an Abliean group, it can only possess 1D irreps. An irrep $\boldsymbol{\Gamma}^k$ of T is characterized by a vector $\boldsymbol{k}$ in the BZ, and the representation matrix $D_{\boldsymbol{\Gamma}^k}(\{1|\boldsymbol{v}\}) = e^{i\boldsymbol{k}\cdot\boldsymbol{v}}$. Since $\boldsymbol{k}\cdot\boldsymbol{v}$ is a phase factor, two vectors $\boldsymbol{k}_1$ and $\boldsymbol{k}_2$ in the BZ are considered equivalent ($\boldsymbol{k}_1 \equiv \boldsymbol{k}_2$) if they satisfy the relation

$$\boldsymbol{k}_1 = \boldsymbol{k}_2 + \sum_{i=1}^{3} m_i \boldsymbol{b}_i, \quad m_i \in \mathbb{Z}, \tag{S6}$$

where $\boldsymbol{b}_i$ represents reciprocal lattice vectors, and $\boldsymbol{b}_i$ and the primitive lattice vectors $\boldsymbol{a}_i$ of T satisfy $\boldsymbol{a}_i \cdot \boldsymbol{b}_j = 2\pi\delta_{i,j}$ for $i, j = 1, 2, 3$.

Next, let us consider the little group $P^{\boldsymbol{k}}$ of $\boldsymbol{k}$ and its allowable irreps $\rho^{\boldsymbol{k}}$. The little group $P^{\boldsymbol{k}}$ of $\boldsymbol{k}$ is defined as

$$P^{\boldsymbol{k}} = \left\{ \{R|\boldsymbol{v}\} \middle| \{R|\boldsymbol{v}\} \in P,\ R\boldsymbol{k} \equiv \boldsymbol{k} \right\} . \tag{S7}$$

Based on this definition, the translation group T is a subgroup of $P^{\boldsymbol{k}}$, and we can decompose $P^{\boldsymbol{k}}$ into cosets with respect to T

$$P^{\boldsymbol{k}} = \{R_1|\boldsymbol{v}_1\}T + \{R_2|\boldsymbol{v}_2\}T + \cdots + \{R_m|\boldsymbol{v}_m\}T \,. \tag{S8}$$

The point-group parts $R_1, R_2, \cdots, R_m$ must be distinct from one another and form a point group, which is referred to as

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the little co-group $\bar{P}^{\boldsymbol{k}}$. An allowable irrep $\rho_{\boldsymbol{k}}$ of $P^{\boldsymbol{k}}$ satisfies $D_{\rho_{\boldsymbol{k}}}(\{1|\boldsymbol{v}\}) = e^{i\boldsymbol{k}\cdot\boldsymbol{v}}1_{r\times r}$, where r is the dimension of $\rho_{\boldsymbol{k}}$. All the allowable irreps of $P^{\boldsymbol{k}}$ can be obtained from (projective) irreps of the little co-group $\bar{P}^{\boldsymbol{k}}$. To see this, let us consider the representation matrices of the coset representatives $\{R_i|\boldsymbol{v}_i\}$ $(i = 1, 2, \cdots, m)$ and their multiplication

$$D_{\rho_{\boldsymbol{k}}}(\{R_i|\boldsymbol{v}_i\})D_{\rho_{\boldsymbol{k}}}(\{R_j|\boldsymbol{v}_j\}) = D_{\rho_{\boldsymbol{k}}}(\{R_iR_j|R_i\boldsymbol{v}_j + \boldsymbol{v}_i\}). \tag{S9}$$

Suppose R_iR_j is identical to $R_{f(i,j)}$, where $f(i,j) \in \{1, 2, \cdots, m\}$. Then, we have

$$\begin{aligned} &D_{\rho_{\boldsymbol{k}}}(\{R_i|\boldsymbol{v}_i\})D_{\rho_{\boldsymbol{k}}}(\{R_j|\boldsymbol{v}_j\}) \\ =&D_{\rho_{\boldsymbol{k}}}(\{1|R_i\boldsymbol{v}_j + \boldsymbol{v}_i - \boldsymbol{v}_{f(i,j)}\})D_{\rho_{\boldsymbol{k}}}(\{R_{f(i,j)}|\boldsymbol{v}_{f(i,j)}\}) \\ =&e^{i\boldsymbol{k}\cdot\left(R_i\boldsymbol{v}_j+\boldsymbol{v}_i-\boldsymbol{v}_{f(i,j)}\right)}D_{\rho_{\boldsymbol{k}}}(\{R_{f(i,j)}|\boldsymbol{v}_{f(i,j)}\}). \end{aligned} \tag{S10}$$

Thus, the allowable irrep $D_{\rho_{\boldsymbol{k}}}(\{R_i|v_i\})$ can also be understood as a projective irrep of the point-group operation $R_i \in \bar{P}^{\boldsymbol{k}}$ with a factor system given by $e^{i\boldsymbol{k}\cdot\left(R_i\boldsymbol{v}_j+\boldsymbol{v}_i-\boldsymbol{v}_{f(i,j)}\right)}$. In the other way, all allowable irreps of the little group $P^{\boldsymbol{k}}$ can be obtained from the irrep of the little co-group $\bar{P}^{\boldsymbol{k}}$ with the projective phase given by Eq. (S10).

B. EQUIVALENCE BETWEEN O(N) REPRESENTATIONS

In this section, we present some technique details for utilizing equivalence relationship between O(N) representations.

Choices of unit cells in different space groups

We begin by discussing the restrictions imposed by the Bravais lattice setting on the lattice vector transformation matrix V. Subsequently, we present an algorithm for enumerating all possible choices of the unit cell for different space groups.

Suppose the lattice basis for a space group is $\boldsymbol{a}_i$ $(i = 1, 2, 3)$, and a transformation matrix V satisfies that $V\boldsymbol{a}_i = \sum_{j=1}^{3}\boldsymbol{a}_jM_{ji}$. Then, on the basis $\boldsymbol{a}_i$'s, the matrix V should be represented as M. As discussed in Sec. II D in the main text, for any space group, M must satisfy that $\det M = 1$ and $M_{ij} \in \mathbb{Z}$. The Bravais lattice should remain unchanged under the action of M. It implies that the transformed unit cell satisfies the same restrictions regarding the interaxial angles α, β, γ, the relative relationship of the lengths a, b, c of the lattice vectors, and the choice of rotation axes as the original unit cell. The requirements for each lattice system are summarized below:

- Triclinic lattice: The only requirements for M are that $\det M = 1$ and $M_{ij} \in \mathbb{Z}$, as the interaxial angles α, β, γ and lattice lengths a, b, c are all distinct.

- Monoclinic lattice: In this case, $\boldsymbol{a}_2$ represents the unique 2-fold rotation axis, and $\alpha = \gamma = \pi/2$. As a result, M can be block diagonalized into a transformation $M_{xz} = \begin{pmatrix} M_{11} & M_{13} \\ M_{31} & M_{33} \end{pmatrix}$ within the $\boldsymbol{a}_1, \boldsymbol{a}_3$ plane and a transformation along $\boldsymbol{a}_2$. $V\boldsymbol{a}_2 = M_{22}\boldsymbol{a}_2$ can be either $\boldsymbol{a}_2$ or $-\boldsymbol{a}_2$. As β does not necessarily equal $\pi/2$ and a does not necessarily equal b, they do not impose any restrictions on M_{xz}. As $\det M = 1$, if $M_{22} = 1$ (-1), M_{xz} is an integer matrix with determinant 1 (-1).

- Orthorhombic lattice: $\boldsymbol{a}_1, \boldsymbol{a}_2, \boldsymbol{a}_3$ are all two-fold rotation axes. Consequently, $V\boldsymbol{a}_i$ $(i = 1, 2, 3)$ can be any of $\pm\boldsymbol{a}_1, \pm\boldsymbol{a}_2, \pm\boldsymbol{a}_3$. The condition $\alpha = \beta = \gamma = \pi/2$ requires that M be an orthogonal matrix. Thus, M must be a rotation in the octahedral point group O.

- Tetragonal lattice: The condition $\alpha = \beta = \gamma = \pi/2$ necessitates M being an orthogonal matrix. Furthermore, $M\boldsymbol{a}_3$ should be parallel to $\boldsymbol{a}_3$, which is the unique 4-fold rotation axis. $V\boldsymbol{a}_1$ can only be one of $\pm\boldsymbol{a}_1, \pm\boldsymbol{a}_2$. Therefore, V (and M) must be a rotation in the dihedral group D_4.

- Hexagonal lattice: $\boldsymbol{a}_3$ represents the unique 6-fold or 3-fold rotation axis, and $\alpha = \gamma = \pi/2$. Consequently, $V\boldsymbol{a}_3$ should be parallel to $\boldsymbol{a}_3$, and $V\boldsymbol{a}_1$ and $V\boldsymbol{a}_2$ should remain within the same plane as $\boldsymbol{a}_1$ and $\boldsymbol{a}_2$. Additionally, $V\boldsymbol{a}_{1,2}$ still represents a lattice translation and can only be one of $\pm\boldsymbol{a}_1$, $\pm\boldsymbol{a}_2$, and $\pm(\boldsymbol{a}_1 + \boldsymbol{a}_2)$. Therefore, V must correspond to an operation in the D_6 group.

- Rhombohedral lattice: $a = b = c$, $\alpha = \beta = \gamma$, $\boldsymbol{a}_1 + \boldsymbol{a}_2 + \boldsymbol{a}_3$ is the unique rotation axis. $V\boldsymbol{a}_i$ $(i = 1, 2, 3)$ can only be one of $\pm\boldsymbol{a}_1, \pm\boldsymbol{a}_2, \pm\boldsymbol{a}_3$. Once $V\boldsymbol{a}_1$ is specified, $V\boldsymbol{a}_2$ and $V\boldsymbol{a}_3$ are also uniquely determined. Such V's form the dihedral group D_3.

- For cubic lattice, $\boldsymbol{a}_1, \boldsymbol{a}_2, \boldsymbol{a}_3$ are all four-fold rotation axes. Consequently, $V\boldsymbol{a}_i$ $(i = 1, 2, 3)$ can be any of $\pm\boldsymbol{a}_1, \pm\boldsymbol{a}_2, \pm\boldsymbol{a}_3$. The condition $\alpha = \beta = \gamma = \pi/2$ requires V to be an orthogonal matrix. Thus, V (and M) must be a rotation in the octahedral point group O.

In the following, we will introduce the algorithm for enumerating all possible choices of the unit cell for a given space group. We note that according to Eq. (17) in the main text, the product of two allowable coordinate transformations is still allowable. Thus, all allowable coordinate transformations $\{V|\boldsymbol{t}\}$ form a group P_C, which generally has infinite order, and we only need to enumerate their generators.

P_C can be decomposed as $P_C = T_C \rtimes V_C$, where T_C contains all allowable origin shift $\boldsymbol{t}$, and V_C contains rotations of the lattice axes. We only need to enumerate elements in T_C and the coset representatives of P_C/T_C.

Let us first consider T_C. If $\boldsymbol{t}$ is a lattice vector, it must produce an automorphism [Eq. (17) in the main text], but it will not transform an irrep into a different one. Consider an irrep $\rho_{\boldsymbol{k}} \uparrow P$ of space group P, which is induced by an irrep $\rho_{\boldsymbol{k}}$ of the little group $P^{\boldsymbol{k}}$ of vector $\boldsymbol{k}$. We investigate how irrep $\rho_{\boldsymbol{k}}$ of the little group is transformed under an origin shift $\boldsymbol{t}$, where $\boldsymbol{t}$ is a lattice vector. Note that $\{1|\boldsymbol{t}\} \in \rho_{\boldsymbol{k}}$ and $\rho_{\boldsymbol{k}}(\{1|\boldsymbol{t}\}) = e^{i\boldsymbol{k}\cdot t}1_{m_{\boldsymbol{k}}\times m_{\boldsymbol{k}}}$, where $m_{\boldsymbol{k}}$ is the dimension of $\rho_{\boldsymbol{k}}$. According to Eq. (18) in the main text, the transformed irrep

$\rho'_{\boldsymbol{k}}(g)$ ($g \in P^{\boldsymbol{k}}$) is given as

$$\begin{aligned}\rho'_{\boldsymbol{k}}(g) &= \rho_{\boldsymbol{k}}(\{1|\boldsymbol{t}\}g\{1|\boldsymbol{t}\}^{-1}) \\ &= \rho_{\boldsymbol{k}}(\{1|\boldsymbol{t}\})\rho_{\boldsymbol{k}}(g)\rho_{\boldsymbol{k}}(\{1|\boldsymbol{t}\}^{-1}) \\ &= e^{i\boldsymbol{k}\cdot t}1_{m_{\boldsymbol{k}}\times m_{\boldsymbol{k}}}\rho_{\boldsymbol{k}}(g)e^{-i\boldsymbol{k}\cdot t}1_{m_{\boldsymbol{k}}\times m_{\boldsymbol{k}}} \\ &= \rho_{\boldsymbol{k}}(g)\,.\end{aligned} \tag{S11}$$

$\rho'_{\boldsymbol{k}}$ is the same little group irrep as $\rho^{\boldsymbol{k}}$, and therefore, they induce the same irrep of the space group P. Thus, we only need to consider $\boldsymbol{t}$ within the primitive unit cell. According to Eq. (17) in the main text, allowable $\boldsymbol{t}$ satisfies the condition:

$$R_p\boldsymbol{t} - \boldsymbol{t} = \sum_{i=1}^{3} m_i\boldsymbol{a}_i\,(m_i \in \mathbb{Z})\,, \forall p \in P\,, \tag{S12}$$

where R_p is the point-group part of operation g. It implies that the new origin must have all point-group symmetries of this space group, and $\boldsymbol{t}$ is solely determined by R_g. In some groups, $\boldsymbol{t}$ can only take discrete groups, such as groups with inversion symmetry. Eq. (S12) implies that the shifted origin should be an inversion-invariant point. In other groups, $\boldsymbol{t}$ can take continuous values. For example, in group P1 (No. 1), $\boldsymbol{t}$ can be an arbitrary vector in the whole space since R_p is always 1. In such cases, we consider a subgroup T_{C0} of T_C, in which $R_p\boldsymbol{t} - \boldsymbol{t} = 0, \forall p \in P$. T_{C0} contains allowable origin shift that can be continuously connected into an identity operation. If $\{1|\boldsymbol{t}\} \in T_{C0}$, $\{1|\boldsymbol{t}\}^{-1}\{R|\boldsymbol{v}\}\{1|\boldsymbol{t}\} = \{R|\boldsymbol{v} + (R-1)\boldsymbol{t}\} = \{R|\boldsymbol{v}\}$. An origin shift in T_{C0} will not transform a space-group operation or an irrep into a different one. Therefore, we only need to consider the effect of coset representatives of T_C/T_{C0} on the irreps. T_C/T_{C0} only takes discrete values and only contains a finite number of $\boldsymbol{t}$ in the primitive unit cell. Thus, for each group, we can obtain a finite number of allowable $\boldsymbol{t}$, and these $\{1|\boldsymbol{t}\}$ serve as one part of generators of the allowable coordinate transformation.

To study V_C, we proceed as follows. In five lattice systems except for triclinic and monoclinic lattice, the number of choices of V is finite due to the restrictions imposed by Bravais lattices, as discussed earlier in this section. For each space group P in these lattice systems and for each V, we perform a numerical search for a $\boldsymbol{t}$ within the unit cell that satisfies Eq. (17) in the main text. If such a $\boldsymbol{t}_V$ exists, we include $\{V|\boldsymbol{t}_V\}$ into the coset representatives of P_C/T_C. For space groups ($P1$ and $P\bar{1}$) in triclinic lattices, all matrices $M \in SL_3(\mathbb{Z})$ are compatible with Bravais lattices (M is the representation matrix of V on the lattice basis). Using Eq. (17) in the main text, one can check that in space groups $P1$ and $P\bar{1}$, for arbitrary $M \in SL_3(\mathbb{Z})$ $\{M|\boldsymbol{0}\}$ is an allowable coordinate transformation, implying that the all the coset representatives of P_C/T_C can always be chosen to have the form $\{M|\boldsymbol{0}\}$. Thus, we can choose generators (for example, see Ref. [1]) of the group $SL_3(\mathbb{Z})$ as coset representatives P_C/T_C.

We need to apply a more careful treatment for space groups in the monoclinic lattice systems. As discussed earlier, due to the restriction on Bravais lattice, M belongs to one of these two sets

$$S_I = \left\{ \begin{pmatrix} M_{11} & 0 & M_{13} \\ 0 & 1 & 0 \\ M_{31} & 0 & M_{33} \end{pmatrix} \middle| M_{xz} = \begin{pmatrix} M_{11} & M_{13} \\ M_{31} & M_{33} \end{pmatrix} \in SL_2(\mathbb{Z}) \right\} \tag{S13}$$

or

$$M_{\boldsymbol{x}}(\pi)S_I \quad \text{with} \quad M_{\boldsymbol{x}}(\pi) = \begin{pmatrix} 1 & 0 & 0 \\ 0 & -1 & 0 \\ 0 & 0 & -1 \end{pmatrix}. \tag{S14}$$

The generators of $SL_2(\mathbb{Z})$ are given as

$$\begin{pmatrix} 1 & 1 \\ 0 & 1 \end{pmatrix}, \begin{pmatrix} 0 & 1 \\ -1 & 0 \end{pmatrix}. \tag{S15}$$

We note that $\{M_{\boldsymbol{x}}(\pi)|\boldsymbol{0}\}$ that reverses the y, z directions is an allowable coordinate transformation for all space groups with Monoclinic lattice, and hence it serves as a coset representative of P_C/T_C. While the number of transformation matrices in S_I is infinite, we can generate them successively by the generators [Eq. (S15)]. For each generated M_I and the corresponding V_I, we perform a numerical search within the unit cell to find a $\boldsymbol{t}_V$ that satisfies Eq. (17) in the main text. We add $\{V_I|\boldsymbol{t}_{V_I}\}$ to the coset representatives of P_C/T_C if such a $\boldsymbol{t}_{V_I}$ exists. This process continues until the newly generated V_I, which is determined as allowable, can be generated by those already in the set of coset representatives.

In summary, the methods described above allow us to obtain the generators of allowable coordinate transformations for every space group. These generators consist of generators for origin shifts and generators for changing the axes of the unit cell.

Example: type-V O(3) representations of space group $P3$

As established in Sec. II D in the main text, O(3) representations of different types do not deform into each other under any coordinate transformation. It enables us to study different types of representations separately. In this section, we will focus on the transformation of type-V O(3) representations for the space group $P3$ as an illustrative example. As shown in Sec. II C in the main text, we need to consider six representations DTiDU$i\oplus$1, and PiPC$i\oplus$1 ($i = 1, 2, 3$), where 1 represents the identity irrep. The explicit representation matrices are given in Eq. (10) in the main text. The identity irrep is always invariant under any coordinate transformation. DTiDUi (PiPCi) is the direct sum of DTi (Pi) and its complex conjugate. Thus, it is sufficient to consider the transformation of the complex irreps DTi and Pi. The generators of allowable coordinate transformation consist of the generator of D_6 group, given as $\{6_{001}|\boldsymbol{0}\}$, $\{2_{100}|\boldsymbol{0}\}$,as well as the generators of origin shift, given as $\{1|1/3, 2/3, 0\}$, $\{1|2/3, 1/3, 0\}$, $\{1|0, 0, z\}$.

According to Eq. (18) in the main text, the momentum $\boldsymbol{k}$ of an irrep will be transformed to $V^{-1}\boldsymbol{k}$ under the action of $\{V|\boldsymbol{t}\}$. The line DT ($\boldsymbol{k} = (0, 0, v\pi)$) is invariant under the action of $V = 6_{001}, 2_{100}, 1$. Similarly, the line P ($\boldsymbol{k} = (2\pi/3, 2\pi/3, u\pi)$) is invariant under the action of

$V = 2_{100}$ and 1, and it is transformed to its TRS-partner line PC ($\boldsymbol{k} = (-2\pi/3, -2\pi/3, -v\pi)$) under $V = 6_{001}$. Therefore, DTi's and Pi's will not be transformed into each other. In table I, ρ and σ denote the irreps before and after the coordinate, respectively, and we show how $D_\sigma(\{3^+_{001}|\mathbf{0}\})$ is determined by ρ and coordinate transformation $\{V|\boldsymbol{t}\}$. Only $\{2_{100}|\mathbf{0}\}$ has a non-trivial effect on DTi's. It transforms DT2 and DT3 into each other while leaving DT1 invariant. We have also shown in Sec. II C in the main text that the real representation induced by DT2 and DT3 should be put in the same class because they can be continuously deformed to each other. Thus, DT1DU1 belongs to one class, and DT2DU2 and DT3DU3 are in the other class. For the irreps on the line P, we observe that $D_{\mathrm{P}i}(C_{3z})$ transforms to $e^{i2\pi/3}D_{\mathrm{P}i}(C_{3z})$ and $e^{i4\pi/3}D_{\mathrm{P}i}(C_{3z})$ under the action of $\{1|2/3, 1/3, 0\}$ and $\{1|1/3, 2/3, 0\}$, respectively (see the fourth and fifth rows of Table I). This implies that irrep P1 can be transformed into irreps P2 and P3, and hence these three irreps belong to the same class.

TABLE I. The transformation of C_{3z} under coordinate transformation $\{V|\boldsymbol{t}\}$. The irrep before the transformation is denoted as ρ (ρ = DTi, Pi, $i = 1, 2, 3$) with momentum $\boldsymbol{k}$, and σ denotes the irrep after the action of $\{V|\boldsymbol{t}\}$.

$\{V\|\boldsymbol{t}\}$	$\{V\|\boldsymbol{t}\}\{3^+_{001}\|\mathbf{0}\}\{V\|\boldsymbol{t}\}^{-1}$	$D_\sigma(C_{3z})$
$\{6_{001}\|\mathbf{0}\}$	$\{3^+_{001}\|\mathbf{0}\}$	$D_\rho(C_{3z})$
$\{2_{100}\|\mathbf{0}\}$	$\{3^-_{001}\|\mathbf{0}\}$	$(D_\rho(C_{3z}))^{-1}$
$\{1\|1/3, 2/3, 0\}$	$\{3^+_{001}\|1, 1, 0\}$	$e^{ik_1+ik_2}D_\rho(C_{3z})$
$\{1\|2/3, 1/3, 0\}$	$\{3^+_{001}\|1, 0, 0\}$	$e^{ik_1}D_\rho(C_{3z})$
$\{1\|0, 0, z\}$	$\{3_{001}\|\mathbf{0}\}$	$D_\rho(C_{3z})$

Details for the equivalence based on continuously connected wave vectors

To fully utilize the third equivalence based on continuously connected wave vectors, we can follow three steps. Firstly, if irreps are on the same high-symmetry line or plane or generic points, and they are labeled by the same symbol (*e.g.,* DT1 of $P3$ on different points on the DT line), they should be categorized into the same class. Secondly, a 2D real representation induced from non-HSP $\boldsymbol{k}$'s, which can be either $[\rho_{\boldsymbol{k}} \uparrow P]^c_1 \oplus [\rho^*_{\boldsymbol{k}} \uparrow P]^c_1$ or $[\rho_{\boldsymbol{k}} \uparrow P]^r_2$, should contain a pair of momenta $\pm\boldsymbol{k}$. If $\pm\boldsymbol{k}$ belongs to the same connected piece of the fix-point manifold of $P^{\boldsymbol{k}}$, they can be continuously moved to each other while remaining on this manifold. It is necessary to investigate whether this 2D real representation will be deformed into another one when the positions of $\pm\boldsymbol{k}$ are switched. For example, we find that DT2DU2 of $P3$ can be deformed into DT2DU3. Thirdly, suppose that the fixed point of $P^{\boldsymbol{k}}$ with $\boldsymbol{k}$ being a non-HSP is a n-dimensional ($n > 0$) manifold. Momentum in this manifold can continuously move within this manifold along the n independent tangent vectors and will return to its original position after completing a full winding around the first BZ. We need to study whether a 2D real representation will be deformed to another one after it momenta $\pm\boldsymbol{k}$ go through the process together, with $\pm\boldsymbol{k}$ moving in opposite directions.

Algorithm of modulo equivalences

To classify O(N) representations into different classes by equivalence relationship, the following algorithm can be utilized. This algorithm takes advantage of the transitivity property of the equivalence relation, and we only need to consider the generators of these equivalences. We start by placing the inequivalent O(N) representations in a given type into separate sets. Then, we successively apply the generators of the second and third equivalences to these representations. If an O(N) representation in one set can be transformed into a different representation in another set based on equivalence, we merge these two sets. Repeat the above process iteratively for all the generators. By following this algorithm, representations within the same set belong to the same class, indicating an equivalence, while those in different sets describe distinct SSGs.

C. ELECTRONIC BANDS IN SSG

d_{SBZ} in commuting SBZ

In this section, we study how SSG symmetries determine the dimension d_{SBZ} of the span of $\vec{S}(\tilde{\boldsymbol{k}})$ in SBZ. We have shown how to determine d_{SBZ} for collinear SSGs (Sec. III D in the main text), and we show the details on non-collinear SSGs where unitary translation generators $\hat{t}_{1,2,3}$ all commute with each other. As established in Sec. III D in the main text, d_{SBZ} are only determined by spin-rotation translations, generated by $\hat{t}_{1,2,3}$, and spin-rotation $\mathcal{PT}$ operation, denoted as $\hat{\mathcal{P}}\hat{\mathcal{T}}$. If $\hat{\mathcal{P}}\hat{\mathcal{T}}$ is present and $\boldsymbol{q}_{\mathcal{PT}} = 0$, $d_{\mathrm{SBZ}} = \dim[\bigcap_{i=1}^3 \ker(U_{t_i} - I) \bigcap \ker(U_{\mathcal{PT}} + I)]$; $d_{\mathrm{SBZ}} = \dim[\bigcap_{i=1}^3 \ker(U_{t_i} - I)]$ otherwise.

First, we will prove that if any of $\hat{t}_i$'s are accompanied by non-trivial spin rotations, they must share the same rotation axis. Without loss of generality, suppose that $U_{t_i} = U_{\boldsymbol{n}_i}(\theta_i)$ ($i = 1, 2$) with $\theta_i \in (0, 2\pi)$. In SSGs with commuting SBZ, $[\hat{t}_1, \hat{t}_2] = 0$ requires that $[e^{i\frac{\theta_1}{2}\boldsymbol{n}_1\cdot\boldsymbol{\sigma}}, e^{i\frac{\theta_2}{2}\boldsymbol{n}_2\cdot\boldsymbol{\sigma}}] = 0$. After some simple algebra, the equation is equivalent to $(\boldsymbol{n}_1 \times \boldsymbol{n}_2)\cdot\boldsymbol{\sigma} = 0$, where "$\times$" denotes the cross product. $\boldsymbol{n}_1$ should be parallel to $\boldsymbol{n}_2$. Thus, if any of U_{t_i} does not equal identity, $\dim[\bigcap_{i=1}^3 \ker(U_{t_i} - I)] = 1$.

Next, we investigate SSGs with $\mathcal{PT}$ symmetry and a non-trivial U_{t_i}. As the square of $\mathcal{PT}$ operation equals the identity, $U^2_{\mathcal{PT}} = I$, and $U_{\mathcal{PT}}$ can be either I or a π-rotation $U_{\boldsymbol{m}}(\pi)$. The group structure constrains the relationship between $U_{\mathcal{PT}}$ and $U_{t_i} = U_{\boldsymbol{n}}(\theta_i)$. As the conjugate of $\hat{t}_i$ under $\hat{\mathcal{P}}\hat{\mathcal{T}}$ is its inverse,

$$U^{-1}_{\mathcal{PT}} U_{\boldsymbol{n}}(\theta_i) U_{\mathcal{PT}} = U_{\boldsymbol{n}}(-\theta_i). \tag{S16}$$

Case (i): $U_{\mathcal{PT}} = I$. A non-zero θ_i must equal π. We notice

that

$$i\sigma_y\mathcal{K}e^{i\frac{\pi}{2}\boldsymbol{n}\cdot\boldsymbol{\sigma}}\left(i\sigma_y\mathcal{K}\right)^{-1}=-e^{-i\frac{\pi}{2}\boldsymbol{n}\cdot\boldsymbol{\sigma}}\,. \tag{S17}$$

Thus, in such a case, the SBZ is nonsymmorphic ($\tilde{\boldsymbol{q}}_{\mathcal{PT}}\neq 0$), and $d_{\rm SBZ}$ is only determined by U_{t_i}, and still equals 1. Case (ii): $U_{\mathcal{PT}}=U_{\boldsymbol{m}}(\pi)$. Eq. (S16) implies that $U_{U_{\boldsymbol{m}}(\pi)\boldsymbol{n}}(\theta_i)=U_{\boldsymbol{n}}(-\theta_i)$. Therefore, $U_{\boldsymbol{m}}(\pi)\boldsymbol{n}$ can equal either $\boldsymbol{n}$ or $-\boldsymbol{n}$. If $U_{\boldsymbol{m}}(\pi)\boldsymbol{n}=-\boldsymbol{n}$, which means that $\boldsymbol{m}\cdot\boldsymbol{n}=0$, θ_i's can take arbitrary values. One can verify that if $\boldsymbol{m}\cdot\boldsymbol{n}=0$,

$$i\sigma_y\mathcal{K}e^{i\frac{\pi}{2}\boldsymbol{m}\cdot\boldsymbol{\sigma}}e^{i\frac{\theta_i}{2}\boldsymbol{n}\cdot\boldsymbol{\sigma}}e^{-i\frac{\pi}{2}\boldsymbol{m}\cdot\boldsymbol{\sigma}}\left(i\sigma_y\mathcal{K}\right)^{-1}=e^{-i\frac{\theta_i}{2}\boldsymbol{n}\cdot\boldsymbol{\sigma}}\,. \tag{S18}$$

Thus, in such a case, the SBZ is symmorphic. $\mathcal{PT}$ constraints $\boldsymbol{S}(\tilde{\boldsymbol{k}})$ in a 2D plane perpendicular to $\boldsymbol{m}$, t_i constraint $\boldsymbol{S}(\tilde{\boldsymbol{k}})$ parallel to $\boldsymbol{n}$, which is a subspace of the 2D plane, resulting $d_{\rm SBZ}=1$. If $U_{\boldsymbol{m}}(\pi)\boldsymbol{n}=\boldsymbol{n}$, which means that $\boldsymbol{m}=\boldsymbol{n}$, non-zero θ_i's can only be π. One can verify that

$$i\sigma_y\mathcal{K}e^{i\frac{\pi}{2}\boldsymbol{n}\cdot\boldsymbol{\sigma}}e^{i\frac{\pi}{2}\boldsymbol{n}\cdot\boldsymbol{\sigma}}e^{-i\frac{\pi}{2}\boldsymbol{n}\cdot\boldsymbol{\sigma}}\left(i\sigma_y\mathcal{K}\right)^{-1}=-e^{-i\frac{\pi}{2}\boldsymbol{n}\cdot\boldsymbol{\sigma}}\,. \tag{S19}$$

Thus, the SBZ is nonsymmorphic with this $U_{\mathcal{PT}}$, and $d_{\rm SBZ}$ is only determined by U_{t_i} and equals 1.

A coplanar magnetic model exhibiting $d_{\rm SBZ}=3$

We consider a 2D coplanar magnetic structure, whose crystalline symmetry is described by the space group P3 (No. 143) with lattice constant $c=\infty$. Three atoms, which are labeled by A, B, and C in Fig. S.1(a), exist in three C_{3z} invariant points $(0,0,0)$, $(2/3,1/3,0)$, and $(1/3,2/3,0)$ in the unit cell, respectively. The coplanar magnetic moments are localized around these atoms, given as

$$\boldsymbol{S}_A=(-\frac{1}{2},\frac{\sqrt{3}}{2},0),\ \boldsymbol{S}_B=(0,-1,0),\ \boldsymbol{S}_C=(1,0,0)\,. \tag{S20}$$

The magnetic structure [Fig. S.1(a)] remains invariant under operations $\{I|3^+_{001}|\boldsymbol{0}\}$ and $\{I|1|\boldsymbol{a}_i\}$ $(i=1,2)$, and hence is described by the SSG P143.1.1 GM1.

We consider an electronic Hamiltonian in this magnetic structure, given as

$$\mathcal{H}=t\sum_{\langle R,\alpha;R',\alpha'\rangle}c^\dagger_{R,\alpha}\sigma_0 c_{R',\alpha'}+J\sum_{R,\alpha}\boldsymbol{S}_\alpha\cdot\boldsymbol{s}_{R,\alpha}, \tag{S21}$$

with

$$\boldsymbol{s}^\mu_{R,\alpha}=\frac{1}{2}c^\dagger_{R,\alpha}\sigma_\mu c_{R,\alpha}\quad(\mu=x,y,z)$$

being the spin operator of the electrons. Here $c^\dagger_{R,\alpha}=(c^\dagger_{R,\alpha,\uparrow},c^\dagger_{R,\alpha,\downarrow})$ $(\alpha=A,B,C)$ is a two-component spin-1/2 electron creation operator in the unit cell R, sub-lattice α. The first term of the Hamiltonian represents nearest-neighboring hopping, represented by the bonds in Fig. S.1 (a). The hopping matrix is proportional to σ_0 because the SOC is considered negligible. The second term describes the on-site interaction between the conduction electron and localized magnetic moments $\boldsymbol{S}_{R,\alpha}$.

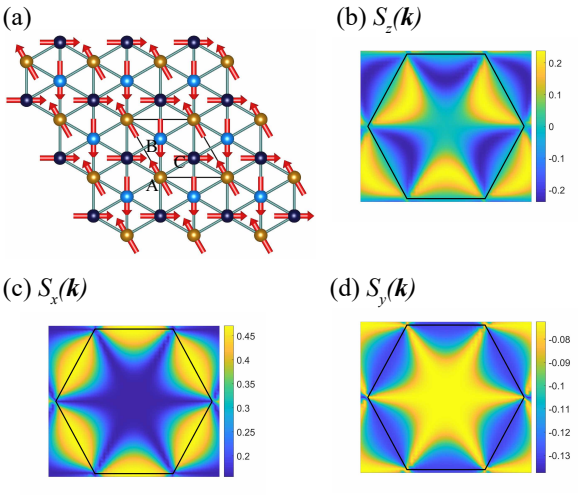


FIG. S.1. (a) Coplanar magnetic structure with SSG P143.1.1 GM1. (b)-(d) The z [(b)], x [(c)], y [(d)] components of the spin expectation values of the Bloch states in the lowest band. The colors (see the color bar) represent the values. The hexagon is the boundary of the first BZ.

We choose parameters as $t=1$, $J=-1$, and study the spin texture $\vec{S}(\boldsymbol{k})$ in the momentum space. Since in this SSG, all translations are accompanied by the identity spin operations, the magnetic BZ and SBZ coincide. Figs. S.1(b)-(d) show the expectation values $\vec{S}(\boldsymbol{k})$ of spin operators for the Bloch states in the lowest energy band. Although $\int_{\rm BZ}S_z(\boldsymbol{k})d\boldsymbol{k}=0$, $S_z(\boldsymbol{k})$ is non-zero at individual $\boldsymbol{k}$ [Fig. S.1(b)]. For generic $\boldsymbol{k}$, $S_x(\boldsymbol{k})$ and $S_y(\boldsymbol{k})$ are also non-zero, leading to $d_{\rm SBZ}=d_{\rm BZ}=3$, consistent with our theoretical analysis (Table IV in the main text).

Algorithm for determining whether an SBZ is symmorphic or nonsymmorphic

In this section, we present the detailed algorithm for determining whether an SBZ of a collinear SSG with $[\hat{t}_i,\hat{t}_j]=0\,(i,j=1,2,3)$ is symmorphic or nonsymmorphic. In Sec. III C in the main text, we have shown the SSG momentum $\tilde{\boldsymbol{k}}$ is transformed to $s_gR_g\tilde{\boldsymbol{k}}+\tilde{\boldsymbol{q}}_g$ under a generic SSG operation $\hat{g}$, where $s_g=1$ (-1) if g is unitary (anti-unitary), and have also explained how to determine the value of $\tilde{\boldsymbol{q}}_g$. To determine whether an SBZ is symmorphic or nonsymmorphic, we need to find out whether a $\boldsymbol{\theta}$ exists such that

$$-s_g\boldsymbol{\theta}+R_g\boldsymbol{\theta}\equiv\tilde{\boldsymbol{q}}_g \tag{S22}$$

holds for all $g\in\mathcal{G}$. Since operations in the unitary translation group T_U leave $\tilde{\boldsymbol{k}}$ invariant, we only need to consider the action of the coset representatives $g_1,g_2,\cdots,g_N$ of $\mathcal{G}/T_U$.

To proceed, we write the matrix R_g and vectors $\tilde{\boldsymbol{q}}_g$ on the basis of reciprocal lattice vectors $\boldsymbol{b}_i$'s. $R_g\boldsymbol{b}_i$ can be written as $\sum_{j=1}^3\boldsymbol{b}_jM_{g;ji}$, where $M_{g;ji}$ are integers since the spatial operations must be compatible with the lattice vectors. As

shown in Sec. III C in the main text, the component of $\tilde{\boldsymbol{q}}_g$ must be a half-integer on the basis of $\boldsymbol{b}_i$'s, We can construct a $3N \times 3$ matrices A and a $3N \times 1$ vector Q

$$C = \begin{pmatrix} M_{g_1} - s_{g_1} I \\ \vdots \\ M_{g_N} - s g_N I \end{pmatrix}, \quad Q = \begin{pmatrix} \tilde{\boldsymbol{q}}_{g_1} \\ \vdots \\ \tilde{\boldsymbol{q}}_{g_N} \end{pmatrix}. \tag{S23}$$

With this construction, solving Eq. (S22) is equivalent to finding a $\boldsymbol{\theta}$ such that $C\boldsymbol{\theta} - Q$ is an integer vector. A necessary condition of $C\boldsymbol{\theta} - Q$ being an integer vector is that $2C\boldsymbol{\theta}$ is an integer vector because $2Q$ is an integer matrix. To find all vectors $\boldsymbol{\theta}$ satisfying $2C\boldsymbol{\theta}$ being an integer vector, we can apply the Smith decomposition to the matrix $2C$, given as:

$$2C = SAT\,, \tag{S24}$$

where S, A, T are $3N \times 3N$, $3N \times 3$, and 3×3 integer matrices, respectively. Matrix A is diagonal, given as

$$A = \begin{pmatrix} \alpha_1 & 0 & 0 \\ 0 & \alpha_2 & 0 \\ 0 & 0 & \alpha_3 \\ 0 & 0 & 0 \\ \vdots & \vdots & \vdots \\ 0 & 0 & 0 \end{pmatrix}, \tag{S25}$$

and the diagonal elements are non-negative integers that satisfy that α_{i+1} being divisible by α_i $(i = 1, 2)$. Some of α_i can be zero, and without loss of generality, we assume that $\alpha_j > 0\,(j \le r \le 3)$ and $\alpha_j = 0\,(j > r)$. S and T satisfy that $|\det(S)| = |\det(T)| = 1$, which means that S^{-1} and T^{-1} are also integer matrices. Thus, the condition for $2C\boldsymbol{\theta} = SAT\boldsymbol{\theta}$ being an integer vector is equivalent to $AT\boldsymbol{\theta}$ being an integer vector. If $AT\boldsymbol{\theta}$ is an integer vector, $AT\boldsymbol{\theta}$ must be in the form

$$AT\boldsymbol{\theta} = \begin{pmatrix} m_1 \\ \vdots \\ m_r \\ 0 \\ \vdots \\ 0 \end{pmatrix} \text{ with } m_i \in \mathbb{Z}\,(i \le r). \tag{S26}$$

We then need to determine whether an $AT\boldsymbol{\theta}$ of this form can satisfy $S(\frac{1}{2}AT\boldsymbol{\theta}) - Q$ to be an integer vector. Enumerating all integers m_i is unnecessary because if m_i's are all even, $S(\frac{1}{2}AT\boldsymbol{\theta})$ must be an integer matrix. Thus, we only need to test the cases $m_i \in \{0, 1\}$. If there exist $m_1, \cdots, m_r$ that satisfy $S(\frac{1}{2}AT\boldsymbol{\theta}) - Q$ to be an integer vector, the SBZ is symmorphic, and $\boldsymbol{\theta}$ is given by

$$\boldsymbol{\theta} = T^{-1} \begin{pmatrix} m_1/\alpha_1 \\ \vdots \\ m_r/\alpha_r \\ \vdots \\ 0 \end{pmatrix}. \tag{S27}$$

Otherwise, the SBZ is nonsymmorphic.

Energy bands in non-commuting SBZ

In this section, we investigate the electron bands in the SSG N143.16.1 M1. This SSG can be generated by $\hat{t}_1 = \{\sigma_y|1|\boldsymbol{a}_1\}$, $\hat{t}_2 = \{\sigma_x|1|\boldsymbol{a}_2\}$, $\hat{t}_3 = \{\sigma_0|1|\boldsymbol{a}_2\}$, and $\hat{C}_{3z} = \{e^{i\frac{\pi}{3}\boldsymbol{n}\cdot\boldsymbol{\sigma}}|3^+_{001}|\boldsymbol{0}\}$ with $\boldsymbol{n} = \frac{\sqrt{3}}{3}(\boldsymbol{e}_x + \boldsymbol{e}_y + \boldsymbol{e}_z)$. Note that in Sec. III A in the main text, $\hat{U}_{t_1}$, $\hat{U}_{t_2}$ are chosen as $i\sigma_y$, $i\sigma_z$. Compared to that, we apply a gauge transformation, which can simplify the form of the transformation of SSG momentum. Bloch states are defined by using the eigenvalues of the commuting operators $\hat{t}_1$, $\hat{t}_2^2$, and $\hat{t}_3$, as shown in Eq. (37) in the main text. Let us consider the action of $\hat{C}_{3z}$ on the Bloch states. In Sec. III C 2 in the main text, we showed $|\psi(\tilde{\boldsymbol{k}})\rangle$ and $\hat{t}_2\,|\psi(\tilde{\boldsymbol{k}})\rangle$ share the same energy $E(\tilde{\boldsymbol{k}})$, Thus, their linear combination is also an eigenstate with energy $E(\tilde{\boldsymbol{k}})$. Let $|\phi_\pm\rangle = |\psi(\tilde{\boldsymbol{k}})\rangle \pm e^{-i(\tilde{k}_2+\pi)/2}\hat{t}_2\,|\psi(\tilde{\boldsymbol{k}})\rangle$, and we will prove $\hat{C}_{3z}\,|\phi\rangle$ is an Bloch state. We can verify that $\hat{C}_{3z}^{-1}\hat{t}_1\hat{C}_{3z} = i\hat{t}_1^{-1}\hat{t}_2^{-1}$, $\hat{C}_{3z}^{-1}\hat{t}_2^2\hat{C}_{3z} = \hat{t}_1^2$, and $\hat{C}_{3z}^{-1}\hat{t}_1\hat{C}_{3z} = \hat{t}_3$ Then,

$$\begin{aligned} &\hat{C}_{3z}^{-1}\hat{t}_1\hat{C}_{3z}\,|\phi_\pm\rangle \\ &= i\hat{t}_1^{-1}\left(\pm e^{-i(\tilde{k}_2+\pi)/2}\,|\psi(\tilde{\boldsymbol{k}})\rangle + \hat{t}_2\hat{t}_2^{-2}\,|\psi(\tilde{\boldsymbol{k}})\rangle\right) \\ &= i\hat{t}_1^{-1}\left(\pm e^{-i(\tilde{k}_2+\pi)/2}\,|\psi(\tilde{\boldsymbol{k}})\rangle + \hat{t}_2 e^{-i\tilde{k}_2}\,|\psi(\tilde{\boldsymbol{k}})\rangle\right) \\ &= \pm e^{-i(2\tilde{k}_1+\tilde{k}_2)/2}\,|\psi(\tilde{\boldsymbol{k}})\rangle + \hat{t}_2 e^{-i\tilde{k}_2 - i\tilde{k}_1 - i\pi/2}\,|\psi(\tilde{\boldsymbol{k}})\rangle \\ &= \pm e^{-i(2\tilde{k}_1+\tilde{k}_2)/2}\,|\phi_\pm\rangle\,. \end{aligned} \tag{S28}$$

In this derivation, we utilize the fact that $\hat{t}_2\,|\psi(\tilde{\boldsymbol{k}})\rangle$ is a Bloch state with SSG momentum $\tilde{\boldsymbol{k}} + \frac{1}{2}\boldsymbol{b}_1$. Similarly, we can show that $\hat{C}_{3z}^{-1}\hat{t}_2^2\hat{C}_{3z}\,|\phi_\pm\rangle = e^{2\tilde{k}_1}\,|\phi_\pm\rangle$ and $\hat{C}_{3z}^{-1}\hat{t}_3\hat{C}_{3z}\,|\phi_\pm\rangle = e^{\tilde{k}_3}\,|\phi_\pm\rangle$. Thus, the $\hat{C}_{3z}\,|\phi_+\rangle$ ($|\phi_-\rangle$) is a Bloch state with SSG momentum $\tilde{\boldsymbol{k}}' = \tilde{k}_1'\boldsymbol{b}_1 + \tilde{k}_2'\frac{1}{2}\boldsymbol{b}_2 + \tilde{k}_3'\boldsymbol{b}_3$, where $\tilde{k}_1' = -(2\tilde{k}_1 + \tilde{k}_2)/2$ $\left(\tilde{k}_1' = -(2\tilde{k}_1 + \tilde{k}_2 + 2\pi)/2\right)$, $\tilde{k}_2' = 2\tilde{k}_1$, and $\tilde{k}_3' = 2\tilde{k}_3$. The momenta after tranformation can also be written as $\tilde{\boldsymbol{k}}'$ are $R_{\boldsymbol{z}}(2\pi/3)\tilde{\boldsymbol{k}}$ $\left(R_{\boldsymbol{z}}(2\pi/3)\tilde{\boldsymbol{k}} + \frac{1}{2}\boldsymbol{b}_1\right)$.

D. MORE DISCUSSIONS ON THE MAGNETIC MATERIALS

Identification of SSGs for magnetic materials

In this section, we summarize how to find the SSG (or qSSG) of a crystalline magnetic structure. We will first show an algorithm that can find all possible O(3) matrices O that can produce the map

$$O\boldsymbol{S}_{P_i} = \boldsymbol{S}_i \quad (i = 1, 2, \cdots, N)\,, \tag{S29}$$

given a finite number of magnetic moments $\boldsymbol{S}_1, \cdots, \boldsymbol{S}_N$ and their permutation $\boldsymbol{S}_{P_1}, \cdots, \boldsymbol{S}_{P_N}$. As discussed in Sec. II A in the main text, in the case that $\boldsymbol{S}_i$'s are non-co-planar, if O exists, it must be unique. For the coplanar (*e.g.,* along the

x, y plane) and collinear (*e.g.,* along the z direction) cases, O must be diagonal in the form $\mathrm{diag}\,(O_{xy}, O_z)$. Meanwhile, only O_{xy} (O_z) influences the transformation in the coplanar (collinear) case, and if O_{xy} (O_z) exists, it must be unique. Thus, we only need to find an O(2) (O(1)) matrix O_{xy} (O_z) if $\boldsymbol{S}_i$'s are coplanar (collinear).

For the non-coplanar case, without loss of generality, we assume that $\boldsymbol{S}_1, \boldsymbol{S}_2, \boldsymbol{S}_3$ are linearly independent. The only 3×3 matrix $\mathcal{V}$ that can transform linearly independent vectors $\boldsymbol{S}_1, \boldsymbol{S}_2, \boldsymbol{S}_3$ to $\boldsymbol{S}_{P_1}, \boldsymbol{S}_{P_2}, \boldsymbol{S}_{P_3}$ is given by

$$\mathcal{V} = (\boldsymbol{S}_{P_1},\, \boldsymbol{S}_{P_2},\, \boldsymbol{S}_{P_3})\,(\boldsymbol{S}_1,\, \boldsymbol{S}_2,\, \boldsymbol{S}_3)^{-1}\ . \tag{S30}$$

If $\mathcal{V} \in \mathrm{O}(3)$, *i.e.,* $\mathcal{V}\mathcal{V}^T = I$ and $\mathcal{V}\boldsymbol{S}_{P_i} = \boldsymbol{S}_i$ is satisfied for all $i > 3$, we can choose the unique O(3) matrix $O = \mathcal{V}$. Otherwise, no O(3) matrix can satisfy Eq. (S29). For the coplanar case, without loss of generality, we assume that $\boldsymbol{S}_1, \boldsymbol{S}_2$ are linearly independent. The unique 2×2 matrix $\mathcal{V}$ that can transform linearly independent vectors $\boldsymbol{S}_1, \boldsymbol{S}_2$ to $\boldsymbol{S}_{P_1}, \boldsymbol{S}_{P_2}$ is given by

$$\mathcal{V}_{xy} = (\boldsymbol{S}_{P_1},\, \boldsymbol{S}_{P_2})\,(\boldsymbol{S}_1,\, \boldsymbol{S}_2)^{-1}\ , \tag{S31}$$

where $\boldsymbol{S}_i$ and $\boldsymbol{S}_{P_i}$ $(i = 1, 2)$ have zero z component and are written as 2×1 column vector. If $\mathcal{V}_{xy} \in \mathrm{O}(2)$, and $\mathcal{V}_{xy}\boldsymbol{S}_{P_i} = \boldsymbol{S}_i$ is satisfied for all $i > 2$, we can choose the unique O(2) matrix $O_{xy} = \mathcal{V}_{xy}$. Otherwise, Eq. (S29) cannot be satisfied. For the collinear case, if $\boldsymbol{S}_{P_i} = \boldsymbol{S}_i$ ($\boldsymbol{S}_{P_i} = -\boldsymbol{S}_i$) is satisfied for all i, $O_z = 1$ (-1). Otherwise, Eq. (S29) cannot be satisfied.

Then, we present the detailed algorithm for finding the SSG of a magnetic structure. Here, we use a non-coplanar magnetic structure as an example. The algorithm for the coplanar (collinear) cases is very similar, and the only difference is that a spin operation is represented by an O(2) (O(1)) matrix but not an O(3) matrix.

1. Find the space group G_{latt} of the crystalline structure without the magnetic moments. Let $\boldsymbol{a}_{L1}, \boldsymbol{a}_{L2}, \boldsymbol{a}_{L3}$ be the lattice vectors of G_{latt}, and T_{latt} be the translation subgroup of G_{latt}.

2. Find the lattice vectors $\boldsymbol{a}_{M1}, \boldsymbol{a}_{M2}, \boldsymbol{a}_{M3}$ of magnetic unit cell. A finite number of magnetic moments $\boldsymbol{S}(\boldsymbol{r}_1), \cdots, \boldsymbol{S}(\boldsymbol{r}_N)$ exist in a magnetic unit cell, and the magnetic moments satisfy $\boldsymbol{S}(\boldsymbol{r}_i) = \boldsymbol{S}(\boldsymbol{r}_i + \boldsymbol{a}_{Mj})$ $(i \le N, j \le 3)$, and translations along the $\boldsymbol{a}_{Mi}$'s generates a subgroup T_M of the translation group T.

3. Some spatial rotation in G_{latt} is not compatible with $\boldsymbol{a}_{Mi}$'s, *i.e.,* cannot be written as an integer matrix in their lattice coordinate. Only spatial operations compatible with $\boldsymbol{a}_{Mi}$'s can belong to the parent space group of the SSG (see proof in the end of this section), and these spatial operations form a subgroup P_{latt} of G_{latt}. Let $p_1, p_2, \cdots, p_m$ be the coset representatives of the quotient group P_{latt}/T_M.

4. After the spatial operation p_j, the magnetic moments in the position $\boldsymbol{r}_1, \cdots, \boldsymbol{r}_N$ are $\boldsymbol{S}(p_j^{-1}\boldsymbol{r}_1), \cdots, \boldsymbol{S}(p_j^{-1}\boldsymbol{r}_N)$, which are a permutation of $\boldsymbol{S}(\boldsymbol{r}_1), \cdots, \boldsymbol{S}(\boldsymbol{r}_N)$. Using the algorithm introduced above, we can determine whether an O(3) matrix O satisfying $O\boldsymbol{S}(g_j^{-1}\boldsymbol{r}_i) = \boldsymbol{S}(\boldsymbol{r}_i)\,\forall i \le N$ exists and find its value if O exists. Suppose for operation $p_{i_1}, p_{i_2}, \cdots, p_{i_n}$ $(n \le m)$, the O(3) matrix satisfying the condition exists and are given as $O_{p_{i_1}}, \cdots, O_{p_{i_n}}$.

5. Up to now, we obtain the parent space group of P the SSG, which are the union of these cosets

$$p_{i_1}T_M,\, p_{i_2}T_M,\, \cdots,\, p_{i_n}T_M\ . \tag{S32}$$

The spin operations in each coset are the same, which are

$$O_{p_1}, O_{p_2}, \cdots, O_{p_n}\ , \tag{S33}$$

respectively. Note that some of $p_{i_1}, p_{i_2}, \cdots, p_{i_n}$ might be translation operations with a non-trivial spin operation.

These spin operations, which are represented by O(N) ($N = 1, 2, 3$) matrices, form a representation of the parent space group. When classifying SSGs, we categorize O(N) representations into different types by the constituent irreps, and the nomenclature of SSGs is also based on the irreps. Thus, to know the specific SSG that the O(N) representation corresponds to, we should decompose the O(N) representations into irreps. To this end, we identify the momenta of the representation by studying the representation matrices of translations. Let $\boldsymbol{a}_i$ $(i = 1, 2, 3)$ be the lattice vectors of the parent space group, and $O_{\boldsymbol{a}_i}$'s be their representation matrices. $O_{\boldsymbol{a}_i}$'s must commute with each other, because $O_{\boldsymbol{a}_i}O_{\boldsymbol{a}_j}$ and $O_{\boldsymbol{a}_j}O_{\boldsymbol{a}_i}$ both equal the representation matrix of $\{1|\boldsymbol{a}_i + \boldsymbol{a}_j\}$. Thus, $O_{\boldsymbol{a}_i}$'s $(i = 1, 2, 3)$ share a set of common eigenvectors $|v_j\rangle$ $(j = 1, \cdots, N)$: $O_{\boldsymbol{a}_i}\,|v_j\rangle = e^{i2\pi\lambda_{ij}}\,|v_j\rangle$ $(\lambda_{ij} \in [0, 1))$. The jth $(j \le N)$ momentum is given by $\boldsymbol{k}_j = \sum_{i=1}^{3} \boldsymbol{b}_i\lambda_{ij}$, where $\boldsymbol{b}_j$ satisfying $\boldsymbol{a}_i \cdot \boldsymbol{b}_j = 2\pi\delta_{i,j}$ is the reciprocal lattice vector. After knowing the momenta $\boldsymbol{k}_j$, we can reduce the O(N) representations to the allowable representation $\rho_{\boldsymbol{k}_j}$ of the little group $P^{\boldsymbol{k}_j}$ of $\boldsymbol{k}_j$. Note that "allowable" means that translation $\{1|\boldsymbol{v}\}$ is represented by $e^{i\boldsymbol{k}_j\cdot\boldsymbol{v}}I$. Suppose that T is the translation subgroup of the parent space group, and the little group of $P^{\boldsymbol{k}_j}$ consists of $p'_1T, p'_2T, \cdots, p'_{n'}T$, and the O($N$) representation matrix of p'_i is $O_{p'_i}$. The representation matrix $D_{\rho_{\boldsymbol{k}_j}}(p'_i)$ of p'_i in $\rho_{\boldsymbol{k}_j}$ should be given by $Q_{\boldsymbol{k}_j}O_{p'_i}Q_{\boldsymbol{k}_j}$, where $Q_{\boldsymbol{k}_j} = \sum_{i\le N, \boldsymbol{k}_i=\boldsymbol{k}_j} |v_i\rangle\,\langle v_i|$ is the projection operator to the eigenspace of the momentum $\boldsymbol{k}_j$. Knowing the little group representation $\rho_{\boldsymbol{k}_j}$, we can easily reduce it to the irreps of $P^{\boldsymbol{k}}$ with the character theory. Repeating this process for all $\boldsymbol{k}_j$, we can reduce the O(N) representation to the irreps of the little groups and hence determine which SSG it corresponds to.

In the following, we will prove that the spatial-rotation part R_g of an SSG operation $g \in \mathcal{G}$ must be compatible with lattice vectors $\boldsymbol{a}_{Mi}$'s of pure translation subgroup $T_M = \{\{I|1|\boldsymbol{v}\}\,|\,\{I|1|\boldsymbol{v}\} \in \mathcal{G}\}$. If $t = \{I|1|\boldsymbol{v}\} \in T_M$, $\boldsymbol{v}$ must be in the form $\sum_i^3 m_i\boldsymbol{a}_{Mi}$ with $m_i \in \mathbb{Z}$. The conjugate operation of $t = \{I|R|\boldsymbol{v}\}$ under a generic SSG operation

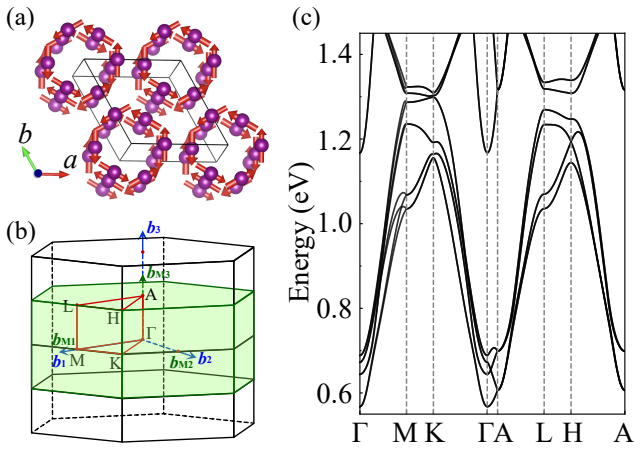


FIG. S.2. (a) The magnetic structure of $InMnO_3$ showing only the magnetic atoms (Mn). (b)The first BZs in the SSG reciprocal lattice $\boldsymbol{b}_i$'s (black lines) and MSG reciprocal lattice $\boldsymbol{b}_{Mi}$'s (green region). (c) The first-principle calculation energy bands.

$g = \{X_g U_g | R_g | \boldsymbol{v}_g\}$ is $g^{-1}tg = \{I|1|R_g^{-1}\boldsymbol{v}\}$, which still belongs to T_M. Thus, for any R_g, $R_g^{-1}\boldsymbol{v}$ must be in the form $\sum_i^3 m_i' \boldsymbol{a}_{Mi}$ with $m_i' \in \mathbb{Z}$, and it is the definition of rotation being compatible with lattice vectors.

Nonsymmorphic SBZ in $InMnO_3$

$InMnO_3$ (No. 1.525) has a hexagonal lattice structure. Let $\boldsymbol{a}_1, \boldsymbol{a}_2, \boldsymbol{a}_3$ be its lattice vectors along the three directions. In the magnetic phase, the spin moments lie in the x, y plane [2]. In each layer along the z direction, spins form a triangular antiferromagnetic structure, and spin moments related by lattice translation $\{1|\boldsymbol{a}_3\}$ have opposite directions. The MSG of this structure is $P_{2c}31m'$ (No. 157.5.1288). The magnetic unit cell is twice that in the paramagnetic phase, in which the MSG lattice vectors $\boldsymbol{a}_{M1,M2} = \boldsymbol{a}_{1,2}$, and $\boldsymbol{a}_{M3} = 2\boldsymbol{a}_3$. Fig. S.2(c) shows the energy bands obtained from the first-principle calculation. These bands are plotted in the BZ of the MSG, and the high symmetry points in MSG BZ are labeled in Fig. S.2(b). They exhibit the following features that MSG cannot explain: (i) Along the line Γ-K-M, the bands are two-fold degenerate. However, the little co-group of the MSG along this line is the point group m, which only has two 1D coirreps. (ii) At points A and H, the degree of degeneracy is either two or four. The little co-group of the MSG on A is $3m1'$ (the direct product point group $3m$ and Z_2^T TRS group), and the little co-group on H is $3m$. Both of them only have two 1D coirreps and one 2D coirrep. (iii) The bands are at least two-fold degenerate along the path A-L-H-A. However, the little co-groups on A-L and L-H-A are m' (the Z_2^T group generated by the joint operation of mirror and time-reversal) and m, respectively, either of which only has a 1D coirrep.

The SSG of this structure is P157.6.2 A3, whose parent space group is $P3m1$. The SSG shares the same lattice vectors $\boldsymbol{a}_i$'s as the space group in the paramagnetic phase. Table II shows the generators of this SSG and how an SSG momentum $\tilde{\boldsymbol{k}}$ is transformed under these operations. The mirror operation $\hat{M}_{\boldsymbol{n}_{1\bar{1}0}} = \{\boldsymbol{n}_{1\bar{1}0}\cdot\boldsymbol{\sigma}|m_{1\bar{1}0}|\boldsymbol{0}\}$ ($\boldsymbol{n}_{1\bar{1}0} = \sqrt{3}/2\boldsymbol{e}_x - 1/2\boldsymbol{e}_y$) acts a glide operation on the $\tilde{\boldsymbol{k}}$. Therefore, the SBZ is nonsymmorphic. Before investigating the energy bands in the SBZ, we study the relationship between SSG and crystal momentum. Within our choice of spin rotation (see the first two rows of Table II), translations $\{1|\sum_{i=1}^3 m_i\boldsymbol{a}_{Mi}\}$ are always accompanied by σ_0 without an extra phase. Thus, the crystal momentum $\boldsymbol{k}$ equals the SSG momentum $\tilde{\boldsymbol{k}}$. On the other hand, the first SSG BZ is twice as large as the magnetic BZ, and $\boldsymbol{b}_3 = 2\boldsymbol{b}_{M3}$, indicating that SSG momenta $\tilde{\boldsymbol{k}}$ and $\tilde{\boldsymbol{k}} + 1/2\boldsymbol{b}_3$ are considered as equivalent in the magnetic BZ. Then, we study the symmetries of different $\tilde{\boldsymbol{k}}$. Let $\tilde{\boldsymbol{k}}_{\Gamma-\mathrm{K}} = u\boldsymbol{b}_1 + u\boldsymbol{b}_2$ with $u \in [0,1)$. $\hat{M}_{\boldsymbol{n}_{1\bar{1}0}}$ transforms $\tilde{\boldsymbol{k}}_{\Gamma-\mathrm{K}}$ to $\tilde{\boldsymbol{k}}'_{\Gamma-\mathrm{K}} = \tilde{\boldsymbol{k}}_1 + \frac{1}{2}\boldsymbol{b}_1$, implying that $E_n(\tilde{\boldsymbol{k}}_{\Gamma-\mathrm{K}}) = E_n(\tilde{\boldsymbol{k}}'_{\Gamma-\mathrm{K}})$ in the SBZ. Similarly, $\hat{M}_{\boldsymbol{n}_{1\bar{1}0}}\hat{C}_{3z}$ ($\hat{C}_{3z} = -\{e^{i\frac{\pi}{3}\sigma_z}|3^+_{001}|\boldsymbol{0}\}$) transforms $\tilde{\boldsymbol{k}}_{\mathrm{K}-\mathrm{M}} = (1/3+v)\boldsymbol{b}_1 + (1/3-2v)\boldsymbol{b}_2$ with $v \in [0, 1/6]$ to $\tilde{\boldsymbol{k}}_{\mathrm{K}-\mathrm{M}} + 1/2\boldsymbol{b}_3$. After folding the band, this symmetry explains the feature (i) in the magnetic BZ. Let $\tilde{\boldsymbol{k}}_{\mathrm{A}} = \frac{1}{4}\boldsymbol{b}_3 = \frac{1}{2}\boldsymbol{b}_{M3}$, $\tilde{\boldsymbol{k}}_{\mathrm{H}} = \frac{1}{3}(\boldsymbol{b}_1+\boldsymbol{b}_2)+\frac{1}{4}\boldsymbol{b}_3$. Both $\tilde{\boldsymbol{k}}_{\mathrm{A}}$ and $\tilde{\boldsymbol{k}}_{\mathrm{H}}$ have the symmetries $\hat{\mathcal{T}} = \{TU_{\boldsymbol{z}}(\pi)|1|\boldsymbol{0}\}$ and $\hat{C}_{3z}$. The little co-groups of the SSG at $\tilde{\boldsymbol{k}}_{\mathrm{A,H}}$ have one 1D coirrep ($D(\hat{C_{3z}}) = 1$) and one 2D coirrep ($D(\hat{C}_{3z}) = \mathrm{diag}(e^{i\frac{2\pi}{3}}, e^{i\frac{4\pi}{3}})$). Due to $\hat{M}_{\boldsymbol{n}_{1\bar{1}0}}$, $E_n(\tilde{\boldsymbol{k}}_{\mathrm{A,H}}) = E_n(\tilde{\boldsymbol{k}}_{\mathrm{A,H}} + \frac{1}{2}\boldsymbol{b}_3)$. The feature (ii) in the magnetic BZ has been successfully explained. Let $\tilde{\boldsymbol{k}}_{\mathrm{A}-\mathrm{L}} = w\boldsymbol{b}_1 + \frac{1}{4}\boldsymbol{b}_3$ with $w \in [0,1)$. $\hat{\mathcal{T}}\hat{M}_{\boldsymbol{n}_{1\bar{1}0}}\hat{C}_{3z}$ transforms $\tilde{\boldsymbol{k}}_{\mathrm{A}-\mathrm{L}}$ to $\tilde{\boldsymbol{k}}'_{\mathrm{A}-\mathrm{L}} = w\boldsymbol{b}_1 - \frac{1}{4}\boldsymbol{b}_3$. Note that $\tilde{\boldsymbol{k}}_{\mathrm{A}-\mathrm{L}}$ and $\tilde{\boldsymbol{k}}'_{\mathrm{A}-\mathrm{L}}$ differ by $\frac{1}{2}\boldsymbol{b}_1$ and hence correspond to the same point in the magnetic BZ. This explains the two-fold degeneracy on the line A-L in magnetic BZ. The two-fold-degeneracy on the L-H-A can be explained in the same manner as we adopted for the line Γ-K-M.

TABLE II. The generators of the SSG (P157.6.2 A3) of coplanar magnetic material $InMnO_3$. The last row is for the pure-spin-operation group $\mathcal{S}$. The last column shows how the SSG momentum is transformed under the SSG operations. In the forth row, $\boldsymbol{n}_{1\bar{1}0} = \sqrt{3}/2\boldsymbol{e}_x - 1/2\boldsymbol{e}_y$.

SSG operation	Spin operations on electrons	Transformation of SSG momentum $\tilde{\boldsymbol{k}}$
$\{I\|1\|\boldsymbol{a}_{1,2}\}$	σ_0	$\tilde{\boldsymbol{k}}$
$\{U_{\boldsymbol{z}}(\pi)\|1\|\boldsymbol{a}_3\}$	σ_z	$\tilde{\boldsymbol{k}}$
$\{U_{\boldsymbol{z}}(\frac{2\pi}{3})\|3^+_{001}\|\boldsymbol{0}\}$	$-e^{i\frac{\pi}{3}\sigma_z}$	$R_{\boldsymbol{z}}(\frac{2\pi}{3})\tilde{\boldsymbol{k}}$
$\{U_{\boldsymbol{x}}(\pi)\|m_{1\bar{1}0}\|\boldsymbol{0}\}$	$\boldsymbol{n}_{1\bar{1}0}\cdot\boldsymbol{\sigma}$	$-R_{\boldsymbol{n}_{1\bar{1}0}}(\pi)\tilde{\boldsymbol{k}} + \frac{1}{2}\boldsymbol{b}_3$
$\{TU_{\boldsymbol{z}}(\pi)\|1\|\boldsymbol{0}\}$	$\sigma_x\mathcal{K}$	$-\tilde{\boldsymbol{k}} + \frac{1}{2}\boldsymbol{b}_3$

Extra band degeneracy in non-coplanar Mn_3Ge

We use Mn_3Ge (No. 0.203) in a non-coplanar magnetic structure as an example to show that SSGs can explain the extra degeneracy of electron bands in non-coplanar magnetism.

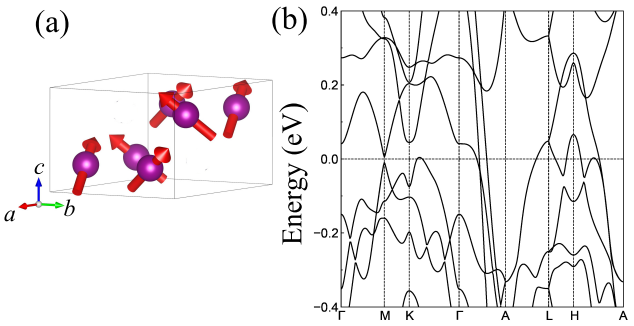


FIG. S.3. (a) The non-coplanar magnetic structure of Mn_3Ge showing only the magnetic atoms (Mn). (b) The first-principle calculation energy bands.

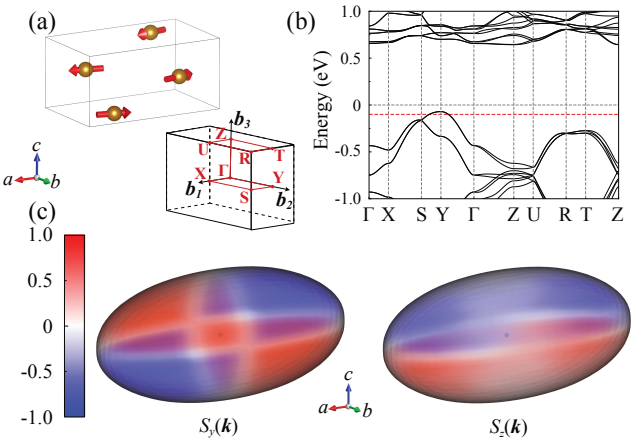


FIG. S.4. (a) Upper left: the magnetic structure of $FePO_4$ showing only the magnetic atoms (Fe). Bottom right: the BZ of $FePO_4$. (b) The first-principle energy bands of $FePO_4$ along the path in the BZ shown in subfigure (a). (c) The spin texture $\vec{S}(\boldsymbol{k})$ on the Fermi surface centered at the Y point with hole doping ($E = -0.08$eV). The y and z components ($S_y(\boldsymbol{k})$ and $S_z(\boldsymbol{k})$) are separately plotted. The color represents normalized $S_\mu(\boldsymbol{k})$ ($\mu = y, z$), given as $S_\mu(\boldsymbol{k})/\left(\max_{\boldsymbol{k}} |S_\mu(\boldsymbol{k})|\right)$. $S_\mu(\boldsymbol{k})$ forms an 1D real irrep of mmm.

Under the ambient pressure, $MnGe_3$ has a coplanar triangular antiferromagnetic structure [see Figs. 7 (a) in the main text]. It was found that spin moments acquire an out-of-plane canting angle θ under high pressure, and θ gradually change with the increase of the pressure [3], and the MSG of non-coplanar Mn_3Ge is $C2'/m'$ (No. 12.5.70). Since non-coplanar Structures with different θ ($\theta \neq 0$ or $\pi/2$) share similar symmetries, *i.e.,* are described by the same MSG and SSG, we study the case with $\theta = \pi/4$, without lost of generality. Fig. S.3 (b) shows the energy bands from the first-principle calculation with constrained spin directions. On line A-L ($\boldsymbol{k} = (u, 0, \pi)$), the bands are always two-fold degenerate. However, the little co-group in MSG on that line is m', which only has a 1D coirrep.

The SSG of non-coplanar Mn_3Ge is N194.6.1 $GM5^+$ with the parent space group being $P6_3/mmc$. Its generators are given as $\hat{C}_{6z} = \{e^{i\frac{\pi}{3}\sigma_z}|6^+_{001}|0,0,1/2\}$. $\hat{\mathcal{P}} = \{\sigma_0|\bar{1}|\mathbf{0}\}$, $\hat{M}_x\hat{\mathcal{T}} = \{e^{i\pi\sigma_x}i\sigma_y\mathcal{K}|m_{100}|\mathbf{0}\}$, and pure spatial translation $\{\sigma_0|1|\boldsymbol{a}_i\}$ ($i = 1, 2, 3$). The little co-group of the A-L line is generated by $\hat{M}_y\hat{\mathcal{T}} = (\hat{C}_{6z})^3\hat{M}_x\hat{\mathcal{T}} = \{i\sigma_z\mathcal{K}|m_{210}|0,0,3/2\}$ and $\hat{M}_x\hat{\mathcal{T}}$. We find that $(\hat{M}_y\hat{\mathcal{T}})^2|\psi(u,0,\pi)\rangle = -|\psi(u,0,\pi)\rangle$, leading to the Kramer's degeneracy along line A-L.

$B_{2g} \oplus B_{1u}$ spin texture in $FePO_4$

The compound $FePO_4$ (No. 0.17) crystallizes in a primitive tetragonal lattice and exhibits a coplanar magnetic material described by MSG $P2_12_12_1$ (No. 19.1.119) [4]. The spin moments are confined in x, y plane and are shown in Fig. S.4 (a). The SSG of $FePO_4$ is P62.3.24 $GM3^- \oplus GM4^+$ with the parent space group being $Pnma$. Besides $\mathcal{S}_{Z_2^T}$ [Eq. (5) in the main text] and lattice translations, the SSG is generated by $\mathcal{P} = \{U_{\boldsymbol{y}}(\pi)|\bar{1}|\mathbf{0}\}$, $M_z = \{U_{\boldsymbol{x}}(\pi)|m_{001}|1/2,0,1/2\}$, and $M_y = \{I|m_{010}|0,1/2,0\}$. The unitary lattice translations in this SSG are all accompanied by the identity spin rotation ($T_U = T_M$). Hence, the SSG momentum and crystal momentum are equivalent, and the spin textures in the SBZ and magnetic BZ are the same.

Let us consider the spin texture $\vec{S}(\boldsymbol{k})$ by the method discussed in Sec. III D in the main text. The spin-operation part of the $\mathcal{PT}$ operation is $TU_{\boldsymbol{x}}(\pi)$, which flips the $S_x(\boldsymbol{k})$ and leaves $S_{y,z}(\boldsymbol{k})$ invariant. Consequently, although spin moments are within the x, y plane in real space, the spin texture $\vec{S}(\boldsymbol{k})$'s are confined to the y, z plane in the $\boldsymbol{k}$ space. It is worth noting that this specific $\mathcal{PT}$ operation, which only forbids $S_z(\boldsymbol{k})$ but not the entire $\vec{S}(\boldsymbol{k})$, does not exist in any MSG. Therefore, the confinement of spin moments to two perpendicular planes in real and momentum space is generally impossible with only MSG symmetries. $\vec{S}(\boldsymbol{k})$ respects a point group $\tilde{P} = \{s_g R_g | g \in \mathcal{G}\}$, which is mmm in this case. The SSG requires that under $\mathcal{P}$, $\boldsymbol{S}_y(\boldsymbol{k})$ is odd, $\boldsymbol{S}_z(\boldsymbol{k})$ is even; under M_z (M_y), $\boldsymbol{S}_{y,z}(\boldsymbol{k})$ are both odd (even). Thus, $S_y(\boldsymbol{k})$ ($S_z(\boldsymbol{k})$) forms a real 1D irrep of mmm, refered to as B_{2g} (B_{1u}). The symmetry of $\vec{S}(\boldsymbol{k})$ of this material is also summarized in Sec. G. Then, we compare this analysis with the result of the first-principle calculation.

By the first-principle calculation, $FePO_4$ is identified as a band insulator [Fig. S.4 (b)]. We study the spin texture $\vec{S}(\boldsymbol{k})$ on the Fermi surface ($E = -0.08$eV) with hole doping. The equal-energy surface is centered at Y point ($\boldsymbol{k} = (0, \pi, 0)$) that is mmm-invariant. Although along the path S-Y-Γ [Fig. S.4 (b)], the energy bands are double-degenerate, but this degeneracy does not exist in generic momentum as the square of the $\mathcal{PT}$ symmetry is equal to 1. As a result, two independent hole-type Fermi surfaces exist. The features of $\vec{S}(\boldsymbol{k})$ on two Fermi surfaces are similar, and we show one of them in Fig. S.4 (c). We verify that $S_x(\boldsymbol{k}) \equiv 0$ within the numerical accuracy. The red and blue colors represent the $S_\mu(\boldsymbol{k})$ ($\mu = x, z$) is positive and negative, respectively, which are consistent with the

prediction of SSGs.

Ths spin textures on the remaining Fermi surfaces of example materials

In the main text and supplemental materials above, we showed the spin textures on one of the Fermi surfaces of Mn_3Ge, Mn_3GaN, and $FePO_4$. In the subsection, we present the spin textures on the remaining Fermi surfaces of these materials (see Figs. S.5, S.6, and S.7). One can verify that the symmetries of the spin textures are consistent with the SSG analysis in the main text.

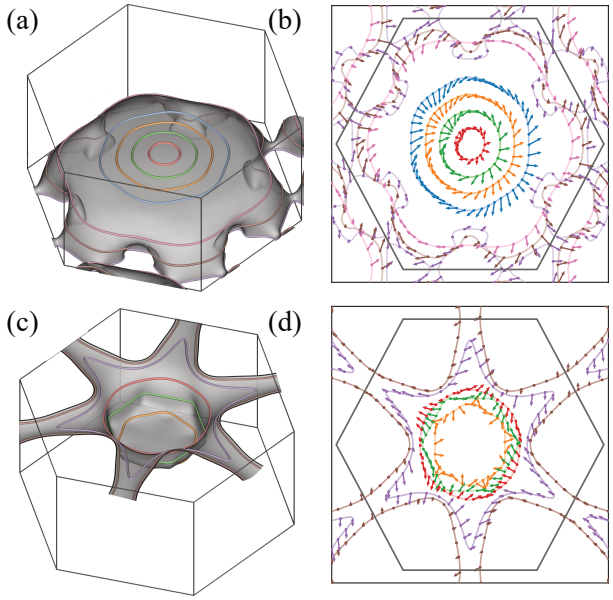


FIG. S.5. (a), (c) The second and third Fermi surfaces of Mn_3Ge. Different colors represent equal-k_z lines. (b), (d) The spin texture $\vec{S}(\boldsymbol{k})$ on equal-k_z lines labeled in the subfigures (a) and (c), respectively. Arrows represent the directions of $\vec{S}(\boldsymbol{k})$.

The spin texture from first-principle calculation with SOC

In the main text, we present the spin texture on the Fermi surface of Mn_3Ge obtained from first-principle calculation without SOC. In the momentum space, the spin texture $\boldsymbol{S}(\boldsymbol{k})$ is coplanar within the x, y plane if the effect of SOC is not included. We find that a tiny $|S_z(\boldsymbol{k})| \approx 1/10|S(\boldsymbol{k})|$ is developed in the first-principle calculation with SOC, because $\mathcal{PT} = \{TU_{\boldsymbol{z}}(\pi)|\bar{1}|0,0,0\}$ is no longer an exact symmetry. However, the spin texture of $(S_x(\boldsymbol{k}), S_y(\boldsymbol{k}))$ shows a similar vortex configuration with charge $S_V = 2$ (Fig. S.8), consistent with the analysis of SSG.

In the supplemental materials above, we study the spin textures of $FePO_4$. The SSG $\mathcal{PT}$ operation $\{TU_{\boldsymbol{x}}(\pi)|\bar{1}|\boldsymbol{0}\}$ require $\boldsymbol{S}(\boldsymbol{k})$ to be confined within y, z planes, as confirmed by the first-principle calculation without SOC. Similarly,

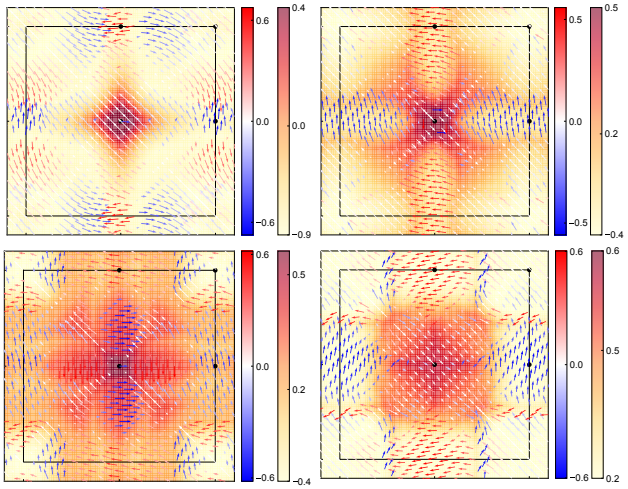


FIG. S.6. The spin texture $\vec{S}(\boldsymbol{k})$ on the $k_z = 0$ (001 plane) in the momentum space of different bands of Mn_3GaN. The background colors denote the values of $E(\boldsymbol{k})$ (see the first color bar on the right). $\vec{S}(\boldsymbol{k})$'s are not confined to the 001 plane, and the red or blue color (the second color bar on the right) represents the value of $S_z(\boldsymbol{k})$.

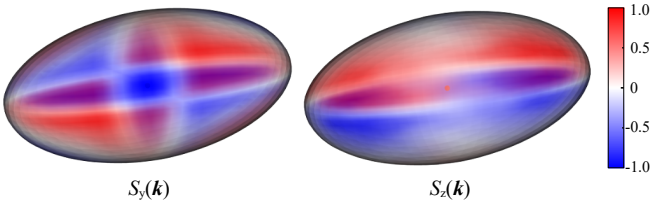


FIG. S.7. The spin texture $\vec{S}(\boldsymbol{k})$ on the second Fermi surface of $FePO_4$. The y and z components ($S_y(\boldsymbol{k})$ and $S_z(\boldsymbol{k})$) are plotted separately. The color represents normalized $S_\mu(\boldsymbol{k})$ ($\mu = y, z$), given as $S_\mu(\boldsymbol{k})/\left(\max_{\boldsymbol{k}} |S_\mu(\boldsymbol{k})|\right)$. $S_\mu(\boldsymbol{k})$ forms an 1D real irrep of mmm.

$|S_x(\boldsymbol{k})| \approx 1/3|S(\boldsymbol{k})|$ is developed in the calculation with SOC, and $(S_y(\boldsymbol{k}), S_z(\boldsymbol{k}))$ shows a similar pattern as the case without SOC. Note that the SOC-induced $|S_x(\boldsymbol{k})|/|S(\boldsymbol{k})|$ here is larger than SOC-induced $|S_z(\boldsymbol{k})|/|S(\boldsymbol{k})|$ observed in Mn_3Ge, which is explained as follows. Despite being in a coplanar magnetic structure, the spin moments of $FePO_4$ predominantly align along the x direction (see Table III). If the y components of magnetic moments were zero, the structure would be collinear anti-ferromagnetic, in which $|\vec{S}(\boldsymbol{k})| \equiv \boldsymbol{0}$. The canting towards the y direction, which induces finite $S_y(\boldsymbol{k})$ and $S_z\boldsymbol{k})$, is a perturbative effect. As a result, $|S_x(\boldsymbol{k})|$ induced by the SOC, which is also a perturbative effect, is not negligible compared to $S_y(\boldsymbol{k})$ and $S_z(\boldsymbol{k})$.

Magnetic moments from first-principle calculations

Table III compares the magnetic structures from DFT calculations to the experimental ones for all the seven materials discussed in this work.

We also perform first-principle calculations with the SOC

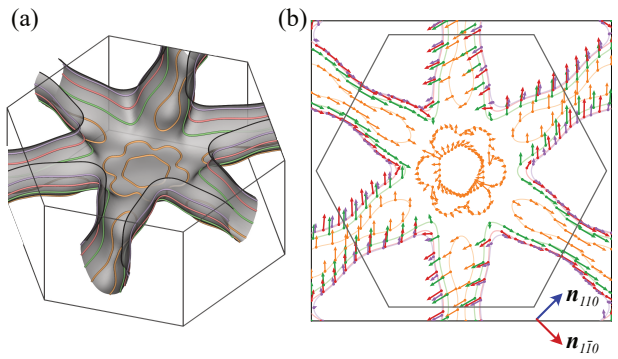


FIG. S.8. (a) The Fermi surface of Mn_3Ge obtained by the first-principle calculation with SOC. Different colors represent equal-k_z lines. (b) The spin texture $\vec{S}(\boldsymbol{k})$ on equal-k_z lines labeled in (a)

TABLE III. The magnetic moments of all the real materials studied in the main text and supplemental materials. The column "DFT" ("Exp") lists the magnetic moments obtained from the first-principle calculation (experimental measurement) with the unit being μ_B. We only list magnetic moments of inequivalent atoms.

	atom	DFT			Exp		
		M_x	M_y	M_z	M_x	M_y	M_z
$CoSO_4$	Co1	0.00	2.46	-0.76	0.00	2.99	-1.39
$CoSO_4$ (constrained)	Co1	0.00	2.34	-1.09			
$FeGe_2$	Fe1	1.52	0.00	0.00	1.21	0.00	0.00
Mn_3Ge (coplanar)	Mn1	2.278	1.316	0.000	2.29	1.33	0.00
	Mn2	-2.278	1.315	0.000	-2.29	1.33	0.00
Mn_3GaN	Mn1	0.000	1.819	-1.819	0.00	0.83	-0.83
$InMnO_3$	Mn1	0.000	3.389	0.000	0.00	3.25	0.00
	Mn2	0.000	3.389	0.000	0.00	3.25	0.00
Mn_3Ge (non-coplanar) (constrained)	Mn1	0.000	1.981	1.643	0.00	1.30	1.10
	Mn2	1.716	-0.991	1.643	1.12	-0.65	1.10
$FePO_4$	Fe1	3.85	0.86	0.00	4.06	0.90	0.00

effect for all the materials discussed in this work. Figs. S.9 and S.10 compare the energy bands without and with SOC for all the materials discussed in this work.

E. DIRAC THEORY FOR THE 3D $\mathbb{Z}_2$ TI

In this section, we discuss how the surface Dirac cone of the 3D $\mathbb{Z}_2$ TI emerges by the Dirac theory. Let us consider $y = N_y$ surface of the 3D TI, and its Hamiltonian can be obtained by coupling helical edge modes of the 2D $\mathbb{Z}_2$ TI in different layers:

$$\mathcal{H}_s(k_x, k_z) = \begin{pmatrix} v_F k_x \sigma_z & V_s(k_z) \\ V_s(k_z)^\dagger & -v_F k_x \sigma_z \end{pmatrix}, \tag{S34}$$

where $\pm v_F k_x \sigma_z$ describe the band dispersion of the helical edge states on $z = n$ and $z = n + 1/2$ ($n \in \mathbb{Z}$) planes, and $V_s(k_z)$ describe the hopping between them. This surface and H_s should respect the symmetries $\hat{G}_x = \{I|m_{100}|0, 0, 1/2\}$ and $\hat{M}_z\hat{T} = \{\mathcal{T}|m_{001}|\mathbf{0}\}$. The G_x and M_zT in this basis are given as

$$D_s(G_x) = \begin{pmatrix} 0 & e^{ik_z} \\ 1 & 0 \end{pmatrix} \otimes \sigma_0, \; D_s(M_z\mathcal{T}) = \begin{pmatrix} 1 & 0 \\ 0 & e^{ik_z} \end{pmatrix} \otimes i\sigma_y\mathcal{K}\,. \tag{S35}$$

On the G_x-and-M_zT-invariant line $k_x = 0$, $\mathcal{H}_s(0, k_z)$ satisfies

$$D_s(g)^{-1}\mathcal{H}_s(0, k_z)D_s(g) = \mathcal{H}_s(0, k_z) \quad \text{for } g = G_x, M_z\mathcal{T}\,. \tag{S36}$$

After some algebra, we find that

$$V_s(k_z) = f(k_z)e^{-ik_z/2}\sigma_0\,, \tag{S37}$$

where $f(k_z) \in \mathbb{R}$. The eigenvalues of $\mathcal{H}_s(k_x, k_z)$ are given as

$$E_s(k_x, k_z) = \sqrt{v_F^2 k_x^2 + f(k_z)^2} \tag{S38}$$

As $V_s(0)$ should equal $V(2\pi)$, $f(0) = -f(2\pi)$, which means that a k_0 exists such that $V_s(k_0) = 0$. The Dirac point should be located at $(k_x, k_z) = (0, k_0)$ or (π, k_0).

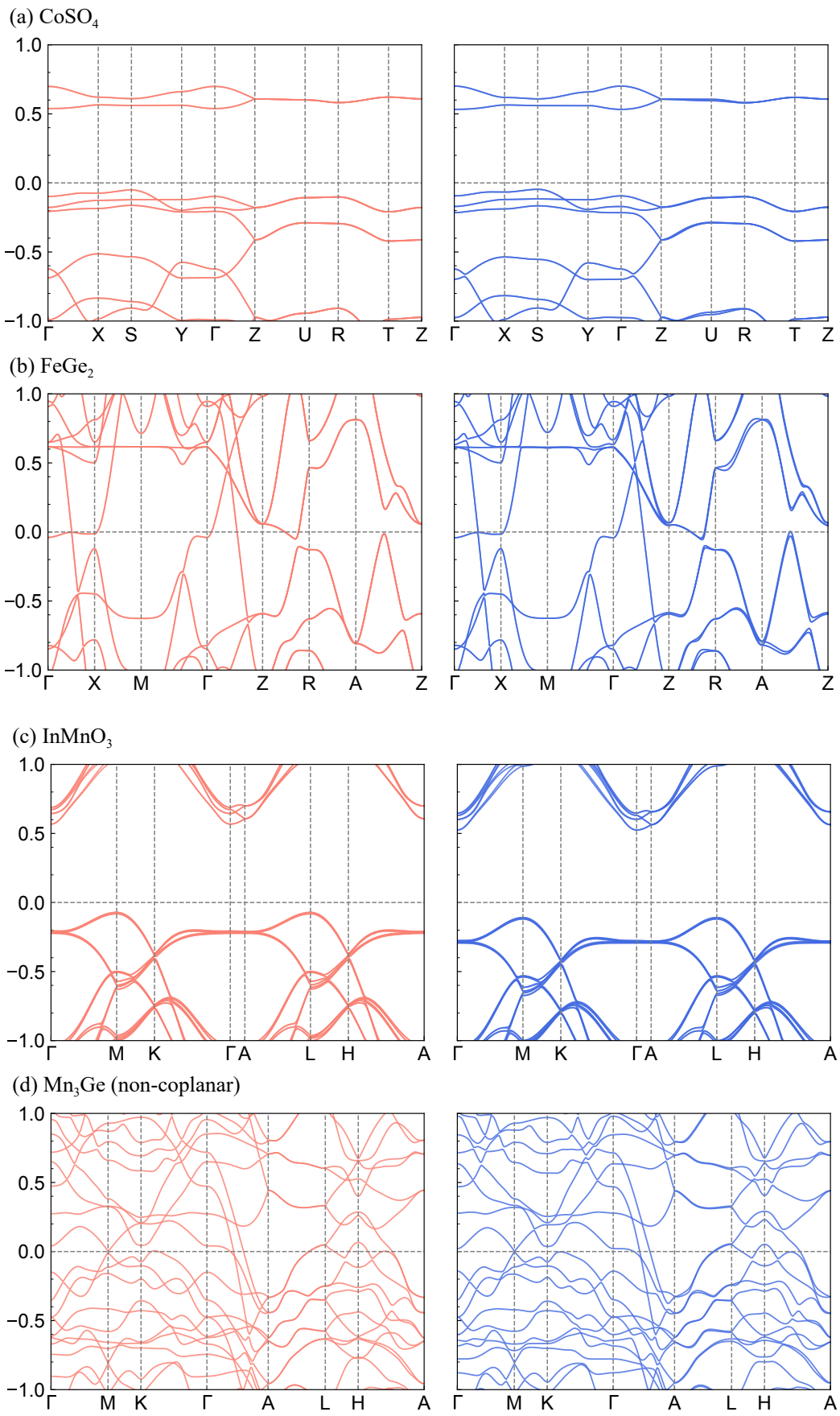


FIG. S.9. Band structures for $CoSO_4$, $FeGe_2$, $InMnO_3$, and Mn_3Ge (non-coplanar). Bands in the left and right columns are obtained without and with SOC, respectively.

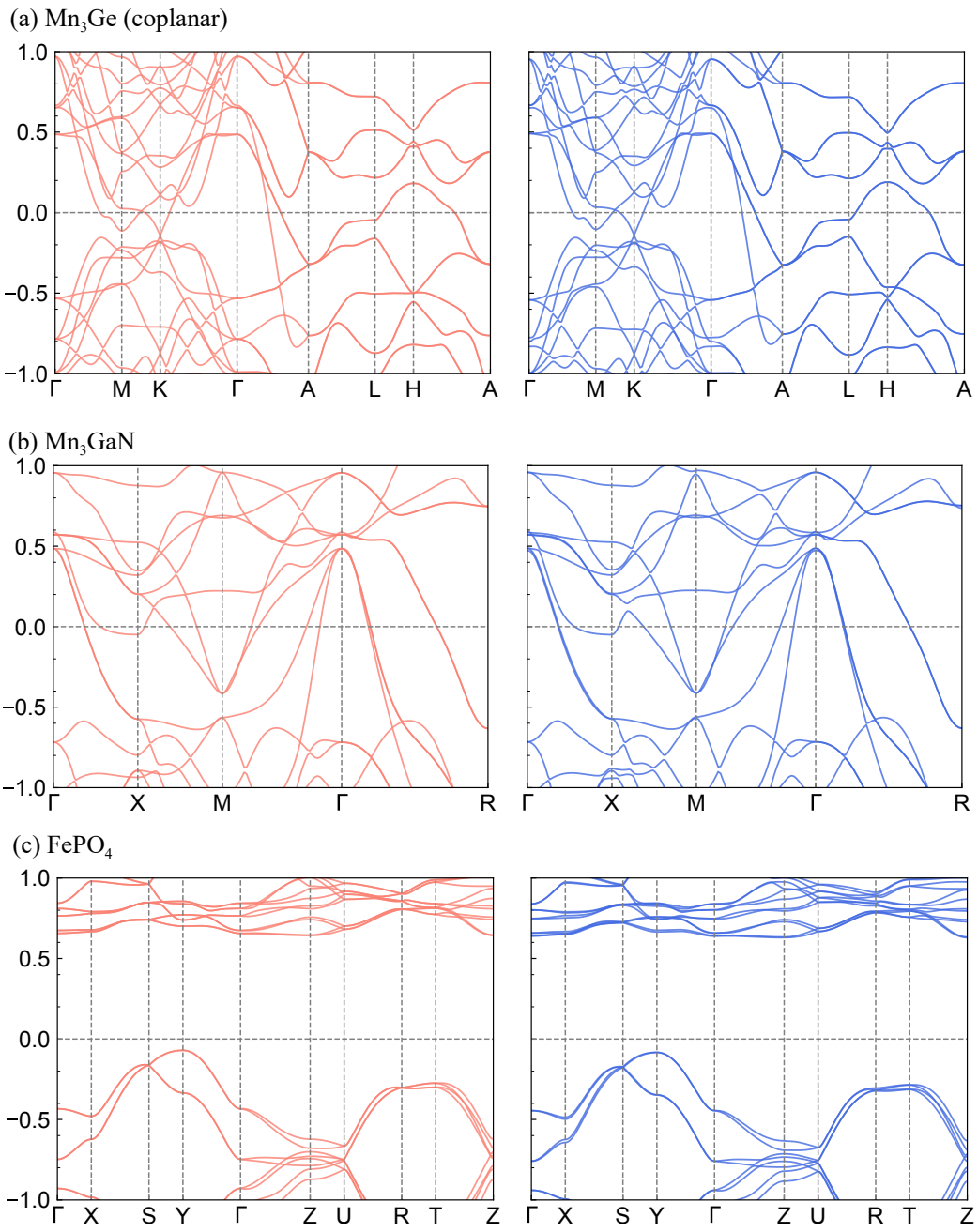


FIG. S.10. Band structures for Mn_3Ge (co-planar), Mn_3GaN, and $FePO_4$. Bands in the left and right columns are obtained without and with SOC, respectively.

F. TABLE OF SSGS

The following tables present all spin space groups (SSGs). The SSGs ($\mathcal{G}$) for collinear, coplanar, and non-coplanar magnetic structures can be represented by O(1), O(2), and O(3) representations of the parent space groups, respectively. For each parent space group, SSGs for the collinear, co-planar, and non-coplanar magnetic structures are listed in the three adjacent tables. The 230×3 tables are arranged in ascending order based on the indices of their parent space groups. Each row in the column "SSG" provides the name of an SSG, in the form $\alpha\mathcal{I}.\mathcal{J}.\mathcal{K}\ \rho$, where α indicates collinear ($\alpha = \mathrm{L}$), coplanar ($\alpha = \mathrm{P}$), or non-coplanar magnetism ($\alpha = \mathrm{N}$), $\mathcal{I} = 1 \cdots 230$ is the index of the parent space group P, $\mathcal{J} = 1 \cdots 16$ is the type of the representation, $\mathcal{K}$ is the additional numbering of the SSG for given $\alpha\mathcal{I}.\mathcal{J}$, and ρ specifies the constituent irreps forming the O(N) representation (see Sec. II E in the main text). The explicit representation matrices of these irreps can be accessed on the Bilbao Crystallographic Server [5]. In cases where several inequivalent O(N) representations correspond to the same SSG, we provide one of them in the table and consistently use the chosen one in the nomenclature. The remaining O(N) representations describing the same SSG can be found in the text files [6].

The additional columns of the tables are the properties of electronic states determined by the SSG and its representation theory. For non-collinear SSGs, if all operations in the unitary translation subgroup T_U commute with each other, the SSG possesses a commuting SSG Brillouin zone (SBZ); it possesses a non-commuting SBZ otherwise. We indicate a commuting SBZ with "$\surd$" and a non-commuting SBZ with "$\times$" in the "Commute" column. In cases of commuting SBZs, the column "d_{SBZ}" ("d_{BZ}") lists the dimension d_{SBZ} (d_{BZ}) of the span of the spin texture $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$ ($\vec{S}(\boldsymbol{k})$) in the SBZ (magnetic BZ). Commuting SBZs can be further classified into symmorphic ("$\surd$" in the column "Symmorphic SBZ") and nonsymmorphic ("$\times$") depending on how SSG momentum $\tilde{\boldsymbol{k}}$ is transformed under SSG operations. In a symmorphic SBZ, the momentum transforms normally under the SSG operations, *i.e.,* $\tilde{\boldsymbol{k}} \to \tilde{\boldsymbol{k}}' = s_g R_g \tilde{\boldsymbol{k}}$, with R_g being the point group part of SSG operation g and s_g being 1 (-1) for unitary (anti-unitary) g. The symmetry of the spin texture $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$ in the SBZ can be characterized by a d_{SBZ}-dimensional representation $\tilde{\rho}$ of a point group $\tilde{P} = \{s_g R_g | g \in \mathcal{G}\}$. It is also notable that in the cases of symmorphic SBZs, $d_{\mathrm{BZ}} = d_{\mathrm{SBZ}}$, and $\vec{S}(\boldsymbol{k})$ realizes the same representation $\tilde{\rho}$ of $\tilde{P}$ as $\tilde{\boldsymbol{S}}(\boldsymbol{k})$ (see Sec. III D in the main text). The point group $\tilde{P}$ and its representation $\tilde{\rho}$, expressed as a direct sum of the irreps of $\tilde{P}$, are shown in the columns "Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$" and "representations", respectively. We adopted the notations of irreps of crystalline point groups in Ref. [7], where the explicit forms and characters of these irreps can also be accessed. Conversely, in a nonsymmorphic SBZ, $\tilde{\boldsymbol{k}}$ transforms to $s_g\left(R_g\tilde{\boldsymbol{k}} + \tilde{\boldsymbol{q}}_g\right)$, where $\tilde{\boldsymbol{q}}_g$ is not a reciprocal lattice. Characterizing the symmetry of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$ in a nonsymmorphic SBZ is left for future study. For collinear SSGs, electronic Bloch states are effectively described by the linear representations of single-valued grey space groups. It is unnecessary to introduce the concepts of non-commuting or nonsymmorphic SBZ. For collinear SSGs, $d_{\mathrm{BZ}} \leq 1$ because the electronic Hamiltonian can be diagonalized into spin-up and spin-down parts.

G. TABLE OF PUBLISHED MAGNETIC MATERIALS

We identify and show the SSGs of 1595 published experimental magnetic structures in the MAGNDATA database [8, 9] on the Bilbao Crystallographic Server in the following tables. The SSGs of collinear, coplanar, and non-coplanar magnetic structures are displayed in three separate tables. Within each table, the materials are further divided into two groups: light-element materials, where all consistent elements are from the first four periods of the periodic table, and heavy-element materials. The column "BCSID" contains the labels of magnetic structures in the database. The column "MSG" lists the magnetic space group of each magnetic material, using the Opechowski-Guccione notation [10]. "PSG" denotes the parent space group of the SSG. The column "Trans from parent structure" shows the transformation matrix and the origin shift from the paramagnetic structure's cell to the conventional cell of the parent space group. The choice of paramagnetic structures' cells can be found in the magnetic crystallographic information files in the MAGNDATA database. The column "Rep" lists the O(N) ($N = 1, 2, 3$) representation realized by the transformation of the spin moments under operations of the parent space group. The column "SSG" lists the names of the SSGs. Note that inequivalent O(N) representations can describe the same SSGs; hence, the representation in the "Rep" column may differ from the representation in the name of an SSG.

For the convenience of future studies, we prepare additional tables listing all the materials with non-commuting or nonsymmorphic SBZs. We also include tables for materials exhibiting non-zero spin texture $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$ ($d_{\mathrm{SBZ}} \neq 0$) with the symmorphic SBZ. The columns "d_{SBZ}", "Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$", and "Representation" denote the same meaning as explained for the tables of SSGs. If the irreps listed in the "representation" column are all trivial irreps, we classify the spin texture as trivial; otherwise, it is classified as non-trivial.

H. NOTATIONS OF SSGS IN THE RELATED WORKS

We note that related works on SSGs were carried out by Chen Fang's [11] group and Qi-Hang Liu's group [12]. In this section, we explain the notations of SSGs they adopted. Their notations of SSGs are related to their classification approach, which is akin to Livtin's (also discussed in Sec. VI in the main text). Litvin's approach involves the introduction of a normal subgroup $P_0 = \{\{R_g|\boldsymbol{v}_g\}|X_gU_g = I, g \in \mathcal{G}\}$ of the parent space group P, consisting of pure spatial operations that leave the magnetic structure unchanged. Additionally, a supergroup $\mathcal{B} = \{X_gU_g|g \in \mathcal{G}\}$ of the pure-spin-operation group $\mathcal{S}$ is introduced, containing the spin operation parts of all SSG operations. P can be decomposed as cosets of P_0

$$P = p_1P_0 + p_2P_0 + \cdots + p_nP_0\ . \tag{S39}$$

Distinct SSGs are defined based on distinct P, P_0 and $\mathcal{B}$, and the isomorphisms between P/P_0 and $\mathcal{B}/\mathcal{S}$, modulo the equivalence induced by coordinate transformation. The group P_0 has a translation subgroup $T_M = \{\{1|\boldsymbol{v}_g\}|X_gU_g = I, R_g = 1, g \in \mathcal{G}\}$ consisting of pure-translation operations, which is also a subgroup of the translation subgroup $T = \{\{1|\boldsymbol{v}_g\}|R_g = 1, g \in \mathcal{G}\}$ of P.

In Ref. [11], the name of an SSG is given by four indices and a letter $N_{\rm SG}.I_k.I_t.N_{\rm rep}.\alpha$. Here $N_{\rm SG}$ is the group index for the parent space group P; $I_k = |T|/|T_M|$, equalling the ratio between the size of the magnetic supercell and the size of the SSG unit cell. The index I_t represents the ratio of distinct point-group operations in P to P_0. The last index $N_{\rm rep}$ specifies the SSGs with the same first three indices, which characterize distinct $\mathcal{B}$'s and distinct isomorphisms between P/P_0 and $\mathcal{B}/\mathcal{S}$. The letter $\alpha = L$ for collinear SSGs, and $\alpha = P$ for coplanar SSGs, while α is omitted for non-coplanar SSGs.

In Ref. [12], the name of an SSG is given by four indices $N_{\rm SG2}.N_{\rm SG}.I_k.m$. Similarly, $N_{\rm SG}$ is the group index for the parent space group, and $I_k = |T|/|T_M|$. The index $N_{\rm SG}$ is the group index of space group P_0 defined before. The last index m specifies the SSGs with the same first three indices. In their nomenclature, they do not specify whether an SSG is for collinear, coplanar, or non-coplanar magnetic structures.

To illustrate the correspondence between their SSG notations and ours, we consider SSG N143.5.1 DT1DU1 (in our notation). As also discussed in Sec. II C in the main text, N143.5.1 DT1DU1 with different momenta $(0, 0, u\pi)$ $[u \in (0, 1)]$ on the line DT1 have different sizes of magnetic supercells, leading to distinct SSGs in their classification. For $\frac{1}{2}u = p/q$ with p, q being coprime integers, the lattice vectors of pure translation group T_0 of this SSG are $\boldsymbol{a}_1, \boldsymbol{a}_2$ and $q\boldsymbol{a}_3$ (see Sec. II C4 in the main text). Thus, the index $I_k = q$. Since the C_{3z} operation in this SSG is accompanied by the identity spin operation, independent of u. The subgroup P_0 is given as $T_0 + T_0C_{3z} + T_0C_{3z}^2$, isomorphic to the space group $P3$ (No. 143). Thus, the index $I_t = 1$, and the group index $N_{\rm SG2} = 143$. Note that the above analysis can only specify the first three indices in their notations, and the fourth index is determined by explicitly considering the spin operations of the generators of the space group. In the case of $u = 2/3$, $I_k = 3$, we find that it corresponds to the SSG 143.3.1.1 in Ref. [11], and corresponds to 143.143.3.1 in Ref. [12]. In the case of $u = 1/2$, $I_k = 4$, it corresponds to the SSG 143.4.1.1 and 143.143.4.1 in these two works, respectively. If $u = 1/6$, $I_k = 12$, it corresponds to the SSG 143.12.1.1 in Ref. [11]. Such an SSG does not exist in Ref. [12] since they only consider the case with $I_k \leq 8$. The SSG N143.5.1 DT1DU1 with $\frac{1}{2}u = 1/p$ and $p > 12$ is only studied in our classification, but not studied in either of their works, because Ref. [11] only consider the case $I_k \leq 12$.

We also map an SSG they study to the notation in our classification (see the related technique in Sec. D). In Ref. [11], the authors study non-coplanar SSG 83.2.4.1 (in their notation) with parent space group $P4/m$ (No. 83). The SSG is generated by

$$\{I|m_{001}|\mathbf{0}\}, \{I|4^+_{001}|\mathbf{0}\}, \{T \cdot U_{\hat{z}}(\pi)|1|001\}, \{I|1|010\}, \text{ and } \{I|1|100\}\ . \tag{S40}$$

Since the corresponding O(3) matrices of translation $\{1|\boldsymbol{a}_i\}$ (i = 1,2,3) are I, I, and $\mathrm{diag}(1, 1, -1)$, respectively. Thus, the momenta of the O(3) representation are $\boldsymbol{k}_1 = \mathbf{0}$ (GM point), $\boldsymbol{k}_2 = \mathbf{0}$ (GM point), and $\boldsymbol{k}_3 = (0, 0, \pi)$ (Z point). Meanwhile, the representation matrices of $\{m_{001}|\mathbf{0}\}$ and $\{4^+_{001}|\mathbf{0}\}$ are both identity matrices. Therefore, this SSG's corresponding O(3) representation is $\mathrm{GM1}^+ \oplus \mathrm{GM1}^+ \oplus \mathrm{Z1}^+$. Since $\mathrm{Z1}^+$ is a 1D real irrep, this SSG belongs to type II and is named N83.2.7 $\mathrm{Z1}^+$. Note that the trivial irrep $\mathrm{GM1}^+$ is omitted in our notation.

In Ref. [12], the authors study SSG 13.54.1.2 (in their notation) with parent space group $Pcca$ (No. 54). The SSG is generated by which is generated by

$$\{U_{\boldsymbol{z}}(\pi)|2_{010}|00\frac{1}{2}\}, \{I|2_{001}|00\frac{1}{2}\}, \{I|\bar{1}|\mathbf{0}\}, \{I|4^+_{001}|\mathbf{0}\}, \{I|1|\boldsymbol{a}_i\}(i = 1, 2, 3)\ . \tag{S41}$$

Since the translations are all accompanied by the identity matrices, the three momenta of the O(3) representations are all $\mathbf{0}$ (GM point). The representation matrices for other operations are diagonal, and hence the O(3) representation is given by the direct sum of three 1D irreps. By studying the explicit forms of spin operations, we find that the O(3) representation is $\mathrm{GM1}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^+$, and the SSG is named N54.3.12 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+$ in our classification.

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TABLE S1: Collinear SSGs with parent space group $P1$ (No. 1).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L1.1.1 GM1	1	$\bar{1}$	$\mathrm{A_g}$
L1.2.1 R1	0	-	-

TABLE S2: Coplanar SSGs with parent space group $P1$ (No. 1).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P1.1.1 GM1	$\surd$	3	3	$\surd$	$\bar{1}$	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{A_u}$
P1.2.1 R1	$\surd$	1	1	$\surd$	$\bar{1}$	$\mathrm{A_g}$
P1.3.1 R1 $\oplus$ R1	$\surd$	1	1	$\surd$	$\bar{1}$	$\mathrm{A_u}$
P1.3.2 R1 $\oplus$ T1	$\times$	-	-	-	-	-
P1.5.1 GP1GQ1	$\surd$	1	1	$\surd$	$\bar{1}$	$\mathrm{A_u}$

TABLE S3: Non-coplanar SSGs with parent space group $P1$ (No. 1).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N1.1.1 GM1	$\surd$	3	3	$\surd$	1	$\mathrm{A}\oplus\mathrm{A}\oplus\mathrm{A}$
N1.2.1 R1	$\surd$	3	3	$\surd$	$\bar{1}$	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{A_u}$
N1.3.1 R1 $\oplus$ R1	$\surd$	1	1	$\surd$	1	A
N1.3.2 R1 $\oplus$ T1	$\surd$	1	1	$\surd$	$\bar{1}$	$\mathrm{A_g}$
N1.5.1 GP1GQ1	$\surd$	1	1	$\surd$	1	A
N1.9.1 R1 $\oplus$ R1 $\oplus$ R1	$\surd$	3	3	$\surd$	$\bar{1}$	$\mathrm{A_u}\oplus\mathrm{A_u}\oplus\mathrm{A_u}$
N1.9.2 R1 $\oplus$ R1 $\oplus$ T1	$\surd$	1	1	$\surd$	$\bar{1}$	$\mathrm{A_u}$
N1.9.3 R1 $\oplus$ T1 $\oplus$ U1	$\times$	-	-	-	-	-
N1.9.4 R1 $\oplus$ T1 $\oplus$ X1	$\times$	-	-	-	-	-
N1.11.1 R1 $\oplus$ GP1GQ1	$\surd$	1	1	$\surd$	$\bar{1}$	$\mathrm{A_u}$

TABLE S4: Collinear SSGs with parent space group $P\bar{1}$ (No. 2).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L2.1.1 GM1$^+$	1	$\bar{1}$	$\mathrm{A_g}$
L2.2.1 GM1$^-$	0	-	-
L2.2.2 R1$^+$	0	-	-

TABLE S5: Coplanar SSGs with parent space group $P\bar{1}$ (No. 2).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P2.1.1 GM1$^+$	$\surd$	2	2	$\surd$	$\bar{1}$	$\mathrm{A_g}\oplus\mathrm{A_g}$

Coplanar SSGs with parent space group $P\bar{1}$ (No. 2) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P2.2.1 $\mathrm{GM1}^-$	$\surd$	2	2	$\surd$	$\bar{1}$	$\mathrm{A_g} \oplus \mathrm{A_u}$
P2.2.2 $\mathrm{R1}^+$	$\surd$	1	1	$\surd$	$\bar{1}$	$\mathrm{A_g}$
P2.3.1 $\mathrm{GM1}^- \oplus \mathrm{GM1}^-$	$\surd$	0	0	$\surd$	-	-
P2.3.2 $\mathrm{GM1}^- \oplus \mathrm{R1}^+$	$\surd$	1	1	$\times$	-	-
P2.3.3 $\mathrm{R1}^+ \oplus \mathrm{R1}^+$	$\surd$	1	0	$\times$	-	-
P2.3.4 $\mathrm{R1}^+ \oplus \mathrm{R1}^-$	$\surd$	1	1	$\surd$	$\bar{1}$	$\mathrm{A_u}$
P2.3.5 $\mathrm{R1}^+ \oplus \mathrm{T1}^+$	$\times$	-	-	-	-	-
P2.8.1 GP1	$\surd$	1	1	$\surd$	$\bar{1}$	$\mathrm{A_u}$

TABLE S6: Non-coplanar SSGs with parent space group $P\bar{1}$ (No. 2).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N2.1.1 $\mathrm{GM1}^+$	$\surd$	3	3	$\surd$	$\bar{1}$	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{A_g}$
N2.2.1 $\mathrm{GM1}^-$	$\surd$	2	2	$\surd$	1	$\mathrm{A} \oplus \mathrm{A}$
N2.2.2 $\mathrm{R1}^+$	$\surd$	2	2	$\surd$	$\bar{1}$	$\mathrm{A_g} \oplus \mathrm{A_g}$
N2.3.1 $\mathrm{GM1}^- \oplus \mathrm{GM1}^-$	$\surd$	3	3	$\surd$	$\bar{1}$	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{A_u}$
N2.3.2 $\mathrm{GM1}^- \oplus \mathrm{R1}^+$	$\surd$	2	2	$\surd$	$\bar{1}$	$\mathrm{A_g} \oplus \mathrm{A_u}$
N2.3.3 $\mathrm{R1}^+ \oplus \mathrm{R1}^+$	$\surd$	1	1	$\surd$	$\bar{1}$	$\mathrm{A_g}$
N2.3.4 $\mathrm{R1}^+ \oplus \mathrm{R1}^-$	$\surd$	1	1	$\surd$	1	A
N2.3.5 $\mathrm{R1}^+ \oplus \mathrm{T1}^+$	$\surd$	1	1	$\surd$	$\bar{1}$	$\mathrm{A_g}$
N2.8.1 GP1	$\surd$	1	1	$\surd$	1	A
N2.9.1 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{GM1}^-$	$\surd$	0	0	$\surd$	-	-
N2.9.2 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{R1}^+$	$\surd$	0	0	$\surd$	-	-
N2.9.3 $\mathrm{GM1}^- \oplus \mathrm{R1}^+ \oplus \mathrm{R1}^+$	$\surd$	1	0	$\times$	-	-
N2.9.4 $\mathrm{GM1}^- \oplus \mathrm{R1}^+ \oplus \mathrm{R1}^-$	$\surd$	1	1	$\surd$	$\bar{1}$	$\mathrm{A_u}$
N2.9.5 $\mathrm{GM1}^- \oplus \mathrm{R1}^+ \oplus \mathrm{T1}^+$	$\surd$	1	0	$\times$	-	-
N2.9.6 $\mathrm{R1}^+ \oplus \mathrm{R1}^+ \oplus \mathrm{R1}^+$	$\surd$	0	0	$\surd$	-	-
N2.9.7 $\mathrm{R1}^+ \oplus \mathrm{R1}^+ \oplus \mathrm{R1}^-$	$\surd$	2	2	$\surd$	$\bar{1}$	$\mathrm{A_u} \oplus \mathrm{A_u}$
N2.9.8 $\mathrm{R1}^+ \oplus \mathrm{R1}^+ \oplus \mathrm{T1}^+$	$\surd$	1	0	$\times$	-	-
N2.9.9 $\mathrm{R1}^+ \oplus \mathrm{R1}^- \oplus \mathrm{T1}^+$	$\surd$	1	1	$\surd$	$\bar{1}$	$\mathrm{A_u}$
N2.9.10 $\mathrm{R1}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{U1}^+$	$\times$	-	-	-	-	-
N2.9.11 $\mathrm{R1}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{X1}^+$	$\times$	-	-	-	-	-
N2.9.12 $\mathrm{R1}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{X1}^-$	$\times$	-	-	-	-	-
N2.14.1 $\mathrm{GM1}^- \oplus \mathrm{GP1}$	$\surd$	1	1	$\surd$	$\bar{1}$	$\mathrm{A_u}$
N2.14.2 $\mathrm{R1}^+ \oplus \mathrm{GP1}$	$\surd$	1	1	$\surd$	$\bar{1}$	$\mathrm{A_u}$

TABLE S7: Collinear SSGs with parent space group $P2$ (No. 3).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L3.1.1 GM1	1	$2/m$	$\mathrm{A_g}$
L3.2.1 GM2	1	$2/m$	$\mathrm{B_g}$
L3.2.2 A1	0	-	-
L3.2.3 C1	0	-	-
L3.2.4 Z1	0	-	-
L3.2.5 Z2	0	-	-

Coplanar SSGs with parent space group $P2$ (No. 3) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation

TABLE S8: Coplanar SSGs with parent space group $P2$ (No. 3).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P3.1.1 GM1	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{A_u}$
P3.2.1 GM2	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g}\oplus\mathrm{B_g}\oplus\mathrm{B_u}$
P3.2.2 A1	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
P3.2.3 C1	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
P3.2.4 Z1	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
P3.2.5 Z2	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
P3.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_u}\oplus\mathrm{B_g}\oplus\mathrm{B_g}$
P3.3.2 GM2 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
P3.3.3 GM2 $\oplus$ C1	$\surd$	1	1	$\times$	-	-
P3.3.4 GM2 $\oplus$ Z1	$\surd$	1	1	$\times$	-	-
P3.3.5 GM2 $\oplus$ Z2	$\surd$	1	1	$\times$	-	-
P3.3.6 A1 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
P3.3.7 A1 $\oplus$ A2	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
P3.3.8 A1 $\oplus$ Y1	$\times$	-	-	-	-	-
P3.3.9 A1 $\oplus$ C1	$\times$	-	-	-	-	-
P3.3.10 A1 $\oplus$ E1	$\times$	-	-	-	-	-
P3.3.11 A1 $\oplus$ E2	$\times$	-	-	-	-	-
P3.3.12 A1 $\oplus$ Z1	$\times$	-	-	-	-	-
P3.3.13 A1 $\oplus$ Z2	$\times$	-	-	-	-	-
P3.3.14 C1 $\oplus$ C1	$\surd$	1	1	$\times$	-	-
P3.3.15 C1 $\oplus$ C2	$\surd$	1	1	$\times$	-	-
P3.3.16 C1 $\oplus$ D1	$\times$	-	-	-	-	-
P3.3.17 C1 $\oplus$ Z1	$\times$	-	-	-	-	-
P3.3.18 C1 $\oplus$ Z2	$\times$	-	-	-	-	-
P3.3.19 Z1 $\oplus$ Z1	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
P3.3.20 Z1 $\oplus$ Z2	$\surd$	1	1	$\times$	-	-
P3.3.21 Z2 $\oplus$ Z2	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
P3.5.1 LD1LE1	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
P3.5.2 LD2LE2	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
P3.5.3 U1UA1	$\surd$	1	1	$\times$	-	-
P3.8.1 F1	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g}\oplus\mathrm{B_g}\oplus\mathrm{B_u}$
P3.8.2 G1	$\surd$	1	1	$\times$	-	-

TABLE S9: Non-coplanar SSGs with parent space group $P2$ (No. 3).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N3.1.1 GM1	$\surd$	3	3	$\surd$	2	$\mathrm{A}\oplus\mathrm{A}\oplus\mathrm{A}$
N3.2.1 GM2	$\surd$	3	3	$\surd$	m	$\mathrm{A'}\oplus\mathrm{A'}\oplus\mathrm{A''}$
N3.2.2 A1	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{A_u}$
N3.2.3 C1	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{A_u}$
N3.2.4 Z1	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{A_u}$

Non-coplanar SSGs with parent space group $P2$ (No. 3) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N3.2.5 Z2	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{A_u}$
N3.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	2	$\mathrm{A} \oplus \mathrm{B} \oplus \mathrm{B}$
N3.3.2 GM2 $\oplus$ A1	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{B_g} \oplus \mathrm{B_u}$
N3.3.3 GM2 $\oplus$ C1	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{B_g} \oplus \mathrm{B_u}$
N3.3.4 GM2 $\oplus$ Z1	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{B_g} \oplus \mathrm{B_u}$
N3.3.5 GM2 $\oplus$ Z2	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{B_g} \oplus \mathrm{B_u}$
N3.3.6 A1 $\oplus$ A1	$\surd$	1	1	$\surd$	2	A
N3.3.7 A1 $\oplus$ A2	$\surd$	1	1	$\surd$	m	A'
N3.3.8 A1 $\oplus$ Y1	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
N3.3.9 A1 $\oplus$ C1	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
N3.3.10 A1 $\oplus$ E1	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
N3.3.11 A1 $\oplus$ E2	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
N3.3.12 A1 $\oplus$ Z1	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
N3.3.13 A1 $\oplus$ Z2	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
N3.3.14 C1 $\oplus$ C1	$\surd$	1	1	$\surd$	2	A
N3.3.15 C1 $\oplus$ C2	$\surd$	1	1	$\surd$	m	A'
N3.3.16 C1 $\oplus$ D1	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
N3.3.17 C1 $\oplus$ Z1	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
N3.3.18 C1 $\oplus$ Z2	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
N3.3.19 Z1 $\oplus$ Z1	$\surd$	1	1	$\surd$	2	A
N3.3.20 Z1 $\oplus$ Z2	$\surd$	1	1	$\surd$	m	A'
N3.3.21 Z2 $\oplus$ Z2	$\surd$	1	1	$\surd$	2	A
N3.5.1 LD1LE1	$\surd$	1	1	$\surd$	2	A
N3.5.2 LD2LE2	$\surd$	1	1	$\surd$	2	A
N3.5.3 U1UA1	$\surd$	1	1	$\surd$	2	A
N3.8.1 F1	$\surd$	3	3	$\surd$	m	$\mathrm{A}' \oplus \mathrm{A}' \oplus \mathrm{A}''$
N3.8.2 G1	$\surd$	1	1	$\surd$	m	A'
N3.9.1 GM2 $\oplus$ GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	m	$\mathrm{A}'' \oplus \mathrm{A}'' \oplus \mathrm{A}''$
N3.9.2 GM2 $\oplus$ GM2 $\oplus$ A1	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_u} \oplus \mathrm{B_g} \oplus \mathrm{B_g}$
N3.9.3 GM2 $\oplus$ GM2 $\oplus$ C1	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_u} \oplus \mathrm{B_g} \oplus \mathrm{B_g}$
N3.9.4 GM2 $\oplus$ GM2 $\oplus$ Z1	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_u} \oplus \mathrm{B_g} \oplus \mathrm{B_g}$
N3.9.5 GM2 $\oplus$ GM2 $\oplus$ Z2	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_u} \oplus \mathrm{B_g} \oplus \mathrm{B_g}$
N3.9.6 GM2 $\oplus$ A1 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
N3.9.7 GM2 $\oplus$ A1 $\oplus$ A2	$\surd$	1	1	$\surd$	2	B
N3.9.8 GM2 $\oplus$ A1 $\oplus$ Y1	$\surd$	1	1	$\times$	-	-
N3.9.9 GM2 $\oplus$ A1 $\oplus$ C1	$\surd$	1	1	$\times$	-	-
N3.9.10 GM2 $\oplus$ A1 $\oplus$ E1	$\surd$	1	1	$\times$	-	-
N3.9.11 GM2 $\oplus$ A1 $\oplus$ E2	$\surd$	1	1	$\times$	-	-
N3.9.12 GM2 $\oplus$ A1 $\oplus$ Z1	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_g}$
N3.9.13 GM2 $\oplus$ A1 $\oplus$ Z2	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_g}$
N3.9.14 GM2 $\oplus$ C1 $\oplus$ C1	$\surd$	1	1	$\times$	-	-
N3.9.15 GM2 $\oplus$ C1 $\oplus$ C2	$\surd$	1	1	$\times$	-	-
N3.9.16 GM2 $\oplus$ C1 $\oplus$ D1	$\surd$	1	1	$\times$	-	-
N3.9.17 GM2 $\oplus$ C1 $\oplus$ Z1	$\surd$	1	1	$\times$	-	-
N3.9.18 GM2 $\oplus$ C1 $\oplus$ Z2	$\surd$	1	1	$\times$	-	-
N3.9.19 GM2 $\oplus$ Z1 $\oplus$ Z1	$\surd$	1	1	$\surd$	m	A''

Non-coplanar SSGs with parent space group $P2$ (No. 3) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N3.9.20 GM2 ⊕ Z1 ⊕ Z2	√	1	1	×	-	-
N3.9.21 GM2 ⊕ Z2 ⊕ Z2	√	1	1	√	m	A''
N3.9.22 A1 ⊕ A1 ⊕ A1	√	3	3	√	$2/m$	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{A_u}$
N3.9.23 A1 ⊕ A1 ⊕ A2	√	3	3	√	$2/m$	$\mathrm{A_u} \oplus \mathrm{B_u} \oplus \mathrm{B_u}$
N3.9.24 A1 ⊕ A1 ⊕ Y1	√	1	1	×	-	-
N3.9.25 A1 ⊕ A2 ⊕ Y1	√	1	1	√	$2/m$	$\mathrm{B_u}$
N3.9.26 B1 ⊕ A1 ⊕ Y1	×	-	-	-	-	-
N3.9.27 B1 ⊕ A1 ⊕ Y2	×	-	-	-	-	-
N3.9.28 A1 ⊕ A1 ⊕ C1	√	1	1	×	-	-
N3.9.29 A1 ⊕ A1 ⊕ E1	√	1	1	√	$2/m$	$\mathrm{A_u}$
N3.9.30 A1 ⊕ A1 ⊕ E2	√	1	1	√	$2/m$	$\mathrm{A_u}$
N3.9.31 A1 ⊕ A2 ⊕ C1	√	1	1	√	$2/m$	$\mathrm{B_u}$
N3.9.32 A1 ⊕ A2 ⊕ E1	√	1	1	√	$2/m$	$\mathrm{B_u}$
N3.9.33 A1 ⊕ Y1 ⊕ D1	×	-	-	-	-	-
N3.9.34 A1 ⊕ Y1 ⊕ D2	×	-	-	-	-	-
N3.9.35 A1 ⊕ Y1 ⊕ C1	×	-	-	-	-	-
N3.9.36 A1 ⊕ Y1 ⊕ C2	×	-	-	-	-	-
N3.9.37 A1 ⊕ A1 ⊕ Z1	√	1	1	×	-	-
N3.9.38 A1 ⊕ A2 ⊕ Z1	√	1	1	√	$2/m$	$\mathrm{B_u}$
N3.9.39 A1 ⊕ Y1 ⊕ Z1	×	-	-	-	-	-
N3.9.40 A1 ⊕ A1 ⊕ Z2	√	1	1	×	-	-
N3.9.41 A1 ⊕ A2 ⊕ Z2	√	1	1	√	$2/m$	$\mathrm{B_u}$
N3.9.42 A1 ⊕ Y1 ⊕ Z2	×	-	-	-	-	-
N3.9.43 A1 ⊕ C1 ⊕ C1	√	1	1	×	-	-
N3.9.44 A1 ⊕ C1 ⊕ C2	√	1	1	×	-	-
N3.9.45 A1 ⊕ C1 ⊕ E1	×	-	-	-	-	-
N3.9.46 A1 ⊕ C1 ⊕ E2	×	-	-	-	-	-
N3.9.47 A1 ⊕ C1 ⊕ D1	×	-	-	-	-	-
N3.9.48 A1 ⊕ C1 ⊕ D2	×	-	-	-	-	-
N3.9.49 A1 ⊕ E1 ⊕ E1	√	1	1	√	$2/m$	$\mathrm{A_u}$
N3.9.50 A1 ⊕ E1 ⊕ E2	√	1	1	×	-	-
N3.9.51 A1 ⊕ E2 ⊕ E2	√	1	1	√	$2/m$	$\mathrm{A_u}$
N3.9.52 A1 ⊕ C1 ⊕ Z1	×	-	-	-	-	-
N3.9.53 A1 ⊕ E1 ⊕ Z1	×	-	-	-	-	-
N3.9.54 A1 ⊕ E2 ⊕ Z1	×	-	-	-	-	-
N3.9.55 A1 ⊕ C1 ⊕ Z2	×	-	-	-	-	-
N3.9.56 A1 ⊕ E1 ⊕ Z2	×	-	-	-	-	-
N3.9.57 A1 ⊕ E2 ⊕ Z2	×	-	-	-	-	-
N3.9.58 A1 ⊕ Z1 ⊕ Z1	√	1	1	√	$2/m$	$\mathrm{A_u}$
N3.9.59 A1 ⊕ Z1 ⊕ Z2	√	1	1	×	-	-
N3.9.60 A1 ⊕ Z2 ⊕ Z2	√	1	1	√	$2/m$	$\mathrm{A_u}$
N3.9.61 C1 ⊕ C1 ⊕ C1	√	3	3	√	$2/m$	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{A_u}$
N3.9.62 C1 ⊕ C1 ⊕ C2	√	3	3	√	$2/m$	$\mathrm{A_u} \oplus \mathrm{B_u} \oplus \mathrm{B_u}$
N3.9.63 C1 ⊕ C1 ⊕ D1	√	1	1	×	-	-
N3.9.64 C1 ⊕ C2 ⊕ D1	√	1	1	√	$2/m$	$\mathrm{B_u}$
N3.9.65 C1 ⊕ D1 ⊕ E1	×	-	-	-	-	-

Non-coplanar SSGs with parent space group $P2$ (No. 3) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N3.9.66 C1 ⊕ D1 ⊕ E2	×	-	-	-	-	-
N3.9.67 C1 ⊕ C1 ⊕ Z1	√	1	1	×	-	-
N3.9.68 C1 ⊕ C2 ⊕ Z1	√	1	1	√	$2/m$	$\mathrm{B_u}$
N3.9.69 C1 ⊕ D1 ⊕ Z1	×	-	-	-	-	-
N3.9.70 C1 ⊕ C1 ⊕ Z2	√	1	1	×	-	-
N3.9.71 C1 ⊕ C2 ⊕ Z2	√	1	1	√	$2/m$	$\mathrm{B_u}$
N3.9.72 C1 ⊕ D1 ⊕ Z2	×	-	-	-	-	-
N3.9.73 C1 ⊕ Z1 ⊕ Z1	√	1	1	√	$2/m$	$\mathrm{A_u}$
N3.9.74 C1 ⊕ Z1 ⊕ Z2	√	1	1	√	$2/m$	$\mathrm{B_u}$
N3.9.75 C1 ⊕ Z2 ⊕ Z2	√	1	1	√	$2/m$	$\mathrm{A_u}$
N3.9.76 Z1 ⊕ Z1 ⊕ Z1	√	3	3	√	$2/m$	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{A_u}$
N3.9.77 Z1 ⊕ Z1 ⊕ Z2	√	3	3	√	$2/m$	$\mathrm{A_u} \oplus \mathrm{B_u} \oplus \mathrm{B_u}$
N3.9.78 Z1 ⊕ Z2 ⊕ Z2	√	3	3	√	$2/m$	$\mathrm{A_u} \oplus \mathrm{B_u} \oplus \mathrm{B_u}$
N3.9.79 Z2 ⊕ Z2 ⊕ Z2	√	3	3	√	$2/m$	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{A_u}$
N3.11.1 GM2 ⊕ LD1LE1	√	1	1	√	m	$\mathrm{A''}$
N3.11.2 GM2 ⊕ LD2LE2	√	1	1	√	m	$\mathrm{A''}$
N3.11.3 GM2 ⊕ U1UA1	√	1	1	×	-	-
N3.11.4 A1 ⊕ LD1LE1	√	1	1	√	$2/m$	$\mathrm{A_u}$
N3.11.5 A1 ⊕ LD2LE2	√	1	1	√	$2/m$	$\mathrm{A_u}$
N3.11.6 A1 ⊕ V1VA1	√	1	1	×	-	-
N3.11.7 A1 ⊕ U1UA1	√	1	1	√	$2/m$	$\mathrm{A_u}$
N3.11.8 A1 ⊕ U2UA2	√	1	1	√	$2/m$	$\mathrm{A_u}$
N3.11.9 C1 ⊕ LD1LE1	√	1	1	√	$2/m$	$\mathrm{A_u}$
N3.11.10 C1 ⊕ LD2LE2	√	1	1	√	$2/m$	$\mathrm{A_u}$
N3.11.11 C1 ⊕ W1WA1	√	1	1	√	$2/m$	$\mathrm{A_u}$
N3.11.12 C1 ⊕ W2WA2	√	1	1	√	$2/m$	$\mathrm{A_u}$
N3.11.13 C1 ⊕ U1UA1	√	1	1	×	-	-
N3.11.14 Z1 ⊕ LD1LE1	√	1	1	√	$2/m$	$\mathrm{A_u}$
N3.11.15 Z1 ⊕ LD2LE2	√	1	1	√	$2/m$	$\mathrm{A_u}$
N3.11.16 Z1 ⊕ U1UA1	√	1	1	×	-	-
N3.11.17 Z2 ⊕ LD1LE1	√	1	1	√	$2/m$	$\mathrm{A_u}$
N3.11.18 Z2 ⊕ LD2LE2	√	1	1	√	$2/m$	$\mathrm{A_u}$
N3.11.19 Z2 ⊕ U1UA1	√	1	1	×	-	-
N3.14.1 GM2 ⊕ F1	√	3	3	√	2	$\mathrm{A} \oplus \mathrm{B} \oplus \mathrm{B}$
N3.14.2 GM2 ⊕ G1	√	1	1	×	-	-
N3.14.3 A1 ⊕ F1	√	3	3	√	$2/m$	$\mathrm{A_g} \oplus \mathrm{B_g} \oplus \mathrm{B_u}$
N3.14.4 A1 ⊕ G1	√	1	1	×	-	-
N3.14.5 C1 ⊕ F1	√	3	3	√	$2/m$	$\mathrm{A_g} \oplus \mathrm{B_g} \oplus \mathrm{B_u}$
N3.14.6 C1 ⊕ G1	√	1	1	√	$2/m$	$\mathrm{B_u}$
N3.14.7 Z1 ⊕ F1	√	3	3	√	$2/m$	$\mathrm{A_g} \oplus \mathrm{B_g} \oplus \mathrm{B_u}$
N3.14.8 Z1 ⊕ G1	√	3	3	√	$2/m$	$\mathrm{A_u} \oplus \mathrm{B_u} \oplus \mathrm{B_u}$
N3.14.9 Z2 ⊕ F1	√	3	3	√	$2/m$	$\mathrm{A_g} \oplus \mathrm{B_g} \oplus \mathrm{B_u}$
N3.14.10 Z2 ⊕ G1	√	3	3	√	$2/m$	$\mathrm{A_u} \oplus \mathrm{B_u} \oplus \mathrm{B_u}$

TABLE S10: Collinear SSGs with parent space group $P2_1$ (No. 4).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L4.1.1 GM1	1	$2/m$	$\mathrm{A_g}$
L4.2.1 GM2	1	$2/m$	$\mathrm{B_g}$
L4.2.2 A1	0	-	-

TABLE S11: Coplanar SSGs with parent space group $P2_1$ (No. 4).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P4.1.1 GM1	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{A_u}$
P4.2.1 GM2	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g}\oplus\mathrm{B_g}\oplus\mathrm{B_u}$
P4.2.2 A1	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
P4.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_u}\oplus\mathrm{B_g}\oplus\mathrm{B_g}$
P4.3.2 GM2 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
P4.3.3 A1 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
P4.3.4 A1 $\oplus$ A2	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
P4.3.5 A1 $\oplus$ Y1	$\times$	-	-	-	-	-
P4.4.1 Z1Z2	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
P4.4.2 C1C2	$\surd$	1	1	$\times$	-	-
P4.5.1 LD1LE1	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
P4.5.2 U1UA1	$\surd$	1	1	$\times$	-	-
P4.8.1 F1	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g}\oplus\mathrm{B_g}\oplus\mathrm{B_u}$

TABLE S12: Non-coplanar SSGs with parent space group $P2_1$ (No. 4).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N4.1.1 GM1	$\surd$	3	3	$\surd$	2	$\mathrm{A}\oplus\mathrm{A}\oplus\mathrm{A}$
N4.2.1 GM2	$\surd$	3	3	$\surd$	m	$\mathrm{A'}\oplus\mathrm{A'}\oplus\mathrm{A''}$
N4.2.2 A1	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{A_u}$
N4.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	2	$\mathrm{A}\oplus\mathrm{B}\oplus\mathrm{B}$
N4.3.2 GM2 $\oplus$ A1	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g}\oplus\mathrm{B_g}\oplus\mathrm{B_u}$
N4.3.3 A1 $\oplus$ A1	$\surd$	1	1	$\surd$	2	A
N4.3.4 A1 $\oplus$ A2	$\surd$	1	1	$\surd$	m	A'
N4.3.5 A1 $\oplus$ Y1	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
N4.4.1 Z1Z2	$\surd$	1	1	$\surd$	2	A
N4.4.2 C1C2	$\surd$	1	1	$\surd$	2	A
N4.5.1 LD1LE1	$\surd$	1	1	$\surd$	2	A
N4.5.2 U1UA1	$\surd$	1	1	$\surd$	2	A
N4.8.1 F1	$\surd$	3	3	$\surd$	m	$\mathrm{A'}\oplus\mathrm{A'}\oplus\mathrm{A''}$
N4.9.1 GM2 $\oplus$ GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	m	$\mathrm{A''}\oplus\mathrm{A''}\oplus\mathrm{A''}$
N4.9.2 GM2 $\oplus$ GM2 $\oplus$ A1	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_u}\oplus\mathrm{B_g}\oplus\mathrm{B_g}$
N4.9.3 GM2 $\oplus$ A1 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
N4.9.4 GM2 $\oplus$ A1 $\oplus$ A2	$\surd$	1	1	$\surd$	2	B
N4.9.5 GM2 $\oplus$ A1 $\oplus$ Y1	$\surd$	1	1	$\times$	-	-
N4.9.6 A1 $\oplus$ A1 $\oplus$ A1	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_u}\oplus\mathrm{A_u}\oplus\mathrm{A_u}$
N4.9.7 A1 $\oplus$ A1 $\oplus$ A2	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_u}\oplus\mathrm{B_u}\oplus\mathrm{B_u}$
N4.9.8 A1 $\oplus$ A1 $\oplus$ Y1	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $P2_1$ (No. 4) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N4.9.9 A1 $\oplus$ A2 $\oplus$ Y1	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
N4.9.10 B1 $\oplus$ A1 $\oplus$ Y1	$\times$	-	-	-	-	-
N4.9.11 B1 $\oplus$ A1 $\oplus$ Y2	$\times$	-	-	-	-	-
N4.10.1 GM2 $\oplus$ Z1Z2	$\surd$	1	1	$\surd$	m	$\mathrm{A''}$
N4.10.2 GM2 $\oplus$ C1C2	$\surd$	1	1	$\times$	-	-
N4.10.3 A1 $\oplus$ Z1Z2	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N4.10.4 A1 $\oplus$ C1C2	$\surd$	1	1	$\times$	-	-
N4.10.5 A1 $\oplus$ E1E2	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N4.11.1 GM2 $\oplus$ LD1LE1	$\surd$	1	1	$\surd$	m	$\mathrm{A''}$
N4.11.2 GM2 $\oplus$ U1UA1	$\surd$	1	1	$\times$	-	-
N4.11.3 A1 $\oplus$ LD1LE1	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N4.11.4 A1 $\oplus$ V1VA1	$\surd$	1	1	$\times$	-	-
N4.11.5 A1 $\oplus$ U1UA1	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N4.14.1 GM2 $\oplus$ F1	$\surd$	3	3	$\surd$	2	A $\oplus$ B $\oplus$ B
N4.14.2 A1 $\oplus$ F1	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{B_g} \oplus \mathrm{B_u}$

TABLE S13: Collinear SSGs with parent space group $C2$ (No. 5).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L5.1.1 GM1	1	$2/m$	$\mathrm{A_g}$
L5.2.1 GM2	1	$2/m$	$\mathrm{B_g}$
L5.2.2 A1	0	-	-
L5.2.3 Y1	0	-	-
L5.2.4 Y2	0	-	-

TABLE S14: Coplanar SSGs with parent space group $C2$ (No. 5).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P5.1.1 GM1	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{A_u}$
P5.2.1 GM2	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{B_g} \oplus \mathrm{B_u}$
P5.2.2 A1	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
P5.2.3 Y1	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
P5.2.4 Y2	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
P5.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_u} \oplus \mathrm{B_g} \oplus \mathrm{B_g}$
P5.3.2 GM2 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
P5.3.3 GM2 $\oplus$ Y1	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_g}$
P5.3.4 GM2 $\oplus$ Y2	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_g}$
P5.3.5 A1 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
P5.3.6 A1 $\oplus$ A2	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
P5.3.7 A1 $\oplus$ M1	$\times$	-	-	-	-	-
P5.3.8 A1 $\oplus$ M2	$\times$	-	-	-	-	-
P5.3.9 A1 $\oplus$ Y1	$\times$	-	-	-	-	-
P5.3.10 A1 $\oplus$ Y2	$\times$	-	-	-	-	-
P5.3.11 Y1 $\oplus$ Y1	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
P5.3.12 Y1 $\oplus$ Y2	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
P5.3.13 Y2 $\oplus$ Y2	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$

Coplanar SSGs with parent space group $C2$ (No. 5) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P5.5.1 LD1LE1	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
P5.5.2 LD2LE2	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
P5.5.3 U1UA1	$\surd$	1	1	$\times$	-	-
P5.7.1 L1	$\times$	-	-	-	-	-
P5.8.1 B1	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{B_g} \oplus \mathrm{B_u}$

TABLE S15: Non-coplanar SSGs with parent space group $C2$ (No. 5).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N5.1.1 GM1	$\surd$	3	3	$\surd$	2	$\mathrm{A} \oplus \mathrm{A} \oplus \mathrm{A}$
N5.2.1 GM2	$\surd$	3	3	$\surd$	m	$\mathrm{A}' \oplus \mathrm{A}' \oplus \mathrm{A}''$
N5.2.2 A1	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{A_u}$
N5.2.3 Y1	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{A_u}$
N5.2.4 Y2	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{A_u}$
N5.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	2	$\mathrm{A} \oplus \mathrm{B} \oplus \mathrm{B}$
N5.3.2 GM2 $\oplus$ A1	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{B_g} \oplus \mathrm{B_u}$
N5.3.3 GM2 $\oplus$ Y1	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{B_g} \oplus \mathrm{B_u}$
N5.3.4 GM2 $\oplus$ Y2	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{B_g} \oplus \mathrm{B_u}$
N5.3.5 A1 $\oplus$ A1	$\surd$	1	1	$\surd$	2	A
N5.3.6 A1 $\oplus$ A2	$\surd$	1	1	$\surd$	m	A'
N5.3.7 A1 $\oplus$ M1	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
N5.3.8 A1 $\oplus$ M2	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
N5.3.9 A1 $\oplus$ Y1	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
N5.3.10 A1 $\oplus$ Y2	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
N5.3.11 Y1 $\oplus$ Y1	$\surd$	1	1	$\surd$	2	A
N5.3.12 Y1 $\oplus$ Y2	$\surd$	1	1	$\surd$	m	A'
N5.3.13 Y2 $\oplus$ Y2	$\surd$	1	1	$\surd$	2	A
N5.5.1 LD1LE1	$\surd$	1	1	$\surd$	2	A
N5.5.2 LD2LE2	$\surd$	1	1	$\surd$	2	A
N5.5.3 U1UA1	$\surd$	1	1	$\surd$	2	A
N5.7.1 L1	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
N5.8.1 B1	$\surd$	3	3	$\surd$	m	$\mathrm{A}' \oplus \mathrm{A}' \oplus \mathrm{A}''$
N5.9.1 GM2 $\oplus$ GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	m	$\mathrm{A}'' \oplus \mathrm{A}'' \oplus \mathrm{A}''$
N5.9.2 GM2 $\oplus$ GM2 $\oplus$ A1	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_u} \oplus \mathrm{B_g} \oplus \mathrm{B_g}$
N5.9.3 GM2 $\oplus$ GM2 $\oplus$ Y1	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_u} \oplus \mathrm{B_g} \oplus \mathrm{B_g}$
N5.9.4 GM2 $\oplus$ GM2 $\oplus$ Y2	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_u} \oplus \mathrm{B_g} \oplus \mathrm{B_g}$
N5.9.5 GM2 $\oplus$ A1 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
N5.9.6 GM2 $\oplus$ A1 $\oplus$ A2	$\surd$	1	1	$\surd$	2	B
N5.9.7 GM2 $\oplus$ A1 $\oplus$ M1	$\surd$	1	1	$\times$	-	-
N5.9.8 GM2 $\oplus$ A1 $\oplus$ M2	$\surd$	1	1	$\times$	-	-
N5.9.9 GM2 $\oplus$ A1 $\oplus$ Y1	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_g}$
N5.9.10 GM2 $\oplus$ A1 $\oplus$ Y2	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_g}$
N5.9.11 GM2 $\oplus$ Y1 $\oplus$ Y1	$\surd$	1	1	$\surd$	m	A''
N5.9.12 GM2 $\oplus$ Y1 $\oplus$ Y2	$\surd$	1	1	$\surd$	2	B
N5.9.13 GM2 $\oplus$ Y2 $\oplus$ Y2	$\surd$	1	1	$\surd$	m	A''
N5.9.14 A1 $\oplus$ A1 $\oplus$ A1	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{A_u}$

Non-coplanar SSGs with parent space group $C2$ (No. 5) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N5.9.15 A1 ⊕ A1 ⊕ A2	√	3	3	√	$2/m$	$\mathrm{A_u} \oplus \mathrm{B_u} \oplus \mathrm{B_u}$
N5.9.16 A1 ⊕ A1 ⊕ M1	√	1	1	√	$2/m$	$\mathrm{A_u}$
N5.9.17 A1 ⊕ A1 ⊕ M2	√	1	1	√	$2/m$	$\mathrm{A_u}$
N5.9.18 A1 ⊕ A2 ⊕ M1	√	1	1	√	$2/m$	$\mathrm{B_u}$
N5.9.19 A1 ⊕ A1 ⊕ Y1	√	1	1	×	-	-
N5.9.20 A1 ⊕ A2 ⊕ Y1	√	1	1	√	$2/m$	$\mathrm{B_u}$
N5.9.21 A1 ⊕ M1 ⊕ Y1	×	-	-	-	-	-
N5.9.22 A1 ⊕ M2 ⊕ Y1	×	-	-	-	-	-
N5.9.23 A1 ⊕ A1 ⊕ Y2	√	1	1	×	-	-
N5.9.24 A1 ⊕ A2 ⊕ Y2	√	1	1	√	$2/m$	$\mathrm{B_u}$
N5.9.25 A1 ⊕ M1 ⊕ Y2	×	-	-	-	-	-
N5.9.26 A1 ⊕ M2 ⊕ Y2	×	-	-	-	-	-
N5.9.27 A1 ⊕ Y1 ⊕ Y1	√	1	1	√	$2/m$	$\mathrm{A_u}$
N5.9.28 A1 ⊕ Y1 ⊕ Y2	√	1	1	√	$2/m$	$\mathrm{B_u}$
N5.9.29 A1 ⊕ Y2 ⊕ Y2	√	1	1	√	$2/m$	$\mathrm{A_u}$
N5.9.30 Y1 ⊕ Y1 ⊕ Y1	√	3	3	√	$2/m$	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{A_u}$
N5.9.31 Y1 ⊕ Y1 ⊕ Y2	√	3	3	√	$2/m$	$\mathrm{A_u} \oplus \mathrm{B_u} \oplus \mathrm{B_u}$
N5.9.32 Y1 ⊕ Y2 ⊕ Y2	√	3	3	√	$2/m$	$\mathrm{A_u} \oplus \mathrm{B_u} \oplus \mathrm{B_u}$
N5.9.33 Y2 ⊕ Y2 ⊕ Y2	√	3	3	√	$2/m$	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{A_u}$
N5.11.1 GM2 ⊕ LD1LE1	√	1	1	√	m	$\mathrm{A''}$
N5.11.2 GM2 ⊕ LD2LE2	√	1	1	√	m	$\mathrm{A''}$
N5.11.3 GM2 ⊕ U1UA1	√	1	1	×	-	-
N5.11.4 A1 ⊕ LD1LE1	√	1	1	√	$2/m$	$\mathrm{A_u}$
N5.11.5 A1 ⊕ LD2LE2	√	1	1	√	$2/m$	$\mathrm{A_u}$
N5.11.6 A1 ⊕ U1UA1	√	1	1	√	$2/m$	$\mathrm{A_u}$
N5.11.7 A1 ⊕ U2UA2	√	1	1	√	$2/m$	$\mathrm{A_u}$
N5.11.8 Y1 ⊕ LD1LE1	√	1	1	√	$2/m$	$\mathrm{A_u}$
N5.11.9 Y1 ⊕ LD2LE2	√	1	1	√	$2/m$	$\mathrm{A_u}$
N5.11.10 Y1 ⊕ U1UA1	√	1	1	×	-	-
N5.11.11 Y2 ⊕ LD1LE1	√	1	1	√	$2/m$	$\mathrm{A_u}$
N5.11.12 Y2 ⊕ LD2LE2	√	1	1	√	$2/m$	$\mathrm{A_u}$
N5.11.13 Y2 ⊕ U1UA1	√	1	1	×	-	-
N5.13.1 GM2 ⊕ L1	√	1	1	×	-	-
N5.13.2 A1 ⊕ L1	×	-	-	-	-	-
N5.13.3 Y1 ⊕ L1	×	-	-	-	-	-
N5.13.4 Y2 ⊕ L1	×	-	-	-	-	-
N5.14.1 GM2 ⊕ B1	√	3	3	√	2	$\mathrm{A} \oplus \mathrm{B} \oplus \mathrm{B}$
N5.14.2 A1 ⊕ B1	√	3	3	√	$2/m$	$\mathrm{A_g} \oplus \mathrm{B_g} \oplus \mathrm{B_u}$
N5.14.3 Y1 ⊕ B1	√	3	3	√	$2/m$	$\mathrm{A_g} \oplus \mathrm{B_g} \oplus \mathrm{B_u}$
N5.14.4 Y2 ⊕ B1	√	3	3	√	$2/m$	$\mathrm{A_g} \oplus \mathrm{B_g} \oplus \mathrm{B_u}$

TABLE S16: Collinear SSGs with parent space group Pm (No. 6).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L6.1.1 GM1	1	$2/m$	$\mathrm{A_g}$
L6.2.1 GM2	1	$2/m$	$\mathrm{B_g}$

Collinear SSGs with parent space group Pm (No. 6)(continued)

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L6.2.2 A1	0	-	-
L6.2.3 A2	0	-	-
L6.2.4 C1	0	-	-
L6.2.5 Z1	0	-	-

TABLE S17: Coplanar SSGs with parent space group Pm (No. 6).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P6.1.1 GM1	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B_u}$
P6.2.1 GM2	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B_g}$
P6.2.2 A1	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
P6.2.3 A2	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
P6.2.4 C1	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
P6.2.5 Z1	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
P6.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{B_g} \oplus \mathrm{B_g} \oplus \mathrm{B_u}$
P6.3.2 GM2 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
P6.3.3 GM2 $\oplus$ A2	$\surd$	1	1	$\times$	-	-
P6.3.4 GM2 $\oplus$ C1	$\surd$	1	1	$\times$	-	-
P6.3.5 GM2 $\oplus$ Z1	$\surd$	1	1	$\times$	-	-
P6.3.6 A1 $\oplus$ A1	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
P6.3.7 A1 $\oplus$ Y1	$\times$	-	-	-	-	-
P6.3.8 A1 $\oplus$ A2	$\surd$	1	1	$\times$	-	-
P6.3.9 A1 $\oplus$ B2	$\times$	-	-	-	-	-
P6.3.10 A1 $\oplus$ C1	$\times$	-	-	-	-	-
P6.3.11 A1 $\oplus$ E1	$\times$	-	-	-	-	-
P6.3.12 A1 $\oplus$ Z1	$\times$	-	-	-	-	-
P6.3.13 A2 $\oplus$ A2	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
P6.3.14 A2 $\oplus$ Y2	$\times$	-	-	-	-	-
P6.3.15 A2 $\oplus$ C1	$\times$	-	-	-	-	-
P6.3.16 A2 $\oplus$ E1	$\times$	-	-	-	-	-
P6.3.17 A2 $\oplus$ Z1	$\times$	-	-	-	-	-
P6.3.18 C1 $\oplus$ C1	$\surd$	1	1	$\times$	-	-
P6.3.19 C1 $\oplus$ C2	$\surd$	1	1	$\times$	-	-
P6.3.20 C1 $\oplus$ D1	$\times$	-	-	-	-	-
P6.3.21 C1 $\oplus$ D2	$\times$	-	-	-	-	-
P6.3.22 C1 $\oplus$ Z1	$\times$	-	-	-	-	-
P6.3.23 C1 $\oplus$ Z2	$\times$	-	-	-	-	-
P6.3.24 Z1 $\oplus$ Z1	$\surd$	1	1	$\times$	-	-
P6.3.25 Z1 $\oplus$ Z2	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
P6.5.1 F1FA1	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B_u}$
P6.5.2 F2FA2	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{B_g} \oplus \mathrm{B_g} \oplus \mathrm{B_u}$
P6.5.3 G1GA1	$\surd$	1	1	$\times$	-	-
P6.8.1 LD1	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
P6.8.2 U1	$\surd$	1	1	$\times$	-	-

TABLE S18: Non-coplanar SSGs with parent space group Pm (No. 6).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N6.1.1 GM1	$\surd$	3	3	$\surd$	m	$\mathrm{A}'\oplus\mathrm{A}'\oplus\mathrm{A}'$
N6.2.1 GM2	$\surd$	3	3	$\surd$	2	$\mathrm{A}\oplus\mathrm{A}\oplus\mathrm{B}$
N6.2.2 A1	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{B_u}$
N6.2.3 A2	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{B_u}$
N6.2.4 C1	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{B_u}$
N6.2.5 Z1	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{B_u}$
N6.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	m	$\mathrm{A}'\oplus\mathrm{A}''\oplus\mathrm{A}''$
N6.3.2 GM2 $\oplus$ A1	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g}\oplus\mathrm{A_u}\oplus\mathrm{B_g}$
N6.3.3 GM2 $\oplus$ A2	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g}\oplus\mathrm{A_u}\oplus\mathrm{B_g}$
N6.3.4 GM2 $\oplus$ C1	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g}\oplus\mathrm{A_u}\oplus\mathrm{B_g}$
N6.3.5 GM2 $\oplus$ Z1	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g}\oplus\mathrm{A_u}\oplus\mathrm{B_g}$
N6.3.6 A1 $\oplus$ A1	$\surd$	1	1	$\surd$	m	A'
N6.3.7 A1 $\oplus$ Y1	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
N6.3.8 A1 $\oplus$ A2	$\surd$	1	1	$\surd$	2	A
N6.3.9 A1 $\oplus$ B2	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
N6.3.10 A1 $\oplus$ C1	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
N6.3.11 A1 $\oplus$ E1	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
N6.3.12 A1 $\oplus$ Z1	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
N6.3.13 A2 $\oplus$ A2	$\surd$	1	1	$\surd$	m	A'
N6.3.14 A2 $\oplus$ Y2	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
N6.3.15 A2 $\oplus$ C1	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
N6.3.16 A2 $\oplus$ E1	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
N6.3.17 A2 $\oplus$ Z1	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
N6.3.18 C1 $\oplus$ C1	$\surd$	1	1	$\surd$	m	A'
N6.3.19 C1 $\oplus$ C2	$\surd$	1	1	$\surd$	2	A
N6.3.20 C1 $\oplus$ D1	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
N6.3.21 C1 $\oplus$ D2	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
N6.3.22 C1 $\oplus$ Z1	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
N6.3.23 C1 $\oplus$ Z2	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
N6.3.24 Z1 $\oplus$ Z1	$\surd$	1	1	$\surd$	m	A'
N6.3.25 Z1 $\oplus$ Z2	$\surd$	1	1	$\surd$	2	A
N6.5.1 F1FA1	$\surd$	3	3	$\surd$	m	$\mathrm{A}'\oplus\mathrm{A}'\oplus\mathrm{A}'$
N6.5.2 F2FA2	$\surd$	3	3	$\surd$	m	$\mathrm{A}'\oplus\mathrm{A}''\oplus\mathrm{A}''$
N6.5.3 G1GA1	$\surd$	1	1	$\surd$	m	A'
N6.8.1 LD1	$\surd$	1	1	$\surd$	2	A
N6.8.2 U1	$\surd$	1	1	$\surd$	2	A
N6.9.1 GM2 $\oplus$ GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	2	$\mathrm{B}\oplus\mathrm{B}\oplus\mathrm{B}$
N6.9.2 GM2 $\oplus$ GM2 $\oplus$ A1	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{B_g}\oplus\mathrm{B_g}\oplus\mathrm{B_u}$
N6.9.3 GM2 $\oplus$ GM2 $\oplus$ A2	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{B_g}\oplus\mathrm{B_g}\oplus\mathrm{B_u}$
N6.9.4 GM2 $\oplus$ GM2 $\oplus$ C1	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{B_g}\oplus\mathrm{B_g}\oplus\mathrm{B_u}$
N6.9.5 GM2 $\oplus$ GM2 $\oplus$ Z1	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{B_g}\oplus\mathrm{B_g}\oplus\mathrm{B_u}$
N6.9.6 GM2 $\oplus$ A1 $\oplus$ A1	$\surd$	1	1	$\surd$	2	B
N6.9.7 GM2 $\oplus$ A1 $\oplus$ Y1	$\surd$	1	1	$\times$	-	-
N6.9.8 GM2 $\oplus$ A1 $\oplus$ A2	$\surd$	1	1	$\times$	-	-
N6.9.9 GM2 $\oplus$ A1 $\oplus$ B2	$\surd$	1	1	$\times$	-	-
N6.9.10 GM2 $\oplus$ A1 $\oplus$ C1	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group Pm (No. 6) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N6.9.11 GM2 ⊕ A1 ⊕ E1	√	1	1	×	-	-
N6.9.12 GM2 ⊕ A1 ⊕ Z1	√	1	1	√	$2/m$	$\mathrm{B_g}$
N6.9.13 GM2 ⊕ A2 ⊕ A2	√	1	1	√	2	B
N6.9.14 GM2 ⊕ A2 ⊕ Y2	√	1	1	×	-	-
N6.9.15 GM2 ⊕ A2 ⊕ C1	√	1	1	×	-	-
N6.9.16 GM2 ⊕ A2 ⊕ E1	√	1	1	×	-	-
N6.9.17 GM2 ⊕ A2 ⊕ Z1	√	1	1	√	$2/m$	$\mathrm{B_g}$
N6.9.18 GM2 ⊕ C1 ⊕ C1	√	1	1	×	-	-
N6.9.19 GM2 ⊕ C1 ⊕ C2	√	1	1	×	-	-
N6.9.20 GM2 ⊕ C1 ⊕ D1	√	1	1	×	-	-
N6.9.21 GM2 ⊕ C1 ⊕ D2	√	1	1	×	-	-
N6.9.22 GM2 ⊕ C1 ⊕ Z1	√	1	1	×	-	-
N6.9.23 GM2 ⊕ C1 ⊕ Z2	√	1	1	×	-	-
N6.9.24 GM2 ⊕ Z1 ⊕ Z1	√	1	1	×	-	-
N6.9.25 GM2 ⊕ Z1 ⊕ Z2	√	1	1	√	m	$\mathrm{A''}$
N6.9.26 A1 ⊕ A1 ⊕ A1	√	3	3	√	$2/m$	$\mathrm{B_u} \oplus \mathrm{B_u} \oplus \mathrm{B_u}$
N6.9.27 A1 ⊕ A1 ⊕ Y1	√	1	1	√	$2/m$	$\mathrm{B_u}$
N6.9.28 B1 ⊕ A1 ⊕ Y1	×	-	-	-	-	-
N6.9.29 A1 ⊕ A1 ⊕ A2	√	3	3	√	$2/m$	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B_u}$
N6.9.30 A1 ⊕ A1 ⊕ B2	√	1	1	√	$2/m$	$\mathrm{B_u}$
N6.9.31 A1 ⊕ Y1 ⊕ A2	√	1	1	×	-	-
N6.9.32 A1 ⊕ Y1 ⊕ B2	×	-	-	-	-	-
N6.9.33 A1 ⊕ A1 ⊕ C1	√	1	1	√	$2/m$	$\mathrm{B_u}$
N6.9.34 A1 ⊕ A1 ⊕ E1	√	1	1	√	$2/m$	$\mathrm{B_u}$
N6.9.35 A1 ⊕ Y1 ⊕ D1	×	-	-	-	-	-
N6.9.36 A1 ⊕ Y1 ⊕ C1	×	-	-	-	-	-
N6.9.37 A1 ⊕ A1 ⊕ Z1	√	1	1	√	$2/m$	$\mathrm{B_u}$
N6.9.38 A1 ⊕ Y1 ⊕ Z1	×	-	-	-	-	-
N6.9.39 A1 ⊕ A2 ⊕ A2	√	3	3	√	$2/m$	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B_u}$
N6.9.40 A1 ⊕ A2 ⊕ Y2	√	1	1	×	-	-
N6.9.41 A1 ⊕ B2 ⊕ B2	√	1	1	√	$2/m$	$\mathrm{B_u}$
N6.9.42 A1 ⊕ B2 ⊕ Y2	×	-	-	-	-	-
N6.9.43 A1 ⊕ A2 ⊕ C1	√	1	1	×	-	-
N6.9.44 A1 ⊕ A2 ⊕ E1	√	1	1	√	$2/m$	$\mathrm{A_u}$
N6.9.45 A1 ⊕ B2 ⊕ C1	×	-	-	-	-	-
N6.9.46 A1 ⊕ B2 ⊕ E1	×	-	-	-	-	-
N6.9.47 A1 ⊕ B2 ⊕ D1	×	-	-	-	-	-
N6.9.48 A1 ⊕ A2 ⊕ Z1	√	1	1	×	-	-
N6.9.49 A1 ⊕ B2 ⊕ Z1	×	-	-	-	-	-
N6.9.50 A1 ⊕ C1 ⊕ C1	√	1	1	×	-	-
N6.9.51 A1 ⊕ C1 ⊕ C2	√	1	1	×	-	-
N6.9.52 A1 ⊕ C1 ⊕ E1	×	-	-	-	-	-
N6.9.53 A1 ⊕ C1 ⊕ E2	×	-	-	-	-	-
N6.9.54 A1 ⊕ C1 ⊕ D1	×	-	-	-	-	-
N6.9.55 A1 ⊕ C1 ⊕ D2	×	-	-	-	-	-
N6.9.56 A1 ⊕ E1 ⊕ E1	√	1	1	×	-	-

Non-coplanar SSGs with parent space group Pm (No. 6) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N6.9.57 A1 ⊕ E1 ⊕ E2	√	1	1	√	$2/m$	$\mathrm{A_u}$
N6.9.58 A1 ⊕ C1 ⊕ Z1	×	-	-	-	-	-
N6.9.59 A1 ⊕ C1 ⊕ Z2	×	-	-	-	-	-
N6.9.60 A1 ⊕ E1 ⊕ Z1	×	-	-	-	-	-
N6.9.61 A1 ⊕ E1 ⊕ Z2	×	-	-	-	-	-
N6.9.62 A1 ⊕ Z1 ⊕ Z1	√	1	1	×	-	-
N6.9.63 A1 ⊕ Z1 ⊕ Z2	√	1	1	√	$2/m$	$\mathrm{A_u}$
N6.9.64 A2 ⊕ A2 ⊕ A2	√	3	3	√	$2/m$	$\mathrm{B_u} \oplus \mathrm{B_u} \oplus \mathrm{B_u}$
N6.9.65 A2 ⊕ A2 ⊕ Y2	√	1	1	√	$2/m$	$\mathrm{B_u}$
N6.9.66 B2 ⊕ A2 ⊕ Y2	×	-	-	-	-	-
N6.9.67 A2 ⊕ A2 ⊕ C1	√	1	1	√	$2/m$	$\mathrm{B_u}$
N6.9.68 A2 ⊕ A2 ⊕ E1	√	1	1	√	$2/m$	$\mathrm{B_u}$
N6.9.69 A2 ⊕ Y2 ⊕ D1	×	-	-	-	-	-
N6.9.70 A2 ⊕ Y2 ⊕ C1	×	-	-	-	-	-
N6.9.71 A2 ⊕ A2 ⊕ Z1	√	1	1	√	$2/m$	$\mathrm{B_u}$
N6.9.72 A2 ⊕ Y2 ⊕ Z1	×	-	-	-	-	-
N6.9.73 A2 ⊕ C1 ⊕ C1	√	1	1	×	-	-
N6.9.74 A2 ⊕ C1 ⊕ C2	√	1	1	×	-	-
N6.9.75 A2 ⊕ C1 ⊕ E1	×	-	-	-	-	-
N6.9.76 A2 ⊕ C1 ⊕ E2	×	-	-	-	-	-
N6.9.77 A2 ⊕ C1 ⊕ D1	×	-	-	-	-	-
N6.9.78 A2 ⊕ C1 ⊕ D2	×	-	-	-	-	-
N6.9.79 A2 ⊕ E1 ⊕ E1	√	1	1	×	-	-
N6.9.80 A2 ⊕ E1 ⊕ E2	√	1	1	√	$2/m$	$\mathrm{A_u}$
N6.9.81 A2 ⊕ C1 ⊕ Z1	×	-	-	-	-	-
N6.9.82 A2 ⊕ C1 ⊕ Z2	×	-	-	-	-	-
N6.9.83 A2 ⊕ E1 ⊕ Z1	×	-	-	-	-	-
N6.9.84 A2 ⊕ E1 ⊕ Z2	×	-	-	-	-	-
N6.9.85 A2 ⊕ Z1 ⊕ Z1	√	1	1	×	-	-
N6.9.86 A2 ⊕ Z1 ⊕ Z2	√	1	1	√	$2/m$	$\mathrm{A_u}$
N6.9.87 C1 ⊕ C1 ⊕ C1	√	3	3	√	$2/m$	$\mathrm{B_u} \oplus \mathrm{B_u} \oplus \mathrm{B_u}$
N6.9.88 C1 ⊕ C1 ⊕ C2	√	3	3	√	$2/m$	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B_u}$
N6.9.89 C1 ⊕ C1 ⊕ D1	√	1	1	√	$2/m$	$\mathrm{B_u}$
N6.9.90 C1 ⊕ C1 ⊕ D2	√	1	1	√	$2/m$	$\mathrm{B_u}$
N6.9.91 C1 ⊕ C2 ⊕ D1	√	1	1	×	-	-
N6.9.92 C1 ⊕ D1 ⊕ E1	×	-	-	-	-	-
N6.9.93 C1 ⊕ D1 ⊕ E2	×	-	-	-	-	-
N6.9.94 C1 ⊕ C1 ⊕ Z1	√	1	1	√	$2/m$	$\mathrm{B_u}$
N6.9.95 C1 ⊕ C1 ⊕ Z2	√	1	1	√	$2/m$	$\mathrm{B_u}$
N6.9.96 C1 ⊕ C2 ⊕ Z1	√	1	1	×	-	-
N6.9.97 C1 ⊕ D1 ⊕ Z1	×	-	-	-	-	-
N6.9.98 C1 ⊕ D1 ⊕ Z2	×	-	-	-	-	-
N6.9.99 C1 ⊕ D2 ⊕ Z1	×	-	-	-	-	-
N6.9.100 C1 ⊕ Z1 ⊕ Z1	√	1	1	√	$2/m$	$\mathrm{B_u}$
N6.9.101 C1 ⊕ Z1 ⊕ Z2	√	1	1	√	$2/m$	$\mathrm{A_u}$
N6.9.102 C1 ⊕ Z2 ⊕ Z2	√	1	1	√	$2/m$	$\mathrm{B_u}$

Non-coplanar SSGs with parent space group Pm (No. 6) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N6.9.103 Z1 ⊕ Z1 ⊕ Z1	√	3	3	√	$2/m$	$\mathrm{B_u} \oplus \mathrm{B_u} \oplus \mathrm{B_u}$
N6.9.104 Z1 ⊕ Z1 ⊕ Z2	√	3	3	√	$2/m$	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B_u}$
N6.11.1 GM2 ⊕ F1FA1	√	3	3	√	2	$\mathrm{A} \oplus \mathrm{A} \oplus \mathrm{B}$
N6.11.2 GM2 ⊕ F2FA2	√	3	3	√	2	$\mathrm{B} \oplus \mathrm{B} \oplus \mathrm{B}$
N6.11.3 GM2 ⊕ G1GA1	√	1	1	×	-	-
N6.11.4 A1 ⊕ F1FA1	√	3	3	√	$2/m$	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B_u}$
N6.11.5 A1 ⊕ F2FA2	√	3	3	√	$2/m$	$\mathrm{B_g} \oplus \mathrm{B_g} \oplus \mathrm{B_u}$
N6.11.6 A1 ⊕ G1GA1	√	1	1	×	-	-
N6.11.7 A2 ⊕ F1FA1	√	3	3	√	$2/m$	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B_u}$
N6.11.8 A2 ⊕ F2FA2	√	3	3	√	$2/m$	$\mathrm{B_g} \oplus \mathrm{B_g} \oplus \mathrm{B_u}$
N6.11.9 A2 ⊕ G1GA1	√	1	1	×	-	-
N6.11.10 C1 ⊕ F1FA1	√	3	3	√	$2/m$	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B_u}$
N6.11.11 C1 ⊕ F2FA2	√	3	3	√	$2/m$	$\mathrm{B_g} \oplus \mathrm{B_g} \oplus \mathrm{B_u}$
N6.11.12 C1 ⊕ G1GA1	√	1	1	√	$2/m$	$\mathrm{B_u}$
N6.11.13 C1 ⊕ G2GA2	√	1	1	√	$2/m$	$\mathrm{B_u}$
N6.11.14 Z1 ⊕ F1FA1	√	3	3	√	$2/m$	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B_u}$
N6.11.15 Z1 ⊕ F2FA2	√	3	3	√	$2/m$	$\mathrm{B_g} \oplus \mathrm{B_g} \oplus \mathrm{B_u}$
N6.11.16 Z1 ⊕ G1GA1	√	3	3	√	$2/m$	$\mathrm{B_u} \oplus \mathrm{B_u} \oplus \mathrm{B_u}$
N6.11.17 Z1 ⊕ G2GA2	√	3	3	√	$2/m$	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B_u}$
N6.14.1 GM2 ⊕ LD1	√	1	1	√	m	$\mathrm{A''}$
N6.14.2 GM2 ⊕ U1	√	1	1	×	-	-
N6.14.3 A1 ⊕ LD1	√	1	1	√	$2/m$	$\mathrm{A_u}$
N6.14.4 A1 ⊕ V1	√	1	1	×	-	-
N6.14.5 A1 ⊕ U1	√	1	1	√	$2/m$	$\mathrm{A_u}$
N6.14.6 A2 ⊕ LD1	√	1	1	√	$2/m$	$\mathrm{A_u}$
N6.14.7 A2 ⊕ V1	√	1	1	×	-	-
N6.14.8 A2 ⊕ U1	√	1	1	√	$2/m$	$\mathrm{A_u}$
N6.14.9 C1 ⊕ LD1	√	1	1	√	$2/m$	$\mathrm{A_u}$
N6.14.10 C1 ⊕ W1	√	1	1	√	$2/m$	$\mathrm{A_u}$
N6.14.11 C1 ⊕ U1	√	1	1	×	-	-
N6.14.12 Z1 ⊕ LD1	√	1	1	√	$2/m$	$\mathrm{A_u}$
N6.14.13 Z1 ⊕ U1	√	1	1	×	-	-

TABLE S19: Collinear SSGs with parent space group Pc (No. 7).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L7.1.1 GM1	1	$2/m$	$\mathrm{A_g}$
L7.2.1 GM2	1	$2/m$	$\mathrm{B_g}$
L7.2.2 C1	0	-	-
L7.2.3 Y1	0	-	-
L7.2.4 Z1	0	-	-

TABLE S20: Coplanar SSGs with parent space group Pc (No. 7).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P7.1.1 GM1	√	3	3	√	$2/m$	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B_u}$

Coplanar SSGs with parent space group Pc (No. 7) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P7.2.1 GM2	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B_g}$
P7.2.2 C1	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
P7.2.3 Y1	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
P7.2.4 Z1	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
P7.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{B_g} \oplus \mathrm{B_g} \oplus \mathrm{B_u}$
P7.3.2 GM2 $\oplus$ C1	$\surd$	1	1	$\times$	-	-
P7.3.3 GM2 $\oplus$ Y1	$\surd$	1	1	$\times$	-	-
P7.3.4 GM2 $\oplus$ Z1	$\surd$	1	1	$\times$	-	-
P7.3.5 C1 $\oplus$ C1	$\surd$	1	1	$\times$	-	-
P7.3.6 C1 $\oplus$ C2	$\surd$	1	1	$\times$	-	-
P7.3.7 C1 $\oplus$ Y1	$\times$	-	-	-	-	-
P7.3.8 C1 $\oplus$ Z1	$\times$	-	-	-	-	-
P7.3.9 Y1 $\oplus$ Y1	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
P7.3.10 Y1 $\oplus$ Y2	$\surd$	1	1	$\times$	-	-
P7.3.11 Y1 $\oplus$ Z1	$\times$	-	-	-	-	-
P7.3.12 Z1 $\oplus$ Z1	$\surd$	1	1	$\times$	-	-
P7.3.13 Z1 $\oplus$ Z2	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
P7.4.1 A1A2	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
P7.4.2 D1D2	$\surd$	1	1	$\times$	-	-
P7.5.1 F1FA1	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B_u}$
P7.5.2 G1GA1	$\surd$	1	1	$\times$	-	-
P7.8.1 LD1	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
P7.8.2 W1	$\surd$	1	1	$\times$	-	-

TABLE S21: Non-coplanar SSGs with parent space group Pc (No. 7).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N7.1.1 GM1	$\surd$	3	3	$\surd$	m	$\mathrm{A'} \oplus \mathrm{A'} \oplus \mathrm{A'}$
N7.2.1 GM2	$\surd$	3	3	$\surd$	2	$\mathrm{A} \oplus \mathrm{A} \oplus \mathrm{B}$
N7.2.2 C1	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B_u}$
N7.2.3 Y1	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B_u}$
N7.2.4 Z1	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B_u}$
N7.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	m	$\mathrm{A'} \oplus \mathrm{A''} \oplus \mathrm{A''}$
N7.3.2 GM2 $\oplus$ C1	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B_g}$
N7.3.3 GM2 $\oplus$ Y1	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B_g}$
N7.3.4 GM2 $\oplus$ Z1	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B_g}$
N7.3.5 C1 $\oplus$ C1	$\surd$	1	1	$\surd$	m	$\mathrm{A'}$
N7.3.6 C1 $\oplus$ C2	$\surd$	1	1	$\surd$	2	A
N7.3.7 C1 $\oplus$ Y1	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
N7.3.8 C1 $\oplus$ Z1	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
N7.3.9 Y1 $\oplus$ Y1	$\surd$	1	1	$\surd$	m	$\mathrm{A'}$
N7.3.10 Y1 $\oplus$ Y2	$\surd$	1	1	$\surd$	2	A
N7.3.11 Y1 $\oplus$ Z1	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
N7.3.12 Z1 $\oplus$ Z1	$\surd$	1	1	$\surd$	m	$\mathrm{A'}$
N7.3.13 Z1 $\oplus$ Z2	$\surd$	1	1	$\surd$	2	A

Non-coplanar SSGs with parent space group Pc (No. 7) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N7.4.1 A1A2	√	1	1	√	m	A'
N7.4.2 D1D2	√	1	1	√	m	A'
N7.5.1 F1FA1	√	3	3	√	m	$\mathrm{A}' \oplus \mathrm{A}' \oplus \mathrm{A}'$
N7.5.2 G1GA1	√	1	1	√	m	A'
N7.8.1 LD1	√	1	1	√	2	A
N7.8.2 W1	√	1	1	√	2	A
N7.9.1 GM2 ⊕ GM2 ⊕ GM2	√	3	3	√	2	B ⊕ B ⊕ B
N7.9.2 GM2 ⊕ GM2 ⊕ C1	√	3	3	√	$2/m$	$\mathrm{B_g} \oplus \mathrm{B_g} \oplus \mathrm{B_u}$
N7.9.3 GM2 ⊕ GM2 ⊕ Y1	√	3	3	√	$2/m$	$\mathrm{B_g} \oplus \mathrm{B_g} \oplus \mathrm{B_u}$
N7.9.4 GM2 ⊕ GM2 ⊕ Z1	√	3	3	√	$2/m$	$\mathrm{B_g} \oplus \mathrm{B_g} \oplus \mathrm{B_u}$
N7.9.5 GM2 ⊕ C1 ⊕ C1	√	1	1	×	-	-
N7.9.6 GM2 ⊕ C1 ⊕ C2	√	1	1	×	-	-
N7.9.7 GM2 ⊕ C1 ⊕ Y1	√	1	1	×	-	-
N7.9.8 GM2 ⊕ C1 ⊕ Z1	√	1	1	×	-	-
N7.9.9 GM2 ⊕ Y1 ⊕ Y1	√	1	1	√	2	B
N7.9.10 GM2 ⊕ Y1 ⊕ Y2	√	1	1	×	-	-
N7.9.11 GM2 ⊕ Y1 ⊕ Z1	√	1	1	√	$2/m$	$\mathrm{B_g}$
N7.9.12 GM2 ⊕ Z1 ⊕ Z1	√	1	1	×	-	-
N7.9.13 GM2 ⊕ Z1 ⊕ Z2	√	1	1	√	m	A''
N7.9.14 C1 ⊕ C1 ⊕ C1	√	3	3	√	$2/m$	$\mathrm{B_u} \oplus \mathrm{B_u} \oplus \mathrm{B_u}$
N7.9.15 C1 ⊕ C1 ⊕ C2	√	3	3	√	$2/m$	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B_u}$
N7.9.16 C1 ⊕ C1 ⊕ Y1	√	1	1	×	-	-
N7.9.17 C1 ⊕ C2 ⊕ Y1	√	1	1	√	$2/m$	$\mathrm{A_u}$
N7.9.18 C1 ⊕ C1 ⊕ Z1	√	1	1	√	$2/m$	$\mathrm{B_u}$
N7.9.19 C1 ⊕ C2 ⊕ Z1	√	1	1	×	-	-
N7.9.20 C1 ⊕ Y1 ⊕ Y1	√	1	1	√	$2/m$	$\mathrm{B_u}$
N7.9.21 C1 ⊕ Y1 ⊕ Y2	√	1	1	√	$2/m$	$\mathrm{A_u}$
N7.9.22 C1 ⊕ Y1 ⊕ Z1	×	-	-	-	-	-
N7.9.23 C1 ⊕ Y1 ⊕ Z2	×	-	-	-	-	-
N7.9.24 C1 ⊕ Z1 ⊕ Z1	√	1	1	√	$2/m$	$\mathrm{B_u}$
N7.9.25 C1 ⊕ Z1 ⊕ Z2	√	1	1	√	$2/m$	$\mathrm{A_u}$
N7.9.26 Y1 ⊕ Y1 ⊕ Y1	√	3	3	√	$2/m$	$\mathrm{B_u} \oplus \mathrm{B_u} \oplus \mathrm{B_u}$
N7.9.27 Y1 ⊕ Y1 ⊕ Y2	√	3	3	√	$2/m$	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B_u}$
N7.9.28 Y1 ⊕ Y1 ⊕ Z1	√	1	1	√	$2/m$	$\mathrm{B_u}$
N7.9.29 Y1 ⊕ Y2 ⊕ Z1	√	1	1	×	-	-
N7.9.30 Y1 ⊕ Z1 ⊕ Z1	√	1	1	×	-	-
N7.9.31 Y1 ⊕ Z1 ⊕ Z2	√	1	1	√	$2/m$	$\mathrm{A_u}$
N7.9.32 Z1 ⊕ Z1 ⊕ Z1	√	3	3	√	$2/m$	$\mathrm{B_u} \oplus \mathrm{B_u} \oplus \mathrm{B_u}$
N7.9.33 Z1 ⊕ Z1 ⊕ Z2	√	3	3	√	$2/m$	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B_u}$
N7.10.1 GM2 ⊕ A1A2	√	1	1	√	2	B
N7.10.2 GM2 ⊕ D1D2	√	1	1	×	-	-
N7.10.3 C1 ⊕ A1A2	√	1	1	√	$2/m$	$\mathrm{B_u}$
N7.10.4 C1 ⊕ D1D2	√	1	1	√	$2/m$	$\mathrm{B_u}$
N7.10.5 Y1 ⊕ A1A2	√	1	1	√	$2/m$	$\mathrm{B_u}$
N7.10.6 Y1 ⊕ D1D2	√	1	1	×	-	-
N7.10.7 Z1 ⊕ A1A2	√	1	1	√	$2/m$	$\mathrm{B_u}$

Non-coplanar SSGs with parent space group Pc (No. 7) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N7.10.8 Z1 $\oplus$ D1D2	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
N7.11.1 GM2 $\oplus$ F1FA1	$\surd$	3	3	$\surd$	2	$\mathrm{A}\oplus\mathrm{A}\oplus\mathrm{B}$
N7.11.2 GM2 $\oplus$ G1GA1	$\surd$	1	1	$\times$	-	-
N7.11.3 C1 $\oplus$ F1FA1	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{B_u}$
N7.11.4 C1 $\oplus$ G1GA1	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
N7.11.5 Y1 $\oplus$ F1FA1	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{B_u}$
N7.11.6 Y1 $\oplus$ G1GA1	$\surd$	1	1	$\times$	-	-
N7.11.7 Z1 $\oplus$ F1FA1	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{B_u}$
N7.11.8 Z1 $\oplus$ G1GA1	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{B_u}\oplus\mathrm{B_u}\oplus\mathrm{B_u}$
N7.14.1 GM2 $\oplus$ LD1	$\surd$	1	1	$\surd$	m	$\mathrm{A''}$
N7.14.2 GM2 $\oplus$ W1	$\surd$	1	1	$\times$	-	-
N7.14.3 C1 $\oplus$ LD1	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N7.14.4 C1 $\oplus$ W1	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N7.14.5 Y1 $\oplus$ LD1	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N7.14.6 Y1 $\oplus$ W1	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N7.14.7 Z1 $\oplus$ LD1	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N7.14.8 Z1 $\oplus$ W1	$\surd$	1	1	$\times$	-	-

TABLE S22: Collinear SSGs with parent space group Cm (No. 8).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L8.1.1 GM1	1	$2/m$	$\mathrm{A_g}$
L8.2.1 GM2	1	$2/m$	$\mathrm{B_g}$
L8.2.2 A1	0	-	-
L8.2.3 A2	0	-	-
L8.2.4 Y1	0	-	-
L8.2.5 Y2	0	-	-

TABLE S23: Coplanar SSGs with parent space group Cm (No. 8).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P8.1.1 GM1	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{B_u}$
P8.2.1 GM2	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g}\oplus\mathrm{A_u}\oplus\mathrm{B_g}$
P8.2.2 A1	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
P8.2.3 A2	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
P8.2.4 Y1	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
P8.2.5 Y2	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
P8.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{B_g}\oplus\mathrm{B_g}\oplus\mathrm{B_u}$
P8.3.2 GM2 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
P8.3.3 GM2 $\oplus$ A2	$\surd$	1	1	$\times$	-	-
P8.3.4 GM2 $\oplus$ Y1	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_g}$
P8.3.5 GM2 $\oplus$ Y2	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_g}$
P8.3.6 A1 $\oplus$ A1	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
P8.3.7 A1 $\oplus$ M1	$\times$	-	-	-	-	-
P8.3.8 A1 $\oplus$ A2	$\surd$	1	1	$\times$	-	-

Coplanar SSGs with parent space group Cm (No. 8) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P8.3.9 A1 $\oplus$ M2	$\times$	-	-	-	-	-
P8.3.10 A1 $\oplus$ Y1	$\times$	-	-	-	-	-
P8.3.11 A1 $\oplus$ Y2	$\times$	-	-	-	-	-
P8.3.12 A2 $\oplus$ A2	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
P8.3.13 A2 $\oplus$ M2	$\times$	-	-	-	-	-
P8.3.14 A2 $\oplus$ Y1	$\times$	-	-	-	-	-
P8.3.15 A2 $\oplus$ Y2	$\times$	-	-	-	-	-
P8.3.16 Y1 $\oplus$ Y1	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
P8.3.17 Y1 $\oplus$ Y2	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
P8.3.18 Y2 $\oplus$ Y2	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
P8.5.1 B1BA1	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B_u}$
P8.5.2 B2BA2	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{B_g} \oplus \mathrm{B_g} \oplus \mathrm{B_u}$
P8.7.1 L1	$\times$	-	-	-	-	-
P8.8.1 LD1	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
P8.8.2 U1	$\surd$	1	1	$\times$	-	-

TABLE S24: Non-coplanar SSGs with parent space group Cm (No. 8).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N8.1.1 GM1	$\surd$	3	3	$\surd$	m	$\mathrm{A'} \oplus \mathrm{A'} \oplus \mathrm{A'}$
N8.2.1 GM2	$\surd$	3	3	$\surd$	2	$\mathrm{A} \oplus \mathrm{A} \oplus \mathrm{B}$
N8.2.2 A1	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B_u}$
N8.2.3 A2	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B_u}$
N8.2.4 Y1	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B_u}$
N8.2.5 Y2	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B_u}$
N8.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	m	$\mathrm{A'} \oplus \mathrm{A''} \oplus \mathrm{A''}$
N8.3.2 GM2 $\oplus$ A1	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B_g}$
N8.3.3 GM2 $\oplus$ A2	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B_g}$
N8.3.4 GM2 $\oplus$ Y1	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B_g}$
N8.3.5 GM2 $\oplus$ Y2	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B_g}$
N8.3.6 A1 $\oplus$ A1	$\surd$	1	1	$\surd$	m	$\mathrm{A'}$
N8.3.7 A1 $\oplus$ M1	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
N8.3.8 A1 $\oplus$ A2	$\surd$	1	1	$\surd$	2	A
N8.3.9 A1 $\oplus$ M2	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
N8.3.10 A1 $\oplus$ Y1	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
N8.3.11 A1 $\oplus$ Y2	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
N8.3.12 A2 $\oplus$ A2	$\surd$	1	1	$\surd$	m	$\mathrm{A'}$
N8.3.13 A2 $\oplus$ M2	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
N8.3.14 A2 $\oplus$ Y1	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
N8.3.15 A2 $\oplus$ Y2	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
N8.3.16 Y1 $\oplus$ Y1	$\surd$	1	1	$\surd$	m	$\mathrm{A'}$
N8.3.17 Y1 $\oplus$ Y2	$\surd$	1	1	$\surd$	2	A
N8.3.18 Y2 $\oplus$ Y2	$\surd$	1	1	$\surd$	m	$\mathrm{A'}$
N8.5.1 B1BA1	$\surd$	3	3	$\surd$	m	$\mathrm{A'} \oplus \mathrm{A'} \oplus \mathrm{A'}$
N8.5.2 B2BA2	$\surd$	3	3	$\surd$	m	$\mathrm{A'} \oplus \mathrm{A''} \oplus \mathrm{A''}$

Non-coplanar SSGs with parent space group Cm (No. 8) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N8.7.1 L1	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
N8.8.1 LD1	$\surd$	1	1	$\surd$	2	A
N8.8.2 U1	$\surd$	1	1	$\surd$	2	A
N8.9.1 GM2 $\oplus$ GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	2	$\mathrm{B}\oplus\mathrm{B}\oplus\mathrm{B}$
N8.9.2 GM2 $\oplus$ GM2 $\oplus$ A1	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{B_g}\oplus\mathrm{B_g}\oplus\mathrm{B_u}$
N8.9.3 GM2 $\oplus$ GM2 $\oplus$ A2	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{B_g}\oplus\mathrm{B_g}\oplus\mathrm{B_u}$
N8.9.4 GM2 $\oplus$ GM2 $\oplus$ Y1	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{B_g}\oplus\mathrm{B_g}\oplus\mathrm{B_u}$
N8.9.5 GM2 $\oplus$ GM2 $\oplus$ Y2	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{B_g}\oplus\mathrm{B_g}\oplus\mathrm{B_u}$
N8.9.6 GM2 $\oplus$ A1 $\oplus$ A1	$\surd$	1	1	$\surd$	2	B
N8.9.7 GM2 $\oplus$ A1 $\oplus$ M1	$\surd$	1	1	$\times$	-	-
N8.9.8 GM2 $\oplus$ A1 $\oplus$ A2	$\surd$	1	1	$\times$	-	-
N8.9.9 GM2 $\oplus$ A1 $\oplus$ M2	$\surd$	1	1	$\times$	-	-
N8.9.10 GM2 $\oplus$ A1 $\oplus$ Y1	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_g}$
N8.9.11 GM2 $\oplus$ A1 $\oplus$ Y2	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_g}$
N8.9.12 GM2 $\oplus$ A2 $\oplus$ A2	$\surd$	1	1	$\surd$	2	B
N8.9.13 GM2 $\oplus$ A2 $\oplus$ M2	$\surd$	1	1	$\times$	-	-
N8.9.14 GM2 $\oplus$ A2 $\oplus$ Y1	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_g}$
N8.9.15 GM2 $\oplus$ A2 $\oplus$ Y2	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_g}$
N8.9.16 GM2 $\oplus$ Y1 $\oplus$ Y1	$\surd$	1	1	$\surd$	2	B
N8.9.17 GM2 $\oplus$ Y1 $\oplus$ Y2	$\surd$	1	1	$\surd$	m	$\mathrm{A''}$
N8.9.18 GM2 $\oplus$ Y2 $\oplus$ Y2	$\surd$	1	1	$\surd$	2	B
N8.9.19 A1 $\oplus$ A1 $\oplus$ A1	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{B_u}\oplus\mathrm{B_u}\oplus\mathrm{B_u}$
N8.9.20 A1 $\oplus$ A1 $\oplus$ M1	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
N8.9.21 A1 $\oplus$ A1 $\oplus$ A2	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_u}\oplus\mathrm{A_u}\oplus\mathrm{B_u}$
N8.9.22 A1 $\oplus$ A1 $\oplus$ M2	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
N8.9.23 A1 $\oplus$ M1 $\oplus$ A2	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N8.9.24 A1 $\oplus$ A1 $\oplus$ Y1	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
N8.9.25 A1 $\oplus$ M1 $\oplus$ Y1	$\times$	-	-	-	-	-
N8.9.26 A1 $\oplus$ A1 $\oplus$ Y2	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
N8.9.27 A1 $\oplus$ M1 $\oplus$ Y2	$\times$	-	-	-	-	-
N8.9.28 A1 $\oplus$ A2 $\oplus$ A2	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_u}\oplus\mathrm{A_u}\oplus\mathrm{B_u}$
N8.9.29 A1 $\oplus$ A2 $\oplus$ M2	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N8.9.30 A1 $\oplus$ M2 $\oplus$ M2	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
N8.9.31 A1 $\oplus$ A2 $\oplus$ Y1	$\surd$	1	1	$\times$	-	-
N8.9.32 A1 $\oplus$ M2 $\oplus$ Y1	$\times$	-	-	-	-	-
N8.9.33 A1 $\oplus$ A2 $\oplus$ Y2	$\surd$	1	1	$\times$	-	-
N8.9.34 A1 $\oplus$ M2 $\oplus$ Y2	$\times$	-	-	-	-	-
N8.9.35 A1 $\oplus$ Y1 $\oplus$ Y1	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
N8.9.36 A1 $\oplus$ Y1 $\oplus$ Y2	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N8.9.37 A1 $\oplus$ Y2 $\oplus$ Y2	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
N8.9.38 A2 $\oplus$ A2 $\oplus$ A2	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{B_u}\oplus\mathrm{B_u}\oplus\mathrm{B_u}$
N8.9.39 A2 $\oplus$ A2 $\oplus$ M2	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
N8.9.40 A2 $\oplus$ A2 $\oplus$ Y1	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
N8.9.41 A2 $\oplus$ M2 $\oplus$ Y1	$\times$	-	-	-	-	-
N8.9.42 A2 $\oplus$ A2 $\oplus$ Y2	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
N8.9.43 A2 $\oplus$ M2 $\oplus$ Y2	$\times$	-	-	-	-	-

Non-coplanar SSGs with parent space group Cm (No. 8) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N8.9.44 A2 ⊕ Y1 ⊕ Y1	√	1	1	√	$2/m$	$\mathrm{B_u}$
N8.9.45 A2 ⊕ Y1 ⊕ Y2	√	1	1	√	$2/m$	$\mathrm{A_u}$
N8.9.46 A2 ⊕ Y2 ⊕ Y2	√	1	1	√	$2/m$	$\mathrm{B_u}$
N8.9.47 Y1 ⊕ Y1 ⊕ Y1	√	3	3	√	$2/m$	$\mathrm{B_u} \oplus \mathrm{B_u} \oplus \mathrm{B_u}$
N8.9.48 Y1 ⊕ Y1 ⊕ Y2	√	3	3	√	$2/m$	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B_u}$
N8.9.49 Y1 ⊕ Y2 ⊕ Y2	√	3	3	√	$2/m$	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B_u}$
N8.9.50 Y2 ⊕ Y2 ⊕ Y2	√	3	3	√	$2/m$	$\mathrm{B_u} \oplus \mathrm{B_u} \oplus \mathrm{B_u}$
N8.11.1 GM2 ⊕ B1BA1	√	3	3	√	2	A ⊕ A ⊕ B
N8.11.2 GM2 ⊕ B2BA2	√	3	3	√	2	B ⊕ B ⊕ B
N8.11.3 A1 ⊕ B1BA1	√	3	3	√	$2/m$	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B_u}$
N8.11.4 A1 ⊕ B2BA2	√	3	3	√	$2/m$	$\mathrm{B_g} \oplus \mathrm{B_g} \oplus \mathrm{B_u}$
N8.11.5 A2 ⊕ B1BA1	√	3	3	√	$2/m$	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B_u}$
N8.11.6 A2 ⊕ B2BA2	√	3	3	√	$2/m$	$\mathrm{B_g} \oplus \mathrm{B_g} \oplus \mathrm{B_u}$
N8.11.7 Y1 ⊕ B1BA1	√	3	3	√	$2/m$	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B_u}$
N8.11.8 Y1 ⊕ B2BA2	√	3	3	√	$2/m$	$\mathrm{B_g} \oplus \mathrm{B_g} \oplus \mathrm{B_u}$
N8.11.9 Y2 ⊕ B1BA1	√	3	3	√	$2/m$	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B_u}$
N8.11.10 Y2 ⊕ B2BA2	√	3	3	√	$2/m$	$\mathrm{B_g} \oplus \mathrm{B_g} \oplus \mathrm{B_u}$
N8.13.1 GM2 ⊕ L1	√	1	1	×	-	-
N8.13.2 A1 ⊕ L1	×	-	-	-	-	-
N8.13.3 A2 ⊕ L1	×	-	-	-	-	-
N8.13.4 Y1 ⊕ L1	×	-	-	-	-	-
N8.13.5 Y2 ⊕ L1	×	-	-	-	-	-
N8.14.1 GM2 ⊕ LD1	√	1	1	√	m	$\mathrm{A''}$
N8.14.2 GM2 ⊕ U1	√	1	1	×	-	-
N8.14.3 A1 ⊕ LD1	√	1	1	√	$2/m$	$\mathrm{A_u}$
N8.14.4 A1 ⊕ U1	√	1	1	√	$2/m$	$\mathrm{A_u}$
N8.14.5 A2 ⊕ LD1	√	1	1	√	$2/m$	$\mathrm{A_u}$
N8.14.6 A2 ⊕ U1	√	1	1	√	$2/m$	$\mathrm{A_u}$
N8.14.7 Y1 ⊕ LD1	√	1	1	√	$2/m$	$\mathrm{A_u}$
N8.14.8 Y1 ⊕ U1	√	1	1	×	-	-
N8.14.9 Y2 ⊕ LD1	√	1	1	√	$2/m$	$\mathrm{A_u}$
N8.14.10 Y2 ⊕ U1	√	1	1	×	-	-

TABLE S25: Collinear SSGs with parent space group Cc (No. 9).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L9.1.1 GM1	1	$2/m$	$\mathrm{A_g}$
L9.2.1 GM2	1	$2/m$	$\mathrm{B_g}$
L9.2.2 Y1	0	-	-

TABLE S26: Coplanar SSGs with parent space group Cc (No. 9).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P9.1.1 GM1	√	3	3	√	$2/m$	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B_u}$
P9.2.1 GM2	√	3	3	√	$2/m$	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B_g}$
P9.2.2 Y1	√	1	1	√	$2/m$	$\mathrm{A_g}$

Coplanar SSGs with parent space group Cc (No. 9) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P9.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{B_g} \oplus \mathrm{B_g} \oplus \mathrm{B_u}$
P9.3.2 GM2 $\oplus$ Y1	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_g}$
P9.3.3 Y1 $\oplus$ Y1	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
P9.3.4 Y1 $\oplus$ Y2	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
P9.4.1 A1A2	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
P9.5.1 B1BA1	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B_u}$
P9.7.1 L1	$\times$	-	-	-	-	-
P9.8.1 LD1	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$

TABLE S27: Non-coplanar SSGs with parent space group Cc (No. 9).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N9.1.1 GM1	$\surd$	3	3	$\surd$	m	$\mathrm{A'} \oplus \mathrm{A'} \oplus \mathrm{A'}$
N9.2.1 GM2	$\surd$	3	3	$\surd$	2	$\mathrm{A} \oplus \mathrm{A} \oplus \mathrm{B}$
N9.2.2 Y1	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B_u}$
N9.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	m	$\mathrm{A'} \oplus \mathrm{A''} \oplus \mathrm{A''}$
N9.3.2 GM2 $\oplus$ Y1	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B_g}$
N9.3.3 Y1 $\oplus$ Y1	$\surd$	1	1	$\surd$	m	$\mathrm{A'}$
N9.3.4 Y1 $\oplus$ Y2	$\surd$	1	1	$\surd$	2	A
N9.4.1 A1A2	$\surd$	1	1	$\surd$	m	$\mathrm{A'}$
N9.5.1 B1BA1	$\surd$	3	3	$\surd$	m	$\mathrm{A'} \oplus \mathrm{A'} \oplus \mathrm{A'}$
N9.7.1 L1	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
N9.8.1 LD1	$\surd$	1	1	$\surd$	2	A
N9.9.1 GM2 $\oplus$ GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	2	$\mathrm{B} \oplus \mathrm{B} \oplus \mathrm{B}$
N9.9.2 GM2 $\oplus$ GM2 $\oplus$ Y1	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{B_g} \oplus \mathrm{B_g} \oplus \mathrm{B_u}$
N9.9.3 GM2 $\oplus$ Y1 $\oplus$ Y1	$\surd$	1	1	$\surd$	2	B
N9.9.4 GM2 $\oplus$ Y1 $\oplus$ Y2	$\surd$	1	1	$\surd$	m	$\mathrm{A''}$
N9.9.5 Y1 $\oplus$ Y1 $\oplus$ Y1	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{B_u} \oplus \mathrm{B_u} \oplus \mathrm{B_u}$
N9.9.6 Y1 $\oplus$ Y1 $\oplus$ Y2	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B_u}$
N9.10.1 GM2 $\oplus$ A1A2	$\surd$	1	1	$\surd$	2	B
N9.10.2 Y1 $\oplus$ A1A2	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
N9.11.1 GM2 $\oplus$ B1BA1	$\surd$	3	3	$\surd$	2	$\mathrm{A} \oplus \mathrm{A} \oplus \mathrm{B}$
N9.11.2 Y1 $\oplus$ B1BA1	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B_u}$
N9.13.1 GM2 $\oplus$ L1	$\surd$	1	1	$\times$	-	-
N9.13.2 Y1 $\oplus$ V1	$\times$	-	-	-	-	-
N9.13.3 Y1 $\oplus$ L1	$\times$	-	-	-	-	-
N9.14.1 GM2 $\oplus$ LD1	$\surd$	1	1	$\surd$	m	$\mathrm{A''}$
N9.14.2 Y1 $\oplus$ LD1	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$

TABLE S28: Collinear SSGs with parent space group $P2/m$ (No. 10).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L10.1.1 $\mathrm{GM1^+}$	1	$2/m$	$\mathrm{A_g}$
L10.2.1 $\mathrm{GM1^-}$	0	-	-
L10.2.2 $\mathrm{GM2^+}$	1	$2/m$	$\mathrm{B_g}$

Collinear SSGs with parent space group $P2/m$ (No. 10)(continued)

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L10.2.3 $\mathrm{GM2}^-$	0	-	-
L10.2.4 $\mathrm{A1}^+$	0	-	-
L10.2.5 $\mathrm{A1}^-$	0	-	-
L10.2.6 $\mathrm{C1}^+$	0	-	-
L10.2.7 $\mathrm{Z1}^+$	0	-	-
L10.2.8 $\mathrm{Z2}^+$	0	-	-

TABLE S29: Coplanar SSGs with parent space group $P2/m$ (No. 10).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P10.1.1 $\mathrm{GM1}^+$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g}\oplus\mathrm{A_g}$
P10.2.1 $\mathrm{GM1}^-$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g}\oplus\mathrm{A_u}$
P10.2.2 $\mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g}\oplus\mathrm{B_g}$
P10.2.3 $\mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g}\oplus\mathrm{B_u}$
P10.2.4 $\mathrm{A1}^+$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
P10.2.5 $\mathrm{A1}^-$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
P10.2.6 $\mathrm{C1}^+$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
P10.2.7 $\mathrm{Z1}^+$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
P10.2.8 $\mathrm{Z2}^+$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
P10.3.1 $\mathrm{GM1}^-\oplus\mathrm{GM1}^-$	$\surd$	0	0	$\surd$	-	-
P10.3.2 $\mathrm{GM1}^-\oplus\mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{B_g}\oplus\mathrm{B_u}$
P10.3.3 $\mathrm{GM1}^-\oplus\mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
P10.3.4 $\mathrm{GM1}^-\oplus\mathrm{A1}^+$	$\surd$	1	1	$\times$	-	-
P10.3.5 $\mathrm{GM1}^-\oplus\mathrm{A1}^-$	$\surd$	1	1	$\times$	-	-
P10.3.6 $\mathrm{GM1}^-\oplus\mathrm{C1}^+$	$\surd$	1	1	$\times$	-	-
P10.3.7 $\mathrm{GM1}^-\oplus\mathrm{Z1}^+$	$\surd$	1	1	$\times$	-	-
P10.3.8 $\mathrm{GM1}^-\oplus\mathrm{Z2}^+$	$\surd$	1	1	$\times$	-	-
P10.3.9 $\mathrm{GM2}^+\oplus\mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{B_g}\oplus\mathrm{B_g}$
P10.3.10 $\mathrm{GM2}^+\oplus\mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_u}\oplus\mathrm{B_g}$
P10.3.11 $\mathrm{GM2}^+\oplus\mathrm{A1}^+$	$\surd$	1	0	$\times$	-	-
P10.3.12 $\mathrm{GM2}^+\oplus\mathrm{A1}^-$	$\surd$	1	0	$\times$	-	-
P10.3.13 $\mathrm{GM2}^+\oplus\mathrm{C1}^+$	$\surd$	1	0	$\times$	-	-
P10.3.14 $\mathrm{GM2}^+\oplus\mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
P10.3.15 $\mathrm{GM2}^+\oplus\mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
P10.3.16 $\mathrm{GM2}^-\oplus\mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
P10.3.17 $\mathrm{GM2}^-\oplus\mathrm{A1}^+$	$\surd$	1	1	$\times$	-	-
P10.3.18 $\mathrm{GM2}^-\oplus\mathrm{A1}^-$	$\surd$	1	1	$\times$	-	-
P10.3.19 $\mathrm{GM2}^-\oplus\mathrm{C1}^+$	$\surd$	1	1	$\times$	-	-
P10.3.20 $\mathrm{GM2}^-\oplus\mathrm{Z1}^+$	$\surd$	1	1	$\times$	-	-
P10.3.21 $\mathrm{GM2}^-\oplus\mathrm{Z2}^+$	$\surd$	1	1	$\times$	-	-
P10.3.22 $\mathrm{A1}^+\oplus\mathrm{A1}^+$	$\surd$	1	0	$\times$	-	-
P10.3.23 $\mathrm{A1}^+\oplus\mathrm{A2}^-$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
P10.3.24 $\mathrm{A1}^+\oplus\mathrm{Y1}^+$	$\times$	-	-	-	-	-
P10.3.25 $\mathrm{A1}^+\oplus\mathrm{A1}^-$	$\surd$	1	1	$\times$	-	-
P10.3.26 $\mathrm{A1}^+\oplus\mathrm{A2}^+$	$\surd$	1	0	$\times$	-	-
P10.3.27 $\mathrm{A1}^+\oplus\mathrm{B1}^-$	$\times$	-	-	-	-	-

Coplanar SSGs with parent space group $P2/m$ (No. 10) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P10.3.28 $\mathrm{A1}^+ \oplus \mathrm{C1}^+$	$\times$	-	-	-	-	-
P10.3.29 $\mathrm{A1}^+ \oplus \mathrm{E1}^+$	$\times$	-	-	-	-	-
P10.3.30 $\mathrm{A1}^+ \oplus \mathrm{E2}^+$	$\times$	-	-	-	-	-
P10.3.31 $\mathrm{A1}^+ \oplus \mathrm{Z1}^+$	$\times$	-	-	-	-	-
P10.3.32 $\mathrm{A1}^+ \oplus \mathrm{Z2}^+$	$\times$	-	-	-	-	-
P10.3.33 $\mathrm{A1}^- \oplus \mathrm{A1}^-$	$\surd$	1	0	$\times$	-	-
P10.3.34 $\mathrm{A1}^- \oplus \mathrm{A2}^+$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
P10.3.35 $\mathrm{A1}^- \oplus \mathrm{Y1}^-$	$\times$	-	-	-	-	-
P10.3.36 $\mathrm{A1}^- \oplus \mathrm{C1}^+$	$\times$	-	-	-	-	-
P10.3.37 $\mathrm{A1}^- \oplus \mathrm{E1}^+$	$\times$	-	-	-	-	-
P10.3.38 $\mathrm{A1}^- \oplus \mathrm{E2}^+$	$\times$	-	-	-	-	-
P10.3.39 $\mathrm{A1}^- \oplus \mathrm{Z1}^+$	$\times$	-	-	-	-	-
P10.3.40 $\mathrm{A1}^- \oplus \mathrm{Z2}^+$	$\times$	-	-	-	-	-
P10.3.41 $\mathrm{C1}^+ \oplus \mathrm{C1}^+$	$\surd$	1	0	$\times$	-	-
P10.3.42 $\mathrm{C1}^+ \oplus \mathrm{C1}^-$	$\surd$	1	1	$\times$	-	-
P10.3.43 $\mathrm{C1}^+ \oplus \mathrm{C2}^+$	$\surd$	1	0	$\times$	-	-
P10.3.44 $\mathrm{C1}^+ \oplus \mathrm{C2}^-$	$\surd$	1	1	$\times$	-	-
P10.3.45 $\mathrm{C1}^+ \oplus \mathrm{D1}^+$	$\times$	-	-	-	-	-
P10.3.46 $\mathrm{C1}^+ \oplus \mathrm{D1}^-$	$\times$	-	-	-	-	-
P10.3.47 $\mathrm{C1}^+ \oplus \mathrm{Z1}^+$	$\times$	-	-	-	-	-
P10.3.48 $\mathrm{C1}^+ \oplus \mathrm{Z1}^-$	$\times$	-	-	-	-	-
P10.3.49 $\mathrm{C1}^+ \oplus \mathrm{Z2}^+$	$\times$	-	-	-	-	-
P10.3.50 $\mathrm{C1}^+ \oplus \mathrm{Z2}^-$	$\times$	-	-	-	-	-
P10.3.51 $\mathrm{Z1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
P10.3.52 $\mathrm{Z1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
P10.3.53 $\mathrm{Z1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
P10.3.54 $\mathrm{Z1}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\times$	-	-
P10.3.55 $\mathrm{Z2}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
P10.3.56 $\mathrm{Z2}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
P10.8.1 LD1	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
P10.8.2 LD2	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
P10.8.3 U1	$\surd$	1	1	$\times$	-	-
P10.8.4 F1	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{B_u}$
P10.8.5 F2	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{B_g} \oplus \mathrm{B_u}$
P10.8.6 G1	$\surd$	1	1	$\times$	-	-

TABLE S30: Non-coplanar SSGs with parent space group $P2/m$ (No. 10).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N10.1.1 $\mathrm{GM1}^+$	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{A_g}$
N10.2.1 $\mathrm{GM1}^-$	$\surd$	2	2	$\surd$	2	$\mathrm{A} \oplus \mathrm{A}$
N10.2.2 $\mathrm{GM2}^+$	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B_g}$
N10.2.3 $\mathrm{GM2}^-$	$\surd$	2	2	$\surd$	m	$\mathrm{A}' \oplus \mathrm{A}'$
N10.2.4 $\mathrm{A1}^+$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{A_g}$
N10.2.5 $\mathrm{A1}^-$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{A_g}$
N10.2.6 $\mathrm{C1}^+$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{A_g}$

Non-coplanar SSGs with parent space group $P2/m$ (No. 10) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N10.2.7 $\mathrm{Z1}^{+}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g}\oplus\mathrm{A_g}$
N10.2.8 $\mathrm{Z2}^{+}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g}\oplus\mathrm{A_g}$
N10.3.1 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}$	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g}\oplus\mathrm{A_u}\oplus\mathrm{A_u}$
N10.3.2 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	m	$\mathrm{A}'\oplus\mathrm{A}''$
N10.3.3 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g}\oplus\mathrm{A_u}\oplus\mathrm{B_u}$
N10.3.4 $\mathrm{GM1}^{-}\oplus\mathrm{A1}^{+}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g}\oplus\mathrm{A_u}$
N10.3.5 $\mathrm{GM1}^{-}\oplus\mathrm{A1}^{-}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g}\oplus\mathrm{A_u}$
N10.3.6 $\mathrm{GM1}^{-}\oplus\mathrm{C1}^{+}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g}\oplus\mathrm{A_u}$
N10.3.7 $\mathrm{GM1}^{-}\oplus\mathrm{Z1}^{+}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g}\oplus\mathrm{A_u}$
N10.3.8 $\mathrm{GM1}^{-}\oplus\mathrm{Z2}^{+}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g}\oplus\mathrm{A_u}$
N10.3.9 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}$	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g}\oplus\mathrm{B_g}\oplus\mathrm{B_g}$
N10.3.10 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	2	$\mathrm{A}\oplus\mathrm{B}$
N10.3.11 $\mathrm{GM2}^{+}\oplus\mathrm{A1}^{+}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g}\oplus\mathrm{B_g}$
N10.3.12 $\mathrm{GM2}^{+}\oplus\mathrm{A1}^{-}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g}\oplus\mathrm{B_g}$
N10.3.13 $\mathrm{GM2}^{+}\oplus\mathrm{C1}^{+}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g}\oplus\mathrm{B_g}$
N10.3.14 $\mathrm{GM2}^{+}\oplus\mathrm{Z1}^{+}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g}\oplus\mathrm{B_g}$
N10.3.15 $\mathrm{GM2}^{+}\oplus\mathrm{Z2}^{+}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g}\oplus\mathrm{B_g}$
N10.3.16 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g}\oplus\mathrm{B_u}\oplus\mathrm{B_u}$
N10.3.17 $\mathrm{GM2}^{-}\oplus\mathrm{A1}^{+}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g}\oplus\mathrm{B_u}$
N10.3.18 $\mathrm{GM2}^{-}\oplus\mathrm{A1}^{-}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g}\oplus\mathrm{B_u}$
N10.3.19 $\mathrm{GM2}^{-}\oplus\mathrm{C1}^{+}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g}\oplus\mathrm{B_u}$
N10.3.20 $\mathrm{GM2}^{-}\oplus\mathrm{Z1}^{+}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g}\oplus\mathrm{B_u}$
N10.3.21 $\mathrm{GM2}^{-}\oplus\mathrm{Z2}^{+}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g}\oplus\mathrm{B_u}$
N10.3.22 $\mathrm{A1}^{+}\oplus\mathrm{A1}^{+}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
N10.3.23 $\mathrm{A1}^{+}\oplus\mathrm{A2}^{-}$	$\surd$	1	1	$\surd$	m	A'
N10.3.24 $\mathrm{A1}^{+}\oplus\mathrm{Y1}^{+}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
N10.3.25 $\mathrm{A1}^{+}\oplus\mathrm{A1}^{-}$	$\surd$	1	1	$\surd$	2	A
N10.3.26 $\mathrm{A1}^{+}\oplus\mathrm{A2}^{+}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
N10.3.27 $\mathrm{A1}^{+}\oplus\mathrm{B1}^{-}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
N10.3.28 $\mathrm{A1}^{+}\oplus\mathrm{C1}^{+}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
N10.3.29 $\mathrm{A1}^{+}\oplus\mathrm{E1}^{+}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
N10.3.30 $\mathrm{A1}^{+}\oplus\mathrm{E2}^{+}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
N10.3.31 $\mathrm{A1}^{+}\oplus\mathrm{Z1}^{+}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
N10.3.32 $\mathrm{A1}^{+}\oplus\mathrm{Z2}^{+}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
N10.3.33 $\mathrm{A1}^{-}\oplus\mathrm{A1}^{-}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
N10.3.34 $\mathrm{A1}^{-}\oplus\mathrm{A2}^{+}$	$\surd$	1	1	$\surd$	m	A'
N10.3.35 $\mathrm{A1}^{-}\oplus\mathrm{Y1}^{-}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
N10.3.36 $\mathrm{A1}^{-}\oplus\mathrm{C1}^{+}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
N10.3.37 $\mathrm{A1}^{-}\oplus\mathrm{E1}^{+}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
N10.3.38 $\mathrm{A1}^{-}\oplus\mathrm{E2}^{+}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
N10.3.39 $\mathrm{A1}^{-}\oplus\mathrm{Z1}^{+}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
N10.3.40 $\mathrm{A1}^{-}\oplus\mathrm{Z2}^{+}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
N10.3.41 $\mathrm{C1}^{+}\oplus\mathrm{C1}^{+}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
N10.3.42 $\mathrm{C1}^{+}\oplus\mathrm{C1}^{-}$	$\surd$	1	1	$\surd$	2	A
N10.3.43 $\mathrm{C1}^{+}\oplus\mathrm{C2}^{+}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
N10.3.44 $\mathrm{C1}^{+}\oplus\mathrm{C2}^{-}$	$\surd$	1	1	$\surd$	m	A'

Non-coplanar SSGs with parent space group $P2/m$ (No. 10) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N10.3.45 $\mathrm{C1^+} \oplus \mathrm{D1^+}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
N10.3.46 $\mathrm{C1^+} \oplus \mathrm{D1^-}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
N10.3.47 $\mathrm{C1^+} \oplus \mathrm{Z1^+}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
N10.3.48 $\mathrm{C1^+} \oplus \mathrm{Z1^-}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
N10.3.49 $\mathrm{C1^+} \oplus \mathrm{Z2^+}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
N10.3.50 $\mathrm{C1^+} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
N10.3.51 $\mathrm{Z1^+} \oplus \mathrm{Z1^+}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
N10.3.52 $\mathrm{Z1^+} \oplus \mathrm{Z1^-}$	$\surd$	1	1	$\surd$	2	A
N10.3.53 $\mathrm{Z1^+} \oplus \mathrm{Z2^+}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
N10.3.54 $\mathrm{Z1^+} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\surd$	m	$\mathrm{A'}$
N10.3.55 $\mathrm{Z2^+} \oplus \mathrm{Z2^+}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
N10.3.56 $\mathrm{Z2^+} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\surd$	2	A
N10.8.1 LD1	$\surd$	1	1	$\surd$	2	A
N10.8.2 LD2	$\surd$	1	1	$\surd$	2	A
N10.8.3 U1	$\surd$	1	1	$\surd$	2	A
N10.8.4 F1	$\surd$	2	2	$\surd$	m	$\mathrm{A'} \oplus \mathrm{A'}$
N10.8.5 F2	$\surd$	2	2	$\surd$	m	$\mathrm{A'} \oplus \mathrm{A''}$
N10.8.6 G1	$\surd$	1	1	$\surd$	m	$\mathrm{A'}$
N10.9.1 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM1^-}$	$\surd$	0	0	$\surd$	-	-
N10.9.2 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM2^+}$	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{B_g} \oplus \mathrm{B_u} \oplus \mathrm{B_u}$
N10.9.3 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM2^-}$	$\surd$	0	0	$\surd$	-	-
N10.9.4 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{A1^+}$	$\surd$	0	0	$\surd$	-	-
N10.9.5 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{A1^-}$	$\surd$	0	0	$\surd$	-	-
N10.9.6 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{C1^+}$	$\surd$	0	0	$\surd$	-	-
N10.9.7 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{Z1^+}$	$\surd$	0	0	$\surd$	-	-
N10.9.8 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{Z2^+}$	$\surd$	0	0	$\surd$	-	-
N10.9.9 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{GM2^+}$	$\surd$	2	2	$\surd$	2	$\mathrm{B} \oplus \mathrm{B}$
N10.9.10 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{GM2^-}$	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_u} \oplus \mathrm{B_g} \oplus \mathrm{B_u}$
N10.9.11 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{A1^+}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{B_g} \oplus \mathrm{B_u}$
N10.9.12 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{A1^-}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{B_g} \oplus \mathrm{B_u}$
N10.9.13 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{C1^+}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{B_g} \oplus \mathrm{B_u}$
N10.9.14 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{Z1^+}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{B_g} \oplus \mathrm{B_u}$
N10.9.15 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{Z2^+}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{B_g} \oplus \mathrm{B_u}$
N10.9.16 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{GM2^-}$	$\surd$	0	0	$\surd$	-	-
N10.9.17 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{A1^+}$	$\surd$	0	0	$\surd$	-	-
N10.9.18 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{A1^-}$	$\surd$	0	0	$\surd$	-	-
N10.9.19 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{C1^+}$	$\surd$	0	0	$\surd$	-	-
N10.9.20 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{Z1^+}$	$\surd$	0	0	$\surd$	-	-
N10.9.21 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{Z2^+}$	$\surd$	0	0	$\surd$	-	-
N10.9.22 $\mathrm{GM1^-} \oplus \mathrm{A1^+} \oplus \mathrm{A1^+}$	$\surd$	1	0	$\times$	-	-
N10.9.23 $\mathrm{GM1^-} \oplus \mathrm{A1^+} \oplus \mathrm{A2^-}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
N10.9.24 $\mathrm{GM1^-} \oplus \mathrm{A1^+} \oplus \mathrm{Y1^+}$	$\surd$	1	0	$\times$	-	-
N10.9.25 $\mathrm{GM1^-} \oplus \mathrm{A1^+} \oplus \mathrm{A1^-}$	$\surd$	1	1	$\times$	-	-
N10.9.26 $\mathrm{GM1^-} \oplus \mathrm{A1^+} \oplus \mathrm{A2^+}$	$\surd$	1	0	$\times$	-	-
N10.9.27 $\mathrm{GM1^-} \oplus \mathrm{A1^+} \oplus \mathrm{B1^-}$	$\surd$	1	0	$\times$	-	-
N10.9.28 $\mathrm{GM1^-} \oplus \mathrm{A1^+} \oplus \mathrm{C1^+}$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $P2/m$ (No. 10) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N10.9.29 $\mathrm{GM1}^- \oplus \mathrm{A1}^+ \oplus \mathrm{E1}^+$	$\surd$	1	0	$\times$	-	-
N10.9.30 $\mathrm{GM1}^- \oplus \mathrm{A1}^+ \oplus \mathrm{E2}^+$	$\surd$	1	0	$\times$	-	-
N10.9.31 $\mathrm{GM1}^- \oplus \mathrm{A1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N10.9.32 $\mathrm{GM1}^- \oplus \mathrm{A1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N10.9.33 $\mathrm{GM1}^- \oplus \mathrm{A1}^- \oplus \mathrm{A1}^-$	$\surd$	1	0	$\times$	-	-
N10.9.34 $\mathrm{GM1}^- \oplus \mathrm{A1}^- \oplus \mathrm{A2}^+$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
N10.9.35 $\mathrm{GM1}^- \oplus \mathrm{A1}^- \oplus \mathrm{Y1}^-$	$\surd$	1	0	$\times$	-	-
N10.9.36 $\mathrm{GM1}^- \oplus \mathrm{A1}^- \oplus \mathrm{C1}^+$	$\surd$	1	0	$\times$	-	-
N10.9.37 $\mathrm{GM1}^- \oplus \mathrm{A1}^- \oplus \mathrm{E1}^+$	$\surd$	1	0	$\times$	-	-
N10.9.38 $\mathrm{GM1}^- \oplus \mathrm{A1}^- \oplus \mathrm{E2}^+$	$\surd$	1	0	$\times$	-	-
N10.9.39 $\mathrm{GM1}^- \oplus \mathrm{A1}^- \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N10.9.40 $\mathrm{GM1}^- \oplus \mathrm{A1}^- \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N10.9.41 $\mathrm{GM1}^- \oplus \mathrm{C1}^+ \oplus \mathrm{C1}^+$	$\surd$	1	0	$\times$	-	-
N10.9.42 $\mathrm{GM1}^- \oplus \mathrm{C1}^+ \oplus \mathrm{C1}^-$	$\surd$	1	1	$\times$	-	-
N10.9.43 $\mathrm{GM1}^- \oplus \mathrm{C1}^+ \oplus \mathrm{C2}^+$	$\surd$	1	0	$\times$	-	-
N10.9.44 $\mathrm{GM1}^- \oplus \mathrm{C1}^+ \oplus \mathrm{C2}^-$	$\surd$	1	1	$\times$	-	-
N10.9.45 $\mathrm{GM1}^- \oplus \mathrm{C1}^+ \oplus \mathrm{D1}^+$	$\surd$	1	0	$\times$	-	-
N10.9.46 $\mathrm{GM1}^- \oplus \mathrm{C1}^+ \oplus \mathrm{D1}^-$	$\surd$	1	0	$\times$	-	-
N10.9.47 $\mathrm{GM1}^- \oplus \mathrm{C1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N10.9.48 $\mathrm{GM1}^- \oplus \mathrm{C1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N10.9.49 $\mathrm{GM1}^- \oplus \mathrm{C1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N10.9.50 $\mathrm{GM1}^- \oplus \mathrm{C1}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-
N10.9.51 $\mathrm{GM1}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N10.9.52 $\mathrm{GM1}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N10.9.53 $\mathrm{GM1}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N10.9.54 $\mathrm{GM1}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\times$	-	-
N10.9.55 $\mathrm{GM1}^- \oplus \mathrm{Z2}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N10.9.56 $\mathrm{GM1}^- \oplus \mathrm{Z2}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N10.9.57 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{B_g} \oplus \mathrm{B_g} \oplus \mathrm{B_g}$
N10.9.58 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	2	2	$\surd$	m	$\mathrm{A}'' \oplus \mathrm{A}''$
N10.9.59 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{A1}^+$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{B_g} \oplus \mathrm{B_g}$
N10.9.60 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{A1}^-$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{B_g} \oplus \mathrm{B_g}$
N10.9.61 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{C1}^+$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{B_g} \oplus \mathrm{B_g}$
N10.9.62 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{Z1}^+$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{B_g} \oplus \mathrm{B_g}$
N10.9.63 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{Z2}^+$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{B_g} \oplus \mathrm{B_g}$
N10.9.64 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B_g}$
N10.9.65 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{A1}^+$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_u} \oplus \mathrm{B_g}$
N10.9.66 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{A1}^-$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_u} \oplus \mathrm{B_g}$
N10.9.67 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{C1}^+$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_u} \oplus \mathrm{B_g}$
N10.9.68 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{Z1}^+$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_u} \oplus \mathrm{B_g}$
N10.9.69 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{Z2}^+$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_u} \oplus \mathrm{B_g}$
N10.9.70 $\mathrm{GM2}^+ \oplus \mathrm{A1}^+ \oplus \mathrm{A1}^+$	$\surd$	1	1	$\times$	-	-
N10.9.71 $\mathrm{GM2}^+ \oplus \mathrm{A1}^+ \oplus \mathrm{A2}^-$	$\surd$	1	1	$\surd$	2	B
N10.9.72 $\mathrm{GM2}^+ \oplus \mathrm{A1}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	1	$\times$	-	-
N10.9.73 $\mathrm{GM2}^+ \oplus \mathrm{A1}^+ \oplus \mathrm{A1}^-$	$\surd$	1	1	$\times$	-	-
N10.9.74 $\mathrm{GM2}^+ \oplus \mathrm{A1}^+ \oplus \mathrm{A2}^+$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $P2/m$ (No. 10) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N10.9.75 $\mathrm{GM2}^{+}\oplus\mathrm{A1}^{+}\oplus\mathrm{B1}^{-}$	$\surd$	1	1	$\times$	-	-
N10.9.76 $\mathrm{GM2}^{+}\oplus\mathrm{A1}^{+}\oplus\mathrm{C1}^{+}$	$\surd$	1	1	$\times$	-	-
N10.9.77 $\mathrm{GM2}^{+}\oplus\mathrm{A1}^{+}\oplus\mathrm{E1}^{+}$	$\surd$	1	1	$\times$	-	-
N10.9.78 $\mathrm{GM2}^{+}\oplus\mathrm{A1}^{+}\oplus\mathrm{E2}^{+}$	$\surd$	1	1	$\times$	-	-
N10.9.79 $\mathrm{GM2}^{+}\oplus\mathrm{A1}^{+}\oplus\mathrm{Z1}^{+}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_g}$
N10.9.80 $\mathrm{GM2}^{+}\oplus\mathrm{A1}^{+}\oplus\mathrm{Z2}^{+}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_g}$
N10.9.81 $\mathrm{GM2}^{+}\oplus\mathrm{A1}^{-}\oplus\mathrm{A1}^{-}$	$\surd$	1	1	$\times$	-	-
N10.9.82 $\mathrm{GM2}^{+}\oplus\mathrm{A1}^{-}\oplus\mathrm{A2}^{+}$	$\surd$	1	1	$\surd$	2	B
N10.9.83 $\mathrm{GM2}^{+}\oplus\mathrm{A1}^{-}\oplus\mathrm{Y1}^{-}$	$\surd$	1	1	$\times$	-	-
N10.9.84 $\mathrm{GM2}^{+}\oplus\mathrm{A1}^{-}\oplus\mathrm{C1}^{+}$	$\surd$	1	1	$\times$	-	-
N10.9.85 $\mathrm{GM2}^{+}\oplus\mathrm{A1}^{-}\oplus\mathrm{E1}^{+}$	$\surd$	1	1	$\times$	-	-
N10.9.86 $\mathrm{GM2}^{+}\oplus\mathrm{A1}^{-}\oplus\mathrm{E2}^{+}$	$\surd$	1	1	$\times$	-	-
N10.9.87 $\mathrm{GM2}^{+}\oplus\mathrm{A1}^{-}\oplus\mathrm{Z1}^{+}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_g}$
N10.9.88 $\mathrm{GM2}^{+}\oplus\mathrm{A1}^{-}\oplus\mathrm{Z2}^{+}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_g}$
N10.9.89 $\mathrm{GM2}^{+}\oplus\mathrm{C1}^{+}\oplus\mathrm{C1}^{+}$	$\surd$	1	1	$\times$	-	-
N10.9.90 $\mathrm{GM2}^{+}\oplus\mathrm{C1}^{+}\oplus\mathrm{C1}^{-}$	$\surd$	1	1	$\times$	-	-
N10.9.91 $\mathrm{GM2}^{+}\oplus\mathrm{C1}^{+}\oplus\mathrm{C2}^{+}$	$\surd$	1	1	$\times$	-	-
N10.9.92 $\mathrm{GM2}^{+}\oplus\mathrm{C1}^{+}\oplus\mathrm{C2}^{-}$	$\surd$	1	1	$\times$	-	-
N10.9.93 $\mathrm{GM2}^{+}\oplus\mathrm{C1}^{+}\oplus\mathrm{D1}^{+}$	$\surd$	1	1	$\times$	-	-
N10.9.94 $\mathrm{GM2}^{+}\oplus\mathrm{C1}^{+}\oplus\mathrm{D1}^{-}$	$\surd$	1	1	$\times$	-	-
N10.9.95 $\mathrm{GM2}^{+}\oplus\mathrm{C1}^{+}\oplus\mathrm{Z1}^{+}$	$\surd$	1	1	$\times$	-	-
N10.9.96 $\mathrm{GM2}^{+}\oplus\mathrm{C1}^{+}\oplus\mathrm{Z1}^{-}$	$\surd$	1	1	$\times$	-	-
N10.9.97 $\mathrm{GM2}^{+}\oplus\mathrm{C1}^{+}\oplus\mathrm{Z2}^{+}$	$\surd$	1	1	$\times$	-	-
N10.9.98 $\mathrm{GM2}^{+}\oplus\mathrm{C1}^{+}\oplus\mathrm{Z2}^{-}$	$\surd$	1	1	$\times$	-	-
N10.9.99 $\mathrm{GM2}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z1}^{+}$	$\surd$	1	1	$\times$	-	-
N10.9.100 $\mathrm{GM2}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z1}^{-}$	$\surd$	1	1	$\surd$	m	A''
N10.9.101 $\mathrm{GM2}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z2}^{+}$	$\surd$	1	1	$\times$	-	-
N10.9.102 $\mathrm{GM2}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z2}^{-}$	$\surd$	1	1	$\times$	-	-
N10.9.103 $\mathrm{GM2}^{+}\oplus\mathrm{Z2}^{+}\oplus\mathrm{Z2}^{+}$	$\surd$	1	1	$\times$	-	-
N10.9.104 $\mathrm{GM2}^{+}\oplus\mathrm{Z2}^{+}\oplus\mathrm{Z2}^{-}$	$\surd$	1	1	$\surd$	m	A''
N10.9.105 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
N10.9.106 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{A1}^{+}$	$\surd$	0	0	$\surd$	-	-
N10.9.107 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{A1}^{-}$	$\surd$	0	0	$\surd$	-	-
N10.9.108 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{C1}^{+}$	$\surd$	0	0	$\surd$	-	-
N10.9.109 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{Z1}^{+}$	$\surd$	0	0	$\surd$	-	-
N10.9.110 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{Z2}^{+}$	$\surd$	0	0	$\surd$	-	-
N10.9.111 $\mathrm{GM2}^{-}\oplus\mathrm{A1}^{+}\oplus\mathrm{A1}^{+}$	$\surd$	1	0	$\times$	-	-
N10.9.112 $\mathrm{GM2}^{-}\oplus\mathrm{A1}^{+}\oplus\mathrm{A2}^{-}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
N10.9.113 $\mathrm{GM2}^{-}\oplus\mathrm{A1}^{+}\oplus\mathrm{Y1}^{+}$	$\surd$	1	0	$\times$	-	-
N10.9.114 $\mathrm{GM2}^{-}\oplus\mathrm{A1}^{+}\oplus\mathrm{A1}^{-}$	$\surd$	1	1	$\times$	-	-
N10.9.115 $\mathrm{GM2}^{-}\oplus\mathrm{A1}^{+}\oplus\mathrm{A2}^{+}$	$\surd$	1	0	$\times$	-	-
N10.9.116 $\mathrm{GM2}^{-}\oplus\mathrm{A1}^{+}\oplus\mathrm{B1}^{-}$	$\surd$	1	0	$\times$	-	-
N10.9.117 $\mathrm{GM2}^{-}\oplus\mathrm{A1}^{+}\oplus\mathrm{C1}^{+}$	$\surd$	1	0	$\times$	-	-
N10.9.118 $\mathrm{GM2}^{-}\oplus\mathrm{A1}^{+}\oplus\mathrm{E1}^{+}$	$\surd$	1	0	$\times$	-	-
N10.9.119 $\mathrm{GM2}^{-}\oplus\mathrm{A1}^{+}\oplus\mathrm{E2}^{+}$	$\surd$	1	0	$\times$	-	-
N10.9.120 $\mathrm{GM2}^{-}\oplus\mathrm{A1}^{+}\oplus\mathrm{Z1}^{+}$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $P2/m$ (No. 10) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N10.9.121 $\mathrm{GM2}^- \oplus \mathrm{A1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N10.9.122 $\mathrm{GM2}^- \oplus \mathrm{A1}^- \oplus \mathrm{A1}^-$	$\surd$	1	0	$\times$	-	-
N10.9.123 $\mathrm{GM2}^- \oplus \mathrm{A1}^- \oplus \mathrm{A2}^+$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
N10.9.124 $\mathrm{GM2}^- \oplus \mathrm{A1}^- \oplus \mathrm{Y1}^-$	$\surd$	1	0	$\times$	-	-
N10.9.125 $\mathrm{GM2}^- \oplus \mathrm{A1}^- \oplus \mathrm{C1}^+$	$\surd$	1	0	$\times$	-	-
N10.9.126 $\mathrm{GM2}^- \oplus \mathrm{A1}^- \oplus \mathrm{E1}^+$	$\surd$	1	0	$\times$	-	-
N10.9.127 $\mathrm{GM2}^- \oplus \mathrm{A1}^- \oplus \mathrm{E2}^+$	$\surd$	1	0	$\times$	-	-
N10.9.128 $\mathrm{GM2}^- \oplus \mathrm{A1}^- \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N10.9.129 $\mathrm{GM2}^- \oplus \mathrm{A1}^- \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N10.9.130 $\mathrm{GM2}^- \oplus \mathrm{C1}^+ \oplus \mathrm{C1}^+$	$\surd$	1	0	$\times$	-	-
N10.9.131 $\mathrm{GM2}^- \oplus \mathrm{C1}^+ \oplus \mathrm{C1}^-$	$\surd$	1	1	$\times$	-	-
N10.9.132 $\mathrm{GM2}^- \oplus \mathrm{C1}^+ \oplus \mathrm{C2}^+$	$\surd$	1	0	$\times$	-	-
N10.9.133 $\mathrm{GM2}^- \oplus \mathrm{C1}^+ \oplus \mathrm{C2}^-$	$\surd$	1	1	$\times$	-	-
N10.9.134 $\mathrm{GM2}^- \oplus \mathrm{C1}^+ \oplus \mathrm{D1}^+$	$\surd$	1	0	$\times$	-	-
N10.9.135 $\mathrm{GM2}^- \oplus \mathrm{C1}^+ \oplus \mathrm{D1}^-$	$\surd$	1	0	$\times$	-	-
N10.9.136 $\mathrm{GM2}^- \oplus \mathrm{C1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N10.9.137 $\mathrm{GM2}^- \oplus \mathrm{C1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N10.9.138 $\mathrm{GM2}^- \oplus \mathrm{C1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N10.9.139 $\mathrm{GM2}^- \oplus \mathrm{C1}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-
N10.9.140 $\mathrm{GM2}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N10.9.141 $\mathrm{GM2}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N10.9.142 $\mathrm{GM2}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N10.9.143 $\mathrm{GM2}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\times$	-	-
N10.9.144 $\mathrm{GM2}^- \oplus \mathrm{Z2}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N10.9.145 $\mathrm{GM2}^- \oplus \mathrm{Z2}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N10.9.146 $\mathrm{A1}^+ \oplus \mathrm{A1}^+ \oplus \mathrm{A1}^+$	$\surd$	0	0	$\surd$	-	-
N10.9.147 $\mathrm{A1}^+ \oplus \mathrm{A1}^+ \oplus \mathrm{A2}^-$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{B_u} \oplus \mathrm{B_u}$
N10.9.148 $\mathrm{A1}^+ \oplus \mathrm{A1}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	0	$\times$	-	-
N10.9.149 $\mathrm{A1}^+ \oplus \mathrm{A2}^- \oplus \mathrm{Y1}^+$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
N10.9.150 $\mathrm{B1}^+ \oplus \mathrm{A1}^+ \oplus \mathrm{Y1}^+$	$\times$	-	-	-	-	-
N10.9.151 $\mathrm{B1}^+ \oplus \mathrm{A1}^+ \oplus \mathrm{Y2}^-$	$\times$	-	-	-	-	-
N10.9.152 $\mathrm{A1}^+ \oplus \mathrm{A1}^+ \oplus \mathrm{A1}^-$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_u} \oplus \mathrm{A_u}$
N10.9.153 $\mathrm{A1}^+ \oplus \mathrm{A1}^+ \oplus \mathrm{A2}^+$	$\surd$	0	0	$\surd$	-	-
N10.9.154 $\mathrm{A1}^+ \oplus \mathrm{A1}^+ \oplus \mathrm{B1}^-$	$\surd$	1	0	$\times$	-	-
N10.9.155 $\mathrm{A1}^+ \oplus \mathrm{A2}^- \oplus \mathrm{A1}^-$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_u} \oplus \mathrm{B_u}$
N10.9.156 $\mathrm{A1}^+ \oplus \mathrm{A2}^- \oplus \mathrm{B1}^-$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
N10.9.157 $\mathrm{A1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{A1}^-$	$\surd$	1	1	$\times$	-	-
N10.9.158 $\mathrm{A1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{A2}^+$	$\surd$	1	0	$\times$	-	-
N10.9.159 $\mathrm{A1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{B1}^-$	$\times$	-	-	-	-	-
N10.9.160 $\mathrm{A1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{B2}^+$	$\times$	-	-	-	-	-
N10.9.161 $\mathrm{A1}^+ \oplus \mathrm{A1}^+ \oplus \mathrm{C1}^+$	$\surd$	1	0	$\times$	-	-
N10.9.162 $\mathrm{A1}^+ \oplus \mathrm{A1}^+ \oplus \mathrm{E1}^+$	$\surd$	1	0	$\times$	-	-
N10.9.163 $\mathrm{A1}^+ \oplus \mathrm{A1}^+ \oplus \mathrm{E2}^+$	$\surd$	1	0	$\times$	-	-
N10.9.164 $\mathrm{A1}^+ \oplus \mathrm{A2}^- \oplus \mathrm{C1}^+$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
N10.9.165 $\mathrm{A1}^+ \oplus \mathrm{A2}^- \oplus \mathrm{E1}^+$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
N10.9.166 $\mathrm{A1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{D1}^+$	$\times$	-	-	-	-	-

Non-coplanar SSGs with parent space group $P2/m$ (No. 10) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N10.9.167 $\mathrm{A1}^{+} \oplus \mathrm{Y1}^{+} \oplus \mathrm{D2}^{+}$	$\times$	-	-	-	-	-
N10.9.168 $\mathrm{A1}^{+} \oplus \mathrm{Y1}^{+} \oplus \mathrm{C1}^{+}$	$\times$	-	-	-	-	-
N10.9.169 $\mathrm{A1}^{+} \oplus \mathrm{Y1}^{+} \oplus \mathrm{C2}^{+}$	$\times$	-	-	-	-	-
N10.9.170 $\mathrm{A1}^{+} \oplus \mathrm{A1}^{+} \oplus \mathrm{Z1}^{+}$	$\surd$	1	0	$\times$	-	-
N10.9.171 $\mathrm{A1}^{+} \oplus \mathrm{A2}^{-} \oplus \mathrm{Z1}^{+}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
N10.9.172 $\mathrm{A1}^{+} \oplus \mathrm{Y1}^{+} \oplus \mathrm{Z1}^{+}$	$\times$	-	-	-	-	-
N10.9.173 $\mathrm{A1}^{+} \oplus \mathrm{A1}^{+} \oplus \mathrm{Z2}^{+}$	$\surd$	1	0	$\times$	-	-
N10.9.174 $\mathrm{A1}^{+} \oplus \mathrm{A2}^{-} \oplus \mathrm{Z2}^{+}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
N10.9.175 $\mathrm{A1}^{+} \oplus \mathrm{Y1}^{+} \oplus \mathrm{Z2}^{+}$	$\times$	-	-	-	-	-
N10.9.176 $\mathrm{A1}^{+} \oplus \mathrm{A1}^{-} \oplus \mathrm{A1}^{-}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_u} \oplus \mathrm{A_u}$
N10.9.177 $\mathrm{A1}^{+} \oplus \mathrm{A1}^{-} \oplus \mathrm{A2}^{+}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_u} \oplus \mathrm{B_u}$
N10.9.178 $\mathrm{A1}^{+} \oplus \mathrm{A1}^{-} \oplus \mathrm{Y1}^{-}$	$\surd$	1	1	$\times$	-	-
N10.9.179 $\mathrm{A1}^{+} \oplus \mathrm{A2}^{+} \oplus \mathrm{A2}^{+}$	$\surd$	0	0	$\surd$	-	-
N10.9.180 $\mathrm{A1}^{+} \oplus \mathrm{A2}^{+} \oplus \mathrm{Y1}^{-}$	$\surd$	1	0	$\times$	-	-
N10.9.181 $\mathrm{A1}^{+} \oplus \mathrm{B1}^{-} \oplus \mathrm{B1}^{-}$	$\surd$	1	0	$\times$	-	-
N10.9.182 $\mathrm{A1}^{+} \oplus \mathrm{B1}^{-} \oplus \mathrm{B2}^{+}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
N10.9.183 $\mathrm{A1}^{+} \oplus \mathrm{B1}^{-} \oplus \mathrm{Y1}^{-}$	$\times$	-	-	-	-	-
N10.9.184 $\mathrm{A1}^{+} \oplus \mathrm{B1}^{-} \oplus \mathrm{Y2}^{+}$	$\times$	-	-	-	-	-
N10.9.185 $\mathrm{A1}^{+} \oplus \mathrm{A1}^{-} \oplus \mathrm{C1}^{+}$	$\surd$	1	1	$\times$	-	-
N10.9.186 $\mathrm{A1}^{+} \oplus \mathrm{A1}^{-} \oplus \mathrm{E1}^{+}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N10.9.187 $\mathrm{A1}^{+} \oplus \mathrm{A1}^{-} \oplus \mathrm{E2}^{+}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N10.9.188 $\mathrm{A1}^{+} \oplus \mathrm{A2}^{+} \oplus \mathrm{C1}^{+}$	$\surd$	1	0	$\times$	-	-
N10.9.189 $\mathrm{A1}^{+} \oplus \mathrm{A2}^{+} \oplus \mathrm{E1}^{+}$	$\surd$	1	0	$\times$	-	-
N10.9.190 $\mathrm{A1}^{+} \oplus \mathrm{A2}^{+} \oplus \mathrm{E2}^{+}$	$\surd$	1	0	$\times$	-	-
N10.9.191 $\mathrm{A1}^{+} \oplus \mathrm{B1}^{-} \oplus \mathrm{C1}^{+}$	$\times$	-	-	-	-	-
N10.9.192 $\mathrm{A1}^{+} \oplus \mathrm{B1}^{-} \oplus \mathrm{C2}^{+}$	$\times$	-	-	-	-	-
N10.9.193 $\mathrm{A1}^{+} \oplus \mathrm{B1}^{-} \oplus \mathrm{E1}^{+}$	$\times$	-	-	-	-	-
N10.9.194 $\mathrm{A1}^{+} \oplus \mathrm{B1}^{-} \oplus \mathrm{E2}^{+}$	$\times$	-	-	-	-	-
N10.9.195 $\mathrm{A1}^{+} \oplus \mathrm{B1}^{-} \oplus \mathrm{D1}^{+}$	$\times$	-	-	-	-	-
N10.9.196 $\mathrm{A1}^{+} \oplus \mathrm{B1}^{-} \oplus \mathrm{D2}^{+}$	$\times$	-	-	-	-	-
N10.9.197 $\mathrm{A1}^{+} \oplus \mathrm{A1}^{-} \oplus \mathrm{Z1}^{+}$	$\surd$	1	1	$\times$	-	-
N10.9.198 $\mathrm{A1}^{+} \oplus \mathrm{A2}^{+} \oplus \mathrm{Z1}^{+}$	$\surd$	1	0	$\times$	-	-
N10.9.199 $\mathrm{A1}^{+} \oplus \mathrm{B1}^{-} \oplus \mathrm{Z1}^{+}$	$\times$	-	-	-	-	-
N10.9.200 $\mathrm{A1}^{+} \oplus \mathrm{A1}^{-} \oplus \mathrm{Z2}^{+}$	$\surd$	1	1	$\times$	-	-
N10.9.201 $\mathrm{A1}^{+} \oplus \mathrm{A2}^{+} \oplus \mathrm{Z2}^{+}$	$\surd$	1	0	$\times$	-	-
N10.9.202 $\mathrm{A1}^{+} \oplus \mathrm{B1}^{-} \oplus \mathrm{Z2}^{+}$	$\times$	-	-	-	-	-
N10.9.203 $\mathrm{A1}^{+} \oplus \mathrm{C1}^{+} \oplus \mathrm{C1}^{+}$	$\surd$	1	0	$\times$	-	-
N10.9.204 $\mathrm{A1}^{+} \oplus \mathrm{C1}^{+} \oplus \mathrm{C1}^{-}$	$\surd$	1	1	$\times$	-	-
N10.9.205 $\mathrm{A1}^{+} \oplus \mathrm{C1}^{+} \oplus \mathrm{C2}^{+}$	$\surd$	1	0	$\times$	-	-
N10.9.206 $\mathrm{A1}^{+} \oplus \mathrm{C1}^{+} \oplus \mathrm{C2}^{-}$	$\surd$	1	1	$\times$	-	-
N10.9.207 $\mathrm{A1}^{+} \oplus \mathrm{C1}^{+} \oplus \mathrm{E1}^{+}$	$\times$	-	-	-	-	-
N10.9.208 $\mathrm{A1}^{+} \oplus \mathrm{C1}^{+} \oplus \mathrm{E1}^{-}$	$\times$	-	-	-	-	-
N10.9.209 $\mathrm{A1}^{+} \oplus \mathrm{C1}^{+} \oplus \mathrm{E2}^{+}$	$\times$	-	-	-	-	-
N10.9.210 $\mathrm{A1}^{+} \oplus \mathrm{C1}^{+} \oplus \mathrm{E2}^{-}$	$\times$	-	-	-	-	-
N10.9.211 $\mathrm{A1}^{+} \oplus \mathrm{C1}^{+} \oplus \mathrm{D1}^{+}$	$\times$	-	-	-	-	-
N10.9.212 $\mathrm{A1}^{+} \oplus \mathrm{C1}^{+} \oplus \mathrm{D1}^{-}$	$\times$	-	-	-	-	-

Non-coplanar SSGs with parent space group $P2/m$ (No. 10) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N10.9.213 $\mathrm{A1}^{+}\oplus\mathrm{C1}^{+}\oplus\mathrm{D2}^{+}$	$\times$	-	-	-	-	-
N10.9.214 $\mathrm{A1}^{+}\oplus\mathrm{C1}^{+}\oplus\mathrm{D2}^{-}$	$\times$	-	-	-	-	-
N10.9.215 $\mathrm{A1}^{+}\oplus\mathrm{E1}^{+}\oplus\mathrm{E1}^{+}$	$\surd$	1	0	$\times$	-	-
N10.9.216 $\mathrm{A1}^{+}\oplus\mathrm{E1}^{+}\oplus\mathrm{E1}^{-}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N10.9.217 $\mathrm{A1}^{+}\oplus\mathrm{E1}^{+}\oplus\mathrm{E2}^{+}$	$\surd$	1	0	$\times$	-	-
N10.9.218 $\mathrm{A1}^{+}\oplus\mathrm{E1}^{+}\oplus\mathrm{E2}^{-}$	$\surd$	1	1	$\times$	-	-
N10.9.219 $\mathrm{A1}^{+}\oplus\mathrm{E2}^{+}\oplus\mathrm{E2}^{+}$	$\surd$	1	0	$\times$	-	-
N10.9.220 $\mathrm{A1}^{+}\oplus\mathrm{E2}^{+}\oplus\mathrm{E2}^{-}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N10.9.221 $\mathrm{A1}^{+}\oplus\mathrm{C1}^{+}\oplus\mathrm{Z1}^{+}$	$\times$	-	-	-	-	-
N10.9.222 $\mathrm{A1}^{+}\oplus\mathrm{C1}^{+}\oplus\mathrm{Z1}^{-}$	$\times$	-	-	-	-	-
N10.9.223 $\mathrm{A1}^{+}\oplus\mathrm{E1}^{+}\oplus\mathrm{Z1}^{+}$	$\times$	-	-	-	-	-
N10.9.224 $\mathrm{A1}^{+}\oplus\mathrm{E1}^{+}\oplus\mathrm{Z1}^{-}$	$\times$	-	-	-	-	-
N10.9.225 $\mathrm{A1}^{+}\oplus\mathrm{E2}^{+}\oplus\mathrm{Z1}^{+}$	$\times$	-	-	-	-	-
N10.9.226 $\mathrm{A1}^{+}\oplus\mathrm{E2}^{+}\oplus\mathrm{Z1}^{-}$	$\times$	-	-	-	-	-
N10.9.227 $\mathrm{A1}^{+}\oplus\mathrm{C1}^{+}\oplus\mathrm{Z2}^{+}$	$\times$	-	-	-	-	-
N10.9.228 $\mathrm{A1}^{+}\oplus\mathrm{C1}^{+}\oplus\mathrm{Z2}^{-}$	$\times$	-	-	-	-	-
N10.9.229 $\mathrm{A1}^{+}\oplus\mathrm{E1}^{+}\oplus\mathrm{Z2}^{+}$	$\times$	-	-	-	-	-
N10.9.230 $\mathrm{A1}^{+}\oplus\mathrm{E1}^{+}\oplus\mathrm{Z2}^{-}$	$\times$	-	-	-	-	-
N10.9.231 $\mathrm{A1}^{+}\oplus\mathrm{E2}^{+}\oplus\mathrm{Z2}^{+}$	$\times$	-	-	-	-	-
N10.9.232 $\mathrm{A1}^{+}\oplus\mathrm{E2}^{+}\oplus\mathrm{Z2}^{-}$	$\times$	-	-	-	-	-
N10.9.233 $\mathrm{A1}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z1}^{+}$	$\surd$	1	0	$\times$	-	-
N10.9.234 $\mathrm{A1}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z1}^{-}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N10.9.235 $\mathrm{A1}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z2}^{+}$	$\surd$	1	0	$\times$	-	-
N10.9.236 $\mathrm{A1}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z2}^{-}$	$\surd$	1	1	$\times$	-	-
N10.9.237 $\mathrm{A1}^{+}\oplus\mathrm{Z2}^{+}\oplus\mathrm{Z2}^{+}$	$\surd$	1	0	$\times$	-	-
N10.9.238 $\mathrm{A1}^{+}\oplus\mathrm{Z2}^{+}\oplus\mathrm{Z2}^{-}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N10.9.239 $\mathrm{A1}^{-}\oplus\mathrm{A1}^{-}\oplus\mathrm{A1}^{-}$	$\surd$	0	0	$\surd$	-	-
N10.9.240 $\mathrm{A1}^{-}\oplus\mathrm{A1}^{-}\oplus\mathrm{A2}^{+}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{B_u}\oplus\mathrm{B_u}$
N10.9.241 $\mathrm{A1}^{-}\oplus\mathrm{A1}^{-}\oplus\mathrm{Y1}^{-}$	$\surd$	1	0	$\times$	-	-
N10.9.242 $\mathrm{A1}^{-}\oplus\mathrm{A2}^{+}\oplus\mathrm{Y1}^{-}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
N10.9.243 $\mathrm{B1}^{-}\oplus\mathrm{A1}^{-}\oplus\mathrm{Y1}^{-}$	$\times$	-	-	-	-	-
N10.9.244 $\mathrm{B1}^{-}\oplus\mathrm{A1}^{-}\oplus\mathrm{Y2}^{+}$	$\times$	-	-	-	-	-
N10.9.245 $\mathrm{A1}^{-}\oplus\mathrm{A1}^{-}\oplus\mathrm{C1}^{+}$	$\surd$	1	0	$\times$	-	-
N10.9.246 $\mathrm{A1}^{-}\oplus\mathrm{A1}^{-}\oplus\mathrm{E1}^{+}$	$\surd$	1	0	$\times$	-	-
N10.9.247 $\mathrm{A1}^{-}\oplus\mathrm{A1}^{-}\oplus\mathrm{E2}^{+}$	$\surd$	1	0	$\times$	-	-
N10.9.248 $\mathrm{A1}^{-}\oplus\mathrm{A2}^{+}\oplus\mathrm{C1}^{+}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
N10.9.249 $\mathrm{A1}^{-}\oplus\mathrm{A2}^{+}\oplus\mathrm{E1}^{+}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
N10.9.250 $\mathrm{A1}^{-}\oplus\mathrm{Y1}^{-}\oplus\mathrm{D1}^{+}$	$\times$	-	-	-	-	-
N10.9.251 $\mathrm{A1}^{-}\oplus\mathrm{Y1}^{-}\oplus\mathrm{D2}^{+}$	$\times$	-	-	-	-	-
N10.9.252 $\mathrm{A1}^{-}\oplus\mathrm{Y1}^{-}\oplus\mathrm{C1}^{+}$	$\times$	-	-	-	-	-
N10.9.253 $\mathrm{A1}^{-}\oplus\mathrm{Y1}^{-}\oplus\mathrm{C2}^{+}$	$\times$	-	-	-	-	-
N10.9.254 $\mathrm{A1}^{-}\oplus\mathrm{A1}^{-}\oplus\mathrm{Z1}^{+}$	$\surd$	1	0	$\times$	-	-
N10.9.255 $\mathrm{A1}^{-}\oplus\mathrm{A2}^{+}\oplus\mathrm{Z1}^{+}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
N10.9.256 $\mathrm{A1}^{-}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Z1}^{+}$	$\times$	-	-	-	-	-
N10.9.257 $\mathrm{A1}^{-}\oplus\mathrm{A1}^{-}\oplus\mathrm{Z2}^{+}$	$\surd$	1	0	$\times$	-	-
N10.9.258 $\mathrm{A1}^{-}\oplus\mathrm{A2}^{+}\oplus\mathrm{Z2}^{+}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$

Non-coplanar SSGs with parent space group $P2/m$ (No. 10) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N10.9.259 $\mathrm{A1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Z2}^+$	$\times$	-	-	-	-	-
N10.9.260 $\mathrm{A1}^- \oplus \mathrm{C1}^+ \oplus \mathrm{C1}^+$	$\surd$	1	0	$\times$	-	-
N10.9.261 $\mathrm{A1}^- \oplus \mathrm{C1}^+ \oplus \mathrm{C1}^-$	$\surd$	1	1	$\times$	-	-
N10.9.262 $\mathrm{A1}^- \oplus \mathrm{C1}^+ \oplus \mathrm{C2}^+$	$\surd$	1	0	$\times$	-	-
N10.9.263 $\mathrm{A1}^- \oplus \mathrm{C1}^+ \oplus \mathrm{C2}^-$	$\surd$	1	1	$\times$	-	-
N10.9.264 $\mathrm{A1}^- \oplus \mathrm{C1}^+ \oplus \mathrm{E1}^+$	$\times$	-	-	-	-	-
N10.9.265 $\mathrm{A1}^- \oplus \mathrm{C1}^+ \oplus \mathrm{E1}^-$	$\times$	-	-	-	-	-
N10.9.266 $\mathrm{A1}^- \oplus \mathrm{C1}^+ \oplus \mathrm{E2}^+$	$\times$	-	-	-	-	-
N10.9.267 $\mathrm{A1}^- \oplus \mathrm{C1}^+ \oplus \mathrm{E2}^-$	$\times$	-	-	-	-	-
N10.9.268 $\mathrm{A1}^- \oplus \mathrm{C1}^+ \oplus \mathrm{D1}^+$	$\times$	-	-	-	-	-
N10.9.269 $\mathrm{A1}^- \oplus \mathrm{C1}^+ \oplus \mathrm{D1}^-$	$\times$	-	-	-	-	-
N10.9.270 $\mathrm{A1}^- \oplus \mathrm{C1}^+ \oplus \mathrm{D2}^+$	$\times$	-	-	-	-	-
N10.9.271 $\mathrm{A1}^- \oplus \mathrm{C1}^+ \oplus \mathrm{D2}^-$	$\times$	-	-	-	-	-
N10.9.272 $\mathrm{A1}^- \oplus \mathrm{E1}^+ \oplus \mathrm{E1}^+$	$\surd$	1	0	$\times$	-	-
N10.9.273 $\mathrm{A1}^- \oplus \mathrm{E1}^+ \oplus \mathrm{E1}^-$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N10.9.274 $\mathrm{A1}^- \oplus \mathrm{E1}^+ \oplus \mathrm{E2}^+$	$\surd$	1	0	$\times$	-	-
N10.9.275 $\mathrm{A1}^- \oplus \mathrm{E1}^+ \oplus \mathrm{E2}^-$	$\surd$	1	1	$\times$	-	-
N10.9.276 $\mathrm{A1}^- \oplus \mathrm{E2}^+ \oplus \mathrm{E2}^+$	$\surd$	1	0	$\times$	-	-
N10.9.277 $\mathrm{A1}^- \oplus \mathrm{E2}^+ \oplus \mathrm{E2}^-$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N10.9.278 $\mathrm{A1}^- \oplus \mathrm{C1}^+ \oplus \mathrm{Z1}^+$	$\times$	-	-	-	-	-
N10.9.279 $\mathrm{A1}^- \oplus \mathrm{C1}^+ \oplus \mathrm{Z1}^-$	$\times$	-	-	-	-	-
N10.9.280 $\mathrm{A1}^- \oplus \mathrm{E1}^+ \oplus \mathrm{Z1}^+$	$\times$	-	-	-	-	-
N10.9.281 $\mathrm{A1}^- \oplus \mathrm{E1}^+ \oplus \mathrm{Z1}^-$	$\times$	-	-	-	-	-
N10.9.282 $\mathrm{A1}^- \oplus \mathrm{E2}^+ \oplus \mathrm{Z1}^+$	$\times$	-	-	-	-	-
N10.9.283 $\mathrm{A1}^- \oplus \mathrm{E2}^+ \oplus \mathrm{Z1}^-$	$\times$	-	-	-	-	-
N10.9.284 $\mathrm{A1}^- \oplus \mathrm{C1}^+ \oplus \mathrm{Z2}^+$	$\times$	-	-	-	-	-
N10.9.285 $\mathrm{A1}^- \oplus \mathrm{C1}^+ \oplus \mathrm{Z2}^-$	$\times$	-	-	-	-	-
N10.9.286 $\mathrm{A1}^- \oplus \mathrm{E1}^+ \oplus \mathrm{Z2}^+$	$\times$	-	-	-	-	-
N10.9.287 $\mathrm{A1}^- \oplus \mathrm{E1}^+ \oplus \mathrm{Z2}^-$	$\times$	-	-	-	-	-
N10.9.288 $\mathrm{A1}^- \oplus \mathrm{E2}^+ \oplus \mathrm{Z2}^+$	$\times$	-	-	-	-	-
N10.9.289 $\mathrm{A1}^- \oplus \mathrm{E2}^+ \oplus \mathrm{Z2}^-$	$\times$	-	-	-	-	-
N10.9.290 $\mathrm{A1}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N10.9.291 $\mathrm{A1}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N10.9.292 $\mathrm{A1}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N10.9.293 $\mathrm{A1}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\times$	-	-
N10.9.294 $\mathrm{A1}^- \oplus \mathrm{Z2}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N10.9.295 $\mathrm{A1}^- \oplus \mathrm{Z2}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N10.9.296 $\mathrm{C1}^+ \oplus \mathrm{C1}^+ \oplus \mathrm{C1}^+$	$\surd$	0	0	$\surd$	-	-
N10.9.297 $\mathrm{C1}^+ \oplus \mathrm{C1}^+ \oplus \mathrm{C1}^-$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_u} \oplus \mathrm{A_u}$
N10.9.298 $\mathrm{C1}^+ \oplus \mathrm{C1}^+ \oplus \mathrm{C2}^+$	$\surd$	0	0	$\surd$	-	-
N10.9.299 $\mathrm{C1}^+ \oplus \mathrm{C1}^+ \oplus \mathrm{C2}^-$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{B_u} \oplus \mathrm{B_u}$
N10.9.300 $\mathrm{C1}^+ \oplus \mathrm{C1}^+ \oplus \mathrm{D1}^+$	$\surd$	1	0	$\times$	-	-
N10.9.301 $\mathrm{C1}^+ \oplus \mathrm{C1}^+ \oplus \mathrm{D1}^-$	$\surd$	1	0	$\times$	-	-
N10.9.302 $\mathrm{C1}^+ \oplus \mathrm{C1}^- \oplus \mathrm{C2}^+$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_u} \oplus \mathrm{B_u}$
N10.9.303 $\mathrm{C1}^+ \oplus \mathrm{C1}^- \oplus \mathrm{D1}^+$	$\surd$	1	1	$\times$	-	-
N10.9.304 $\mathrm{C1}^+ \oplus \mathrm{C2}^+ \oplus \mathrm{D1}^+$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $P2/m$ (No. 10) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N10.9.305 $\mathrm{C1}^+ \oplus \mathrm{C2}^- \oplus \mathrm{D1}^+$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
N10.9.306 $\mathrm{C1}^+ \oplus \mathrm{C2}^- \oplus \mathrm{D1}^-$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
N10.9.307 $\mathrm{C1}^+ \oplus \mathrm{D1}^+ \oplus \mathrm{E1}^+$	$\times$	-	-	-	-	-
N10.9.308 $\mathrm{C1}^+ \oplus \mathrm{D1}^+ \oplus \mathrm{E1}^-$	$\times$	-	-	-	-	-
N10.9.309 $\mathrm{C1}^+ \oplus \mathrm{D1}^+ \oplus \mathrm{E2}^+$	$\times$	-	-	-	-	-
N10.9.310 $\mathrm{C1}^+ \oplus \mathrm{D1}^+ \oplus \mathrm{E2}^-$	$\times$	-	-	-	-	-
N10.9.311 $\mathrm{C1}^+ \oplus \mathrm{C1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N10.9.312 $\mathrm{C1}^+ \oplus \mathrm{C1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N10.9.313 $\mathrm{C1}^+ \oplus \mathrm{C1}^- \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\times$	-	-
N10.9.314 $\mathrm{C1}^+ \oplus \mathrm{C2}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N10.9.315 $\mathrm{C1}^+ \oplus \mathrm{C2}^- \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
N10.9.316 $\mathrm{C1}^+ \oplus \mathrm{C2}^- \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
N10.9.317 $\mathrm{C1}^+ \oplus \mathrm{D1}^+ \oplus \mathrm{Z1}^+$	$\times$	-	-	-	-	-
N10.9.318 $\mathrm{C1}^+ \oplus \mathrm{D1}^+ \oplus \mathrm{Z1}^-$	$\times$	-	-	-	-	-
N10.9.319 $\mathrm{C1}^+ \oplus \mathrm{D1}^- \oplus \mathrm{Z1}^+$	$\times$	-	-	-	-	-
N10.9.320 $\mathrm{C1}^+ \oplus \mathrm{C1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N10.9.321 $\mathrm{C1}^+ \oplus \mathrm{C1}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-
N10.9.322 $\mathrm{C1}^+ \oplus \mathrm{C1}^- \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\times$	-	-
N10.9.323 $\mathrm{C1}^+ \oplus \mathrm{C2}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N10.9.324 $\mathrm{C1}^+ \oplus \mathrm{C2}^- \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
N10.9.325 $\mathrm{C1}^+ \oplus \mathrm{C2}^- \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
N10.9.326 $\mathrm{C1}^+ \oplus \mathrm{D1}^+ \oplus \mathrm{Z2}^+$	$\times$	-	-	-	-	-
N10.9.327 $\mathrm{C1}^+ \oplus \mathrm{D1}^+ \oplus \mathrm{Z2}^-$	$\times$	-	-	-	-	-
N10.9.328 $\mathrm{C1}^+ \oplus \mathrm{D1}^- \oplus \mathrm{Z2}^+$	$\times$	-	-	-	-	-
N10.9.329 $\mathrm{C1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N10.9.330 $\mathrm{C1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N10.9.331 $\mathrm{C1}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N10.9.332 $\mathrm{C1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N10.9.333 $\mathrm{C1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
N10.9.334 $\mathrm{C1}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
N10.9.335 $\mathrm{C1}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-
N10.9.336 $\mathrm{C1}^+ \oplus \mathrm{Z2}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N10.9.337 $\mathrm{C1}^+ \oplus \mathrm{Z2}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N10.9.338 $\mathrm{C1}^+ \oplus \mathrm{Z2}^- \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-
N10.9.339 $\mathrm{Z1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^+$	$\surd$	0	0	$\surd$	-	-
N10.9.340 $\mathrm{Z1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^-$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_u} \oplus \mathrm{A_u}$
N10.9.341 $\mathrm{Z1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^+$	$\surd$	0	0	$\surd$	-	-
N10.9.342 $\mathrm{Z1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^-$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{B_u} \oplus \mathrm{B_u}$
N10.9.343 $\mathrm{Z1}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z2}^+$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_u} \oplus \mathrm{B_u}$
N10.9.344 $\mathrm{Z1}^+ \oplus \mathrm{Z2}^+ \oplus \mathrm{Z2}^+$	$\surd$	0	0	$\surd$	-	-
N10.9.345 $\mathrm{Z1}^+ \oplus \mathrm{Z2}^+ \oplus \mathrm{Z2}^-$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_u} \oplus \mathrm{B_u}$
N10.9.346 $\mathrm{Z1}^+ \oplus \mathrm{Z2}^- \oplus \mathrm{Z2}^-$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{B_u} \oplus \mathrm{B_u}$
N10.9.347 $\mathrm{Z2}^+ \oplus \mathrm{Z2}^+ \oplus \mathrm{Z2}^+$	$\surd$	0	0	$\surd$	-	-
N10.9.348 $\mathrm{Z2}^+ \oplus \mathrm{Z2}^+ \oplus \mathrm{Z2}^-$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_u} \oplus \mathrm{A_u}$
N10.14.1 $\mathrm{GM1}^- \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N10.14.2 $\mathrm{GM1}^- \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$

Non-coplanar SSGs with parent space group $P2/m$ (No. 10) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N10.14.3 GM1$^-$ ⊕ U1	√	1	1	×	-	-
N10.14.4 GM2$^+$ ⊕ LD1	√	1	1	√	m	A''
N10.14.5 GM2$^+$ ⊕ LD2	√	1	1	√	m	A''
N10.14.6 GM2$^+$ ⊕ U1	√	1	1	×	-	-
N10.14.7 GM2$^-$ ⊕ LD1	√	1	1	√	$2/m$	$\mathrm{A_u}$
N10.14.8 GM2$^-$ ⊕ LD2	√	1	1	√	$2/m$	$\mathrm{A_u}$
N10.14.9 GM2$^-$ ⊕ U1	√	1	1	×	-	-
N10.14.10 A1$^+$ ⊕ LD1	√	1	1	√	$2/m$	$\mathrm{A_u}$
N10.14.11 A1$^+$ ⊕ LD2	√	1	1	√	$2/m$	$\mathrm{A_u}$
N10.14.12 A1$^+$ ⊕ V1	√	1	1	×	-	-
N10.14.13 A1$^+$ ⊕ U1	√	1	1	√	$2/m$	$\mathrm{A_u}$
N10.14.14 A1$^+$ ⊕ U2	√	1	1	√	$2/m$	$\mathrm{A_u}$
N10.14.15 A1$^-$ ⊕ LD1	√	1	1	√	$2/m$	$\mathrm{A_u}$
N10.14.16 A1$^-$ ⊕ LD2	√	1	1	√	$2/m$	$\mathrm{A_u}$
N10.14.17 A1$^-$ ⊕ V1	√	1	1	×	-	-
N10.14.18 A1$^-$ ⊕ U1	√	1	1	√	$2/m$	$\mathrm{A_u}$
N10.14.19 A1$^-$ ⊕ U2	√	1	1	√	$2/m$	$\mathrm{A_u}$
N10.14.20 C1$^+$ ⊕ LD1	√	1	1	√	$2/m$	$\mathrm{A_u}$
N10.14.21 C1$^+$ ⊕ LD2	√	1	1	√	$2/m$	$\mathrm{A_u}$
N10.14.22 C1$^+$ ⊕ W1	√	1	1	√	$2/m$	$\mathrm{A_u}$
N10.14.23 C1$^+$ ⊕ W2	√	1	1	√	$2/m$	$\mathrm{A_u}$
N10.14.24 C1$^+$ ⊕ U1	√	1	1	×	-	-
N10.14.25 Z1$^+$ ⊕ LD1	√	1	1	√	$2/m$	$\mathrm{A_u}$
N10.14.26 Z1$^+$ ⊕ LD2	√	1	1	√	$2/m$	$\mathrm{A_u}$
N10.14.27 Z1$^+$ ⊕ U1	√	1	1	×	-	-
N10.14.28 Z2$^+$ ⊕ LD1	√	1	1	√	$2/m$	$\mathrm{A_u}$
N10.14.29 Z2$^+$ ⊕ LD2	√	1	1	√	$2/m$	$\mathrm{A_u}$
N10.14.30 Z2$^+$ ⊕ U1	√	1	1	×	-	-
N10.14.31 GM1$^-$ ⊕ F1	√	3	3	√	$2/m$	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B_u}$
N10.14.32 GM1$^-$ ⊕ F2	√	3	3	√	$2/m$	$\mathrm{B_g} \oplus \mathrm{B_u} \oplus \mathrm{B_u}$
N10.14.33 GM1$^-$ ⊕ G1	√	1	1	×	-	-
N10.14.34 GM2$^+$ ⊕ F1	√	2	2	√	2	$\mathrm{A} \oplus \mathrm{B}$
N10.14.35 GM2$^+$ ⊕ F2	√	2	2	√	2	$\mathrm{B} \oplus \mathrm{B}$
N10.14.36 GM2$^+$ ⊕ G1	√	1	1	×	-	-
N10.14.37 GM2$^-$ ⊕ F1	√	3	3	√	$2/m$	$\mathrm{A_g} \oplus \mathrm{B_u} \oplus \mathrm{B_u}$
N10.14.38 GM2$^-$ ⊕ F2	√	3	3	√	$2/m$	$\mathrm{A_u} \oplus \mathrm{B_g} \oplus \mathrm{B_u}$
N10.14.39 GM2$^-$ ⊕ G1	√	1	1	×	-	-
N10.14.40 A1$^+$ ⊕ F1	√	2	2	√	$2/m$	$\mathrm{A_g} \oplus \mathrm{B_u}$
N10.14.41 A1$^+$ ⊕ F2	√	2	2	√	$2/m$	$\mathrm{B_g} \oplus \mathrm{B_u}$
N10.14.42 A1$^+$ ⊕ G1	√	1	1	×	-	-
N10.14.43 A1$^-$ ⊕ F1	√	2	2	√	$2/m$	$\mathrm{A_g} \oplus \mathrm{B_u}$
N10.14.44 A1$^-$ ⊕ F2	√	2	2	√	$2/m$	$\mathrm{B_g} \oplus \mathrm{B_u}$
N10.14.45 A1$^-$ ⊕ G1	√	1	1	×	-	-
N10.14.46 C1$^+$ ⊕ F1	√	2	2	√	$2/m$	$\mathrm{A_g} \oplus \mathrm{B_u}$
N10.14.47 C1$^+$ ⊕ F2	√	2	2	√	$2/m$	$\mathrm{B_g} \oplus \mathrm{B_u}$
N10.14.48 C1$^+$ ⊕ G1	√	1	1	√	$2/m$	$\mathrm{B_u}$

Non-coplanar SSGs with parent space group $P2/m$ (No. 10) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N10.14.49 $\mathrm{C1}^+ \oplus \mathrm{G2}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
N10.14.50 $\mathrm{Z1}^+ \oplus \mathrm{F1}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{B_u}$
N10.14.51 $\mathrm{Z1}^+ \oplus \mathrm{F2}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{B_g} \oplus \mathrm{B_u}$
N10.14.52 $\mathrm{Z1}^+ \oplus \mathrm{G1}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{B_u} \oplus \mathrm{B_u}$
N10.14.53 $\mathrm{Z1}^+ \oplus \mathrm{G2}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_u} \oplus \mathrm{B_u}$
N10.14.54 $\mathrm{Z2}^+ \oplus \mathrm{F1}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{B_u}$
N10.14.55 $\mathrm{Z2}^+ \oplus \mathrm{F2}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{B_g} \oplus \mathrm{B_u}$
N10.14.56 $\mathrm{Z2}^+ \oplus \mathrm{G1}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_u} \oplus \mathrm{B_u}$
N10.14.57 $\mathrm{Z2}^+ \oplus \mathrm{G2}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{B_u} \oplus \mathrm{B_u}$

TABLE S31: Collinear SSGs with parent space group $P2_1/m$ (No. 11).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L11.1.1 $\mathrm{GM1}^+$	1	$2/m$	$\mathrm{A_g}$
L11.2.1 $\mathrm{GM1}^-$	0	-	-
L11.2.2 $\mathrm{GM2}^+$	1	$2/m$	$\mathrm{B_g}$
L11.2.3 $\mathrm{GM2}^-$	0	-	-
L11.2.4 $\mathrm{A1}^+$	0	-	-
L11.2.5 $\mathrm{A1}^-$	0	-	-

TABLE S32: Coplanar SSGs with parent space group $P2_1/m$ (No. 11).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P11.1.1 $\mathrm{GM1}^+$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{A_g}$
P11.2.1 $\mathrm{GM1}^-$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{A_u}$
P11.2.2 $\mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{B_g}$
P11.2.3 $\mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{B_u}$
P11.2.4 $\mathrm{A1}^+$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
P11.2.5 $\mathrm{A1}^-$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
P11.3.1 $\mathrm{GM1}^- \oplus \mathrm{GM1}^-$	$\surd$	0	0	$\surd$	-	-
P11.3.2 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{B_g} \oplus \mathrm{B_u}$
P11.3.3 $\mathrm{GM1}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
P11.3.4 $\mathrm{GM1}^- \oplus \mathrm{A1}^+$	$\surd$	1	1	$\times$	-	-
P11.3.5 $\mathrm{GM1}^- \oplus \mathrm{A1}^-$	$\surd$	1	1	$\times$	-	-
P11.3.6 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{B_g} \oplus \mathrm{B_g}$
P11.3.7 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_u} \oplus \mathrm{B_g}$
P11.3.8 $\mathrm{GM2}^+ \oplus \mathrm{A1}^+$	$\surd$	1	0	$\times$	-	-
P11.3.9 $\mathrm{GM2}^+ \oplus \mathrm{A1}^-$	$\surd$	1	0	$\times$	-	-
P11.3.10 $\mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
P11.3.11 $\mathrm{GM2}^- \oplus \mathrm{A1}^+$	$\surd$	1	1	$\times$	-	-
P11.3.12 $\mathrm{GM2}^- \oplus \mathrm{A1}^-$	$\surd$	1	1	$\times$	-	-
P11.3.13 $\mathrm{A1}^+ \oplus \mathrm{A1}^+$	$\surd$	1	0	$\times$	-	-
P11.3.14 $\mathrm{A1}^+ \oplus \mathrm{A2}^-$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
P11.3.15 $\mathrm{A1}^+ \oplus \mathrm{Y1}^+$	$\times$	-	-	-	-	-
P11.3.16 $\mathrm{A1}^+ \oplus \mathrm{A1}^-$	$\surd$	1	1	$\times$	-	-

Coplanar SSGs with parent space group $P2_1/m$ (No. 11) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P11.3.17 $\mathrm{A1}^+ \oplus \mathrm{A2}^+$	$\surd$	1	0	$\times$	-	-
P11.3.18 $\mathrm{A1}^+ \oplus \mathrm{B1}^-$	$\times$	-	-	-	-	-
P11.3.19 $\mathrm{A1}^- \oplus \mathrm{A1}^-$	$\surd$	1	0	$\times$	-	-
P11.3.20 $\mathrm{A1}^- \oplus \mathrm{A2}^+$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
P11.3.21 $\mathrm{A1}^- \oplus \mathrm{Y1}^-$	$\times$	-	-	-	-	-
P11.6.1 C1	$\surd$	1	1	$\times$	-	-
P11.6.2 Z1	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
P11.8.1 LD1	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
P11.8.2 U1	$\surd$	1	1	$\times$	-	-
P11.8.3 F1	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{B_u}$
P11.8.4 F2	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{B_g} \oplus \mathrm{B_u}$

TABLE S33: Non-coplanar SSGs with parent space group $P2_1/m$ (No. 11).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N11.1.1 $\mathrm{GM1}^+$	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{A_g}$
N11.2.1 $\mathrm{GM1}^-$	$\surd$	2	2	$\surd$	2	$\mathrm{A} \oplus \mathrm{A}$
N11.2.2 $\mathrm{GM2}^+$	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B_g}$
N11.2.3 $\mathrm{GM2}^-$	$\surd$	2	2	$\surd$	m	$\mathrm{A}' \oplus \mathrm{A}'$
N11.2.4 $\mathrm{A1}^+$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{A_g}$
N11.2.5 $\mathrm{A1}^-$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{A_g}$
N11.3.1 $\mathrm{GM1}^- \oplus \mathrm{GM1}^-$	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{A_u}$
N11.3.2 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+$	$\surd$	2	2	$\surd$	m	$\mathrm{A}' \oplus \mathrm{A}''$
N11.3.3 $\mathrm{GM1}^- \oplus \mathrm{GM2}^-$	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B_u}$
N11.3.4 $\mathrm{GM1}^- \oplus \mathrm{A1}^+$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{A_u}$
N11.3.5 $\mathrm{GM1}^- \oplus \mathrm{A1}^-$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{A_u}$
N11.3.6 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{B_g} \oplus \mathrm{B_g}$
N11.3.7 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	2	2	$\surd$	2	$\mathrm{A} \oplus \mathrm{B}$
N11.3.8 $\mathrm{GM2}^+ \oplus \mathrm{A1}^+$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{B_g}$
N11.3.9 $\mathrm{GM2}^+ \oplus \mathrm{A1}^-$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{B_g}$
N11.3.10 $\mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{B_u} \oplus \mathrm{B_u}$
N11.3.11 $\mathrm{GM2}^- \oplus \mathrm{A1}^+$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{B_u}$
N11.3.12 $\mathrm{GM2}^- \oplus \mathrm{A1}^-$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{B_u}$
N11.3.13 $\mathrm{A1}^+ \oplus \mathrm{A1}^+$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
N11.3.14 $\mathrm{A1}^+ \oplus \mathrm{A2}^-$	$\surd$	1	1	$\surd$	m	A'
N11.3.15 $\mathrm{A1}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
N11.3.16 $\mathrm{A1}^+ \oplus \mathrm{A1}^-$	$\surd$	1	1	$\surd$	2	A
N11.3.17 $\mathrm{A1}^+ \oplus \mathrm{A2}^+$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
N11.3.18 $\mathrm{A1}^+ \oplus \mathrm{B1}^-$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
N11.3.19 $\mathrm{A1}^- \oplus \mathrm{A1}^-$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
N11.3.20 $\mathrm{A1}^- \oplus \mathrm{A2}^+$	$\surd$	1	1	$\surd$	m	A'
N11.3.21 $\mathrm{A1}^- \oplus \mathrm{Y1}^-$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
N11.6.1 C1	$\surd$	1	1	$\surd$	2	A
N11.6.2 Z1	$\surd$	1	1	$\surd$	2	A
N11.8.1 LD1	$\surd$	1	1	$\surd$	2	A
N11.8.2 U1	$\surd$	1	1	$\surd$	2	A

Non-coplanar SSGs with parent space group $P2_1/m$ (No. 11) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N11.8.3 F1	$\surd$	2	2	$\surd$	m	$\mathrm{A}' \oplus \mathrm{A}'$
N11.8.4 F2	$\surd$	2	2	$\surd$	m	$\mathrm{A}' \oplus \mathrm{A}''$
N11.9.1 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{GM1}^-$	$\surd$	0	0	$\surd$	-	-
N11.9.2 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{GM2}^+$	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{B_g} \oplus \mathrm{B_u} \oplus \mathrm{B_u}$
N11.9.3 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
N11.9.4 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{A1}^+$	$\surd$	0	0	$\surd$	-	-
N11.9.5 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{A1}^-$	$\surd$	0	0	$\surd$	-	-
N11.9.6 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	2	2	$\surd$	2	$\mathrm{B} \oplus \mathrm{B}$
N11.9.7 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_u} \oplus \mathrm{B_g} \oplus \mathrm{B_u}$
N11.9.8 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{A1}^+$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{B_g} \oplus \mathrm{B_u}$
N11.9.9 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{A1}^-$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{B_g} \oplus \mathrm{B_u}$
N11.9.10 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
N11.9.11 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{A1}^+$	$\surd$	0	0	$\surd$	-	-
N11.9.12 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{A1}^-$	$\surd$	0	0	$\surd$	-	-
N11.9.13 $\mathrm{GM1}^- \oplus \mathrm{A1}^+ \oplus \mathrm{A1}^+$	$\surd$	1	0	$\times$	-	-
N11.9.14 $\mathrm{GM1}^- \oplus \mathrm{A1}^+ \oplus \mathrm{A2}^-$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
N11.9.15 $\mathrm{GM1}^- \oplus \mathrm{A1}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	0	$\times$	-	-
N11.9.16 $\mathrm{GM1}^- \oplus \mathrm{A1}^+ \oplus \mathrm{A1}^-$	$\surd$	1	1	$\times$	-	-
N11.9.17 $\mathrm{GM1}^- \oplus \mathrm{A1}^+ \oplus \mathrm{A2}^+$	$\surd$	1	0	$\times$	-	-
N11.9.18 $\mathrm{GM1}^- \oplus \mathrm{A1}^+ \oplus \mathrm{B1}^-$	$\surd$	1	0	$\times$	-	-
N11.9.19 $\mathrm{GM1}^- \oplus \mathrm{A1}^- \oplus \mathrm{A1}^-$	$\surd$	1	0	$\times$	-	-
N11.9.20 $\mathrm{GM1}^- \oplus \mathrm{A1}^- \oplus \mathrm{A2}^+$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
N11.9.21 $\mathrm{GM1}^- \oplus \mathrm{A1}^- \oplus \mathrm{Y1}^-$	$\surd$	1	0	$\times$	-	-
N11.9.22 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{B_g} \oplus \mathrm{B_g} \oplus \mathrm{B_g}$
N11.9.23 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	2	2	$\surd$	m	$\mathrm{A}'' \oplus \mathrm{A}''$
N11.9.24 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{A1}^+$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{B_g} \oplus \mathrm{B_g}$
N11.9.25 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{A1}^-$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{B_g} \oplus \mathrm{B_g}$
N11.9.26 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B_g}$
N11.9.27 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{A1}^+$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_u} \oplus \mathrm{B_g}$
N11.9.28 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{A1}^-$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_u} \oplus \mathrm{B_g}$
N11.9.29 $\mathrm{GM2}^+ \oplus \mathrm{A1}^+ \oplus \mathrm{A1}^+$	$\surd$	1	1	$\times$	-	-
N11.9.30 $\mathrm{GM2}^+ \oplus \mathrm{A1}^+ \oplus \mathrm{A2}^-$	$\surd$	1	1	$\surd$	2	B
N11.9.31 $\mathrm{GM2}^+ \oplus \mathrm{A1}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	1	$\times$	-	-
N11.9.32 $\mathrm{GM2}^+ \oplus \mathrm{A1}^+ \oplus \mathrm{A1}^-$	$\surd$	1	1	$\times$	-	-
N11.9.33 $\mathrm{GM2}^+ \oplus \mathrm{A1}^+ \oplus \mathrm{A2}^+$	$\surd$	1	1	$\times$	-	-
N11.9.34 $\mathrm{GM2}^+ \oplus \mathrm{A1}^+ \oplus \mathrm{B1}^-$	$\surd$	1	1	$\times$	-	-
N11.9.35 $\mathrm{GM2}^+ \oplus \mathrm{A1}^- \oplus \mathrm{A1}^-$	$\surd$	1	1	$\times$	-	-
N11.9.36 $\mathrm{GM2}^+ \oplus \mathrm{A1}^- \oplus \mathrm{A2}^+$	$\surd$	1	1	$\surd$	2	B
N11.9.37 $\mathrm{GM2}^+ \oplus \mathrm{A1}^- \oplus \mathrm{Y1}^-$	$\surd$	1	1	$\times$	-	-
N11.9.38 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
N11.9.39 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{A1}^+$	$\surd$	0	0	$\surd$	-	-
N11.9.40 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{A1}^-$	$\surd$	0	0	$\surd$	-	-
N11.9.41 $\mathrm{GM2}^- \oplus \mathrm{A1}^+ \oplus \mathrm{A1}^+$	$\surd$	1	0	$\times$	-	-
N11.9.42 $\mathrm{GM2}^- \oplus \mathrm{A1}^+ \oplus \mathrm{A2}^-$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
N11.9.43 $\mathrm{GM2}^- \oplus \mathrm{A1}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	0	$\times$	-	-
N11.9.44 $\mathrm{GM2}^- \oplus \mathrm{A1}^+ \oplus \mathrm{A1}^-$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $P2_1/m$ (No. 11) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N11.9.45 $\mathrm{GM2}^- \oplus \mathrm{A1}^+ \oplus \mathrm{A2}^+$	$\surd$	1	0	$\times$	-	-
N11.9.46 $\mathrm{GM2}^- \oplus \mathrm{A1}^+ \oplus \mathrm{B1}^-$	$\surd$	1	0	$\times$	-	-
N11.9.47 $\mathrm{GM2}^- \oplus \mathrm{A1}^- \oplus \mathrm{A1}^-$	$\surd$	1	0	$\times$	-	-
N11.9.48 $\mathrm{GM2}^- \oplus \mathrm{A1}^- \oplus \mathrm{A2}^+$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
N11.9.49 $\mathrm{GM2}^- \oplus \mathrm{A1}^- \oplus \mathrm{Y1}^-$	$\surd$	1	0	$\times$	-	-
N11.9.50 $\mathrm{A1}^+ \oplus \mathrm{A1}^+ \oplus \mathrm{A1}^+$	$\surd$	0	0	$\surd$	-	-
N11.9.51 $\mathrm{A1}^+ \oplus \mathrm{A1}^+ \oplus \mathrm{A2}^-$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{B_u} \oplus \mathrm{B_u}$
N11.9.52 $\mathrm{A1}^+ \oplus \mathrm{A1}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	0	$\times$	-	-
N11.9.53 $\mathrm{A1}^+ \oplus \mathrm{A2}^- \oplus \mathrm{Y1}^+$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
N11.9.54 $\mathrm{B1}^+ \oplus \mathrm{A1}^+ \oplus \mathrm{Y1}^+$	$\times$	-	-	-	-	-
N11.9.55 $\mathrm{B1}^+ \oplus \mathrm{A1}^+ \oplus \mathrm{Y2}^-$	$\times$	-	-	-	-	-
N11.9.56 $\mathrm{A1}^+ \oplus \mathrm{A1}^+ \oplus \mathrm{A1}^-$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_u} \oplus \mathrm{A_u}$
N11.9.57 $\mathrm{A1}^+ \oplus \mathrm{A1}^+ \oplus \mathrm{A2}^+$	$\surd$	0	0	$\surd$	-	-
N11.9.58 $\mathrm{A1}^+ \oplus \mathrm{A1}^+ \oplus \mathrm{B1}^-$	$\surd$	1	0	$\times$	-	-
N11.9.59 $\mathrm{A1}^+ \oplus \mathrm{A2}^- \oplus \mathrm{A1}^-$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_u} \oplus \mathrm{B_u}$
N11.9.60 $\mathrm{A1}^+ \oplus \mathrm{A2}^- \oplus \mathrm{B1}^-$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
N11.9.61 $\mathrm{A1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{A1}^-$	$\surd$	1	1	$\times$	-	-
N11.9.62 $\mathrm{A1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{A2}^+$	$\surd$	1	0	$\times$	-	-
N11.9.63 $\mathrm{A1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{B1}^-$	$\times$	-	-	-	-	-
N11.9.64 $\mathrm{A1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{B2}^+$	$\times$	-	-	-	-	-
N11.9.65 $\mathrm{A1}^+ \oplus \mathrm{A1}^- \oplus \mathrm{A1}^-$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_u} \oplus \mathrm{A_u}$
N11.9.66 $\mathrm{A1}^+ \oplus \mathrm{A1}^- \oplus \mathrm{A2}^+$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_u} \oplus \mathrm{B_u}$
N11.9.67 $\mathrm{A1}^+ \oplus \mathrm{A1}^- \oplus \mathrm{Y1}^-$	$\surd$	1	1	$\times$	-	-
N11.9.68 $\mathrm{A1}^+ \oplus \mathrm{A2}^+ \oplus \mathrm{A2}^+$	$\surd$	0	0	$\surd$	-	-
N11.9.69 $\mathrm{A1}^+ \oplus \mathrm{A2}^+ \oplus \mathrm{Y1}^-$	$\surd$	1	0	$\times$	-	-
N11.9.70 $\mathrm{A1}^+ \oplus \mathrm{B1}^- \oplus \mathrm{B1}^-$	$\surd$	1	0	$\times$	-	-
N11.9.71 $\mathrm{A1}^+ \oplus \mathrm{B1}^- \oplus \mathrm{B2}^+$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
N11.9.72 $\mathrm{A1}^+ \oplus \mathrm{B1}^- \oplus \mathrm{Y1}^-$	$\times$	-	-	-	-	-
N11.9.73 $\mathrm{A1}^+ \oplus \mathrm{B1}^- \oplus \mathrm{Y2}^+$	$\times$	-	-	-	-	-
N11.9.74 $\mathrm{A1}^- \oplus \mathrm{A1}^- \oplus \mathrm{A1}^-$	$\surd$	0	0	$\surd$	-	-
N11.9.75 $\mathrm{A1}^- \oplus \mathrm{A1}^- \oplus \mathrm{A2}^+$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{B_u} \oplus \mathrm{B_u}$
N11.9.76 $\mathrm{A1}^- \oplus \mathrm{A1}^- \oplus \mathrm{Y1}^-$	$\surd$	1	0	$\times$	-	-
N11.9.77 $\mathrm{A1}^- \oplus \mathrm{A2}^+ \oplus \mathrm{Y1}^-$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
N11.9.78 $\mathrm{B1}^- \oplus \mathrm{A1}^- \oplus \mathrm{Y1}^-$	$\times$	-	-	-	-	-
N11.9.79 $\mathrm{B1}^- \oplus \mathrm{A1}^- \oplus \mathrm{Y2}^+$	$\times$	-	-	-	-	-
N11.12.1 $\mathrm{GM1}^- \oplus \mathrm{C1}$	$\surd$	1	1	$\times$	-	-
N11.12.2 $\mathrm{GM1}^- \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N11.12.3 $\mathrm{GM2}^+ \oplus \mathrm{C1}$	$\surd$	1	1	$\times$	-	-
N11.12.4 $\mathrm{GM2}^+ \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	m	$\mathrm{A''}$
N11.12.5 $\mathrm{GM2}^- \oplus \mathrm{C1}$	$\surd$	1	1	$\times$	-	-
N11.12.6 $\mathrm{GM2}^- \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N11.12.7 $\mathrm{A1}^+ \oplus \mathrm{C1}$	$\surd$	1	1	$\times$	-	-
N11.12.8 $\mathrm{A1}^+ \oplus \mathrm{E1}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N11.12.9 $\mathrm{A1}^+ \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N11.12.10 $\mathrm{A1}^- \oplus \mathrm{C1}$	$\surd$	1	1	$\times$	-	-
N11.12.11 $\mathrm{A1}^- \oplus \mathrm{E1}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$

Non-coplanar SSGs with parent space group $P2_1/m$ (No. 11) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N11.12.12 $\mathrm{A1}^-\oplus\mathrm{Z1}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N11.14.1 $\mathrm{GM1}^-\oplus\mathrm{LD1}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N11.14.2 $\mathrm{GM1}^-\oplus\mathrm{U1}$	$\surd$	1	1	$\times$	-	-
N11.14.3 $\mathrm{GM2}^+\oplus\mathrm{LD1}$	$\surd$	1	1	$\surd$	m	$\mathrm{A''}$
N11.14.4 $\mathrm{GM2}^+\oplus\mathrm{U1}$	$\surd$	1	1	$\times$	-	-
N11.14.5 $\mathrm{GM2}^-\oplus\mathrm{LD1}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N11.14.6 $\mathrm{GM2}^-\oplus\mathrm{U1}$	$\surd$	1	1	$\times$	-	-
N11.14.7 $\mathrm{A1}^+\oplus\mathrm{LD1}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N11.14.8 $\mathrm{A1}^+\oplus\mathrm{V1}$	$\surd$	1	1	$\times$	-	-
N11.14.9 $\mathrm{A1}^+\oplus\mathrm{U1}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N11.14.10 $\mathrm{A1}^-\oplus\mathrm{LD1}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N11.14.11 $\mathrm{A1}^-\oplus\mathrm{V1}$	$\surd$	1	1	$\times$	-	-
N11.14.12 $\mathrm{A1}^-\oplus\mathrm{U1}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N11.14.13 $\mathrm{GM1}^-\oplus\mathrm{F1}$	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g}\oplus\mathrm{A_u}\oplus\mathrm{B_u}$
N11.14.14 $\mathrm{GM1}^-\oplus\mathrm{F2}$	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{B_g}\oplus\mathrm{B_u}\oplus\mathrm{B_u}$
N11.14.15 $\mathrm{GM2}^+\oplus\mathrm{F1}$	$\surd$	2	2	$\surd$	2	$\mathrm{A}\oplus\mathrm{B}$
N11.14.16 $\mathrm{GM2}^+\oplus\mathrm{F2}$	$\surd$	2	2	$\surd$	2	$\mathrm{B}\oplus\mathrm{B}$
N11.14.17 $\mathrm{GM2}^-\oplus\mathrm{F1}$	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g}\oplus\mathrm{B_u}\oplus\mathrm{B_u}$
N11.14.18 $\mathrm{GM2}^-\oplus\mathrm{F2}$	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_u}\oplus\mathrm{B_g}\oplus\mathrm{B_u}$
N11.14.19 $\mathrm{A1}^+\oplus\mathrm{F1}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g}\oplus\mathrm{B_u}$
N11.14.20 $\mathrm{A1}^+\oplus\mathrm{F2}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{B_g}\oplus\mathrm{B_u}$
N11.14.21 $\mathrm{A1}^-\oplus\mathrm{F1}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g}\oplus\mathrm{B_u}$
N11.14.22 $\mathrm{A1}^-\oplus\mathrm{F2}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{B_g}\oplus\mathrm{B_u}$

TABLE S34: Collinear SSGs with parent space group $C2/m$ (No. 12).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L12.1.1 $\mathrm{GM1}^+$	1	$2/m$	$\mathrm{A_g}$
L12.2.1 $\mathrm{GM1}^-$	0	-	-
L12.2.2 $\mathrm{GM2}^+$	1	$2/m$	$\mathrm{B_g}$
L12.2.3 $\mathrm{GM2}^-$	0	-	-
L12.2.4 $\mathrm{A1}^+$	0	-	-
L12.2.5 $\mathrm{A1}^-$	0	-	-
L12.2.6 $\mathrm{Y1}^+$	0	-	-
L12.2.7 $\mathrm{Y1}^-$	0	-	-
L12.2.8 $\mathrm{Y2}^+$	0	-	-
L12.2.9 $\mathrm{Y2}^-$	0	-	-

TABLE S35: Coplanar SSGs with parent space group $C2/m$ (No. 12).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P12.1.1 $\mathrm{GM1}^+$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g}\oplus\mathrm{A_g}$
P12.2.1 $\mathrm{GM1}^-$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g}\oplus\mathrm{A_u}$
P12.2.2 $\mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g}\oplus\mathrm{B_g}$
P12.2.3 $\mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g}\oplus\mathrm{B_u}$

Coplanar SSGs with parent space group $C2/m$ (No. 12) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P12.2.4 $\mathrm{A1}^{+}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
P12.2.5 $\mathrm{A1}^{-}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
P12.2.6 $\mathrm{Y1}^{+}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
P12.2.7 $\mathrm{Y1}^{-}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
P12.2.8 $\mathrm{Y2}^{+}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
P12.2.9 $\mathrm{Y2}^{-}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
P12.3.1 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}$	$\surd$	0	0	$\surd$	-	-
P12.3.2 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{B_g}\oplus\mathrm{B_u}$
P12.3.3 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
P12.3.4 $\mathrm{GM1}^{-}\oplus\mathrm{A1}^{+}$	$\surd$	1	1	$\times$	-	-
P12.3.5 $\mathrm{GM1}^{-}\oplus\mathrm{A1}^{-}$	$\surd$	1	1	$\times$	-	-
P12.3.6 $\mathrm{GM1}^{-}\oplus\mathrm{Y1}^{+}$	$\surd$	1	1	$\times$	-	-
P12.3.7 $\mathrm{GM1}^{-}\oplus\mathrm{Y1}^{-}$	$\surd$	1	1	$\times$	-	-
P12.3.8 $\mathrm{GM1}^{-}\oplus\mathrm{Y2}^{+}$	$\surd$	1	1	$\times$	-	-
P12.3.9 $\mathrm{GM1}^{-}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\times$	-	-
P12.3.10 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{B_g}\oplus\mathrm{B_g}$
P12.3.11 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_u}\oplus\mathrm{B_g}$
P12.3.12 $\mathrm{GM2}^{+}\oplus\mathrm{A1}^{+}$	$\surd$	1	0	$\times$	-	-
P12.3.13 $\mathrm{GM2}^{+}\oplus\mathrm{A1}^{-}$	$\surd$	1	0	$\times$	-	-
P12.3.14 $\mathrm{GM2}^{+}\oplus\mathrm{Y1}^{+}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_g}$
P12.3.15 $\mathrm{GM2}^{+}\oplus\mathrm{Y1}^{-}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_g}$
P12.3.16 $\mathrm{GM2}^{+}\oplus\mathrm{Y2}^{+}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_g}$
P12.3.17 $\mathrm{GM2}^{+}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_g}$
P12.3.18 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
P12.3.19 $\mathrm{GM2}^{-}\oplus\mathrm{A1}^{+}$	$\surd$	1	1	$\times$	-	-
P12.3.20 $\mathrm{GM2}^{-}\oplus\mathrm{A1}^{-}$	$\surd$	1	1	$\times$	-	-
P12.3.21 $\mathrm{GM2}^{-}\oplus\mathrm{Y1}^{+}$	$\surd$	1	1	$\times$	-	-
P12.3.22 $\mathrm{GM2}^{-}\oplus\mathrm{Y1}^{-}$	$\surd$	1	1	$\times$	-	-
P12.3.23 $\mathrm{GM2}^{-}\oplus\mathrm{Y2}^{+}$	$\surd$	1	1	$\times$	-	-
P12.3.24 $\mathrm{GM2}^{-}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\times$	-	-
P12.3.25 $\mathrm{A1}^{+}\oplus\mathrm{A1}^{+}$	$\surd$	1	0	$\times$	-	-
P12.3.26 $\mathrm{A1}^{+}\oplus\mathrm{A2}^{-}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
P12.3.27 $\mathrm{A1}^{+}\oplus\mathrm{M1}^{+}$	$\times$	-	-	-	-	-
P12.3.28 $\mathrm{A1}^{+}\oplus\mathrm{M2}^{-}$	$\times$	-	-	-	-	-
P12.3.29 $\mathrm{A1}^{+}\oplus\mathrm{A1}^{-}$	$\surd$	1	1	$\times$	-	-
P12.3.30 $\mathrm{A1}^{+}\oplus\mathrm{A2}^{+}$	$\surd$	1	0	$\times$	-	-
P12.3.31 $\mathrm{A1}^{+}\oplus\mathrm{M1}^{-}$	$\times$	-	-	-	-	-
P12.3.32 $\mathrm{A1}^{+}\oplus\mathrm{M2}^{+}$	$\times$	-	-	-	-	-
P12.3.33 $\mathrm{A1}^{+}\oplus\mathrm{Y1}^{+}$	$\times$	-	-	-	-	-
P12.3.34 $\mathrm{A1}^{+}\oplus\mathrm{Y1}^{-}$	$\times$	-	-	-	-	-
P12.3.35 $\mathrm{A1}^{+}\oplus\mathrm{Y2}^{+}$	$\times$	-	-	-	-	-
P12.3.36 $\mathrm{A1}^{+}\oplus\mathrm{Y2}^{-}$	$\times$	-	-	-	-	-
P12.3.37 $\mathrm{A1}^{-}\oplus\mathrm{A1}^{-}$	$\surd$	1	0	$\times$	-	-
P12.3.38 $\mathrm{A1}^{-}\oplus\mathrm{A2}^{+}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
P12.3.39 $\mathrm{A1}^{-}\oplus\mathrm{M1}^{-}$	$\times$	-	-	-	-	-
P12.3.40 $\mathrm{A1}^{-}\oplus\mathrm{M2}^{+}$	$\times$	-	-	-	-	-

Coplanar SSGs with parent space group $C2/m$ (No. 12) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P12.3.41 $\mathrm{A1}^{-} \oplus \mathrm{Y1}^{+}$	$\times$	-	-	-	-	-
P12.3.42 $\mathrm{A1}^{-} \oplus \mathrm{Y1}^{-}$	$\times$	-	-	-	-	-
P12.3.43 $\mathrm{A1}^{-} \oplus \mathrm{Y2}^{+}$	$\times$	-	-	-	-	-
P12.3.44 $\mathrm{A1}^{-} \oplus \mathrm{Y2}^{-}$	$\times$	-	-	-	-	-
P12.3.45 $\mathrm{Y1}^{+} \oplus \mathrm{Y1}^{+}$	$\surd$	1	0	$\times$	-	-
P12.3.46 $\mathrm{Y1}^{+} \oplus \mathrm{Y1}^{-}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
P12.3.47 $\mathrm{Y1}^{+} \oplus \mathrm{Y2}^{+}$	$\surd$	1	0	$\times$	-	-
P12.3.48 $\mathrm{Y1}^{+} \oplus \mathrm{Y2}^{-}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
P12.3.49 $\mathrm{Y1}^{-} \oplus \mathrm{Y1}^{-}$	$\surd$	1	0	$\times$	-	-
P12.3.50 $\mathrm{Y1}^{-} \oplus \mathrm{Y2}^{+}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
P12.3.51 $\mathrm{Y1}^{-} \oplus \mathrm{Y2}^{-}$	$\surd$	1	0	$\times$	-	-
P12.3.52 $\mathrm{Y2}^{+} \oplus \mathrm{Y2}^{+}$	$\surd$	1	0	$\times$	-	-
P12.3.53 $\mathrm{Y2}^{+} \oplus \mathrm{Y2}^{-}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
P12.3.54 $\mathrm{Y2}^{-} \oplus \mathrm{Y2}^{-}$	$\surd$	1	0	$\times$	-	-
P12.7.1 $\mathrm{L1}^{+}$	$\times$	-	-	-	-	-
P12.8.1 LD1	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
P12.8.2 LD2	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
P12.8.3 U1	$\surd$	1	1	$\times$	-	-
P12.8.4 B1	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{B_u}$
P12.8.5 B2	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{B_g} \oplus \mathrm{B_u}$

TABLE S36: Non-coplanar SSGs with parent space group $C2/m$ (No. 12).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N12.1.1 $\mathrm{GM1}^{+}$	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{A_g}$
N12.2.1 $\mathrm{GM1}^{-}$	$\surd$	2	2	$\surd$	2	$\mathrm{A} \oplus \mathrm{A}$
N12.2.2 $\mathrm{GM2}^{+}$	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B_g}$
N12.2.3 $\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	m	$\mathrm{A}' \oplus \mathrm{A}'$
N12.2.4 $\mathrm{A1}^{+}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{A_g}$
N12.2.5 $\mathrm{A1}^{-}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{A_g}$
N12.2.6 $\mathrm{Y1}^{+}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{A_g}$
N12.2.7 $\mathrm{Y1}^{-}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{A_g}$
N12.2.8 $\mathrm{Y2}^{+}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{A_g}$
N12.2.9 $\mathrm{Y2}^{-}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{A_g}$
N12.3.1 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-}$	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{A_u}$
N12.3.2 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	m	$\mathrm{A}' \oplus \mathrm{A}''$
N12.3.3 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{-}$	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B_u}$
N12.3.4 $\mathrm{GM1}^{-} \oplus \mathrm{A1}^{+}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{A_u}$
N12.3.5 $\mathrm{GM1}^{-} \oplus \mathrm{A1}^{-}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{A_u}$
N12.3.6 $\mathrm{GM1}^{-} \oplus \mathrm{Y1}^{+}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{A_u}$
N12.3.7 $\mathrm{GM1}^{-} \oplus \mathrm{Y1}^{-}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{A_u}$
N12.3.8 $\mathrm{GM1}^{-} \oplus \mathrm{Y2}^{+}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{A_u}$
N12.3.9 $\mathrm{GM1}^{-} \oplus \mathrm{Y2}^{-}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{A_u}$
N12.3.10 $\mathrm{GM2}^{+} \oplus \mathrm{GM2}^{+}$	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{B_g} \oplus \mathrm{B_g}$
N12.3.11 $\mathrm{GM2}^{+} \oplus \mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	2	$\mathrm{A} \oplus \mathrm{B}$
N12.3.12 $\mathrm{GM2}^{+} \oplus \mathrm{A1}^{+}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{B_g}$

Non-coplanar SSGs with parent space group $C2/m$ (No. 12) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N12.3.13 $\mathrm{GM2}^+ \oplus \mathrm{A1}^-$	√	2	2	√	$2/m$	$\mathrm{A_g} \oplus \mathrm{B_g}$
N12.3.14 $\mathrm{GM2}^+ \oplus \mathrm{Y1}^+$	√	2	2	√	$2/m$	$\mathrm{A_g} \oplus \mathrm{B_g}$
N12.3.15 $\mathrm{GM2}^+ \oplus \mathrm{Y1}^-$	√	2	2	√	$2/m$	$\mathrm{A_g} \oplus \mathrm{B_g}$
N12.3.16 $\mathrm{GM2}^+ \oplus \mathrm{Y2}^+$	√	2	2	√	$2/m$	$\mathrm{A_g} \oplus \mathrm{B_g}$
N12.3.17 $\mathrm{GM2}^+ \oplus \mathrm{Y2}^-$	√	2	2	√	$2/m$	$\mathrm{A_g} \oplus \mathrm{B_g}$
N12.3.18 $\mathrm{GM2}^- \oplus \mathrm{GM2}^-$	√	3	3	√	$2/m$	$\mathrm{A_g} \oplus \mathrm{B_u} \oplus \mathrm{B_u}$
N12.3.19 $\mathrm{GM2}^- \oplus \mathrm{A1}^+$	√	2	2	√	$2/m$	$\mathrm{A_g} \oplus \mathrm{B_u}$
N12.3.20 $\mathrm{GM2}^- \oplus \mathrm{A1}^-$	√	2	2	√	$2/m$	$\mathrm{A_g} \oplus \mathrm{B_u}$
N12.3.21 $\mathrm{GM2}^- \oplus \mathrm{Y1}^+$	√	2	2	√	$2/m$	$\mathrm{A_g} \oplus \mathrm{B_u}$
N12.3.22 $\mathrm{GM2}^- \oplus \mathrm{Y1}^-$	√	2	2	√	$2/m$	$\mathrm{A_g} \oplus \mathrm{B_u}$
N12.3.23 $\mathrm{GM2}^- \oplus \mathrm{Y2}^+$	√	2	2	√	$2/m$	$\mathrm{A_g} \oplus \mathrm{B_u}$
N12.3.24 $\mathrm{GM2}^- \oplus \mathrm{Y2}^-$	√	2	2	√	$2/m$	$\mathrm{A_g} \oplus \mathrm{B_u}$
N12.3.25 $\mathrm{A1}^+ \oplus \mathrm{A1}^+$	√	1	1	√	$2/m$	$\mathrm{A_g}$
N12.3.26 $\mathrm{A1}^+ \oplus \mathrm{A2}^-$	√	1	1	√	m	A'
N12.3.27 $\mathrm{A1}^+ \oplus \mathrm{M1}^+$	√	1	1	√	$2/m$	$\mathrm{A_g}$
N12.3.28 $\mathrm{A1}^+ \oplus \mathrm{M2}^-$	√	1	1	√	$2/m$	$\mathrm{A_g}$
N12.3.29 $\mathrm{A1}^+ \oplus \mathrm{A1}^-$	√	1	1	√	2	A
N12.3.30 $\mathrm{A1}^+ \oplus \mathrm{A2}^+$	√	1	1	√	$2/m$	$\mathrm{A_g}$
N12.3.31 $\mathrm{A1}^+ \oplus \mathrm{M1}^-$	√	1	1	√	$2/m$	$\mathrm{A_g}$
N12.3.32 $\mathrm{A1}^+ \oplus \mathrm{M2}^+$	√	1	1	√	$2/m$	$\mathrm{A_g}$
N12.3.33 $\mathrm{A1}^+ \oplus \mathrm{Y1}^+$	√	1	1	√	$2/m$	$\mathrm{A_g}$
N12.3.34 $\mathrm{A1}^+ \oplus \mathrm{Y1}^-$	√	1	1	√	$2/m$	$\mathrm{A_g}$
N12.3.35 $\mathrm{A1}^+ \oplus \mathrm{Y2}^+$	√	1	1	√	$2/m$	$\mathrm{A_g}$
N12.3.36 $\mathrm{A1}^+ \oplus \mathrm{Y2}^-$	√	1	1	√	$2/m$	$\mathrm{A_g}$
N12.3.37 $\mathrm{A1}^- \oplus \mathrm{A1}^-$	√	1	1	√	$2/m$	$\mathrm{A_g}$
N12.3.38 $\mathrm{A1}^- \oplus \mathrm{A2}^+$	√	1	1	√	m	A'
N12.3.39 $\mathrm{A1}^- \oplus \mathrm{M1}^-$	√	1	1	√	$2/m$	$\mathrm{A_g}$
N12.3.40 $\mathrm{A1}^- \oplus \mathrm{M2}^+$	√	1	1	√	$2/m$	$\mathrm{A_g}$
N12.3.41 $\mathrm{A1}^- \oplus \mathrm{Y1}^+$	√	1	1	√	$2/m$	$\mathrm{A_g}$
N12.3.42 $\mathrm{A1}^- \oplus \mathrm{Y1}^-$	√	1	1	√	$2/m$	$\mathrm{A_g}$
N12.3.43 $\mathrm{A1}^- \oplus \mathrm{Y2}^+$	√	1	1	√	$2/m$	$\mathrm{A_g}$
N12.3.44 $\mathrm{A1}^- \oplus \mathrm{Y2}^-$	√	1	1	√	$2/m$	$\mathrm{A_g}$
N12.3.45 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^+$	√	1	1	√	$2/m$	$\mathrm{A_g}$
N12.3.46 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^-$	√	1	1	√	2	A
N12.3.47 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^+$	√	1	1	√	$2/m$	$\mathrm{A_g}$
N12.3.48 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^-$	√	1	1	√	m	A'
N12.3.49 $\mathrm{Y1}^- \oplus \mathrm{Y1}^-$	√	1	1	√	$2/m$	$\mathrm{A_g}$
N12.3.50 $\mathrm{Y1}^- \oplus \mathrm{Y2}^+$	√	1	1	√	m	A'
N12.3.51 $\mathrm{Y1}^- \oplus \mathrm{Y2}^-$	√	1	1	√	$2/m$	$\mathrm{A_g}$
N12.3.52 $\mathrm{Y2}^+ \oplus \mathrm{Y2}^+$	√	1	1	√	$2/m$	$\mathrm{A_g}$
N12.3.53 $\mathrm{Y2}^+ \oplus \mathrm{Y2}^-$	√	1	1	√	2	A
N12.3.54 $\mathrm{Y2}^- \oplus \mathrm{Y2}^-$	√	1	1	√	$2/m$	$\mathrm{A_g}$
N12.7.1 $\mathrm{L1}^+$	√	1	1	√	$2/m$	$\mathrm{A_g}$
N12.8.1 LD1	√	1	1	√	2	A
N12.8.2 LD2	√	1	1	√	2	A
N12.8.3 U1	√	1	1	√	2	A

Non-coplanar SSGs with parent space group $C2/m$ (No. 12) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N12.8.4 B1	$\surd$	2	2	$\surd$	m	$\mathrm{A}' \oplus \mathrm{A}'$
N12.8.5 B2	$\surd$	2	2	$\surd$	m	$\mathrm{A}' \oplus \mathrm{A}''$
N12.9.1 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{GM1}^-$	$\surd$	0	0	$\surd$	-	-
N12.9.2 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{GM2}^+$	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{B_g} \oplus \mathrm{B_u} \oplus \mathrm{B_u}$
N12.9.3 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
N12.9.4 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{A1}^+$	$\surd$	0	0	$\surd$	-	-
N12.9.5 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{A1}^-$	$\surd$	0	0	$\surd$	-	-
N12.9.6 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{Y1}^+$	$\surd$	0	0	$\surd$	-	-
N12.9.7 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{Y1}^-$	$\surd$	0	0	$\surd$	-	-
N12.9.8 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{Y2}^+$	$\surd$	0	0	$\surd$	-	-
N12.9.9 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{Y2}^-$	$\surd$	0	0	$\surd$	-	-
N12.9.10 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	2	2	$\surd$	2	$\mathrm{B} \oplus \mathrm{B}$
N12.9.11 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_u} \oplus \mathrm{B_g} \oplus \mathrm{B_u}$
N12.9.12 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{A1}^+$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{B_g} \oplus \mathrm{B_u}$
N12.9.13 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{A1}^-$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{B_g} \oplus \mathrm{B_u}$
N12.9.14 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{B_g} \oplus \mathrm{B_u}$
N12.9.15 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{B_g} \oplus \mathrm{B_u}$
N12.9.16 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{B_g} \oplus \mathrm{B_u}$
N12.9.17 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{B_g} \oplus \mathrm{B_u}$
N12.9.18 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
N12.9.19 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{A1}^+$	$\surd$	0	0	$\surd$	-	-
N12.9.20 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{A1}^-$	$\surd$	0	0	$\surd$	-	-
N12.9.21 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Y1}^+$	$\surd$	0	0	$\surd$	-	-
N12.9.22 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Y1}^-$	$\surd$	0	0	$\surd$	-	-
N12.9.23 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Y2}^+$	$\surd$	0	0	$\surd$	-	-
N12.9.24 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Y2}^-$	$\surd$	0	0	$\surd$	-	-
N12.9.25 $\mathrm{GM1}^- \oplus \mathrm{A1}^+ \oplus \mathrm{A1}^+$	$\surd$	1	0	$\times$	-	-
N12.9.26 $\mathrm{GM1}^- \oplus \mathrm{A1}^+ \oplus \mathrm{A2}^-$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
N12.9.27 $\mathrm{GM1}^- \oplus \mathrm{A1}^+ \oplus \mathrm{M1}^+$	$\surd$	1	0	$\times$	-	-
N12.9.28 $\mathrm{GM1}^- \oplus \mathrm{A1}^+ \oplus \mathrm{M2}^-$	$\surd$	1	0	$\times$	-	-
N12.9.29 $\mathrm{GM1}^- \oplus \mathrm{A1}^+ \oplus \mathrm{A1}^-$	$\surd$	1	1	$\times$	-	-
N12.9.30 $\mathrm{GM1}^- \oplus \mathrm{A1}^+ \oplus \mathrm{A2}^+$	$\surd$	1	0	$\times$	-	-
N12.9.31 $\mathrm{GM1}^- \oplus \mathrm{A1}^+ \oplus \mathrm{M1}^-$	$\surd$	1	0	$\times$	-	-
N12.9.32 $\mathrm{GM1}^- \oplus \mathrm{A1}^+ \oplus \mathrm{M2}^+$	$\surd$	1	0	$\times$	-	-
N12.9.33 $\mathrm{GM1}^- \oplus \mathrm{A1}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	0	$\times$	-	-
N12.9.34 $\mathrm{GM1}^- \oplus \mathrm{A1}^+ \oplus \mathrm{Y1}^-$	$\surd$	1	0	$\times$	-	-
N12.9.35 $\mathrm{GM1}^- \oplus \mathrm{A1}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N12.9.36 $\mathrm{GM1}^- \oplus \mathrm{A1}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N12.9.37 $\mathrm{GM1}^- \oplus \mathrm{A1}^- \oplus \mathrm{A1}^-$	$\surd$	1	0	$\times$	-	-
N12.9.38 $\mathrm{GM1}^- \oplus \mathrm{A1}^- \oplus \mathrm{A2}^+$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
N12.9.39 $\mathrm{GM1}^- \oplus \mathrm{A1}^- \oplus \mathrm{M1}^-$	$\surd$	1	0	$\times$	-	-
N12.9.40 $\mathrm{GM1}^- \oplus \mathrm{A1}^- \oplus \mathrm{M2}^+$	$\surd$	1	0	$\times$	-	-
N12.9.41 $\mathrm{GM1}^- \oplus \mathrm{A1}^- \oplus \mathrm{Y1}^+$	$\surd$	1	0	$\times$	-	-
N12.9.42 $\mathrm{GM1}^- \oplus \mathrm{A1}^- \oplus \mathrm{Y1}^-$	$\surd$	1	0	$\times$	-	-
N12.9.43 $\mathrm{GM1}^- \oplus \mathrm{A1}^- \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N12.9.44 $\mathrm{GM1}^- \oplus \mathrm{A1}^- \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $C2/m$ (No. 12) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N12.9.45 $\mathrm{GM1}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	0	$\times$	-	-
N12.9.46 $\mathrm{GM1}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^-$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N12.9.47 $\mathrm{GM1}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N12.9.48 $\mathrm{GM1}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
N12.9.49 $\mathrm{GM1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y1}^-$	$\surd$	1	0	$\times$	-	-
N12.9.50 $\mathrm{GM1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
N12.9.51 $\mathrm{GM1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N12.9.52 $\mathrm{GM1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N12.9.53 $\mathrm{GM1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N12.9.54 $\mathrm{GM1}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N12.9.55 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{B_g} \oplus \mathrm{B_g} \oplus \mathrm{B_g}$
N12.9.56 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	2	2	$\surd$	m	$\mathrm{A}'' \oplus \mathrm{A}''$
N12.9.57 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{A1}^+$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{B_g} \oplus \mathrm{B_g}$
N12.9.58 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{A1}^-$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{B_g} \oplus \mathrm{B_g}$
N12.9.59 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{B_g} \oplus \mathrm{B_g}$
N12.9.60 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{B_g} \oplus \mathrm{B_g}$
N12.9.61 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{B_g} \oplus \mathrm{B_g}$
N12.9.62 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{B_g} \oplus \mathrm{B_g}$
N12.9.63 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B_g}$
N12.9.64 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{A1}^+$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_u} \oplus \mathrm{B_g}$
N12.9.65 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{A1}^-$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_u} \oplus \mathrm{B_g}$
N12.9.66 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_u} \oplus \mathrm{B_g}$
N12.9.67 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_u} \oplus \mathrm{B_g}$
N12.9.68 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_u} \oplus \mathrm{B_g}$
N12.9.69 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_u} \oplus \mathrm{B_g}$
N12.9.70 $\mathrm{GM2}^+ \oplus \mathrm{A1}^+ \oplus \mathrm{A1}^+$	$\surd$	1	1	$\times$	-	-
N12.9.71 $\mathrm{GM2}^+ \oplus \mathrm{A1}^+ \oplus \mathrm{A2}^-$	$\surd$	1	1	$\surd$	2	B
N12.9.72 $\mathrm{GM2}^+ \oplus \mathrm{A1}^+ \oplus \mathrm{M1}^+$	$\surd$	1	1	$\times$	-	-
N12.9.73 $\mathrm{GM2}^+ \oplus \mathrm{A1}^+ \oplus \mathrm{M2}^-$	$\surd$	1	1	$\times$	-	-
N12.9.74 $\mathrm{GM2}^+ \oplus \mathrm{A1}^+ \oplus \mathrm{A1}^-$	$\surd$	1	1	$\times$	-	-
N12.9.75 $\mathrm{GM2}^+ \oplus \mathrm{A1}^+ \oplus \mathrm{A2}^+$	$\surd$	1	1	$\times$	-	-
N12.9.76 $\mathrm{GM2}^+ \oplus \mathrm{A1}^+ \oplus \mathrm{M1}^-$	$\surd$	1	1	$\times$	-	-
N12.9.77 $\mathrm{GM2}^+ \oplus \mathrm{A1}^+ \oplus \mathrm{M2}^+$	$\surd$	1	1	$\times$	-	-
N12.9.78 $\mathrm{GM2}^+ \oplus \mathrm{A1}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_g}$
N12.9.79 $\mathrm{GM2}^+ \oplus \mathrm{A1}^+ \oplus \mathrm{Y1}^-$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_g}$
N12.9.80 $\mathrm{GM2}^+ \oplus \mathrm{A1}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_g}$
N12.9.81 $\mathrm{GM2}^+ \oplus \mathrm{A1}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_g}$
N12.9.82 $\mathrm{GM2}^+ \oplus \mathrm{A1}^- \oplus \mathrm{A1}^-$	$\surd$	1	1	$\times$	-	-
N12.9.83 $\mathrm{GM2}^+ \oplus \mathrm{A1}^- \oplus \mathrm{A2}^+$	$\surd$	1	1	$\surd$	2	B
N12.9.84 $\mathrm{GM2}^+ \oplus \mathrm{A1}^- \oplus \mathrm{M1}^-$	$\surd$	1	1	$\times$	-	-
N12.9.85 $\mathrm{GM2}^+ \oplus \mathrm{A1}^- \oplus \mathrm{M2}^+$	$\surd$	1	1	$\times$	-	-
N12.9.86 $\mathrm{GM2}^+ \oplus \mathrm{A1}^- \oplus \mathrm{Y1}^+$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_g}$
N12.9.87 $\mathrm{GM2}^+ \oplus \mathrm{A1}^- \oplus \mathrm{Y1}^-$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_g}$
N12.9.88 $\mathrm{GM2}^+ \oplus \mathrm{A1}^- \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_g}$
N12.9.89 $\mathrm{GM2}^+ \oplus \mathrm{A1}^- \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_g}$
N12.9.90 $\mathrm{GM2}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_g}$

Non-coplanar SSGs with parent space group $C2/m$ (No. 12) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N12.9.91 $\mathrm{GM2}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^-$	$\surd$	1	1	$\surd$	m	A''
N12.9.92 $\mathrm{GM2}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_g}$
N12.9.93 $\mathrm{GM2}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\surd$	2	B
N12.9.94 $\mathrm{GM2}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y1}^-$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_g}$
N12.9.95 $\mathrm{GM2}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\surd$	2	B
N12.9.96 $\mathrm{GM2}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_g}$
N12.9.97 $\mathrm{GM2}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_g}$
N12.9.98 $\mathrm{GM2}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\surd$	m	A''
N12.9.99 $\mathrm{GM2}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_g}$
N12.9.100 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
N12.9.101 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{A1}^+$	$\surd$	0	0	$\surd$	-	-
N12.9.102 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{A1}^-$	$\surd$	0	0	$\surd$	-	-
N12.9.103 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Y1}^+$	$\surd$	0	0	$\surd$	-	-
N12.9.104 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Y1}^-$	$\surd$	0	0	$\surd$	-	-
N12.9.105 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Y2}^+$	$\surd$	0	0	$\surd$	-	-
N12.9.106 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Y2}^-$	$\surd$	0	0	$\surd$	-	-
N12.9.107 $\mathrm{GM2}^- \oplus \mathrm{A1}^+ \oplus \mathrm{A1}^+$	$\surd$	1	0	$\times$	-	-
N12.9.108 $\mathrm{GM2}^- \oplus \mathrm{A1}^+ \oplus \mathrm{A2}^-$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
N12.9.109 $\mathrm{GM2}^- \oplus \mathrm{A1}^+ \oplus \mathrm{M1}^+$	$\surd$	1	0	$\times$	-	-
N12.9.110 $\mathrm{GM2}^- \oplus \mathrm{A1}^+ \oplus \mathrm{M2}^-$	$\surd$	1	0	$\times$	-	-
N12.9.111 $\mathrm{GM2}^- \oplus \mathrm{A1}^+ \oplus \mathrm{A1}^-$	$\surd$	1	1	$\times$	-	-
N12.9.112 $\mathrm{GM2}^- \oplus \mathrm{A1}^+ \oplus \mathrm{A2}^+$	$\surd$	1	0	$\times$	-	-
N12.9.113 $\mathrm{GM2}^- \oplus \mathrm{A1}^+ \oplus \mathrm{M1}^-$	$\surd$	1	0	$\times$	-	-
N12.9.114 $\mathrm{GM2}^- \oplus \mathrm{A1}^+ \oplus \mathrm{M2}^+$	$\surd$	1	0	$\times$	-	-
N12.9.115 $\mathrm{GM2}^- \oplus \mathrm{A1}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	0	$\times$	-	-
N12.9.116 $\mathrm{GM2}^- \oplus \mathrm{A1}^+ \oplus \mathrm{Y1}^-$	$\surd$	1	0	$\times$	-	-
N12.9.117 $\mathrm{GM2}^- \oplus \mathrm{A1}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N12.9.118 $\mathrm{GM2}^- \oplus \mathrm{A1}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N12.9.119 $\mathrm{GM2}^- \oplus \mathrm{A1}^- \oplus \mathrm{A1}^-$	$\surd$	1	0	$\times$	-	-
N12.9.120 $\mathrm{GM2}^- \oplus \mathrm{A1}^- \oplus \mathrm{A2}^+$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
N12.9.121 $\mathrm{GM2}^- \oplus \mathrm{A1}^- \oplus \mathrm{M1}^-$	$\surd$	1	0	$\times$	-	-
N12.9.122 $\mathrm{GM2}^- \oplus \mathrm{A1}^- \oplus \mathrm{M2}^+$	$\surd$	1	0	$\times$	-	-
N12.9.123 $\mathrm{GM2}^- \oplus \mathrm{A1}^- \oplus \mathrm{Y1}^+$	$\surd$	1	0	$\times$	-	-
N12.9.124 $\mathrm{GM2}^- \oplus \mathrm{A1}^- \oplus \mathrm{Y1}^-$	$\surd$	1	0	$\times$	-	-
N12.9.125 $\mathrm{GM2}^- \oplus \mathrm{A1}^- \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N12.9.126 $\mathrm{GM2}^- \oplus \mathrm{A1}^- \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N12.9.127 $\mathrm{GM2}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	0	$\times$	-	-
N12.9.128 $\mathrm{GM2}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^-$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N12.9.129 $\mathrm{GM2}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N12.9.130 $\mathrm{GM2}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
N12.9.131 $\mathrm{GM2}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y1}^-$	$\surd$	1	0	$\times$	-	-
N12.9.132 $\mathrm{GM2}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
N12.9.133 $\mathrm{GM2}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N12.9.134 $\mathrm{GM2}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N12.9.135 $\mathrm{GM2}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N12.9.136 $\mathrm{GM2}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $C2/m$ (No. 12) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N12.9.137 $\mathrm{A1}^{+}\oplus\mathrm{A1}^{+}\oplus\mathrm{A1}^{+}$	$\surd$	0	0	$\surd$	-	-
N12.9.138 $\mathrm{A1}^{+}\oplus\mathrm{A1}^{+}\oplus\mathrm{A2}^{-}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{B_u}\oplus\mathrm{B_u}$
N12.9.139 $\mathrm{A1}^{+}\oplus\mathrm{A1}^{+}\oplus\mathrm{M1}^{+}$	$\surd$	1	0	$\times$	-	-
N12.9.140 $\mathrm{A1}^{+}\oplus\mathrm{A1}^{+}\oplus\mathrm{M2}^{-}$	$\surd$	1	0	$\times$	-	-
N12.9.141 $\mathrm{A1}^{+}\oplus\mathrm{A2}^{-}\oplus\mathrm{M1}^{+}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
N12.9.142 $\mathrm{A1}^{+}\oplus\mathrm{A1}^{+}\oplus\mathrm{A1}^{-}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_u}\oplus\mathrm{A_u}$
N12.9.143 $\mathrm{A1}^{+}\oplus\mathrm{A1}^{+}\oplus\mathrm{A2}^{+}$	$\surd$	0	0	$\surd$	-	-
N12.9.144 $\mathrm{A1}^{+}\oplus\mathrm{A1}^{+}\oplus\mathrm{M1}^{-}$	$\surd$	1	0	$\times$	-	-
N12.9.145 $\mathrm{A1}^{+}\oplus\mathrm{A1}^{+}\oplus\mathrm{M2}^{+}$	$\surd$	1	0	$\times$	-	-
N12.9.146 $\mathrm{A1}^{+}\oplus\mathrm{A2}^{-}\oplus\mathrm{A1}^{-}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_u}\oplus\mathrm{B_u}$
N12.9.147 $\mathrm{A1}^{+}\oplus\mathrm{A2}^{-}\oplus\mathrm{M1}^{-}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
N12.9.148 $\mathrm{A1}^{+}\oplus\mathrm{M1}^{+}\oplus\mathrm{A1}^{-}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N12.9.149 $\mathrm{A1}^{+}\oplus\mathrm{M1}^{+}\oplus\mathrm{A2}^{+}$	$\surd$	1	0	$\times$	-	-
N12.9.150 $\mathrm{A1}^{+}\oplus\mathrm{M2}^{-}\oplus\mathrm{A1}^{-}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N12.9.151 $\mathrm{A1}^{+}\oplus\mathrm{M2}^{-}\oplus\mathrm{A2}^{+}$	$\surd$	1	0	$\times$	-	-
N12.9.152 $\mathrm{A1}^{+}\oplus\mathrm{A1}^{+}\oplus\mathrm{Y1}^{+}$	$\surd$	1	0	$\times$	-	-
N12.9.153 $\mathrm{A1}^{+}\oplus\mathrm{A2}^{-}\oplus\mathrm{Y1}^{+}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
N12.9.154 $\mathrm{A1}^{+}\oplus\mathrm{M1}^{+}\oplus\mathrm{Y1}^{+}$	$\times$	-	-	-	-	-
N12.9.155 $\mathrm{A1}^{+}\oplus\mathrm{M2}^{-}\oplus\mathrm{Y1}^{+}$	$\times$	-	-	-	-	-
N12.9.156 $\mathrm{A1}^{+}\oplus\mathrm{A1}^{+}\oplus\mathrm{Y1}^{-}$	$\surd$	1	0	$\times$	-	-
N12.9.157 $\mathrm{A1}^{+}\oplus\mathrm{A2}^{-}\oplus\mathrm{Y1}^{-}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
N12.9.158 $\mathrm{A1}^{+}\oplus\mathrm{M1}^{+}\oplus\mathrm{Y1}^{-}$	$\times$	-	-	-	-	-
N12.9.159 $\mathrm{A1}^{+}\oplus\mathrm{M2}^{-}\oplus\mathrm{Y1}^{-}$	$\times$	-	-	-	-	-
N12.9.160 $\mathrm{A1}^{+}\oplus\mathrm{A1}^{+}\oplus\mathrm{Y2}^{+}$	$\surd$	1	0	$\times$	-	-
N12.9.161 $\mathrm{A1}^{+}\oplus\mathrm{A2}^{-}\oplus\mathrm{Y2}^{+}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
N12.9.162 $\mathrm{A1}^{+}\oplus\mathrm{M1}^{+}\oplus\mathrm{Y2}^{+}$	$\times$	-	-	-	-	-
N12.9.163 $\mathrm{A1}^{+}\oplus\mathrm{M2}^{-}\oplus\mathrm{Y2}^{+}$	$\times$	-	-	-	-	-
N12.9.164 $\mathrm{A1}^{+}\oplus\mathrm{A1}^{+}\oplus\mathrm{Y2}^{-}$	$\surd$	1	0	$\times$	-	-
N12.9.165 $\mathrm{A1}^{+}\oplus\mathrm{A2}^{-}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
N12.9.166 $\mathrm{A1}^{+}\oplus\mathrm{M1}^{+}\oplus\mathrm{Y2}^{-}$	$\times$	-	-	-	-	-
N12.9.167 $\mathrm{A1}^{+}\oplus\mathrm{M2}^{-}\oplus\mathrm{Y2}^{-}$	$\times$	-	-	-	-	-
N12.9.168 $\mathrm{A1}^{+}\oplus\mathrm{A1}^{-}\oplus\mathrm{A1}^{-}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_u}\oplus\mathrm{A_u}$
N12.9.169 $\mathrm{A1}^{+}\oplus\mathrm{A1}^{-}\oplus\mathrm{A2}^{+}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_u}\oplus\mathrm{B_u}$
N12.9.170 $\mathrm{A1}^{+}\oplus\mathrm{A1}^{-}\oplus\mathrm{M1}^{-}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N12.9.171 $\mathrm{A1}^{+}\oplus\mathrm{A1}^{-}\oplus\mathrm{M2}^{+}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N12.9.172 $\mathrm{A1}^{+}\oplus\mathrm{A2}^{+}\oplus\mathrm{A2}^{+}$	$\surd$	0	0	$\surd$	-	-
N12.9.173 $\mathrm{A1}^{+}\oplus\mathrm{A2}^{+}\oplus\mathrm{M1}^{-}$	$\surd$	1	0	$\times$	-	-
N12.9.174 $\mathrm{A1}^{+}\oplus\mathrm{A2}^{+}\oplus\mathrm{M2}^{+}$	$\surd$	1	0	$\times$	-	-
N12.9.175 $\mathrm{A1}^{+}\oplus\mathrm{M1}^{-}\oplus\mathrm{M1}^{-}$	$\surd$	1	0	$\times$	-	-
N12.9.176 $\mathrm{A1}^{+}\oplus\mathrm{M1}^{-}\oplus\mathrm{M2}^{+}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
N12.9.177 $\mathrm{A1}^{+}\oplus\mathrm{M2}^{+}\oplus\mathrm{M2}^{+}$	$\surd$	1	0	$\times$	-	-
N12.9.178 $\mathrm{A1}^{+}\oplus\mathrm{A1}^{-}\oplus\mathrm{Y1}^{+}$	$\surd$	1	1	$\times$	-	-
N12.9.179 $\mathrm{A1}^{+}\oplus\mathrm{A2}^{+}\oplus\mathrm{Y1}^{+}$	$\surd$	1	0	$\times$	-	-
N12.9.180 $\mathrm{A1}^{+}\oplus\mathrm{M1}^{-}\oplus\mathrm{Y1}^{+}$	$\times$	-	-	-	-	-
N12.9.181 $\mathrm{A1}^{+}\oplus\mathrm{M2}^{+}\oplus\mathrm{Y1}^{+}$	$\times$	-	-	-	-	-
N12.9.182 $\mathrm{A1}^{+}\oplus\mathrm{A1}^{-}\oplus\mathrm{Y1}^{-}$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $C2/m$ (No. 12) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N12.9.183 $\mathrm{A1}^{+}\oplus\mathrm{A2}^{+}\oplus\mathrm{Y1}^{-}$	$\surd$	1	0	$\times$	-	-
N12.9.184 $\mathrm{A1}^{+}\oplus\mathrm{M1}^{-}\oplus\mathrm{Y1}^{-}$	$\times$	-	-	-	-	-
N12.9.185 $\mathrm{A1}^{+}\oplus\mathrm{M2}^{+}\oplus\mathrm{Y1}^{-}$	$\times$	-	-	-	-	-
N12.9.186 $\mathrm{A1}^{+}\oplus\mathrm{A1}^{-}\oplus\mathrm{Y2}^{+}$	$\surd$	1	1	$\times$	-	-
N12.9.187 $\mathrm{A1}^{+}\oplus\mathrm{A2}^{+}\oplus\mathrm{Y2}^{+}$	$\surd$	1	0	$\times$	-	-
N12.9.188 $\mathrm{A1}^{+}\oplus\mathrm{M1}^{-}\oplus\mathrm{Y2}^{+}$	$\times$	-	-	-	-	-
N12.9.189 $\mathrm{A1}^{+}\oplus\mathrm{M2}^{+}\oplus\mathrm{Y2}^{+}$	$\times$	-	-	-	-	-
N12.9.190 $\mathrm{A1}^{+}\oplus\mathrm{A1}^{-}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\times$	-	-
N12.9.191 $\mathrm{A1}^{+}\oplus\mathrm{A2}^{+}\oplus\mathrm{Y2}^{-}$	$\surd$	1	0	$\times$	-	-
N12.9.192 $\mathrm{A1}^{+}\oplus\mathrm{M1}^{-}\oplus\mathrm{Y2}^{-}$	$\times$	-	-	-	-	-
N12.9.193 $\mathrm{A1}^{+}\oplus\mathrm{M2}^{+}\oplus\mathrm{Y2}^{-}$	$\times$	-	-	-	-	-
N12.9.194 $\mathrm{A1}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y1}^{+}$	$\surd$	1	0	$\times$	-	-
N12.9.195 $\mathrm{A1}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y1}^{-}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N12.9.196 $\mathrm{A1}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y2}^{+}$	$\surd$	1	0	$\times$	-	-
N12.9.197 $\mathrm{A1}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
N12.9.198 $\mathrm{A1}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y1}^{-}$	$\surd$	1	0	$\times$	-	-
N12.9.199 $\mathrm{A1}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y2}^{+}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
N12.9.200 $\mathrm{A1}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y2}^{-}$	$\surd$	1	0	$\times$	-	-
N12.9.201 $\mathrm{A1}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Y2}^{+}$	$\surd$	1	0	$\times$	-	-
N12.9.202 $\mathrm{A1}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N12.9.203 $\mathrm{A1}^{+}\oplus\mathrm{Y2}^{-}\oplus\mathrm{Y2}^{-}$	$\surd$	1	0	$\times$	-	-
N12.9.204 $\mathrm{A1}^{-}\oplus\mathrm{A1}^{-}\oplus\mathrm{A1}^{-}$	$\surd$	0	0	$\surd$	-	-
N12.9.205 $\mathrm{A1}^{-}\oplus\mathrm{A1}^{-}\oplus\mathrm{A2}^{+}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{B_u}\oplus\mathrm{B_u}$
N12.9.206 $\mathrm{A1}^{-}\oplus\mathrm{A1}^{-}\oplus\mathrm{M1}^{-}$	$\surd$	1	0	$\times$	-	-
N12.9.207 $\mathrm{A1}^{-}\oplus\mathrm{A1}^{-}\oplus\mathrm{M2}^{+}$	$\surd$	1	0	$\times$	-	-
N12.9.208 $\mathrm{A1}^{-}\oplus\mathrm{A2}^{+}\oplus\mathrm{M1}^{-}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
N12.9.209 $\mathrm{A1}^{-}\oplus\mathrm{A1}^{-}\oplus\mathrm{Y1}^{+}$	$\surd$	1	0	$\times$	-	-
N12.9.210 $\mathrm{A1}^{-}\oplus\mathrm{A2}^{+}\oplus\mathrm{Y1}^{+}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
N12.9.211 $\mathrm{A1}^{-}\oplus\mathrm{M1}^{-}\oplus\mathrm{Y1}^{+}$	$\times$	-	-	-	-	-
N12.9.212 $\mathrm{A1}^{-}\oplus\mathrm{M2}^{+}\oplus\mathrm{Y1}^{+}$	$\times$	-	-	-	-	-
N12.9.213 $\mathrm{A1}^{-}\oplus\mathrm{A1}^{-}\oplus\mathrm{Y1}^{-}$	$\surd$	1	0	$\times$	-	-
N12.9.214 $\mathrm{A1}^{-}\oplus\mathrm{A2}^{+}\oplus\mathrm{Y1}^{-}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
N12.9.215 $\mathrm{A1}^{-}\oplus\mathrm{M1}^{-}\oplus\mathrm{Y1}^{-}$	$\times$	-	-	-	-	-
N12.9.216 $\mathrm{A1}^{-}\oplus\mathrm{M2}^{+}\oplus\mathrm{Y1}^{-}$	$\times$	-	-	-	-	-
N12.9.217 $\mathrm{A1}^{-}\oplus\mathrm{A1}^{-}\oplus\mathrm{Y2}^{+}$	$\surd$	1	0	$\times$	-	-
N12.9.218 $\mathrm{A1}^{-}\oplus\mathrm{A2}^{+}\oplus\mathrm{Y2}^{+}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
N12.9.219 $\mathrm{A1}^{-}\oplus\mathrm{M1}^{-}\oplus\mathrm{Y2}^{+}$	$\times$	-	-	-	-	-
N12.9.220 $\mathrm{A1}^{-}\oplus\mathrm{M2}^{+}\oplus\mathrm{Y2}^{+}$	$\times$	-	-	-	-	-
N12.9.221 $\mathrm{A1}^{-}\oplus\mathrm{A1}^{-}\oplus\mathrm{Y2}^{-}$	$\surd$	1	0	$\times$	-	-
N12.9.222 $\mathrm{A1}^{-}\oplus\mathrm{A2}^{+}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
N12.9.223 $\mathrm{A1}^{-}\oplus\mathrm{M1}^{-}\oplus\mathrm{Y2}^{-}$	$\times$	-	-	-	-	-
N12.9.224 $\mathrm{A1}^{-}\oplus\mathrm{M2}^{+}\oplus\mathrm{Y2}^{-}$	$\times$	-	-	-	-	-
N12.9.225 $\mathrm{A1}^{-}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y1}^{+}$	$\surd$	1	0	$\times$	-	-
N12.9.226 $\mathrm{A1}^{-}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y1}^{-}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N12.9.227 $\mathrm{A1}^{-}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y2}^{+}$	$\surd$	1	0	$\times$	-	-
N12.9.228 $\mathrm{A1}^{-}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$

Non-coplanar SSGs with parent space group $C2/m$ (No. 12) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N12.9.229 $\mathrm{A1}^{-} \oplus \mathrm{Y1}^{-} \oplus \mathrm{Y1}^{-}$	$\surd$	1	0	$\times$	-	-
N12.9.230 $\mathrm{A1}^{-} \oplus \mathrm{Y1}^{-} \oplus \mathrm{Y2}^{+}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
N12.9.231 $\mathrm{A1}^{-} \oplus \mathrm{Y1}^{-} \oplus \mathrm{Y2}^{-}$	$\surd$	1	0	$\times$	-	-
N12.9.232 $\mathrm{A1}^{-} \oplus \mathrm{Y2}^{+} \oplus \mathrm{Y2}^{+}$	$\surd$	1	0	$\times$	-	-
N12.9.233 $\mathrm{A1}^{-} \oplus \mathrm{Y2}^{+} \oplus \mathrm{Y2}^{-}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N12.9.234 $\mathrm{A1}^{-} \oplus \mathrm{Y2}^{-} \oplus \mathrm{Y2}^{-}$	$\surd$	1	0	$\times$	-	-
N12.9.235 $\mathrm{Y1}^{+} \oplus \mathrm{Y1}^{+} \oplus \mathrm{Y1}^{+}$	$\surd$	0	0	$\surd$	-	-
N12.9.236 $\mathrm{Y1}^{+} \oplus \mathrm{Y1}^{+} \oplus \mathrm{Y1}^{-}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_u} \oplus \mathrm{A_u}$
N12.9.237 $\mathrm{Y1}^{+} \oplus \mathrm{Y1}^{+} \oplus \mathrm{Y2}^{+}$	$\surd$	0	0	$\surd$	-	-
N12.9.238 $\mathrm{Y1}^{+} \oplus \mathrm{Y1}^{+} \oplus \mathrm{Y2}^{-}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{B_u} \oplus \mathrm{B_u}$
N12.9.239 $\mathrm{Y1}^{+} \oplus \mathrm{Y1}^{-} \oplus \mathrm{Y1}^{-}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_u} \oplus \mathrm{A_u}$
N12.9.240 $\mathrm{Y1}^{+} \oplus \mathrm{Y1}^{-} \oplus \mathrm{Y2}^{+}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_u} \oplus \mathrm{B_u}$
N12.9.241 $\mathrm{Y1}^{+} \oplus \mathrm{Y1}^{-} \oplus \mathrm{Y2}^{-}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_u} \oplus \mathrm{B_u}$
N12.9.242 $\mathrm{Y1}^{+} \oplus \mathrm{Y2}^{+} \oplus \mathrm{Y2}^{+}$	$\surd$	0	0	$\surd$	-	-
N12.9.243 $\mathrm{Y1}^{+} \oplus \mathrm{Y2}^{+} \oplus \mathrm{Y2}^{-}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_u} \oplus \mathrm{B_u}$
N12.9.244 $\mathrm{Y1}^{+} \oplus \mathrm{Y2}^{-} \oplus \mathrm{Y2}^{-}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{B_u} \oplus \mathrm{B_u}$
N12.9.245 $\mathrm{Y1}^{-} \oplus \mathrm{Y1}^{-} \oplus \mathrm{Y1}^{-}$	$\surd$	0	0	$\surd$	-	-
N12.9.246 $\mathrm{Y1}^{-} \oplus \mathrm{Y1}^{-} \oplus \mathrm{Y2}^{+}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{B_u} \oplus \mathrm{B_u}$
N12.9.247 $\mathrm{Y1}^{-} \oplus \mathrm{Y1}^{-} \oplus \mathrm{Y2}^{-}$	$\surd$	0	0	$\surd$	-	-
N12.9.248 $\mathrm{Y1}^{-} \oplus \mathrm{Y2}^{+} \oplus \mathrm{Y2}^{+}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{B_u} \oplus \mathrm{B_u}$
N12.9.249 $\mathrm{Y1}^{-} \oplus \mathrm{Y2}^{+} \oplus \mathrm{Y2}^{-}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_u} \oplus \mathrm{B_u}$
N12.9.250 $\mathrm{Y1}^{-} \oplus \mathrm{Y2}^{-} \oplus \mathrm{Y2}^{-}$	$\surd$	0	0	$\surd$	-	-
N12.9.251 $\mathrm{Y2}^{+} \oplus \mathrm{Y2}^{+} \oplus \mathrm{Y2}^{+}$	$\surd$	0	0	$\surd$	-	-
N12.9.252 $\mathrm{Y2}^{+} \oplus \mathrm{Y2}^{+} \oplus \mathrm{Y2}^{-}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_u} \oplus \mathrm{A_u}$
N12.9.253 $\mathrm{Y2}^{+} \oplus \mathrm{Y2}^{-} \oplus \mathrm{Y2}^{-}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_u} \oplus \mathrm{A_u}$
N12.9.254 $\mathrm{Y2}^{-} \oplus \mathrm{Y2}^{-} \oplus \mathrm{Y2}^{-}$	$\surd$	0	0	$\surd$	-	-
N12.13.1 $\mathrm{GM1}^{-} \oplus \mathrm{L1}^{+}$	$\surd$	1	0	$\times$	-	-
N12.13.2 $\mathrm{GM2}^{+} \oplus \mathrm{L1}^{+}$	$\surd$	1	1	$\times$	-	-
N12.13.3 $\mathrm{GM2}^{-} \oplus \mathrm{L1}^{+}$	$\surd$	1	0	$\times$	-	-
N12.13.4 $\mathrm{A1}^{+} \oplus \mathrm{L1}^{+}$	$\times$	-	-	-	-	-
N12.13.5 $\mathrm{A1}^{-} \oplus \mathrm{L1}^{+}$	$\times$	-	-	-	-	-
N12.13.6 $\mathrm{Y1}^{+} \oplus \mathrm{L1}^{+}$	$\times$	-	-	-	-	-
N12.13.7 $\mathrm{Y1}^{-} \oplus \mathrm{L1}^{+}$	$\times$	-	-	-	-	-
N12.13.8 $\mathrm{Y2}^{+} \oplus \mathrm{L1}^{+}$	$\times$	-	-	-	-	-
N12.13.9 $\mathrm{Y2}^{-} \oplus \mathrm{L1}^{+}$	$\times$	-	-	-	-	-
N12.14.1 $\mathrm{GM1}^{-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N12.14.2 $\mathrm{GM1}^{-} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N12.14.3 $\mathrm{GM1}^{-} \oplus \mathrm{U1}$	$\surd$	1	1	$\times$	-	-
N12.14.4 $\mathrm{GM2}^{+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	m	$\mathrm{A''}$
N12.14.5 $\mathrm{GM2}^{+} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	m	$\mathrm{A''}$
N12.14.6 $\mathrm{GM2}^{+} \oplus \mathrm{U1}$	$\surd$	1	1	$\times$	-	-
N12.14.7 $\mathrm{GM2}^{-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N12.14.8 $\mathrm{GM2}^{-} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N12.14.9 $\mathrm{GM2}^{-} \oplus \mathrm{U1}$	$\surd$	1	1	$\times$	-	-
N12.14.10 $\mathrm{A1}^{+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N12.14.11 $\mathrm{A1}^{+} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$

Non-coplanar SSGs with parent space group $C2/m$ (No. 12) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N12.14.12 $\mathrm{A1}^{+} \oplus \mathrm{U1}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N12.14.13 $\mathrm{A1}^{+} \oplus \mathrm{U2}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N12.14.14 $\mathrm{A1}^{-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N12.14.15 $\mathrm{A1}^{-} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N12.14.16 $\mathrm{A1}^{-} \oplus \mathrm{U1}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N12.14.17 $\mathrm{A1}^{-} \oplus \mathrm{U2}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N12.14.18 $\mathrm{Y1}^{+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N12.14.19 $\mathrm{Y1}^{+} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N12.14.20 $\mathrm{Y1}^{+} \oplus \mathrm{U1}$	$\surd$	1	1	$\times$	-	-
N12.14.21 $\mathrm{Y1}^{-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N12.14.22 $\mathrm{Y1}^{-} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N12.14.23 $\mathrm{Y1}^{-} \oplus \mathrm{U1}$	$\surd$	1	1	$\times$	-	-
N12.14.24 $\mathrm{Y2}^{+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N12.14.25 $\mathrm{Y2}^{+} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N12.14.26 $\mathrm{Y2}^{+} \oplus \mathrm{U1}$	$\surd$	1	1	$\times$	-	-
N12.14.27 $\mathrm{Y2}^{-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N12.14.28 $\mathrm{Y2}^{-} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N12.14.29 $\mathrm{Y2}^{-} \oplus \mathrm{U1}$	$\surd$	1	1	$\times$	-	-
N12.14.30 $\mathrm{GM1}^{-} \oplus \mathrm{B1}$	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B_u}$
N12.14.31 $\mathrm{GM1}^{-} \oplus \mathrm{B2}$	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{B_g} \oplus \mathrm{B_u} \oplus \mathrm{B_u}$
N12.14.32 $\mathrm{GM2}^{+} \oplus \mathrm{B1}$	$\surd$	2	2	$\surd$	2	$\mathrm{A} \oplus \mathrm{B}$
N12.14.33 $\mathrm{GM2}^{+} \oplus \mathrm{B2}$	$\surd$	2	2	$\surd$	2	$\mathrm{B} \oplus \mathrm{B}$
N12.14.34 $\mathrm{GM2}^{-} \oplus \mathrm{B1}$	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{B_u} \oplus \mathrm{B_u}$
N12.14.35 $\mathrm{GM2}^{-} \oplus \mathrm{B2}$	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_u} \oplus \mathrm{B_g} \oplus \mathrm{B_u}$
N12.14.36 $\mathrm{A1}^{+} \oplus \mathrm{B1}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{B_u}$
N12.14.37 $\mathrm{A1}^{+} \oplus \mathrm{B2}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{B_g} \oplus \mathrm{B_u}$
N12.14.38 $\mathrm{A1}^{-} \oplus \mathrm{B1}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{B_u}$
N12.14.39 $\mathrm{A1}^{-} \oplus \mathrm{B2}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{B_g} \oplus \mathrm{B_u}$
N12.14.40 $\mathrm{Y1}^{+} \oplus \mathrm{B1}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{B_u}$
N12.14.41 $\mathrm{Y1}^{+} \oplus \mathrm{B2}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{B_g} \oplus \mathrm{B_u}$
N12.14.42 $\mathrm{Y1}^{-} \oplus \mathrm{B1}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{B_u}$
N12.14.43 $\mathrm{Y1}^{-} \oplus \mathrm{B2}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{B_g} \oplus \mathrm{B_u}$
N12.14.44 $\mathrm{Y2}^{+} \oplus \mathrm{B1}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{B_u}$
N12.14.45 $\mathrm{Y2}^{+} \oplus \mathrm{B2}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{B_g} \oplus \mathrm{B_u}$
N12.14.46 $\mathrm{Y2}^{-} \oplus \mathrm{B1}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{B_u}$
N12.14.47 $\mathrm{Y2}^{-} \oplus \mathrm{B2}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{B_g} \oplus \mathrm{B_u}$

TABLE S37: Collinear SSGs with parent space group $P2/c$ (No. 13).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L13.1.1 $\mathrm{GM1}^{+}$	1	$2/m$	$\mathrm{A_g}$
L13.2.1 $\mathrm{GM1}^{-}$	0	-	-
L13.2.2 $\mathrm{GM2}^{+}$	1	$2/m$	$\mathrm{B_g}$
L13.2.3 $\mathrm{GM2}^{-}$	0	-	-
L13.2.4 $\mathrm{C1}^{+}$	0	-	-
L13.2.5 $\mathrm{Y1}^{+}$	0	-	-

Collinear SSGs with parent space group $P2/c$ (No. 13)(continued)

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L13.2.6 $\mathrm{Z1}^{+}$	0	-	-
L13.2.7 $\mathrm{Z2}^{+}$	0	-	-

TABLE S38: Coplanar SSGs with parent space group $P2/c$ (No. 13).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P13.1.1 $\mathrm{GM1}^{+}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g}\oplus\mathrm{A_g}$
P13.2.1 $\mathrm{GM1}^{-}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g}\oplus\mathrm{A_u}$
P13.2.2 $\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g}\oplus\mathrm{B_g}$
P13.2.3 $\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g}\oplus\mathrm{B_u}$
P13.2.4 $\mathrm{C1}^{+}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
P13.2.5 $\mathrm{Y1}^{+}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
P13.2.6 $\mathrm{Z1}^{+}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
P13.2.7 $\mathrm{Z2}^{+}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
P13.3.1 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}$	$\surd$	0	0	$\surd$	-	-
P13.3.2 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{B_g}\oplus\mathrm{B_u}$
P13.3.3 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
P13.3.4 $\mathrm{GM1}^{-}\oplus\mathrm{C1}^{+}$	$\surd$	1	1	$\times$	-	-
P13.3.5 $\mathrm{GM1}^{-}\oplus\mathrm{Y1}^{+}$	$\surd$	1	1	$\times$	-	-
P13.3.6 $\mathrm{GM1}^{-}\oplus\mathrm{Z1}^{+}$	$\surd$	1	1	$\times$	-	-
P13.3.7 $\mathrm{GM1}^{-}\oplus\mathrm{Z2}^{+}$	$\surd$	1	1	$\times$	-	-
P13.3.8 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{B_g}\oplus\mathrm{B_g}$
P13.3.9 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_u}\oplus\mathrm{B_g}$
P13.3.10 $\mathrm{GM2}^{+}\oplus\mathrm{C1}^{+}$	$\surd$	1	0	$\times$	-	-
P13.3.11 $\mathrm{GM2}^{+}\oplus\mathrm{Y1}^{+}$	$\surd$	1	0	$\times$	-	-
P13.3.12 $\mathrm{GM2}^{+}\oplus\mathrm{Z1}^{+}$	$\surd$	1	0	$\times$	-	-
P13.3.13 $\mathrm{GM2}^{+}\oplus\mathrm{Z2}^{+}$	$\surd$	1	0	$\times$	-	-
P13.3.14 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
P13.3.15 $\mathrm{GM2}^{-}\oplus\mathrm{C1}^{+}$	$\surd$	1	1	$\times$	-	-
P13.3.16 $\mathrm{GM2}^{-}\oplus\mathrm{Y1}^{+}$	$\surd$	1	1	$\times$	-	-
P13.3.17 $\mathrm{GM2}^{-}\oplus\mathrm{Z1}^{+}$	$\surd$	1	1	$\times$	-	-
P13.3.18 $\mathrm{GM2}^{-}\oplus\mathrm{Z2}^{+}$	$\surd$	1	1	$\times$	-	-
P13.3.19 $\mathrm{C1}^{+}\oplus\mathrm{C1}^{+}$	$\surd$	1	0	$\times$	-	-
P13.3.20 $\mathrm{C1}^{+}\oplus\mathrm{C1}^{-}$	$\surd$	1	1	$\times$	-	-
P13.3.21 $\mathrm{C1}^{+}\oplus\mathrm{C2}^{+}$	$\surd$	1	0	$\times$	-	-
P13.3.22 $\mathrm{C1}^{+}\oplus\mathrm{C2}^{-}$	$\surd$	1	1	$\times$	-	-
P13.3.23 $\mathrm{C1}^{+}\oplus\mathrm{Y1}^{+}$	$\times$	-	-	-	-	-
P13.3.24 $\mathrm{C1}^{+}\oplus\mathrm{Y2}^{+}$	$\times$	-	-	-	-	-
P13.3.25 $\mathrm{C1}^{+}\oplus\mathrm{Z1}^{+}$	$\times$	-	-	-	-	-
P13.3.26 $\mathrm{C1}^{+}\oplus\mathrm{Z2}^{+}$	$\times$	-	-	-	-	-
P13.3.27 $\mathrm{Y1}^{+}\oplus\mathrm{Y1}^{+}$	$\surd$	1	0	$\times$	-	-
P13.3.28 $\mathrm{Y1}^{+}\oplus\mathrm{Y1}^{-}$	$\surd$	1	1	$\times$	-	-
P13.3.29 $\mathrm{Y1}^{+}\oplus\mathrm{Y2}^{+}$	$\surd$	1	0	$\times$	-	-
P13.3.30 $\mathrm{Y1}^{+}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
P13.3.31 $\mathrm{Y1}^{+}\oplus\mathrm{Z1}^{+}$	$\times$	-	-	-	-	-
P13.3.32 $\mathrm{Y1}^{+}\oplus\mathrm{Z2}^{+}$	$\times$	-	-	-	-	-

Coplanar SSGs with parent space group $P2/c$ (No. 13) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P13.3.33 $\mathrm{Z1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
P13.3.34 $\mathrm{Z1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
P13.3.35 $\mathrm{Z1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
P13.3.36 $\mathrm{Z1}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\times$	-	-
P13.3.37 $\mathrm{Z2}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
P13.3.38 $\mathrm{Z2}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
P13.6.1 A1	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
P13.6.2 D1	$\surd$	1	1	$\times$	-	-
P13.8.1 LD1	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
P13.8.2 LD2	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
P13.8.3 W1	$\surd$	1	1	$\times$	-	-
P13.8.4 F1	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{B_u}$
P13.8.5 G1	$\surd$	1	1	$\times$	-	-

TABLE S39: Non-coplanar SSGs with parent space group $P2/c$ (No. 13).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N13.1.1 $\mathrm{GM1}^+$	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{A_g}$
N13.2.1 $\mathrm{GM1}^-$	$\surd$	2	2	$\surd$	2	$\mathrm{A} \oplus \mathrm{A}$
N13.2.2 $\mathrm{GM2}^+$	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B_g}$
N13.2.3 $\mathrm{GM2}^-$	$\surd$	2	2	$\surd$	m	$\mathrm{A}' \oplus \mathrm{A}'$
N13.2.4 $\mathrm{C1}^+$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{A_g}$
N13.2.5 $\mathrm{Y1}^+$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{A_g}$
N13.2.6 $\mathrm{Z1}^+$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{A_g}$
N13.2.7 $\mathrm{Z2}^+$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{A_g}$
N13.3.1 $\mathrm{GM1}^- \oplus \mathrm{GM1}^-$	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{A_u}$
N13.3.2 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+$	$\surd$	2	2	$\surd$	m	$\mathrm{A}' \oplus \mathrm{A}''$
N13.3.3 $\mathrm{GM1}^- \oplus \mathrm{GM2}^-$	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B_u}$
N13.3.4 $\mathrm{GM1}^- \oplus \mathrm{C1}^+$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{A_u}$
N13.3.5 $\mathrm{GM1}^- \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{A_u}$
N13.3.6 $\mathrm{GM1}^- \oplus \mathrm{Z1}^+$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{A_u}$
N13.3.7 $\mathrm{GM1}^- \oplus \mathrm{Z2}^+$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{A_u}$
N13.3.8 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{B_g} \oplus \mathrm{B_g}$
N13.3.9 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	2	2	$\surd$	2	$\mathrm{A} \oplus \mathrm{B}$
N13.3.10 $\mathrm{GM2}^+ \oplus \mathrm{C1}^+$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{B_g}$
N13.3.11 $\mathrm{GM2}^+ \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{B_g}$
N13.3.12 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^+$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{B_g}$
N13.3.13 $\mathrm{GM2}^+ \oplus \mathrm{Z2}^+$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{B_g}$
N13.3.14 $\mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{B_u} \oplus \mathrm{B_u}$
N13.3.15 $\mathrm{GM2}^- \oplus \mathrm{C1}^+$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{B_u}$
N13.3.16 $\mathrm{GM2}^- \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{B_u}$
N13.3.17 $\mathrm{GM2}^- \oplus \mathrm{Z1}^+$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{B_u}$
N13.3.18 $\mathrm{GM2}^- \oplus \mathrm{Z2}^+$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{B_u}$
N13.3.19 $\mathrm{C1}^+ \oplus \mathrm{C1}^+$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
N13.3.20 $\mathrm{C1}^+ \oplus \mathrm{C1}^-$	$\surd$	1	1	$\surd$	2	A
N13.3.21 $\mathrm{C1}^+ \oplus \mathrm{C2}^+$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$

Non-coplanar SSGs with parent space group $P2/c$ (No. 13) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N13.3.22 $\mathrm{C1}^+ \oplus \mathrm{C2}^-$	√	1	1	√	m	A'
N13.3.23 $\mathrm{C1}^+ \oplus \mathrm{Y1}^+$	√	1	1	√	$2/m$	$\mathrm{A_g}$
N13.3.24 $\mathrm{C1}^+ \oplus \mathrm{Y2}^+$	√	1	1	√	$2/m$	$\mathrm{A_g}$
N13.3.25 $\mathrm{C1}^+ \oplus \mathrm{Z1}^+$	√	1	1	√	$2/m$	$\mathrm{A_g}$
N13.3.26 $\mathrm{C1}^+ \oplus \mathrm{Z2}^+$	√	1	1	√	$2/m$	$\mathrm{A_g}$
N13.3.27 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^+$	√	1	1	√	$2/m$	$\mathrm{A_g}$
N13.3.28 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^-$	√	1	1	√	2	A
N13.3.29 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^+$	√	1	1	√	$2/m$	$\mathrm{A_g}$
N13.3.30 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^-$	√	1	1	√	m	A'
N13.3.31 $\mathrm{Y1}^+ \oplus \mathrm{Z1}^+$	√	1	1	√	$2/m$	$\mathrm{A_g}$
N13.3.32 $\mathrm{Y1}^+ \oplus \mathrm{Z2}^+$	√	1	1	√	$2/m$	$\mathrm{A_g}$
N13.3.33 $\mathrm{Z1}^+ \oplus \mathrm{Z1}^+$	√	1	1	√	$2/m$	$\mathrm{A_g}$
N13.3.34 $\mathrm{Z1}^+ \oplus \mathrm{Z1}^-$	√	1	1	√	2	A
N13.3.35 $\mathrm{Z1}^+ \oplus \mathrm{Z2}^+$	√	1	1	√	$2/m$	$\mathrm{A_g}$
N13.3.36 $\mathrm{Z1}^+ \oplus \mathrm{Z2}^-$	√	1	1	√	m	A'
N13.3.37 $\mathrm{Z2}^+ \oplus \mathrm{Z2}^+$	√	1	1	√	$2/m$	$\mathrm{A_g}$
N13.3.38 $\mathrm{Z2}^+ \oplus \mathrm{Z2}^-$	√	1	1	√	2	A
N13.6.1 A1	√	1	1	√	m	A'
N13.6.2 D1	√	1	1	√	m	A'
N13.8.1 LD1	√	1	1	√	2	A
N13.8.2 LD2	√	1	1	√	2	A
N13.8.3 W1	√	1	1	√	2	A
N13.8.4 F1	√	2	2	√	m	$\mathrm{A}' \oplus \mathrm{A}'$
N13.8.5 G1	√	1	1	√	m	A'
N13.9.1 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{GM1}^-$	√	0	0	√	-	-
N13.9.2 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{GM2}^+$	√	3	3	√	$2/m$	$\mathrm{B_g} \oplus \mathrm{B_u} \oplus \mathrm{B_u}$
N13.9.3 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{GM2}^-$	√	0	0	√	-	-
N13.9.4 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{C1}^+$	√	0	0	√	-	-
N13.9.5 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{Y1}^+$	√	0	0	√	-	-
N13.9.6 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{Z1}^+$	√	0	0	√	-	-
N13.9.7 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{Z2}^+$	√	0	0	√	-	-
N13.9.8 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	√	2	2	√	2	$\mathrm{B} \oplus \mathrm{B}$
N13.9.9 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	√	3	3	√	$2/m$	$\mathrm{A_u} \oplus \mathrm{B_g} \oplus \mathrm{B_u}$
N13.9.10 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{C1}^+$	√	2	2	√	$2/m$	$\mathrm{B_g} \oplus \mathrm{B_u}$
N13.9.11 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{Y1}^+$	√	2	2	√	$2/m$	$\mathrm{B_g} \oplus \mathrm{B_u}$
N13.9.12 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{Z1}^+$	√	2	2	√	$2/m$	$\mathrm{B_g} \oplus \mathrm{B_u}$
N13.9.13 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{Z2}^+$	√	2	2	√	$2/m$	$\mathrm{B_g} \oplus \mathrm{B_u}$
N13.9.14 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	√	0	0	√	-	-
N13.9.15 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{C1}^+$	√	0	0	√	-	-
N13.9.16 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Y1}^+$	√	0	0	√	-	-
N13.9.17 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Z1}^+$	√	0	0	√	-	-
N13.9.18 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Z2}^+$	√	0	0	√	-	-
N13.9.19 $\mathrm{GM1}^- \oplus \mathrm{C1}^+ \oplus \mathrm{C1}^+$	√	1	0	×	-	-
N13.9.20 $\mathrm{GM1}^- \oplus \mathrm{C1}^+ \oplus \mathrm{C1}^-$	√	1	1	×	-	-
N13.9.21 $\mathrm{GM1}^- \oplus \mathrm{C1}^+ \oplus \mathrm{C2}^+$	√	1	0	×	-	-
N13.9.22 $\mathrm{GM1}^- \oplus \mathrm{C1}^+ \oplus \mathrm{C2}^-$	√	1	1	×	-	-

Non-coplanar SSGs with parent space group $P2/c$ (No. 13) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N13.9.23 $\mathrm{GM1}^- \oplus \mathrm{C1}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	0	$\times$	-	-
N13.9.24 $\mathrm{GM1}^- \oplus \mathrm{C1}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N13.9.25 $\mathrm{GM1}^- \oplus \mathrm{C1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N13.9.26 $\mathrm{GM1}^- \oplus \mathrm{C1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N13.9.27 $\mathrm{GM1}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	0	$\times$	-	-
N13.9.28 $\mathrm{GM1}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^-$	$\surd$	1	1	$\times$	-	-
N13.9.29 $\mathrm{GM1}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N13.9.30 $\mathrm{GM1}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
N13.9.31 $\mathrm{GM1}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N13.9.32 $\mathrm{GM1}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N13.9.33 $\mathrm{GM1}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N13.9.34 $\mathrm{GM1}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N13.9.35 $\mathrm{GM1}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N13.9.36 $\mathrm{GM1}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\times$	-	-
N13.9.37 $\mathrm{GM1}^- \oplus \mathrm{Z2}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N13.9.38 $\mathrm{GM1}^- \oplus \mathrm{Z2}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N13.9.39 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{B_g} \oplus \mathrm{B_g} \oplus \mathrm{B_g}$
N13.9.40 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	2	2	$\surd$	m	$\mathrm{A}'' \oplus \mathrm{A}''$
N13.9.41 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{C1}^+$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{B_g} \oplus \mathrm{B_g}$
N13.9.42 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{B_g} \oplus \mathrm{B_g}$
N13.9.43 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{Z1}^+$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{B_g} \oplus \mathrm{B_g}$
N13.9.44 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{Z2}^+$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{B_g} \oplus \mathrm{B_g}$
N13.9.45 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B_g}$
N13.9.46 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{C1}^+$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_u} \oplus \mathrm{B_g}$
N13.9.47 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_u} \oplus \mathrm{B_g}$
N13.9.48 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{Z1}^+$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_u} \oplus \mathrm{B_g}$
N13.9.49 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{Z2}^+$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_u} \oplus \mathrm{B_g}$
N13.9.50 $\mathrm{GM2}^+ \oplus \mathrm{C1}^+ \oplus \mathrm{C1}^+$	$\surd$	1	1	$\times$	-	-
N13.9.51 $\mathrm{GM2}^+ \oplus \mathrm{C1}^+ \oplus \mathrm{C1}^-$	$\surd$	1	1	$\times$	-	-
N13.9.52 $\mathrm{GM2}^+ \oplus \mathrm{C1}^+ \oplus \mathrm{C2}^+$	$\surd$	1	1	$\times$	-	-
N13.9.53 $\mathrm{GM2}^+ \oplus \mathrm{C1}^+ \oplus \mathrm{C2}^-$	$\surd$	1	1	$\times$	-	-
N13.9.54 $\mathrm{GM2}^+ \oplus \mathrm{C1}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	1	$\times$	-	-
N13.9.55 $\mathrm{GM2}^+ \oplus \mathrm{C1}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\times$	-	-
N13.9.56 $\mathrm{GM2}^+ \oplus \mathrm{C1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\times$	-	-
N13.9.57 $\mathrm{GM2}^+ \oplus \mathrm{C1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\times$	-	-
N13.9.58 $\mathrm{GM2}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	1	$\times$	-	-
N13.9.59 $\mathrm{GM2}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^-$	$\surd$	1	1	$\times$	-	-
N13.9.60 $\mathrm{GM2}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\times$	-	-
N13.9.61 $\mathrm{GM2}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\surd$	2	B
N13.9.62 $\mathrm{GM2}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_g}$
N13.9.63 $\mathrm{GM2}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_g}$
N13.9.64 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\times$	-	-
N13.9.65 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\surd$	m	A''
N13.9.66 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\times$	-	-
N13.9.67 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\times$	-	-
N13.9.68 $\mathrm{GM2}^+ \oplus \mathrm{Z2}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $P2/c$ (No. 13) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N13.9.69 $\mathrm{GM2}^{+} \oplus \mathrm{Z2}^{+} \oplus \mathrm{Z2}^{-}$	$\surd$	1	1	$\surd$	m	A''
N13.9.70 $\mathrm{GM2}^{-} \oplus \mathrm{GM2}^{-} \oplus \mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
N13.9.71 $\mathrm{GM2}^{-} \oplus \mathrm{GM2}^{-} \oplus \mathrm{C1}^{+}$	$\surd$	0	0	$\surd$	-	-
N13.9.72 $\mathrm{GM2}^{-} \oplus \mathrm{GM2}^{-} \oplus \mathrm{Y1}^{+}$	$\surd$	0	0	$\surd$	-	-
N13.9.73 $\mathrm{GM2}^{-} \oplus \mathrm{GM2}^{-} \oplus \mathrm{Z1}^{+}$	$\surd$	0	0	$\surd$	-	-
N13.9.74 $\mathrm{GM2}^{-} \oplus \mathrm{GM2}^{-} \oplus \mathrm{Z2}^{+}$	$\surd$	0	0	$\surd$	-	-
N13.9.75 $\mathrm{GM2}^{-} \oplus \mathrm{C1}^{+} \oplus \mathrm{C1}^{+}$	$\surd$	1	0	$\times$	-	-
N13.9.76 $\mathrm{GM2}^{-} \oplus \mathrm{C1}^{+} \oplus \mathrm{C1}^{-}$	$\surd$	1	1	$\times$	-	-
N13.9.77 $\mathrm{GM2}^{-} \oplus \mathrm{C1}^{+} \oplus \mathrm{C2}^{+}$	$\surd$	1	0	$\times$	-	-
N13.9.78 $\mathrm{GM2}^{-} \oplus \mathrm{C1}^{+} \oplus \mathrm{C2}^{-}$	$\surd$	1	1	$\times$	-	-
N13.9.79 $\mathrm{GM2}^{-} \oplus \mathrm{C1}^{+} \oplus \mathrm{Y1}^{+}$	$\surd$	1	0	$\times$	-	-
N13.9.80 $\mathrm{GM2}^{-} \oplus \mathrm{C1}^{+} \oplus \mathrm{Y2}^{+}$	$\surd$	1	0	$\times$	-	-
N13.9.81 $\mathrm{GM2}^{-} \oplus \mathrm{C1}^{+} \oplus \mathrm{Z1}^{+}$	$\surd$	1	0	$\times$	-	-
N13.9.82 $\mathrm{GM2}^{-} \oplus \mathrm{C1}^{+} \oplus \mathrm{Z2}^{+}$	$\surd$	1	0	$\times$	-	-
N13.9.83 $\mathrm{GM2}^{-} \oplus \mathrm{Y1}^{+} \oplus \mathrm{Y1}^{+}$	$\surd$	1	0	$\times$	-	-
N13.9.84 $\mathrm{GM2}^{-} \oplus \mathrm{Y1}^{+} \oplus \mathrm{Y1}^{-}$	$\surd$	1	1	$\times$	-	-
N13.9.85 $\mathrm{GM2}^{-} \oplus \mathrm{Y1}^{+} \oplus \mathrm{Y2}^{+}$	$\surd$	1	0	$\times$	-	-
N13.9.86 $\mathrm{GM2}^{-} \oplus \mathrm{Y1}^{+} \oplus \mathrm{Y2}^{-}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
N13.9.87 $\mathrm{GM2}^{-} \oplus \mathrm{Y1}^{+} \oplus \mathrm{Z1}^{+}$	$\surd$	1	0	$\times$	-	-
N13.9.88 $\mathrm{GM2}^{-} \oplus \mathrm{Y1}^{+} \oplus \mathrm{Z2}^{+}$	$\surd$	1	0	$\times$	-	-
N13.9.89 $\mathrm{GM2}^{-} \oplus \mathrm{Z1}^{+} \oplus \mathrm{Z1}^{+}$	$\surd$	1	0	$\times$	-	-
N13.9.90 $\mathrm{GM2}^{-} \oplus \mathrm{Z1}^{+} \oplus \mathrm{Z1}^{-}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N13.9.91 $\mathrm{GM2}^{-} \oplus \mathrm{Z1}^{+} \oplus \mathrm{Z2}^{+}$	$\surd$	1	0	$\times$	-	-
N13.9.92 $\mathrm{GM2}^{-} \oplus \mathrm{Z1}^{+} \oplus \mathrm{Z2}^{-}$	$\surd$	1	1	$\times$	-	-
N13.9.93 $\mathrm{GM2}^{-} \oplus \mathrm{Z2}^{+} \oplus \mathrm{Z2}^{+}$	$\surd$	1	0	$\times$	-	-
N13.9.94 $\mathrm{GM2}^{-} \oplus \mathrm{Z2}^{+} \oplus \mathrm{Z2}^{-}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N13.9.95 $\mathrm{C1}^{+} \oplus \mathrm{C1}^{+} \oplus \mathrm{C1}^{+}$	$\surd$	0	0	$\surd$	-	-
N13.9.96 $\mathrm{C1}^{+} \oplus \mathrm{C1}^{+} \oplus \mathrm{C1}^{-}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_u} \oplus \mathrm{A_u}$
N13.9.97 $\mathrm{C1}^{+} \oplus \mathrm{C1}^{+} \oplus \mathrm{C2}^{+}$	$\surd$	0	0	$\surd$	-	-
N13.9.98 $\mathrm{C1}^{+} \oplus \mathrm{C1}^{+} \oplus \mathrm{C2}^{-}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{B_u} \oplus \mathrm{B_u}$
N13.9.99 $\mathrm{C1}^{+} \oplus \mathrm{C1}^{-} \oplus \mathrm{C2}^{+}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_u} \oplus \mathrm{B_u}$
N13.9.100 $\mathrm{C1}^{+} \oplus \mathrm{C1}^{+} \oplus \mathrm{Y1}^{+}$	$\surd$	1	0	$\times$	-	-
N13.9.101 $\mathrm{C1}^{+} \oplus \mathrm{C1}^{+} \oplus \mathrm{Y2}^{+}$	$\surd$	1	0	$\times$	-	-
N13.9.102 $\mathrm{C1}^{+} \oplus \mathrm{C1}^{-} \oplus \mathrm{Y1}^{+}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N13.9.103 $\mathrm{C1}^{+} \oplus \mathrm{C1}^{-} \oplus \mathrm{Y2}^{+}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N13.9.104 $\mathrm{C1}^{+} \oplus \mathrm{C2}^{+} \oplus \mathrm{Y1}^{+}$	$\surd$	1	0	$\times$	-	-
N13.9.105 $\mathrm{C1}^{+} \oplus \mathrm{C2}^{-} \oplus \mathrm{Y1}^{+}$	$\surd$	1	1	$\times$	-	-
N13.9.106 $\mathrm{C1}^{+} \oplus \mathrm{C1}^{+} \oplus \mathrm{Z1}^{+}$	$\surd$	1	0	$\times$	-	-
N13.9.107 $\mathrm{C1}^{+} \oplus \mathrm{C1}^{-} \oplus \mathrm{Z1}^{+}$	$\surd$	1	1	$\times$	-	-
N13.9.108 $\mathrm{C1}^{+} \oplus \mathrm{C2}^{+} \oplus \mathrm{Z1}^{+}$	$\surd$	1	0	$\times$	-	-
N13.9.109 $\mathrm{C1}^{+} \oplus \mathrm{C2}^{-} \oplus \mathrm{Z1}^{+}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
N13.9.110 $\mathrm{C1}^{+} \oplus \mathrm{C1}^{+} \oplus \mathrm{Z2}^{+}$	$\surd$	1	0	$\times$	-	-
N13.9.111 $\mathrm{C1}^{+} \oplus \mathrm{C1}^{-} \oplus \mathrm{Z2}^{+}$	$\surd$	1	1	$\times$	-	-
N13.9.112 $\mathrm{C1}^{+} \oplus \mathrm{C2}^{+} \oplus \mathrm{Z2}^{+}$	$\surd$	1	0	$\times$	-	-
N13.9.113 $\mathrm{C1}^{+} \oplus \mathrm{C2}^{-} \oplus \mathrm{Z2}^{+}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
N13.9.114 $\mathrm{C1}^{+} \oplus \mathrm{Y1}^{+} \oplus \mathrm{Y1}^{+}$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $P2/c$ (No. 13) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N13.9.115 $\mathrm{C1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^-$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N13.9.116 $\mathrm{C1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N13.9.117 $\mathrm{C1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
N13.9.118 $\mathrm{C1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N13.9.119 $\mathrm{C1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N13.9.120 $\mathrm{C1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Z1}^+$	$\times$	-	-	-	-	-
N13.9.121 $\mathrm{C1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Z1}^-$	$\times$	-	-	-	-	-
N13.9.122 $\mathrm{C1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Z1}^+$	$\times$	-	-	-	-	-
N13.9.123 $\mathrm{C1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Z1}^-$	$\times$	-	-	-	-	-
N13.9.124 $\mathrm{C1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Z2}^+$	$\times$	-	-	-	-	-
N13.9.125 $\mathrm{C1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Z2}^-$	$\times$	-	-	-	-	-
N13.9.126 $\mathrm{C1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Z2}^+$	$\times$	-	-	-	-	-
N13.9.127 $\mathrm{C1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Z2}^-$	$\times$	-	-	-	-	-
N13.9.128 $\mathrm{C1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N13.9.129 $\mathrm{C1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N13.9.130 $\mathrm{C1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N13.9.131 $\mathrm{C1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
N13.9.132 $\mathrm{C1}^+ \oplus \mathrm{Z2}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N13.9.133 $\mathrm{C1}^+ \oplus \mathrm{Z2}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N13.9.134 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^+$	$\surd$	0	0	$\surd$	-	-
N13.9.135 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_u} \oplus \mathrm{A_u}$
N13.9.136 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^+$	$\surd$	0	0	$\surd$	-	-
N13.9.137 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{B_u} \oplus \mathrm{B_u}$
N13.9.138 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_u} \oplus \mathrm{B_u}$
N13.9.139 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N13.9.140 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\times$	-	-
N13.9.141 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N13.9.142 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
N13.9.143 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N13.9.144 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\times$	-	-
N13.9.145 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N13.9.146 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
N13.9.147 $\mathrm{Y1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N13.9.148 $\mathrm{Y1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N13.9.149 $\mathrm{Y1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N13.9.150 $\mathrm{Y1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\times$	-	-
N13.9.151 $\mathrm{Y1}^+ \oplus \mathrm{Z2}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N13.9.152 $\mathrm{Y1}^+ \oplus \mathrm{Z2}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N13.9.153 $\mathrm{Z1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^+$	$\surd$	0	0	$\surd$	-	-
N13.9.154 $\mathrm{Z1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^-$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_u} \oplus \mathrm{A_u}$
N13.9.155 $\mathrm{Z1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^+$	$\surd$	0	0	$\surd$	-	-
N13.9.156 $\mathrm{Z1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^-$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{B_u} \oplus \mathrm{B_u}$
N13.9.157 $\mathrm{Z1}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z2}^+$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_u} \oplus \mathrm{B_u}$
N13.9.158 $\mathrm{Z1}^+ \oplus \mathrm{Z2}^+ \oplus \mathrm{Z2}^+$	$\surd$	0	0	$\surd$	-	-
N13.9.159 $\mathrm{Z1}^+ \oplus \mathrm{Z2}^+ \oplus \mathrm{Z2}^-$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_u} \oplus \mathrm{B_u}$
N13.9.160 $\mathrm{Z1}^+ \oplus \mathrm{Z2}^- \oplus \mathrm{Z2}^-$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{B_u} \oplus \mathrm{B_u}$

Non-coplanar SSGs with parent space group $P2/c$ (No. 13) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N13.9.161 $\mathrm{Z2}^+ \oplus \mathrm{Z2}^+ \oplus \mathrm{Z2}^+$	$\surd$	0	0	$\surd$	-	-
N13.9.162 $\mathrm{Z2}^+ \oplus \mathrm{Z2}^+ \oplus \mathrm{Z2}^-$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_u} \oplus \mathrm{A_u}$
N13.12.1 $\mathrm{GM1}^- \oplus \mathrm{A1}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
N13.12.2 $\mathrm{GM1}^- \oplus \mathrm{D1}$	$\surd$	1	1	$\times$	-	-
N13.12.3 $\mathrm{GM2}^+ \oplus \mathrm{A1}$	$\surd$	1	1	$\surd$	2	B
N13.12.4 $\mathrm{GM2}^+ \oplus \mathrm{D1}$	$\surd$	1	1	$\times$	-	-
N13.12.5 $\mathrm{GM2}^- \oplus \mathrm{A1}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
N13.12.6 $\mathrm{GM2}^- \oplus \mathrm{D1}$	$\surd$	1	1	$\times$	-	-
N13.12.7 $\mathrm{C1}^+ \oplus \mathrm{A1}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
N13.12.8 $\mathrm{C1}^+ \oplus \mathrm{D1}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
N13.12.9 $\mathrm{Y1}^+ \oplus \mathrm{A1}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
N13.12.10 $\mathrm{Y1}^+ \oplus \mathrm{D1}$	$\surd$	1	1	$\times$	-	-
N13.12.11 $\mathrm{Z1}^+ \oplus \mathrm{A1}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
N13.12.12 $\mathrm{Z1}^+ \oplus \mathrm{D1}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
N13.12.13 $\mathrm{Z2}^+ \oplus \mathrm{A1}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
N13.12.14 $\mathrm{Z2}^+ \oplus \mathrm{D1}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
N13.14.1 $\mathrm{GM1}^- \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N13.14.2 $\mathrm{GM1}^- \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N13.14.3 $\mathrm{GM1}^- \oplus \mathrm{W1}$	$\surd$	1	1	$\times$	-	-
N13.14.4 $\mathrm{GM2}^+ \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	m	$\mathrm{A''}$
N13.14.5 $\mathrm{GM2}^+ \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	m	$\mathrm{A''}$
N13.14.6 $\mathrm{GM2}^+ \oplus \mathrm{W1}$	$\surd$	1	1	$\times$	-	-
N13.14.7 $\mathrm{GM2}^- \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N13.14.8 $\mathrm{GM2}^- \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N13.14.9 $\mathrm{GM2}^- \oplus \mathrm{W1}$	$\surd$	1	1	$\times$	-	-
N13.14.10 $\mathrm{C1}^+ \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N13.14.11 $\mathrm{C1}^+ \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N13.14.12 $\mathrm{C1}^+ \oplus \mathrm{W1}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N13.14.13 $\mathrm{C1}^+ \oplus \mathrm{W2}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N13.14.14 $\mathrm{Y1}^+ \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N13.14.15 $\mathrm{Y1}^+ \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N13.14.16 $\mathrm{Y1}^+ \oplus \mathrm{W1}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N13.14.17 $\mathrm{Y1}^+ \oplus \mathrm{W2}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N13.14.18 $\mathrm{Z1}^+ \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N13.14.19 $\mathrm{Z1}^+ \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N13.14.20 $\mathrm{Z1}^+ \oplus \mathrm{W1}$	$\surd$	1	1	$\times$	-	-
N13.14.21 $\mathrm{Z2}^+ \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N13.14.22 $\mathrm{Z2}^+ \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N13.14.23 $\mathrm{Z2}^+ \oplus \mathrm{W1}$	$\surd$	1	1	$\times$	-	-
N13.14.24 $\mathrm{GM1}^- \oplus \mathrm{F1}$	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B_u}$
N13.14.25 $\mathrm{GM1}^- \oplus \mathrm{G1}$	$\surd$	1	1	$\times$	-	-
N13.14.26 $\mathrm{GM2}^+ \oplus \mathrm{F1}$	$\surd$	2	2	$\surd$	2	$\mathrm{A} \oplus \mathrm{B}$
N13.14.27 $\mathrm{GM2}^+ \oplus \mathrm{G1}$	$\surd$	1	1	$\times$	-	-
N13.14.28 $\mathrm{GM2}^- \oplus \mathrm{F1}$	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{B_u} \oplus \mathrm{B_u}$
N13.14.29 $\mathrm{GM2}^- \oplus \mathrm{G1}$	$\surd$	1	1	$\times$	-	-
N13.14.30 $\mathrm{C1}^+ \oplus \mathrm{F1}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{B_u}$

Non-coplanar SSGs with parent space group $P2/c$ (No. 13) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N13.14.31 $\mathrm{C1}^{+} \oplus \mathrm{G1}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
N13.14.32 $\mathrm{Y1}^{+} \oplus \mathrm{F1}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{B_u}$
N13.14.33 $\mathrm{Y1}^{+} \oplus \mathrm{G1}$	$\surd$	1	1	$\times$	-	-
N13.14.34 $\mathrm{Z1}^{+} \oplus \mathrm{F1}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{B_u}$
N13.14.35 $\mathrm{Z1}^{+} \oplus \mathrm{G1}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{B_u} \oplus \mathrm{B_u}$
N13.14.36 $\mathrm{Z2}^{+} \oplus \mathrm{F1}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{B_u}$
N13.14.37 $\mathrm{Z2}^{+} \oplus \mathrm{G1}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_u} \oplus \mathrm{B_u}$

TABLE S40: Collinear SSGs with parent space group $P2_1/c$ (No. 14).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L14.1.1 $\mathrm{GM1}^{+}$	1	$2/m$	$\mathrm{A_g}$
L14.2.1 $\mathrm{GM1}^{-}$	0	-	-
L14.2.2 $\mathrm{GM2}^{+}$	1	$2/m$	$\mathrm{B_g}$
L14.2.3 $\mathrm{GM2}^{-}$	0	-	-
L14.2.4 $\mathrm{Y1}^{+}$	0	-	-

TABLE S41: Coplanar SSGs with parent space group $P2_1/c$ (No. 14).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P14.1.1 $\mathrm{GM1}^{+}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{A_g}$
P14.2.1 $\mathrm{GM1}^{-}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{A_u}$
P14.2.2 $\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{B_g}$
P14.2.3 $\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{B_u}$
P14.2.4 $\mathrm{Y1}^{+}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
P14.3.1 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-}$	$\surd$	0	0	$\surd$	-	-
P14.3.2 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{B_g} \oplus \mathrm{B_u}$
P14.3.3 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
P14.3.4 $\mathrm{GM1}^{-} \oplus \mathrm{Y1}^{+}$	$\surd$	1	1	$\times$	-	-
P14.3.5 $\mathrm{GM2}^{+} \oplus \mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{B_g} \oplus \mathrm{B_g}$
P14.3.6 $\mathrm{GM2}^{+} \oplus \mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_u} \oplus \mathrm{B_g}$
P14.3.7 $\mathrm{GM2}^{+} \oplus \mathrm{Y1}^{+}$	$\surd$	1	0	$\times$	-	-
P14.3.8 $\mathrm{GM2}^{-} \oplus \mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
P14.3.9 $\mathrm{GM2}^{-} \oplus \mathrm{Y1}^{+}$	$\surd$	1	1	$\times$	-	-
P14.3.10 $\mathrm{Y1}^{+} \oplus \mathrm{Y1}^{+}$	$\surd$	1	0	$\times$	-	-
P14.3.11 $\mathrm{Y1}^{+} \oplus \mathrm{Y1}^{-}$	$\surd$	1	1	$\times$	-	-
P14.3.12 $\mathrm{Y1}^{+} \oplus \mathrm{Y2}^{+}$	$\surd$	1	0	$\times$	-	-
P14.3.13 $\mathrm{Y1}^{+} \oplus \mathrm{Y2}^{-}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
P14.4.1 $\mathrm{D1}^{+}\mathrm{D2}^{+}$	$\surd$	1	0	$\times$	-	-
P14.6.1 A1	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
P14.6.2 C1	$\surd$	1	1	$\times$	-	-
P14.6.3 Z1	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
P14.8.1 LD1	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
P14.8.2 W1	$\surd$	1	1	$\times$	-	-
P14.8.3 F1	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{B_u}$

Non-coplanar SSGs with parent space group $P2_1/c$ (No. 14) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation

TABLE S42: Non-coplanar SSGs with parent space group $P2_1/c$ (No. 14).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N14.1.1 $\mathrm{GM1}^+$	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{A_g}$
N14.2.1 $\mathrm{GM1}^-$	$\surd$	2	2	$\surd$	2	$\mathrm{A}\oplus\mathrm{A}$
N14.2.2 $\mathrm{GM2}^+$	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{B_g}$
N14.2.3 $\mathrm{GM2}^-$	$\surd$	2	2	$\surd$	m	$\mathrm{A}'\oplus\mathrm{A}'$
N14.2.4 $\mathrm{Y1}^+$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g}\oplus\mathrm{A_g}$
N14.3.1 $\mathrm{GM1}^-\oplus\mathrm{GM1}^-$	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g}\oplus\mathrm{A_u}\oplus\mathrm{A_u}$
N14.3.2 $\mathrm{GM1}^-\oplus\mathrm{GM2}^+$	$\surd$	2	2	$\surd$	m	$\mathrm{A}'\oplus\mathrm{A}''$
N14.3.3 $\mathrm{GM1}^-\oplus\mathrm{GM2}^-$	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g}\oplus\mathrm{A_u}\oplus\mathrm{B_u}$
N14.3.4 $\mathrm{GM1}^-\oplus\mathrm{Y1}^+$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g}\oplus\mathrm{A_u}$
N14.3.5 $\mathrm{GM2}^+\oplus\mathrm{GM2}^+$	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g}\oplus\mathrm{B_g}\oplus\mathrm{B_g}$
N14.3.6 $\mathrm{GM2}^+\oplus\mathrm{GM2}^-$	$\surd$	2	2	$\surd$	2	$\mathrm{A}\oplus\mathrm{B}$
N14.3.7 $\mathrm{GM2}^+\oplus\mathrm{Y1}^+$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g}\oplus\mathrm{B_g}$
N14.3.8 $\mathrm{GM2}^-\oplus\mathrm{GM2}^-$	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g}\oplus\mathrm{B_u}\oplus\mathrm{B_u}$
N14.3.9 $\mathrm{GM2}^-\oplus\mathrm{Y1}^+$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g}\oplus\mathrm{B_u}$
N14.3.10 $\mathrm{Y1}^+\oplus\mathrm{Y1}^+$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
N14.3.11 $\mathrm{Y1}^+\oplus\mathrm{Y1}^-$	$\surd$	1	1	$\surd$	2	A
N14.3.12 $\mathrm{Y1}^+\oplus\mathrm{Y2}^+$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
N14.3.13 $\mathrm{Y1}^+\oplus\mathrm{Y2}^-$	$\surd$	1	1	$\surd$	m	A'
N14.4.1 $\mathrm{D1}^+\mathrm{D2}^+$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
N14.6.1 A1	$\surd$	1	1	$\surd$	m	A'
N14.6.2 C1	$\surd$	1	1	$\surd$	2	A
N14.6.3 Z1	$\surd$	1	1	$\surd$	2	A
N14.8.1 LD1	$\surd$	1	1	$\surd$	2	A
N14.8.2 W1	$\surd$	1	1	$\surd$	2	A
N14.8.3 F1	$\surd$	2	2	$\surd$	m	$\mathrm{A}'\oplus\mathrm{A}'$
N14.9.1 $\mathrm{GM1}^-\oplus\mathrm{GM1}^-\oplus\mathrm{GM1}^-$	$\surd$	0	0	$\surd$	-	-
N14.9.2 $\mathrm{GM1}^-\oplus\mathrm{GM1}^-\oplus\mathrm{GM2}^+$	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{B_g}\oplus\mathrm{B_u}\oplus\mathrm{B_u}$
N14.9.3 $\mathrm{GM1}^-\oplus\mathrm{GM1}^-\oplus\mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
N14.9.4 $\mathrm{GM1}^-\oplus\mathrm{GM1}^-\oplus\mathrm{Y1}^+$	$\surd$	0	0	$\surd$	-	-
N14.9.5 $\mathrm{GM1}^-\oplus\mathrm{GM2}^+\oplus\mathrm{GM2}^+$	$\surd$	2	2	$\surd$	2	$\mathrm{B}\oplus\mathrm{B}$
N14.9.6 $\mathrm{GM1}^-\oplus\mathrm{GM2}^+\oplus\mathrm{GM2}^-$	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_u}\oplus\mathrm{B_g}\oplus\mathrm{B_u}$
N14.9.7 $\mathrm{GM1}^-\oplus\mathrm{GM2}^+\oplus\mathrm{Y1}^+$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{B_g}\oplus\mathrm{B_u}$
N14.9.8 $\mathrm{GM1}^-\oplus\mathrm{GM2}^-\oplus\mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
N14.9.9 $\mathrm{GM1}^-\oplus\mathrm{GM2}^-\oplus\mathrm{Y1}^+$	$\surd$	0	0	$\surd$	-	-
N14.9.10 $\mathrm{GM1}^-\oplus\mathrm{Y1}^+\oplus\mathrm{Y1}^+$	$\surd$	1	0	$\times$	-	-
N14.9.11 $\mathrm{GM1}^-\oplus\mathrm{Y1}^+\oplus\mathrm{Y1}^-$	$\surd$	1	1	$\times$	-	-
N14.9.12 $\mathrm{GM1}^-\oplus\mathrm{Y1}^+\oplus\mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N14.9.13 $\mathrm{GM1}^-\oplus\mathrm{Y1}^+\oplus\mathrm{Y2}^-$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
N14.9.14 $\mathrm{GM2}^+\oplus\mathrm{GM2}^+\oplus\mathrm{GM2}^+$	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{B_g}\oplus\mathrm{B_g}\oplus\mathrm{B_g}$
N14.9.15 $\mathrm{GM2}^+\oplus\mathrm{GM2}^+\oplus\mathrm{GM2}^-$	$\surd$	2	2	$\surd$	m	$\mathrm{A}''\oplus\mathrm{A}''$
N14.9.16 $\mathrm{GM2}^+\oplus\mathrm{GM2}^+\oplus\mathrm{Y1}^+$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{B_g}\oplus\mathrm{B_g}$
N14.9.17 $\mathrm{GM2}^+\oplus\mathrm{GM2}^-\oplus\mathrm{GM2}^-$	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_u}\oplus\mathrm{A_u}\oplus\mathrm{B_g}$

Non-coplanar SSGs with parent space group $P2_1/c$ (No. 14) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N14.9.18 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{Y1}^+$	√	2	2	√	$2/m$	$\mathrm{A_u} \oplus \mathrm{B_g}$
N14.9.19 $\mathrm{GM2}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^+$	√	1	1	×	-	-
N14.9.20 $\mathrm{GM2}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^-$	√	1	1	×	-	-
N14.9.21 $\mathrm{GM2}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^+$	√	1	1	×	-	-
N14.9.22 $\mathrm{GM2}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^-$	√	1	1	√	2	B
N14.9.23 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	√	0	0	√	-	-
N14.9.24 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Y1}^+$	√	0	0	√	-	-
N14.9.25 $\mathrm{GM2}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^+$	√	1	0	×	-	-
N14.9.26 $\mathrm{GM2}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^-$	√	1	1	×	-	-
N14.9.27 $\mathrm{GM2}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^+$	√	1	0	×	-	-
N14.9.28 $\mathrm{GM2}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^-$	√	1	1	√	$2/m$	$\mathrm{B_u}$
N14.9.29 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^+$	√	0	0	√	-	-
N14.9.30 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^-$	√	2	2	√	$2/m$	$\mathrm{A_u} \oplus \mathrm{A_u}$
N14.9.31 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^+$	√	0	0	√	-	-
N14.9.32 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^-$	√	2	2	√	$2/m$	$\mathrm{B_u} \oplus \mathrm{B_u}$
N14.9.33 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y2}^+$	√	2	2	√	$2/m$	$\mathrm{A_u} \oplus \mathrm{B_u}$
N14.10.1 $\mathrm{GM1}^- \oplus \mathrm{D1}^+\mathrm{D2}^+$	√	1	0	×	-	-
N14.10.2 $\mathrm{GM2}^+ \oplus \mathrm{D1}^+\mathrm{D2}^+$	√	1	1	×	-	-
N14.10.3 $\mathrm{GM2}^- \oplus \mathrm{D1}^+\mathrm{D2}^+$	√	1	0	×	-	-
N14.10.4 $\mathrm{Y1}^+ \oplus \mathrm{D1}^+\mathrm{D2}^+$	√	1	0	×	-	-
N14.12.1 $\mathrm{GM1}^- \oplus \mathrm{A1}$	√	1	1	√	$2/m$	$\mathrm{B_u}$
N14.12.2 $\mathrm{GM1}^- \oplus \mathrm{C1}$	√	1	1	×	-	-
N14.12.3 $\mathrm{GM1}^- \oplus \mathrm{Z1}$	√	1	1	√	$2/m$	$\mathrm{A_u}$
N14.12.4 $\mathrm{GM2}^+ \oplus \mathrm{A1}$	√	1	1	√	2	B
N14.12.5 $\mathrm{GM2}^+ \oplus \mathrm{C1}$	√	1	1	×	-	-
N14.12.6 $\mathrm{GM2}^+ \oplus \mathrm{Z1}$	√	1	1	√	m	$\mathrm{A''}$
N14.12.7 $\mathrm{GM2}^- \oplus \mathrm{A1}$	√	1	1	√	$2/m$	$\mathrm{B_u}$
N14.12.8 $\mathrm{GM2}^- \oplus \mathrm{C1}$	√	1	1	×	-	-
N14.12.9 $\mathrm{GM2}^- \oplus \mathrm{Z1}$	√	1	1	√	$2/m$	$\mathrm{A_u}$
N14.12.10 $\mathrm{Y1}^+ \oplus \mathrm{A1}$	√	1	1	√	$2/m$	$\mathrm{B_u}$
N14.12.11 $\mathrm{Y1}^+ \oplus \mathrm{C1}$	√	1	1	√	$2/m$	$\mathrm{A_u}$
N14.12.12 $\mathrm{Y1}^+ \oplus \mathrm{Z1}$	√	1	1	√	$2/m$	$\mathrm{A_u}$
N14.14.1 $\mathrm{GM1}^- \oplus \mathrm{LD1}$	√	1	1	√	$2/m$	$\mathrm{A_u}$
N14.14.2 $\mathrm{GM1}^- \oplus \mathrm{W1}$	√	1	1	×	-	-
N14.14.3 $\mathrm{GM2}^+ \oplus \mathrm{LD1}$	√	1	1	√	m	$\mathrm{A''}$
N14.14.4 $\mathrm{GM2}^+ \oplus \mathrm{W1}$	√	1	1	×	-	-
N14.14.5 $\mathrm{GM2}^- \oplus \mathrm{LD1}$	√	1	1	√	$2/m$	$\mathrm{A_u}$
N14.14.6 $\mathrm{GM2}^- \oplus \mathrm{W1}$	√	1	1	×	-	-
N14.14.7 $\mathrm{Y1}^+ \oplus \mathrm{LD1}$	√	1	1	√	$2/m$	$\mathrm{A_u}$
N14.14.8 $\mathrm{Y1}^+ \oplus \mathrm{W1}$	√	1	1	√	$2/m$	$\mathrm{A_u}$
N14.14.9 $\mathrm{GM1}^- \oplus \mathrm{F1}$	√	3	3	√	$2/m$	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B_u}$
N14.14.10 $\mathrm{GM2}^+ \oplus \mathrm{F1}$	√	2	2	√	2	$\mathrm{A} \oplus \mathrm{B}$
N14.14.11 $\mathrm{GM2}^- \oplus \mathrm{F1}$	√	3	3	√	$2/m$	$\mathrm{A_g} \oplus \mathrm{B_u} \oplus \mathrm{B_u}$
N14.14.12 $\mathrm{Y1}^+ \oplus \mathrm{F1}$	√	2	2	√	$2/m$	$\mathrm{A_g} \oplus \mathrm{B_u}$

TABLE S43: Collinear SSGs with parent space group $C2/c$ (No. 15).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L15.1.1 $\mathrm{GM1}^{+}$	1	$2/m$	$\mathrm{A_g}$
L15.2.1 $\mathrm{GM1}^{-}$	0	-	-
L15.2.2 $\mathrm{GM2}^{+}$	1	$2/m$	$\mathrm{B_g}$
L15.2.3 $\mathrm{GM2}^{-}$	0	-	-
L15.2.4 $\mathrm{Y1}^{+}$	0	-	-
L15.2.5 $\mathrm{Y2}^{+}$	0	-	-

TABLE S44: Coplanar SSGs with parent space group $C2/c$ (No. 15).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P15.1.1 $\mathrm{GM1}^{+}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g}\oplus\mathrm{A_g}$
P15.2.1 $\mathrm{GM1}^{-}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g}\oplus\mathrm{A_u}$
P15.2.2 $\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g}\oplus\mathrm{B_g}$
P15.2.3 $\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g}\oplus\mathrm{B_u}$
P15.2.4 $\mathrm{Y1}^{+}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
P15.2.5 $\mathrm{Y2}^{+}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
P15.3.1 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}$	$\surd$	0	0	$\surd$	-	-
P15.3.2 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{B_g}\oplus\mathrm{B_u}$
P15.3.3 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
P15.3.4 $\mathrm{GM1}^{-}\oplus\mathrm{Y1}^{+}$	$\surd$	1	1	$\times$	-	-
P15.3.5 $\mathrm{GM1}^{-}\oplus\mathrm{Y2}^{+}$	$\surd$	1	1	$\times$	-	-
P15.3.6 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{B_g}\oplus\mathrm{B_g}$
P15.3.7 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_u}\oplus\mathrm{B_g}$
P15.3.8 $\mathrm{GM2}^{+}\oplus\mathrm{Y1}^{+}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_g}$
P15.3.9 $\mathrm{GM2}^{+}\oplus\mathrm{Y2}^{+}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_g}$
P15.3.10 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
P15.3.11 $\mathrm{GM2}^{-}\oplus\mathrm{Y1}^{+}$	$\surd$	1	1	$\times$	-	-
P15.3.12 $\mathrm{GM2}^{-}\oplus\mathrm{Y2}^{+}$	$\surd$	1	1	$\times$	-	-
P15.3.13 $\mathrm{Y1}^{+}\oplus\mathrm{Y1}^{+}$	$\surd$	1	0	$\times$	-	-
P15.3.14 $\mathrm{Y1}^{+}\oplus\mathrm{Y1}^{-}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
P15.3.15 $\mathrm{Y1}^{+}\oplus\mathrm{Y2}^{+}$	$\surd$	1	0	$\times$	-	-
P15.3.16 $\mathrm{Y1}^{+}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
P15.3.17 $\mathrm{Y2}^{+}\oplus\mathrm{Y2}^{+}$	$\surd$	1	0	$\times$	-	-
P15.3.18 $\mathrm{Y2}^{+}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
P15.6.1 A1	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
P15.7.1 $\mathrm{L1}^{+}$	$\times$	-	-	-	-	-
P15.8.1 LD1	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
P15.8.2 LD2	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
P15.8.3 B1	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g}\oplus\mathrm{B_u}$

TABLE S45: Non-coplanar SSGs with parent space group $C2/c$ (No. 15).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N15.1.1 $\mathrm{GM1}^{+}$	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{A_g}$

Non-coplanar SSGs with parent space group $C2/c$ (No. 15) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N15.2.1 $\mathrm{GM1}^-$	$\surd$	2	2	$\surd$	2	$\mathrm{A}\oplus\mathrm{A}$
N15.2.2 $\mathrm{GM2}^+$	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{B_g}$
N15.2.3 $\mathrm{GM2}^-$	$\surd$	2	2	$\surd$	m	$\mathrm{A'}\oplus\mathrm{A'}$
N15.2.4 $\mathrm{Y1}^+$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g}\oplus\mathrm{A_g}$
N15.2.5 $\mathrm{Y2}^+$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g}\oplus\mathrm{A_g}$
N15.3.1 $\mathrm{GM1}^-\oplus\mathrm{GM1}^-$	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g}\oplus\mathrm{A_u}\oplus\mathrm{A_u}$
N15.3.2 $\mathrm{GM1}^-\oplus\mathrm{GM2}^+$	$\surd$	2	2	$\surd$	m	$\mathrm{A'}\oplus\mathrm{A''}$
N15.3.3 $\mathrm{GM1}^-\oplus\mathrm{GM2}^-$	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g}\oplus\mathrm{A_u}\oplus\mathrm{B_u}$
N15.3.4 $\mathrm{GM1}^-\oplus\mathrm{Y1}^+$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g}\oplus\mathrm{A_u}$
N15.3.5 $\mathrm{GM1}^-\oplus\mathrm{Y2}^+$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g}\oplus\mathrm{A_u}$
N15.3.6 $\mathrm{GM2}^+\oplus\mathrm{GM2}^+$	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g}\oplus\mathrm{B_g}\oplus\mathrm{B_g}$
N15.3.7 $\mathrm{GM2}^+\oplus\mathrm{GM2}^-$	$\surd$	2	2	$\surd$	2	$\mathrm{A}\oplus\mathrm{B}$
N15.3.8 $\mathrm{GM2}^+\oplus\mathrm{Y1}^+$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g}\oplus\mathrm{B_g}$
N15.3.9 $\mathrm{GM2}^+\oplus\mathrm{Y2}^+$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g}\oplus\mathrm{B_g}$
N15.3.10 $\mathrm{GM2}^-\oplus\mathrm{GM2}^-$	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g}\oplus\mathrm{B_u}\oplus\mathrm{B_u}$
N15.3.11 $\mathrm{GM2}^-\oplus\mathrm{Y1}^+$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g}\oplus\mathrm{B_u}$
N15.3.12 $\mathrm{GM2}^-\oplus\mathrm{Y2}^+$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g}\oplus\mathrm{B_u}$
N15.3.13 $\mathrm{Y1}^+\oplus\mathrm{Y1}^+$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
N15.3.14 $\mathrm{Y1}^+\oplus\mathrm{Y1}^-$	$\surd$	1	1	$\surd$	2	A
N15.3.15 $\mathrm{Y1}^+\oplus\mathrm{Y2}^+$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
N15.3.16 $\mathrm{Y1}^+\oplus\mathrm{Y2}^-$	$\surd$	1	1	$\surd$	m	$\mathrm{A'}$
N15.3.17 $\mathrm{Y2}^+\oplus\mathrm{Y2}^+$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
N15.3.18 $\mathrm{Y2}^+\oplus\mathrm{Y2}^-$	$\surd$	1	1	$\surd$	2	A
N15.6.1 A1	$\surd$	1	1	$\surd$	m	$\mathrm{A'}$
N15.7.1 $\mathrm{L1}^+$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_g}$
N15.8.1 LD1	$\surd$	1	1	$\surd$	2	A
N15.8.2 LD2	$\surd$	1	1	$\surd$	2	A
N15.8.3 B1	$\surd$	2	2	$\surd$	m	$\mathrm{A'}\oplus\mathrm{A'}$
N15.9.1 $\mathrm{GM1}^-\oplus\mathrm{GM1}^-\oplus\mathrm{GM1}^-$	$\surd$	0	0	$\surd$	-	-
N15.9.2 $\mathrm{GM1}^-\oplus\mathrm{GM1}^-\oplus\mathrm{GM2}^+$	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{B_g}\oplus\mathrm{B_u}\oplus\mathrm{B_u}$
N15.9.3 $\mathrm{GM1}^-\oplus\mathrm{GM1}^-\oplus\mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
N15.9.4 $\mathrm{GM1}^-\oplus\mathrm{GM1}^-\oplus\mathrm{Y1}^+$	$\surd$	0	0	$\surd$	-	-
N15.9.5 $\mathrm{GM1}^-\oplus\mathrm{GM1}^-\oplus\mathrm{Y2}^+$	$\surd$	0	0	$\surd$	-	-
N15.9.6 $\mathrm{GM1}^-\oplus\mathrm{GM2}^+\oplus\mathrm{GM2}^+$	$\surd$	2	2	$\surd$	2	$\mathrm{B}\oplus\mathrm{B}$
N15.9.7 $\mathrm{GM1}^-\oplus\mathrm{GM2}^+\oplus\mathrm{GM2}^-$	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_u}\oplus\mathrm{B_g}\oplus\mathrm{B_u}$
N15.9.8 $\mathrm{GM1}^-\oplus\mathrm{GM2}^+\oplus\mathrm{Y1}^+$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{B_g}\oplus\mathrm{B_u}$
N15.9.9 $\mathrm{GM1}^-\oplus\mathrm{GM2}^+\oplus\mathrm{Y2}^+$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{B_g}\oplus\mathrm{B_u}$
N15.9.10 $\mathrm{GM1}^-\oplus\mathrm{GM2}^-\oplus\mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
N15.9.11 $\mathrm{GM1}^-\oplus\mathrm{GM2}^-\oplus\mathrm{Y1}^+$	$\surd$	0	0	$\surd$	-	-
N15.9.12 $\mathrm{GM1}^-\oplus\mathrm{GM2}^-\oplus\mathrm{Y2}^+$	$\surd$	0	0	$\surd$	-	-
N15.9.13 $\mathrm{GM1}^-\oplus\mathrm{Y1}^+\oplus\mathrm{Y1}^+$	$\surd$	1	0	$\times$	-	-
N15.9.14 $\mathrm{GM1}^-\oplus\mathrm{Y1}^+\oplus\mathrm{Y1}^-$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N15.9.15 $\mathrm{GM1}^-\oplus\mathrm{Y1}^+\oplus\mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N15.9.16 $\mathrm{GM1}^-\oplus\mathrm{Y1}^+\oplus\mathrm{Y2}^-$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
N15.9.17 $\mathrm{GM1}^-\oplus\mathrm{Y2}^+\oplus\mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N15.9.18 $\mathrm{GM1}^-\oplus\mathrm{Y2}^+\oplus\mathrm{Y2}^-$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$

Non-coplanar SSGs with parent space group $C2/c$ (No. 15) (continued).

SSG		Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N15.9.19	$\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{B_g} \oplus \mathrm{B_g} \oplus \mathrm{B_g}$
N15.9.20	$\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	2	2	$\surd$	m	$\mathrm{A}'' \oplus \mathrm{A}''$
N15.9.21	$\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{B_g} \oplus \mathrm{B_g}$
N15.9.22	$\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{B_g} \oplus \mathrm{B_g}$
N15.9.23	$\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B_g}$
N15.9.24	$\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_u} \oplus \mathrm{B_g}$
N15.9.25	$\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_u} \oplus \mathrm{B_g}$
N15.9.26	$\mathrm{GM2}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_g}$
N15.9.27	$\mathrm{GM2}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^-$	$\surd$	1	1	$\surd$	m	A''
N15.9.28	$\mathrm{GM2}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_g}$
N15.9.29	$\mathrm{GM2}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\surd$	2	B
N15.9.30	$\mathrm{GM2}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_g}$
N15.9.31	$\mathrm{GM2}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\surd$	m	A''
N15.9.32	$\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
N15.9.33	$\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Y1}^+$	$\surd$	0	0	$\surd$	-	-
N15.9.34	$\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Y2}^+$	$\surd$	0	0	$\surd$	-	-
N15.9.35	$\mathrm{GM2}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	0	$\times$	-	-
N15.9.36	$\mathrm{GM2}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^-$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N15.9.37	$\mathrm{GM2}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N15.9.38	$\mathrm{GM2}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
N15.9.39	$\mathrm{GM2}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N15.9.40	$\mathrm{GM2}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N15.9.41	$\mathrm{Y1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^+$	$\surd$	0	0	$\surd$	-	-
N15.9.42	$\mathrm{Y1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_u} \oplus \mathrm{A_u}$
N15.9.43	$\mathrm{Y1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^+$	$\surd$	0	0	$\surd$	-	-
N15.9.44	$\mathrm{Y1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{B_u} \oplus \mathrm{B_u}$
N15.9.45	$\mathrm{Y1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_u} \oplus \mathrm{B_u}$
N15.9.46	$\mathrm{Y1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^+$	$\surd$	0	0	$\surd$	-	-
N15.9.47	$\mathrm{Y1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_u} \oplus \mathrm{B_u}$
N15.9.48	$\mathrm{Y1}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{B_u} \oplus \mathrm{B_u}$
N15.9.49	$\mathrm{Y2}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^+$	$\surd$	0	0	$\surd$	-	-
N15.9.50	$\mathrm{Y2}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_u} \oplus \mathrm{A_u}$
N15.12.1	$\mathrm{GM1}^- \oplus \mathrm{A1}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
N15.12.2	$\mathrm{GM2}^+ \oplus \mathrm{A1}$	$\surd$	1	1	$\surd$	2	B
N15.12.3	$\mathrm{GM2}^- \oplus \mathrm{A1}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
N15.12.4	$\mathrm{Y1}^+ \oplus \mathrm{A1}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
N15.12.5	$\mathrm{Y2}^+ \oplus \mathrm{A1}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{B_u}$
N15.13.1	$\mathrm{GM1}^- \oplus \mathrm{L1}^+$	$\surd$	1	0	$\times$	-	-
N15.13.2	$\mathrm{GM2}^+ \oplus \mathrm{L1}^+$	$\surd$	1	1	$\times$	-	-
N15.13.3	$\mathrm{GM2}^- \oplus \mathrm{L1}^+$	$\surd$	1	0	$\times$	-	-
N15.13.4	$\mathrm{Y1}^+ \oplus \mathrm{V1}^+$	$\times$	-	-	-	-	-
N15.13.5	$\mathrm{Y1}^+ \oplus \mathrm{L1}^+$	$\times$	-	-	-	-	-
N15.13.6	$\mathrm{Y2}^+ \oplus \mathrm{V1}^+$	$\times$	-	-	-	-	-
N15.13.7	$\mathrm{Y2}^+ \oplus \mathrm{L1}^+$	$\times$	-	-	-	-	-
N15.14.1	$\mathrm{GM1}^- \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N15.14.2	$\mathrm{GM1}^- \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$

Non-coplanar SSGs with parent space group $C2/c$ (No. 15) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N15.14.3 $\mathrm{GM2}^{+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	m	A''
N15.14.4 $\mathrm{GM2}^{+} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	m	A''
N15.14.5 $\mathrm{GM2}^{-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N15.14.6 $\mathrm{GM2}^{-} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N15.14.7 $\mathrm{Y1}^{+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N15.14.8 $\mathrm{Y1}^{+} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N15.14.9 $\mathrm{Y2}^{+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N15.14.10 $\mathrm{Y2}^{+} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	$2/m$	$\mathrm{A_u}$
N15.14.11 $\mathrm{GM1}^{-} \oplus \mathrm{B1}$	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B_u}$
N15.14.12 $\mathrm{GM2}^{+} \oplus \mathrm{B1}$	$\surd$	2	2	$\surd$	2	$\mathrm{A} \oplus \mathrm{B}$
N15.14.13 $\mathrm{GM2}^{-} \oplus \mathrm{B1}$	$\surd$	3	3	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{B_u} \oplus \mathrm{B_u}$
N15.14.14 $\mathrm{Y1}^{+} \oplus \mathrm{B1}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{B_u}$
N15.14.15 $\mathrm{Y2}^{+} \oplus \mathrm{B1}$	$\surd$	2	2	$\surd$	$2/m$	$\mathrm{A_g} \oplus \mathrm{B_u}$

TABLE S46: Collinear SSGs with parent space group $P222$ (No. 16).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L16.1.1 GM1	1	mmm	$\mathrm{A_g}$
L16.2.1 GM2	1	mmm	$\mathrm{B1_g}$
L16.2.2 R1	0	-	-
L16.2.3 S1	0	-	-
L16.2.4 X1	0	-	-
L16.2.5 X2	0	-	-

TABLE S47: Coplanar SSGs with parent space group $P222$ (No. 16).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P16.1.1 GM1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{A_u}$
P16.2.1 GM2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
P16.2.2 R1	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P16.2.3 S1	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P16.2.4 X1	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P16.2.5 X2	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P16.3.1 $\mathrm{GM2} \oplus \mathrm{GM2}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
P16.3.2 $\mathrm{GM2} \oplus \mathrm{GM3}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
P16.3.3 $\mathrm{GM2} \oplus \mathrm{R1}$	$\surd$	1	1	$\times$	-	-
P16.3.4 $\mathrm{GM2} \oplus \mathrm{S1}$	$\surd$	1	1	$\times$	-	-
P16.3.5 $\mathrm{GM2} \oplus \mathrm{T1}$	$\surd$	1	1	$\times$	-	-
P16.3.6 $\mathrm{GM2} \oplus \mathrm{X1}$	$\surd$	1	1	$\times$	-	-
P16.3.7 $\mathrm{GM2} \oplus \mathrm{Z1}$	$\surd$	1	1	$\times$	-	-
P16.3.8 $\mathrm{GM2} \oplus \mathrm{X2}$	$\surd$	1	1	$\times$	-	-
P16.3.9 $\mathrm{GM2} \oplus \mathrm{Z3}$	$\surd$	1	1	$\times$	-	-
P16.3.10 $\mathrm{R1} \oplus \mathrm{R1}$	$\surd$	1	1	$\times$	-	-
P16.3.11 $\mathrm{R1} \oplus \mathrm{R2}$	$\surd$	1	1	$\times$	-	-
P16.3.12 $\mathrm{R1} \oplus \mathrm{S1}$	$\times$	-	-	-	-	-

Coplanar SSGs with parent space group $P222$ (No. 16) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P16.3.13 R1 $\oplus$ S3	$\times$	-	-	-	-	-
P16.3.14 R1 $\oplus$ X1	$\times$	-	-	-	-	-
P16.3.15 R1 $\oplus$ X2	$\times$	-	-	-	-	-
P16.3.16 S1 $\oplus$ S1	$\surd$	1	1	$\times$	-	-
P16.3.17 S1 $\oplus$ S2	$\surd$	1	1	$\times$	-	-
P16.3.18 S1 $\oplus$ S3	$\surd$	1	1	$\times$	-	-
P16.3.19 S1 $\oplus$ T1	$\times$	-	-	-	-	-
P16.3.20 S1 $\oplus$ T3	$\times$	-	-	-	-	-
P16.3.21 S1 $\oplus$ X1	$\times$	-	-	-	-	-
P16.3.22 S1 $\oplus$ X3	$\times$	-	-	-	-	-
P16.3.23 S1 $\oplus$ Z1	$\times$	-	-	-	-	-
P16.3.24 S1 $\oplus$ X2	$\times$	-	-	-	-	-
P16.3.25 S1 $\oplus$ X4	$\times$	-	-	-	-	-
P16.3.26 S1 $\oplus$ Z3	$\times$	-	-	-	-	-
P16.3.27 X1 $\oplus$ X1	$\surd$	1	1	$\times$	-	-
P16.3.28 X1 $\oplus$ X3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P16.3.29 X1 $\oplus$ Y1	$\times$	-	-	-	-	-
P16.3.30 X1 $\oplus$ X2	$\surd$	1	1	$\times$	-	-
P16.3.31 X1 $\oplus$ Y2	$\times$	-	-	-	-	-
P16.3.32 X2 $\oplus$ X2	$\surd$	1	1	$\times$	-	-
P16.3.33 X2 $\oplus$ X4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P16.3.34 X2 $\oplus$ Y2	$\times$	-	-	-	-	-
P16.8.1 DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P16.8.2 DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P16.8.3 A1	$\surd$	1	1	$\times$	-	-
P16.8.4 E1	$\surd$	1	1	$\times$	-	-

TABLE S48: Non-coplanar SSGs with parent space group $P222$ (No. 16).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N16.1.1 GM1	$\surd$	3	3	$\surd$	222	A1 $\oplus$ A1 $\oplus$ A1
N16.2.1 GM2	$\surd$	3	3	$\surd$	$mm2$	A1 $\oplus$ A1 $\oplus$ A2
N16.2.2 R1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{A_u}$
N16.2.3 S1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{A_u}$
N16.2.4 X1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{A_u}$
N16.2.5 X2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{A_u}$
N16.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	222	A1 $\oplus$ B1 $\oplus$ B1
N16.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$mm2$	A1 $\oplus$ B2 $\oplus$ B1
N16.3.3 GM2 $\oplus$ R1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N16.3.4 GM2 $\oplus$ S1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N16.3.5 GM2 $\oplus$ T1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N16.3.6 GM2 $\oplus$ X1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N16.3.7 GM2 $\oplus$ Z1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N16.3.8 GM2 $\oplus$ X2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N16.3.9 GM2 $\oplus$ Z3	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N16.3.10 R1 $\oplus$ R1	$\surd$	1	1	$\surd$	222	A1

Non-coplanar SSGs with parent space group $P222$ (No. 16) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N16.3.11 R1 ⊕ R2	√	1	1	√	$mm2$	A1
N16.3.12 R1 ⊕ S1	√	1	1	√	mmm	$\mathrm{A_g}$
N16.3.13 R1 ⊕ S3	√	1	1	√	mmm	$\mathrm{A_g}$
N16.3.14 R1 ⊕ X1	√	1	1	√	mmm	$\mathrm{A_g}$
N16.3.15 R1 ⊕ X2	√	1	1	√	mmm	$\mathrm{A_g}$
N16.3.16 S1 ⊕ S1	√	1	1	√	222	A1
N16.3.17 S1 ⊕ S2	√	1	1	√	$mm2$	A1
N16.3.18 S1 ⊕ S3	√	1	1	√	$mm2$	A1
N16.3.19 S1 ⊕ T1	√	1	1	√	mmm	$\mathrm{A_g}$
N16.3.20 S1 ⊕ T3	√	1	1	√	mmm	$\mathrm{A_g}$
N16.3.21 S1 ⊕ X1	√	1	1	√	mmm	$\mathrm{A_g}$
N16.3.22 S1 ⊕ X3	√	1	1	√	mmm	$\mathrm{A_g}$
N16.3.23 S1 ⊕ Z1	√	1	1	√	mmm	$\mathrm{A_g}$
N16.3.24 S1 ⊕ X2	√	1	1	√	mmm	$\mathrm{A_g}$
N16.3.25 S1 ⊕ X4	√	1	1	√	mmm	$\mathrm{A_g}$
N16.3.26 S1 ⊕ Z3	√	1	1	√	mmm	$\mathrm{A_g}$
N16.3.27 X1 ⊕ X1	√	1	1	√	222	A1
N16.3.28 X1 ⊕ X3	√	1	1	√	$mm2$	A1
N16.3.29 X1 ⊕ Y1	√	1	1	√	mmm	$\mathrm{A_g}$
N16.3.30 X1 ⊕ X2	√	1	1	√	$mm2$	A1
N16.3.31 X1 ⊕ Y2	√	1	1	√	mmm	$\mathrm{A_g}$
N16.3.32 X2 ⊕ X2	√	1	1	√	222	A1
N16.3.33 X2 ⊕ X4	√	1	1	√	$mm2$	A1
N16.3.34 X2 ⊕ Y2	√	1	1	√	mmm	$\mathrm{A_g}$
N16.8.1 DT1	√	1	1	√	$mm2$	A1
N16.8.2 DT2	√	1	1	√	$mm2$	A1
N16.8.3 A1	√	1	1	√	$mm2$	A1
N16.8.4 E1	√	1	1	√	$mm2$	A1
N16.9.1 GM2 ⊕ GM2 ⊕ GM2	√	3	3	√	$mm2$	A2 ⊕ A2 ⊕ A2
N16.9.2 GM2 ⊕ GM2 ⊕ GM3	√	3	3	√	$mm2$	A2 ⊕ B2 ⊕ B2
N16.9.3 GM2 ⊕ GM3 ⊕ GM4	√	3	3	√	222	B1 ⊕ B3 ⊕ B2
N16.9.4 GM2 ⊕ GM2 ⊕ R1	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N16.9.5 GM2 ⊕ GM3 ⊕ R1	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N16.9.6 GM2 ⊕ GM2 ⊕ S1	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N16.9.7 GM2 ⊕ GM2 ⊕ T1	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N16.9.8 GM2 ⊕ GM3 ⊕ S1	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N16.9.9 GM2 ⊕ GM3 ⊕ U1	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N16.9.10 GM2 ⊕ GM2 ⊕ X1	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N16.9.11 GM2 ⊕ GM2 ⊕ Z1	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N16.9.12 GM2 ⊕ GM3 ⊕ X1	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N16.9.13 GM2 ⊕ GM3 ⊕ Y1	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N16.9.14 GM2 ⊕ GM2 ⊕ X2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N16.9.15 GM2 ⊕ GM2 ⊕ Z3	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N16.9.16 GM2 ⊕ GM3 ⊕ X2	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N16.9.17 GM2 ⊕ GM3 ⊕ Y2	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N16.9.18 GM2 ⊕ R1 ⊕ R1	√	1	1	×	-	-

Non-coplanar SSGs with parent space group $P222$ (No. 16) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N16.9.19 GM2 ⊕ R1 ⊕ R2	√	1	1	×	-	-
N16.9.20 GM2 ⊕ R1 ⊕ R3	√	1	1	×	-	-
N16.9.21 GM2 ⊕ R1 ⊕ S1	√	1	1	×	-	-
N16.9.22 GM2 ⊕ R1 ⊕ S3	√	1	1	×	-	-
N16.9.23 GM2 ⊕ R1 ⊕ T1	√	1	1	×	-	-
N16.9.24 GM2 ⊕ R1 ⊕ T2	√	1	1	×	-	-
N16.9.25 GM2 ⊕ R1 ⊕ X1	√	1	1	×	-	-
N16.9.26 GM2 ⊕ R1 ⊕ Z1	√	1	1	×	-	-
N16.9.27 GM2 ⊕ R1 ⊕ X2	√	1	1	×	-	-
N16.9.28 GM2 ⊕ R1 ⊕ Z3	√	1	1	×	-	-
N16.9.29 GM2 ⊕ S1 ⊕ S1	√	1	1	×	-	-
N16.9.30 GM2 ⊕ S1 ⊕ S2	√	1	1	×	-	-
N16.9.31 GM2 ⊕ S1 ⊕ S3	√	1	1	×	-	-
N16.9.32 GM2 ⊕ S1 ⊕ T1	√	1	1	×	-	-
N16.9.33 GM2 ⊕ S1 ⊕ T3	√	1	1	×	-	-
N16.9.34 GM2 ⊕ T1 ⊕ T1	√	1	1	×	-	-
N16.9.35 GM2 ⊕ T1 ⊕ T2	√	1	1	×	-	-
N16.9.36 GM2 ⊕ T1 ⊕ T3	√	1	1	×	-	-
N16.9.37 GM2 ⊕ T1 ⊕ T4	√	1	1	×	-	-
N16.9.38 GM2 ⊕ T1 ⊕ U1	√	1	1	×	-	-
N16.9.39 GM2 ⊕ T1 ⊕ U2	√	1	1	×	-	-
N16.9.40 GM2 ⊕ S1 ⊕ X1	√	1	1	×	-	-
N16.9.41 GM2 ⊕ S1 ⊕ X3	√	1	1	×	-	-
N16.9.42 GM2 ⊕ S1 ⊕ Z1	√	1	1	×	-	-
N16.9.43 GM2 ⊕ T1 ⊕ X1	√	1	1	×	-	-
N16.9.44 GM2 ⊕ T1 ⊕ Y1	√	1	1	×	-	-
N16.9.45 GM2 ⊕ T1 ⊕ Y4	√	1	1	×	-	-
N16.9.46 GM2 ⊕ T1 ⊕ Z1	√	1	1	×	-	-
N16.9.47 GM2 ⊕ T1 ⊕ Z2	√	1	1	×	-	-
N16.9.48 GM2 ⊕ S1 ⊕ X2	√	1	1	×	-	-
N16.9.49 GM2 ⊕ S1 ⊕ X4	√	1	1	×	-	-
N16.9.50 GM2 ⊕ S1 ⊕ Z3	√	1	1	×	-	-
N16.9.51 GM2 ⊕ T1 ⊕ X2	√	1	1	×	-	-
N16.9.52 GM2 ⊕ T1 ⊕ Y2	√	1	1	×	-	-
N16.9.53 GM2 ⊕ T1 ⊕ Y3	√	1	1	×	-	-
N16.9.54 GM2 ⊕ T1 ⊕ Z3	√	1	1	×	-	-
N16.9.55 GM2 ⊕ T1 ⊕ Z4	√	1	1	×	-	-
N16.9.56 GM2 ⊕ X1 ⊕ X1	√	1	1	×	-	-
N16.9.57 GM2 ⊕ X1 ⊕ X3	√	1	1	√	$mm2$	B1
N16.9.58 GM2 ⊕ X1 ⊕ Y1	√	1	1	√	mmm	$\mathrm{B1_g}$
N16.9.59 GM2 ⊕ X1 ⊕ Z1	√	1	1	×	-	-
N16.9.60 GM2 ⊕ Z1 ⊕ Z1	√	1	1	×	-	-
N16.9.61 GM2 ⊕ Z1 ⊕ Z2	√	1	1	√	222	B1
N16.9.62 GM2 ⊕ X1 ⊕ X2	√	1	1	×	-	-
N16.9.63 GM2 ⊕ X1 ⊕ X4	√	1	1	×	-	-
N16.9.64 GM2 ⊕ X1 ⊕ Y2	√	1	1	√	mmm	$\mathrm{B1_g}$

Non-coplanar SSGs with parent space group $P222$ (No. 16) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N16.9.65 GM2 ⊕ X1 ⊕ Z3	√	1	1	×	-	-
N16.9.66 GM2 ⊕ Z1 ⊕ X2	√	1	1	×	-	-
N16.9.67 GM2 ⊕ Z1 ⊕ Z3	√	1	1	×	-	-
N16.9.68 GM2 ⊕ X2 ⊕ X2	√	1	1	×	-	-
N16.9.69 GM2 ⊕ X2 ⊕ X4	√	1	1	√	$mm2$	B1
N16.9.70 GM2 ⊕ X2 ⊕ Y2	√	1	1	√	mmm	$\mathrm{B1_g}$
N16.9.71 GM2 ⊕ X2 ⊕ Z3	√	1	1	×	-	-
N16.9.72 GM2 ⊕ Z3 ⊕ Z3	√	1	1	×	-	-
N16.9.73 GM2 ⊕ Z3 ⊕ Z4	√	1	1	√	222	B1
N16.9.74 R1 ⊕ R1 ⊕ R1	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{A_u}$
N16.9.75 R1 ⊕ R1 ⊕ R2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N16.9.76 R1 ⊕ R2 ⊕ R3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N16.9.77 R1 ⊕ R1 ⊕ S1	√	1	1	×	-	-
N16.9.78 R1 ⊕ R1 ⊕ S3	√	1	1	×	-	-
N16.9.79 R1 ⊕ R2 ⊕ S1	√	1	1	√	mmm	$\mathrm{B1_u}$
N16.9.80 R1 ⊕ R2 ⊕ S3	√	1	1	√	mmm	$\mathrm{B1_u}$
N16.9.81 R1 ⊕ R2 ⊕ T1	√	1	1	×	-	-
N16.9.82 R1 ⊕ R1 ⊕ X1	√	1	1	×	-	-
N16.9.83 R1 ⊕ R2 ⊕ X1	√	1	1	×	-	-
N16.9.84 R1 ⊕ R2 ⊕ Z1	√	1	1	×	-	-
N16.9.85 R1 ⊕ R1 ⊕ X2	√	1	1	×	-	-
N16.9.86 R1 ⊕ R2 ⊕ X2	√	1	1	×	-	-
N16.9.87 R1 ⊕ R2 ⊕ Z3	√	1	1	×	-	-
N16.9.88 R1 ⊕ S1 ⊕ S1	√	1	1	×	-	-
N16.9.89 R1 ⊕ S1 ⊕ S2	√	1	1	√	mmm	$\mathrm{B1_u}$
N16.9.90 R1 ⊕ S1 ⊕ S3	√	1	1	×	-	-
N16.9.91 R1 ⊕ S1 ⊕ T1	×	-	-	-	-	-
N16.9.92 R1 ⊕ S1 ⊕ T2	×	-	-	-	-	-
N16.9.93 R1 ⊕ S1 ⊕ T3	×	-	-	-	-	-
N16.9.94 R1 ⊕ S1 ⊕ T4	×	-	-	-	-	-
N16.9.95 R1 ⊕ S3 ⊕ S3	√	1	1	×	-	-
N16.9.96 R1 ⊕ S3 ⊕ S4	√	1	1	√	mmm	$\mathrm{B1_u}$
N16.9.97 R1 ⊕ S3 ⊕ T2	×	-	-	-	-	-
N16.9.98 R1 ⊕ S3 ⊕ T4	×	-	-	-	-	-
N16.9.99 R1 ⊕ S1 ⊕ X1	×	-	-	-	-	-
N16.9.100 R1 ⊕ S1 ⊕ X3	×	-	-	-	-	-
N16.9.101 R1 ⊕ S1 ⊕ Z1	×	-	-	-	-	-
N16.9.102 R1 ⊕ S1 ⊕ Z2	×	-	-	-	-	-
N16.9.103 R1 ⊕ S3 ⊕ X1	×	-	-	-	-	-
N16.9.104 R1 ⊕ S3 ⊕ X3	×	-	-	-	-	-
N16.9.105 R1 ⊕ S3 ⊕ Z1	×	-	-	-	-	-
N16.9.106 R1 ⊕ S1 ⊕ X2	×	-	-	-	-	-
N16.9.107 R1 ⊕ S1 ⊕ X4	×	-	-	-	-	-
N16.9.108 R1 ⊕ S1 ⊕ Z3	×	-	-	-	-	-
N16.9.109 R1 ⊕ S3 ⊕ X2	×	-	-	-	-	-
N16.9.110 R1 ⊕ S3 ⊕ X4	×	-	-	-	-	-

Non-coplanar SSGs with parent space group $P222$ (No. 16) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N16.9.111 R1 ⊕ S3 ⊕ Z3	×	-	-	-	-	-
N16.9.112 R1 ⊕ S3 ⊕ Z4	×	-	-	-	-	-
N16.9.113 R1 ⊕ X1 ⊕ X1	√	1	1	×	-	-
N16.9.114 R1 ⊕ X1 ⊕ X3	√	1	1	√	mmm	$\mathrm{B3_u}$
N16.9.115 R1 ⊕ X1 ⊕ Y1	×	-	-	-	-	-
N16.9.116 R1 ⊕ X1 ⊕ Y4	×	-	-	-	-	-
N16.9.117 R1 ⊕ X1 ⊕ X2	√	1	1	×	-	-
N16.9.118 R1 ⊕ X1 ⊕ Y2	×	-	-	-	-	-
N16.9.119 R1 ⊕ X1 ⊕ Y3	×	-	-	-	-	-
N16.9.120 R1 ⊕ X2 ⊕ X2	√	1	1	×	-	-
N16.9.121 R1 ⊕ X2 ⊕ X4	√	1	1	√	mmm	$\mathrm{B3_u}$
N16.9.122 R1 ⊕ X2 ⊕ Y2	×	-	-	-	-	-
N16.9.123 R1 ⊕ X2 ⊕ Y3	×	-	-	-	-	-
N16.9.124 S1 ⊕ S1 ⊕ S1	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{A_u}$
N16.9.125 S1 ⊕ S1 ⊕ S2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N16.9.126 S1 ⊕ S1 ⊕ S3	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N16.9.127 S1 ⊕ S1 ⊕ T1	√	1	1	×	-	-
N16.9.128 S1 ⊕ S1 ⊕ T3	√	1	1	×	-	-
N16.9.129 S1 ⊕ S2 ⊕ S3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N16.9.130 S1 ⊕ S2 ⊕ T1	√	1	1	×	-	-
N16.9.131 S1 ⊕ S3 ⊕ T1	√	1	1	×	-	-
N16.9.132 S1 ⊕ S3 ⊕ T3	√	1	1	×	-	-
N16.9.133 S1 ⊕ S3 ⊕ U1	√	1	1	×	-	-
N16.9.134 S1 ⊕ T1 ⊕ U1	×	-	-	-	-	-
N16.9.135 S1 ⊕ T1 ⊕ U2	×	-	-	-	-	-
N16.9.136 S1 ⊕ T1 ⊕ U4	×	-	-	-	-	-
N16.9.137 S1 ⊕ T3 ⊕ U3	×	-	-	-	-	-
N16.9.138 S1 ⊕ S1 ⊕ X1	√	1	1	×	-	-
N16.9.139 S1 ⊕ S1 ⊕ X3	√	1	1	×	-	-
N16.9.140 S1 ⊕ S1 ⊕ Z1	√	1	1	×	-	-
N16.9.141 S1 ⊕ S2 ⊕ X1	√	1	1	×	-	-
N16.9.142 S1 ⊕ S2 ⊕ Z1	√	1	1	×	-	-
N16.9.143 S1 ⊕ S3 ⊕ X1	√	1	1	×	-	-
N16.9.144 S1 ⊕ S3 ⊕ Y1	√	1	1	√	mmm	$\mathrm{B3_u}$
N16.9.145 S1 ⊕ S3 ⊕ Y4	√	1	1	√	mmm	$\mathrm{B3_u}$
N16.9.146 S1 ⊕ S3 ⊕ Z1	√	1	1	×	-	-
N16.9.147 S1 ⊕ T1 ⊕ X1	×	-	-	-	-	-
N16.9.148 S1 ⊕ T1 ⊕ X3	×	-	-	-	-	-
N16.9.149 S1 ⊕ T1 ⊕ Y1	×	-	-	-	-	-
N16.9.150 S1 ⊕ T1 ⊕ Y4	×	-	-	-	-	-
N16.9.151 S1 ⊕ T3 ⊕ X1	×	-	-	-	-	-
N16.9.152 S1 ⊕ T3 ⊕ X3	×	-	-	-	-	-
N16.9.153 S1 ⊕ T3 ⊕ Y1	×	-	-	-	-	-
N16.9.154 S1 ⊕ S1 ⊕ X2	√	1	1	×	-	-
N16.9.155 S1 ⊕ S1 ⊕ X4	√	1	1	×	-	-
N16.9.156 S1 ⊕ S1 ⊕ Z3	√	1	1	×	-	-

Non-coplanar SSGs with parent space group $P222$ (No. 16) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N16.9.157 S1 ⊕ S2 ⊕ X2	√	1	1	×	-	-
N16.9.158 S1 ⊕ S2 ⊕ Z3	√	1	1	×	-	-
N16.9.159 S1 ⊕ S3 ⊕ X2	√	1	1	×	-	-
N16.9.160 S1 ⊕ S3 ⊕ Y2	√	1	1	√	mmm	$\mathrm{B3_u}$
N16.9.161 S1 ⊕ S3 ⊕ Y3	√	1	1	√	mmm	$\mathrm{B3_u}$
N16.9.162 S1 ⊕ S3 ⊕ Z3	√	1	1	×	-	-
N16.9.163 S1 ⊕ T1 ⊕ X2	×	-	-	-	-	-
N16.9.164 S1 ⊕ T1 ⊕ X4	×	-	-	-	-	-
N16.9.165 S1 ⊕ T1 ⊕ Y2	×	-	-	-	-	-
N16.9.166 S1 ⊕ T3 ⊕ X2	×	-	-	-	-	-
N16.9.167 S1 ⊕ T3 ⊕ X4	×	-	-	-	-	-
N16.9.168 S1 ⊕ T3 ⊕ Y2	×	-	-	-	-	-
N16.9.169 S1 ⊕ T3 ⊕ Y3	×	-	-	-	-	-
N16.9.170 S1 ⊕ X1 ⊕ X1	√	1	1	×	-	-
N16.9.171 S1 ⊕ X1 ⊕ X3	√	1	1	√	mmm	$\mathrm{B3_u}$
N16.9.172 S1 ⊕ X1 ⊕ Y1	×	-	-	-	-	-
N16.9.173 S1 ⊕ X1 ⊕ Y4	×	-	-	-	-	-
N16.9.174 S1 ⊕ X1 ⊕ Z1	×	-	-	-	-	-
N16.9.175 S1 ⊕ X3 ⊕ X3	√	1	1	×	-	-
N16.9.176 S1 ⊕ X3 ⊕ Y4	×	-	-	-	-	-
N16.9.177 S1 ⊕ X3 ⊕ Z1	×	-	-	-	-	-
N16.9.178 S1 ⊕ Z1 ⊕ Z1	√	1	1	×	-	-
N16.9.179 S1 ⊕ Z1 ⊕ Z2	√	1	1	√	mmm	$\mathrm{B1_u}$
N16.9.180 S1 ⊕ X1 ⊕ X2	√	1	1	×	-	-
N16.9.181 S1 ⊕ X1 ⊕ X4	√	1	1	√	mmm	$\mathrm{B2_u}$
N16.9.182 S1 ⊕ X1 ⊕ Y2	×	-	-	-	-	-
N16.9.183 S1 ⊕ X1 ⊕ Y3	×	-	-	-	-	-
N16.9.184 S1 ⊕ X1 ⊕ Z3	×	-	-	-	-	-
N16.9.185 S1 ⊕ X3 ⊕ X2	√	1	1	√	mmm	$\mathrm{B2_u}$
N16.9.186 S1 ⊕ X3 ⊕ X4	√	1	1	×	-	-
N16.9.187 S1 ⊕ X3 ⊕ Y2	×	-	-	-	-	-
N16.9.188 S1 ⊕ X3 ⊕ Y3	×	-	-	-	-	-
N16.9.189 S1 ⊕ X3 ⊕ Z3	×	-	-	-	-	-
N16.9.190 S1 ⊕ Z1 ⊕ X2	×	-	-	-	-	-
N16.9.191 S1 ⊕ Z1 ⊕ X4	×	-	-	-	-	-
N16.9.192 S1 ⊕ Z1 ⊕ Z3	√	1	1	×	-	-
N16.9.193 S1 ⊕ X2 ⊕ X2	√	1	1	×	-	-
N16.9.194 S1 ⊕ X2 ⊕ X4	√	1	1	√	mmm	$\mathrm{B3_u}$
N16.9.195 S1 ⊕ X2 ⊕ Y2	×	-	-	-	-	-
N16.9.196 S1 ⊕ X2 ⊕ Y3	×	-	-	-	-	-
N16.9.197 S1 ⊕ X2 ⊕ Z3	×	-	-	-	-	-
N16.9.198 S1 ⊕ X4 ⊕ X4	√	1	1	×	-	-
N16.9.199 S1 ⊕ X4 ⊕ Y3	×	-	-	-	-	-
N16.9.200 S1 ⊕ X4 ⊕ Z3	×	-	-	-	-	-
N16.9.201 S1 ⊕ Z3 ⊕ Z3	√	1	1	×	-	-
N16.9.202 S1 ⊕ Z3 ⊕ Z4	√	1	1	√	mmm	$\mathrm{B1_u}$

Non-coplanar SSGs with parent space group $P222$ (No. 16) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N16.9.203 X1 ⊕ X1 ⊕ X1	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{A_u}$
N16.9.204 X1 ⊕ X1 ⊕ X3	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N16.9.205 X1 ⊕ X1 ⊕ Y1	√	1	1	×	-	-
N16.9.206 X1 ⊕ X3 ⊕ Y1	√	1	1	√	mmm	$\mathrm{B3_u}$
N16.9.207 X1 ⊕ Y1 ⊕ Z1	×	-	-	-	-	-
N16.9.208 X1 ⊕ X1 ⊕ X2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N16.9.209 X1 ⊕ X1 ⊕ Y2	√	1	1	×	-	-
N16.9.210 X1 ⊕ X3 ⊕ X2	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N16.9.211 X1 ⊕ X3 ⊕ Y2	√	1	1	√	mmm	$\mathrm{B3_u}$
N16.9.212 X1 ⊕ Y1 ⊕ X2	√	1	1	×	-	-
N16.9.213 X1 ⊕ Y1 ⊕ X4	√	1	1	×	-	-
N16.9.214 X1 ⊕ Y1 ⊕ Z3	×	-	-	-	-	-
N16.9.215 X1 ⊕ X2 ⊕ X2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N16.9.216 X1 ⊕ X2 ⊕ X4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N16.9.217 X1 ⊕ X2 ⊕ Y2	√	1	1	×	-	-
N16.9.218 X1 ⊕ X2 ⊕ Z3	√	1	1	×	-	-
N16.9.219 X1 ⊕ Y2 ⊕ Y2	√	1	1	×	-	-
N16.9.220 X1 ⊕ Y2 ⊕ Y3	√	1	1	√	mmm	$\mathrm{B2_u}$
N16.9.221 X1 ⊕ Y2 ⊕ Z3	×	-	-	-	-	-
N16.9.222 X2 ⊕ X2 ⊕ X2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{A_u}$
N16.9.223 X2 ⊕ X2 ⊕ X4	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N16.9.224 X2 ⊕ X2 ⊕ Y2	√	1	1	×	-	-
N16.9.225 X2 ⊕ X4 ⊕ Y2	√	1	1	√	mmm	$\mathrm{B3_u}$
N16.9.226 X2 ⊕ Y2 ⊕ Z3	×	-	-	-	-	-
N16.14.1 GM2 ⊕ DT1	√	1	1	√	$mm2$	B2
N16.14.2 GM2 ⊕ LD1	√	1	1	√	222	B1
N16.14.3 GM2 ⊕ DT2	√	1	1	√	$mm2$	B2
N16.14.4 GM2 ⊕ LD2	√	1	1	√	222	B1
N16.14.5 GM2 ⊕ A1	√	1	1	×	-	-
N16.14.6 GM2 ⊕ C1	√	1	1	×	-	-
N16.14.7 GM2 ⊕ G1	√	1	1	×	-	-
N16.14.8 GM2 ⊕ E1	√	1	1	×	-	-
N16.14.9 GM2 ⊕ Q1	√	1	1	×	-	-
N16.14.10 R1 ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N16.14.11 R1 ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
N16.14.12 R1 ⊕ A1	√	1	1	×	-	-
N16.14.13 R1 ⊕ E1	√	1	1	√	mmm	$\mathrm{B3_u}$
N16.14.14 R1 ⊕ E2	√	1	1	√	mmm	$\mathrm{B3_u}$
N16.14.15 S1 ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N16.14.16 S1 ⊕ LD1	√	1	1	√	mmm	$\mathrm{B1_u}$
N16.14.17 S1 ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
N16.14.18 S1 ⊕ LD2	√	1	1	√	mmm	$\mathrm{B1_u}$
N16.14.19 S1 ⊕ A1	√	1	1	×	-	-
N16.14.20 S1 ⊕ C1	√	1	1	√	mmm	$\mathrm{B3_u}$
N16.14.21 S1 ⊕ C2	√	1	1	√	mmm	$\mathrm{B3_u}$
N16.14.22 S1 ⊕ G1	√	1	1	×	-	-

Non-coplanar SSGs with parent space group $P222$ (No. 16) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N16.14.23 S1 $\oplus$ G2	$\surd$	1	1	$\times$	-	-
N16.14.24 S1 $\oplus$ E1	$\surd$	1	1	$\times$	-	-
N16.14.25 S1 $\oplus$ Q1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N16.14.26 S1 $\oplus$ Q2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N16.14.27 X1 $\oplus$ SM1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N16.14.28 X1 $\oplus$ DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N16.14.29 X1 $\oplus$ SM2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N16.14.30 X1 $\oplus$ DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N16.14.31 X1 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
N16.14.32 X1 $\oplus$ B1	$\surd$	1	1	$\times$	-	-
N16.14.33 X1 $\oplus$ D1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N16.14.34 X1 $\oplus$ D2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N16.14.35 X1 $\oplus$ E1	$\surd$	1	1	$\times$	-	-
N16.14.36 X1 $\oplus$ P1	$\surd$	1	1	$\times$	-	-
N16.14.37 X2 $\oplus$ SM1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N16.14.38 X2 $\oplus$ DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N16.14.39 X2 $\oplus$ SM2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N16.14.40 X2 $\oplus$ DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N16.14.41 X2 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
N16.14.42 X2 $\oplus$ B1	$\surd$	1	1	$\times$	-	-
N16.14.43 X2 $\oplus$ D1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N16.14.44 X2 $\oplus$ D2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N16.14.45 X2 $\oplus$ E1	$\surd$	1	1	$\times$	-	-
N16.14.46 X2 $\oplus$ P1	$\surd$	1	1	$\times$	-	-

TABLE S49: Collinear SSGs with parent space group $P222_1$ (No. 17).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L17.1.1 GM1	1	mmm	$\mathrm{A_g}$
L17.2.1 GM2	1	mmm	$\mathrm{B1_g}$
L17.2.2 GM3	1	mmm	$\mathrm{B3_g}$
L17.2.3 S1	0	-	-
L17.2.4 X1	0	-	-
L17.2.5 X2	0	-	-

TABLE S50: Coplanar SSGs with parent space group $P222_1$ (No. 17).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P17.1.1 GM1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{A_u}$
P17.2.1 GM2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
P17.2.2 GM3	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
P17.2.3 S1	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P17.2.4 X1	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P17.2.5 X2	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$

Coplanar SSGs with parent space group $P222_1$ (No. 17) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P17.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
P17.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
P17.3.3 GM2 $\oplus$ S1	$\surd$	1	1	$\times$	-	-
P17.3.4 GM2 $\oplus$ X1	$\surd$	1	1	$\times$	-	-
P17.3.5 GM2 $\oplus$ X2	$\surd$	1	1	$\times$	-	-
P17.3.6 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
P17.3.7 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
P17.3.8 GM3 $\oplus$ S1	$\surd$	1	1	$\times$	-	-
P17.3.9 GM3 $\oplus$ X1	$\surd$	1	1	$\times$	-	-
P17.3.10 GM3 $\oplus$ Y1	$\surd$	1	1	$\times$	-	-
P17.3.11 GM3 $\oplus$ X2	$\surd$	1	1	$\times$	-	-
P17.3.12 GM3 $\oplus$ Y2	$\surd$	1	1	$\times$	-	-
P17.3.13 S1 $\oplus$ S1	$\surd$	1	1	$\times$	-	-
P17.3.14 S1 $\oplus$ S2	$\surd$	1	1	$\times$	-	-
P17.3.15 S1 $\oplus$ S3	$\surd$	1	1	$\times$	-	-
P17.3.16 S1 $\oplus$ X1	$\times$	-	-	-	-	-
P17.3.17 S1 $\oplus$ X3	$\times$	-	-	-	-	-
P17.3.18 S1 $\oplus$ X2	$\times$	-	-	-	-	-
P17.3.19 S1 $\oplus$ X4	$\times$	-	-	-	-	-
P17.3.20 X1 $\oplus$ X1	$\surd$	1	1	$\times$	-	-
P17.3.21 X1 $\oplus$ X3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P17.3.22 X1 $\oplus$ Y1	$\times$	-	-	-	-	-
P17.3.23 X1 $\oplus$ X2	$\surd$	1	1	$\times$	-	-
P17.3.24 X1 $\oplus$ X4	$\surd$	1	1	$\times$	-	-
P17.3.25 X1 $\oplus$ Y2	$\times$	-	-	-	-	-
P17.3.26 X2 $\oplus$ X2	$\surd$	1	1	$\times$	-	-
P17.3.27 X2 $\oplus$ X4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P17.3.28 X2 $\oplus$ Y2	$\times$	-	-	-	-	-
P17.6.1 R1	$\surd$	1	1	$\times$	-	-
P17.6.2 T1	$\surd$	1	1	$\times$	-	-
P17.6.3 Z1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P17.8.1 DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P17.8.2 DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P17.8.3 C1	$\surd$	1	1	$\times$	-	-
P17.8.4 LD1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P17.8.5 G1	$\surd$	1	1	$\times$	-	-
P17.8.6 Q1	$\surd$	1	1	$\times$	-	-

TABLE S51: Non-coplanar SSGs with parent space group $P222_1$ (No. 17).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N17.1.1 GM1	$\surd$	3	3	$\surd$	222	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{A1}$
N17.2.1 GM2	$\surd$	3	3	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{A2}$
N17.2.2 GM3	$\surd$	3	3	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{A2}$
N17.2.3 S1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{A_u}$
N17.2.4 X1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{A_u}$

Non-coplanar SSGs with parent space group $P222_1$ (No. 17) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N17.2.5 X2	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{A_u}$
N17.3.1 GM2 ⊕ GM2	√	3	3	√	222	A1 ⊕ B1 ⊕ B1
N17.3.2 GM2 ⊕ GM3	√	3	3	√	$mm2$	A1 ⊕ B2 ⊕ B1
N17.3.3 GM2 ⊕ S1	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N17.3.4 GM2 ⊕ X1	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N17.3.5 GM2 ⊕ X2	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N17.3.6 GM3 ⊕ GM3	√	3	3	√	222	A1 ⊕ B3 ⊕ B3
N17.3.7 GM3 ⊕ GM4	√	3	3	√	$mm2$	A1 ⊕ B2 ⊕ B1
N17.3.8 GM3 ⊕ S1	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N17.3.9 GM3 ⊕ X1	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N17.3.10 GM3 ⊕ Y1	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N17.3.11 GM3 ⊕ X2	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N17.3.12 GM3 ⊕ Y2	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N17.3.13 S1 ⊕ S1	√	1	1	√	222	A1
N17.3.14 S1 ⊕ S2	√	1	1	√	$mm2$	A1
N17.3.15 S1 ⊕ S3	√	1	1	√	$mm2$	A1
N17.3.16 S1 ⊕ X1	√	1	1	√	mmm	$\mathrm{A_g}$
N17.3.17 S1 ⊕ X3	√	1	1	√	mmm	$\mathrm{A_g}$
N17.3.18 S1 ⊕ X2	√	1	1	√	mmm	$\mathrm{A_g}$
N17.3.19 S1 ⊕ X4	√	1	1	√	mmm	$\mathrm{A_g}$
N17.3.20 X1 ⊕ X1	√	1	1	√	222	A1
N17.3.21 X1 ⊕ X3	√	1	1	√	$mm2$	A1
N17.3.22 X1 ⊕ Y1	√	1	1	√	mmm	$\mathrm{A_g}$
N17.3.23 X1 ⊕ X2	√	1	1	√	$mm2$	A1
N17.3.24 X1 ⊕ X4	√	1	1	√	$mm2$	A1
N17.3.25 X1 ⊕ Y2	√	1	1	√	mmm	$\mathrm{A_g}$
N17.3.26 X2 ⊕ X2	√	1	1	√	222	A1
N17.3.27 X2 ⊕ X4	√	1	1	√	$mm2$	A1
N17.3.28 X2 ⊕ Y2	√	1	1	√	mmm	$\mathrm{A_g}$
N17.6.1 R1	√	1	1	√	$mm2$	A1
N17.6.2 T1	√	1	1	√	$mm2$	A1
N17.6.3 Z1	√	1	1	√	$mm2$	A1
N17.8.1 DT1	√	1	1	√	$mm2$	A1
N17.8.2 DT2	√	1	1	√	$mm2$	A1
N17.8.3 C1	√	1	1	√	$mm2$	A1
N17.8.4 LD1	√	1	1	√	$mm2$	A1
N17.8.5 G1	√	1	1	√	$mm2$	A1
N17.8.6 Q1	√	1	1	√	$mm2$	A1
N17.9.1 GM2 ⊕ GM2 ⊕ GM2	√	3	3	√	$mm2$	A2 ⊕ A2 ⊕ A2
N17.9.2 GM2 ⊕ GM2 ⊕ GM3	√	3	3	√	$mm2$	A2 ⊕ B2 ⊕ B2
N17.9.3 GM2 ⊕ GM2 ⊕ S1	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N17.9.4 GM2 ⊕ GM2 ⊕ X1	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N17.9.5 GM2 ⊕ GM2 ⊕ X2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N17.9.6 GM2 ⊕ GM3 ⊕ GM3	√	3	3	√	$mm2$	A2 ⊕ B2 ⊕ B2
N17.9.7 GM2 ⊕ GM3 ⊕ GM4	√	3	3	√	222	B1 ⊕ B3 ⊕ B2
N17.9.8 GM2 ⊕ GM3 ⊕ S1	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$

Non-coplanar SSGs with parent space group $P222_1$ (No. 17) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N17.9.9 GM2 ⊕ GM3 ⊕ X1	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N17.9.10 GM2 ⊕ GM3 ⊕ Y1	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N17.9.11 GM2 ⊕ GM3 ⊕ X2	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N17.9.12 GM2 ⊕ GM3 ⊕ Y2	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N17.9.13 GM2 ⊕ S1 ⊕ S1	√	1	1	×	-	-
N17.9.14 GM2 ⊕ S1 ⊕ S2	√	1	1	×	-	-
N17.9.15 GM2 ⊕ S1 ⊕ S3	√	1	1	×	-	-
N17.9.16 GM2 ⊕ S1 ⊕ X1	√	1	1	×	-	-
N17.9.17 GM2 ⊕ S1 ⊕ X3	√	1	1	×	-	-
N17.9.18 GM2 ⊕ S1 ⊕ X2	√	1	1	×	-	-
N17.9.19 GM2 ⊕ S1 ⊕ X4	√	1	1	×	-	-
N17.9.20 GM2 ⊕ X1 ⊕ X1	√	1	1	×	-	-
N17.9.21 GM2 ⊕ X1 ⊕ X3	√	1	1	√	$mm2$	B1
N17.9.22 GM2 ⊕ X1 ⊕ Y1	√	1	1	√	mmm	$\mathrm{B1_g}$
N17.9.23 GM2 ⊕ X1 ⊕ X2	√	1	1	×	-	-
N17.9.24 GM2 ⊕ X1 ⊕ X4	√	1	1	×	-	-
N17.9.25 GM2 ⊕ X1 ⊕ Y2	√	1	1	√	mmm	$\mathrm{B1_g}$
N17.9.26 GM2 ⊕ X2 ⊕ X2	√	1	1	×	-	-
N17.9.27 GM2 ⊕ X2 ⊕ X4	√	1	1	√	$mm2$	B1
N17.9.28 GM2 ⊕ X2 ⊕ Y2	√	1	1	√	mmm	$\mathrm{B1_g}$
N17.9.29 GM3 ⊕ GM3 ⊕ GM3	√	3	3	√	$mm2$	A2 ⊕ A2 ⊕ A2
N17.9.30 GM3 ⊕ GM3 ⊕ GM4	√	3	3	√	$mm2$	A2 ⊕ B2 ⊕ B2
N17.9.31 GM3 ⊕ GM3 ⊕ S1	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N17.9.32 GM3 ⊕ GM4 ⊕ S1	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N17.9.33 GM3 ⊕ GM3 ⊕ X1	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N17.9.34 GM3 ⊕ GM3 ⊕ Y1	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N17.9.35 GM3 ⊕ GM4 ⊕ X1	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N17.9.36 GM3 ⊕ GM3 ⊕ X2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N17.9.37 GM3 ⊕ GM3 ⊕ Y2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N17.9.38 GM3 ⊕ GM4 ⊕ X2	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N17.9.39 GM3 ⊕ S1 ⊕ S1	√	1	1	×	-	-
N17.9.40 GM3 ⊕ S1 ⊕ S2	√	1	1	×	-	-
N17.9.41 GM3 ⊕ S1 ⊕ S3	√	1	1	×	-	-
N17.9.42 GM3 ⊕ S1 ⊕ S4	√	1	1	×	-	-
N17.9.43 GM3 ⊕ S1 ⊕ X1	√	1	1	×	-	-
N17.9.44 GM3 ⊕ S1 ⊕ X3	√	1	1	×	-	-
N17.9.45 GM3 ⊕ S1 ⊕ Y1	√	1	1	×	-	-
N17.9.46 GM3 ⊕ S1 ⊕ Y4	√	1	1	×	-	-
N17.9.47 GM3 ⊕ S1 ⊕ X2	√	1	1	×	-	-
N17.9.48 GM3 ⊕ S1 ⊕ X4	√	1	1	×	-	-
N17.9.49 GM3 ⊕ S1 ⊕ Y2	√	1	1	×	-	-
N17.9.50 GM3 ⊕ S1 ⊕ Y3	√	1	1	×	-	-
N17.9.51 GM3 ⊕ X1 ⊕ X1	√	1	1	×	-	-
N17.9.52 GM3 ⊕ X1 ⊕ X3	√	1	1	√	222	B3
N17.9.53 GM3 ⊕ X1 ⊕ Y1	√	1	1	×	-	-
N17.9.54 GM3 ⊕ Y1 ⊕ Y1	√	1	1	×	-	-

Non-coplanar SSGs with parent space group $P222_1$ (No. 17) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N17.9.55 GM3 ⊕ Y1 ⊕ Y4	√	1	1	√	$mm2$	B2
N17.9.56 GM3 ⊕ X1 ⊕ X2	√	1	1	×	-	-
N17.9.57 GM3 ⊕ X1 ⊕ X4	√	1	1	×	-	-
N17.9.58 GM3 ⊕ X1 ⊕ Y2	√	1	1	×	-	-
N17.9.59 GM3 ⊕ Y1 ⊕ X2	√	1	1	×	-	-
N17.9.60 GM3 ⊕ Y1 ⊕ Y2	√	1	1	×	-	-
N17.9.61 GM3 ⊕ Y1 ⊕ Y3	√	1	1	×	-	-
N17.9.62 GM3 ⊕ X2 ⊕ X2	√	1	1	×	-	-
N17.9.63 GM3 ⊕ X2 ⊕ X4	√	1	1	√	222	B3
N17.9.64 GM3 ⊕ X2 ⊕ Y2	√	1	1	×	-	-
N17.9.65 GM3 ⊕ Y2 ⊕ Y2	√	1	1	×	-	-
N17.9.66 GM3 ⊕ Y2 ⊕ Y3	√	1	1	√	$mm2$	B2
N17.9.67 S1 ⊕ S1 ⊕ S1	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{A_u}$
N17.9.68 S1 ⊕ S1 ⊕ S2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N17.9.69 S1 ⊕ S1 ⊕ S3	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N17.9.70 S1 ⊕ S2 ⊕ S3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N17.9.71 S1 ⊕ S1 ⊕ X1	√	1	1	×	-	-
N17.9.72 S1 ⊕ S1 ⊕ X3	√	1	1	×	-	-
N17.9.73 S1 ⊕ S2 ⊕ X1	√	1	1	×	-	-
N17.9.74 S1 ⊕ S3 ⊕ X1	√	1	1	×	-	-
N17.9.75 S1 ⊕ S3 ⊕ Y1	√	1	1	√	mmm	$\mathrm{B3_u}$
N17.9.76 S1 ⊕ S3 ⊕ Y4	√	1	1	√	mmm	$\mathrm{B3_u}$
N17.9.77 S1 ⊕ S1 ⊕ X2	√	1	1	×	-	-
N17.9.78 S1 ⊕ S1 ⊕ X4	√	1	1	×	-	-
N17.9.79 S1 ⊕ S2 ⊕ X2	√	1	1	×	-	-
N17.9.80 S1 ⊕ S3 ⊕ X2	√	1	1	×	-	-
N17.9.81 S1 ⊕ S3 ⊕ Y2	√	1	1	√	mmm	$\mathrm{B3_u}$
N17.9.82 S1 ⊕ S3 ⊕ Y3	√	1	1	√	mmm	$\mathrm{B3_u}$
N17.9.83 S1 ⊕ X1 ⊕ X1	√	1	1	×	-	-
N17.9.84 S1 ⊕ X1 ⊕ X3	√	1	1	√	mmm	$\mathrm{B3_u}$
N17.9.85 S1 ⊕ X1 ⊕ Y1	×	-	-	-	-	-
N17.9.86 S1 ⊕ X1 ⊕ Y4	×	-	-	-	-	-
N17.9.87 S1 ⊕ X3 ⊕ X3	√	1	1	×	-	-
N17.9.88 S1 ⊕ X3 ⊕ Y4	×	-	-	-	-	-
N17.9.89 S1 ⊕ X1 ⊕ X2	√	1	1	×	-	-
N17.9.90 S1 ⊕ X1 ⊕ X4	√	1	1	√	mmm	$\mathrm{B2_u}$
N17.9.91 S1 ⊕ X1 ⊕ Y2	×	-	-	-	-	-
N17.9.92 S1 ⊕ X1 ⊕ Y3	×	-	-	-	-	-
N17.9.93 S1 ⊕ X3 ⊕ X2	√	1	1	√	mmm	$\mathrm{B2_u}$
N17.9.94 S1 ⊕ X3 ⊕ X4	√	1	1	×	-	-
N17.9.95 S1 ⊕ X3 ⊕ Y2	×	-	-	-	-	-
N17.9.96 S1 ⊕ X3 ⊕ Y3	×	-	-	-	-	-
N17.9.97 S1 ⊕ X2 ⊕ X2	√	1	1	×	-	-
N17.9.98 S1 ⊕ X2 ⊕ X4	√	1	1	√	mmm	$\mathrm{B3_u}$
N17.9.99 S1 ⊕ X2 ⊕ Y2	×	-	-	-	-	-
N17.9.100 S1 ⊕ X2 ⊕ Y3	×	-	-	-	-	-

Non-coplanar SSGs with parent space group $P222_1$ (No. 17) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N17.9.101 S1 ⊕ X4 ⊕ X4	√	1	1	×	-	-
N17.9.102 S1 ⊕ X4 ⊕ Y3	×	-	-	-	-	-
N17.9.103 X1 ⊕ X1 ⊕ X1	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{A_u}$
N17.9.104 X1 ⊕ X1 ⊕ X3	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N17.9.105 X1 ⊕ X1 ⊕ Y1	√	1	1	×	-	-
N17.9.106 X1 ⊕ X3 ⊕ Y1	√	1	1	√	mmm	$\mathrm{B3_u}$
N17.9.107 X1 ⊕ X1 ⊕ X2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N17.9.108 X1 ⊕ X1 ⊕ X4	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N17.9.109 X1 ⊕ X1 ⊕ Y2	√	1	1	×	-	-
N17.9.110 X1 ⊕ X3 ⊕ X2	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N17.9.111 X1 ⊕ X3 ⊕ Y2	√	1	1	√	mmm	$\mathrm{B3_u}$
N17.9.112 X1 ⊕ Y1 ⊕ X2	√	1	1	×	-	-
N17.9.113 X1 ⊕ Y1 ⊕ X4	√	1	1	×	-	-
N17.9.114 X1 ⊕ X2 ⊕ X2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N17.9.115 X1 ⊕ X2 ⊕ X4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N17.9.116 X1 ⊕ X2 ⊕ Y2	√	1	1	×	-	-
N17.9.117 X1 ⊕ X4 ⊕ X4	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N17.9.118 X1 ⊕ X4 ⊕ Y2	√	1	1	×	-	-
N17.9.119 X1 ⊕ Y2 ⊕ Y2	√	1	1	×	-	-
N17.9.120 X1 ⊕ Y2 ⊕ Y3	√	1	1	√	mmm	$\mathrm{B2_u}$
N17.9.121 X2 ⊕ X2 ⊕ X2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{A_u}$
N17.9.122 X2 ⊕ X2 ⊕ X4	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N17.9.123 X2 ⊕ X2 ⊕ Y2	√	1	1	×	-	-
N17.9.124 X2 ⊕ X4 ⊕ Y2	√	1	1	√	mmm	$\mathrm{B3_u}$
N17.12.1 GM2 ⊕ R1	√	1	1	×	-	-
N17.12.2 GM2 ⊕ T1	√	1	1	×	-	-
N17.12.3 GM2 ⊕ Z1	√	1	1	√	222	B1
N17.12.4 GM3 ⊕ R1	√	1	1	×	-	-
N17.12.5 GM3 ⊕ T1	√	1	1	×	-	-
N17.12.6 GM3 ⊕ U1	√	1	1	×	-	-
N17.12.7 GM3 ⊕ Z1	√	1	1	√	$mm2$	B2
N17.12.8 S1 ⊕ R1	√	1	1	√	mmm	$\mathrm{B1_u}$
N17.12.9 S1 ⊕ T1	√	1	1	×	-	-
N17.12.10 S1 ⊕ Z1	√	1	1	√	mmm	$\mathrm{B1_u}$
N17.12.11 X1 ⊕ R1	√	1	1	×	-	-
N17.12.12 X1 ⊕ T1	√	1	1	×	-	-
N17.12.13 X1 ⊕ U1	√	1	1	√	mmm	$\mathrm{B1_u}$
N17.12.14 X1 ⊕ Z1	√	1	1	√	mmm	$\mathrm{B1_u}$
N17.12.15 X2 ⊕ R1	√	1	1	×	-	-
N17.12.16 X2 ⊕ T1	√	1	1	×	-	-
N17.12.17 X2 ⊕ U1	√	1	1	√	mmm	$\mathrm{B1_u}$
N17.12.18 X2 ⊕ Z1	√	1	1	√	mmm	$\mathrm{B1_u}$
N17.14.1 GM2 ⊕ DT1	√	1	1	√	$mm2$	B2
N17.14.2 GM2 ⊕ DT2	√	1	1	√	$mm2$	B2
N17.14.3 GM2 ⊕ C1	√	1	1	×	-	-
N17.14.4 GM2 ⊕ LD1	√	1	1	√	222	B1

Non-coplanar SSGs with parent space group $P222_1$ (No. 17) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N17.14.5 GM2 ⊕ G1	√	1	1	×	-	-
N17.14.6 GM2 ⊕ Q1	√	1	1	×	-	-
N17.14.7 GM3 ⊕ SM1	√	1	1	√	222	B3
N17.14.8 GM3 ⊕ DT1	√	1	1	√	$mm2$	B2
N17.14.9 GM3 ⊕ SM2	√	1	1	√	222	B3
N17.14.10 GM3 ⊕ DT2	√	1	1	√	$mm2$	B2
N17.14.11 GM3 ⊕ C1	√	1	1	×	-	-
N17.14.12 GM3 ⊕ D1	√	1	1	×	-	-
N17.14.13 GM3 ⊕ LD1	√	1	1	√	$mm2$	B2
N17.14.14 GM3 ⊕ H1	√	1	1	×	-	-
N17.14.15 GM3 ⊕ G1	√	1	1	×	-	-
N17.14.16 GM3 ⊕ Q1	√	1	1	×	-	-
N17.14.17 S1 ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N17.14.18 S1 ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
N17.14.19 S1 ⊕ C1	√	1	1	√	mmm	$\mathrm{B3_u}$
N17.14.20 S1 ⊕ C2	√	1	1	√	mmm	$\mathrm{B3_u}$
N17.14.21 S1 ⊕ LD1	√	1	1	√	mmm	$\mathrm{B1_u}$
N17.14.22 S1 ⊕ G1	√	1	1	×	-	-
N17.14.23 S1 ⊕ Q1	√	1	1	√	mmm	$\mathrm{B1_u}$
N17.14.24 X1 ⊕ SM1	√	1	1	√	mmm	$\mathrm{B3_u}$
N17.14.25 X1 ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N17.14.26 X1 ⊕ SM2	√	1	1	√	mmm	$\mathrm{B3_u}$
N17.14.27 X1 ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
N17.14.28 X1 ⊕ C1	√	1	1	×	-	-
N17.14.29 X1 ⊕ D1	√	1	1	√	mmm	$\mathrm{B2_u}$
N17.14.30 X1 ⊕ D2	√	1	1	√	mmm	$\mathrm{B2_u}$
N17.14.31 X1 ⊕ LD1	√	1	1	√	mmm	$\mathrm{B1_u}$
N17.14.32 X1 ⊕ H1	√	1	1	×	-	-
N17.14.33 X1 ⊕ G1	√	1	1	√	mmm	$\mathrm{B1_u}$
N17.14.34 X1 ⊕ Q1	√	1	1	×	-	-
N17.14.35 X2 ⊕ SM1	√	1	1	√	mmm	$\mathrm{B3_u}$
N17.14.36 X2 ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N17.14.37 X2 ⊕ SM2	√	1	1	√	mmm	$\mathrm{B3_u}$
N17.14.38 X2 ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
N17.14.39 X2 ⊕ C1	√	1	1	×	-	-
N17.14.40 X2 ⊕ D1	√	1	1	√	mmm	$\mathrm{B2_u}$
N17.14.41 X2 ⊕ D2	√	1	1	√	mmm	$\mathrm{B2_u}$
N17.14.42 X2 ⊕ LD1	√	1	1	√	mmm	$\mathrm{B1_u}$
N17.14.43 X2 ⊕ H1	√	1	1	×	-	-
N17.14.44 X2 ⊕ G1	√	1	1	√	mmm	$\mathrm{B1_u}$
N17.14.45 X2 ⊕ Q1	√	1	1	×	-	-

TABLE S52: Collinear SSGs with parent space group $P2_12_12$ (No. 18).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L18.1.1 GM1	1	mmm	$\mathrm{A_g}$

Collinear SSGs with parent space group $P2_12_12$ (No. 18)(continued)

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L18.2.1 GM2	1	mmm	$\mathrm{B1_g}$
L18.2.2 GM3	1	mmm	$\mathrm{B3_g}$
L18.2.3 Z1	0	-	-
L18.2.4 Z3	0	-	-

TABLE S53: Coplanar SSGs with parent space group $P2_12_12$ (No. 18).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P18.1.1 GM1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{A_u}$
P18.2.1 GM2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B1_g}\oplus\mathrm{B1_u}$
P18.2.2 GM3	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}\oplus\mathrm{B3_u}$
P18.2.3 Z1	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P18.2.4 Z3	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P18.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B1_g}\oplus\mathrm{B1_g}$
P18.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B3_g}\oplus\mathrm{B2_u}$
P18.3.3 GM2 $\oplus$ Z1	$\surd$	1	1	$\times$	-	-
P18.3.4 GM2 $\oplus$ Z3	$\surd$	1	1	$\times$	-	-
P18.3.5 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B3_g}\oplus\mathrm{B3_g}$
P18.3.6 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B3_g}\oplus\mathrm{B2_g}$
P18.3.7 GM3 $\oplus$ Z1	$\surd$	1	1	$\times$	-	-
P18.3.8 GM3 $\oplus$ Z3	$\surd$	1	1	$\times$	-	-
P18.3.9 Z1 $\oplus$ Z1	$\surd$	1	1	$\times$	-	-
P18.3.10 Z1 $\oplus$ Z2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P18.3.11 Z1 $\oplus$ Z3	$\surd$	1	1	$\times$	-	-
P18.3.12 Z3 $\oplus$ Z3	$\surd$	1	1	$\times$	-	-
P18.3.13 Z3 $\oplus$ Z4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P18.4.1 S1S2	$\surd$	1	1	$\times$	-	-
P18.4.2 R1R2	$\surd$	1	1	$\times$	-	-
P18.6.1 T1	$\surd$	1	1	$\times$	-	-
P18.6.2 X1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P18.8.1 DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P18.8.2 A1	$\surd$	1	1	$\times$	-	-
P18.8.3 LD1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P18.8.4 LD2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$

TABLE S54: Non-coplanar SSGs with parent space group $P2_12_12$ (No. 18).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N18.1.1 GM1	$\surd$	3	3	$\surd$	222	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{A1}$
N18.2.1 GM2	$\surd$	3	3	$\surd$	$mm2$	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{A2}$
N18.2.2 GM3	$\surd$	3	3	$\surd$	$mm2$	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{A2}$
N18.2.3 Z1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{A_u}$
N18.2.4 Z3	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{A_u}$
N18.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	222	$\mathrm{A1}\oplus\mathrm{B1}\oplus\mathrm{B1}$
N18.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$mm2$	$\mathrm{A1}\oplus\mathrm{B2}\oplus\mathrm{B1}$

Non-coplanar SSGs with parent space group $P2_12_12$ (No. 18) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N18.3.3 GM2 ⊕ Z1	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N18.3.4 GM2 ⊕ Z3	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N18.3.5 GM3 ⊕ GM3	√	3	3	√	222	A1 ⊕ B3 ⊕ B3
N18.3.6 GM3 ⊕ GM4	√	3	3	√	$mm2$	A1 ⊕ B2 ⊕ B1
N18.3.7 GM3 ⊕ Z1	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N18.3.8 GM3 ⊕ Z3	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N18.3.9 Z1 ⊕ Z1	√	1	1	√	222	A1
N18.3.10 Z1 ⊕ Z2	√	1	1	√	$mm2$	A1
N18.3.11 Z1 ⊕ Z3	√	1	1	√	$mm2$	A1
N18.3.12 Z3 ⊕ Z3	√	1	1	√	222	A1
N18.3.13 Z3 ⊕ Z4	√	1	1	√	$mm2$	A1
N18.4.1 S1S2	√	1	1	√	222	A1
N18.4.2 R1R2	√	1	1	√	222	A1
N18.6.1 T1	√	1	1	√	$mm2$	A1
N18.6.2 X1	√	1	1	√	$mm2$	A1
N18.8.1 DT1	√	1	1	√	$mm2$	A1
N18.8.2 A1	√	1	1	√	$mm2$	A1
N18.8.3 LD1	√	1	1	√	$mm2$	A1
N18.8.4 LD2	√	1	1	√	$mm2$	A1
N18.9.1 GM2 ⊕ GM2 ⊕ GM2	√	3	3	√	$mm2$	A2 ⊕ A2 ⊕ A2
N18.9.2 GM2 ⊕ GM2 ⊕ GM3	√	3	3	√	$mm2$	A2 ⊕ B2 ⊕ B2
N18.9.3 GM2 ⊕ GM2 ⊕ Z1	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N18.9.4 GM2 ⊕ GM2 ⊕ Z3	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N18.9.5 GM2 ⊕ GM3 ⊕ GM3	√	3	3	√	$mm2$	A2 ⊕ B2 ⊕ B2
N18.9.6 GM2 ⊕ GM3 ⊕ GM4	√	3	3	√	222	B1 ⊕ B3 ⊕ B2
N18.9.7 GM2 ⊕ GM3 ⊕ Z1	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N18.9.8 GM2 ⊕ GM3 ⊕ Z3	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N18.9.9 GM2 ⊕ Z1 ⊕ Z1	√	1	1	×	-	-
N18.9.10 GM2 ⊕ Z1 ⊕ Z2	√	1	1	√	222	B1
N18.9.11 GM2 ⊕ Z1 ⊕ Z3	√	1	1	×	-	-
N18.9.12 GM2 ⊕ Z3 ⊕ Z3	√	1	1	×	-	-
N18.9.13 GM2 ⊕ Z3 ⊕ Z4	√	1	1	√	222	B1
N18.9.14 GM3 ⊕ GM3 ⊕ GM3	√	3	3	√	$mm2$	A2 ⊕ A2 ⊕ A2
N18.9.15 GM3 ⊕ GM3 ⊕ GM4	√	3	3	√	$mm2$	A2 ⊕ B2 ⊕ B2
N18.9.16 GM3 ⊕ GM3 ⊕ Z1	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N18.9.17 GM3 ⊕ GM4 ⊕ Z1	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N18.9.18 GM3 ⊕ GM3 ⊕ Z3	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N18.9.19 GM3 ⊕ GM4 ⊕ Z3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N18.9.20 GM3 ⊕ Z1 ⊕ Z1	√	1	1	×	-	-
N18.9.21 GM3 ⊕ Z1 ⊕ Z2	√	1	1	√	$mm2$	B2
N18.9.22 GM3 ⊕ Z1 ⊕ Z3	√	1	1	×	-	-
N18.9.23 GM3 ⊕ Z1 ⊕ Z4	√	1	1	×	-	-
N18.9.24 GM3 ⊕ Z3 ⊕ Z3	√	1	1	×	-	-
N18.9.25 GM3 ⊕ Z3 ⊕ Z4	√	1	1	√	$mm2$	B2
N18.9.26 Z1 ⊕ Z1 ⊕ Z1	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{A_u}$
N18.9.27 Z1 ⊕ Z1 ⊕ Z2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$

Non-coplanar SSGs with parent space group $P2_12_12$ (No. 18) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N18.9.28 Z1 ⊕ Z1 ⊕ Z3	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N18.9.29 Z1 ⊕ Z2 ⊕ Z3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N18.9.30 Z1 ⊕ Z3 ⊕ Z3	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N18.9.31 Z1 ⊕ Z3 ⊕ Z4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N18.9.32 Z3 ⊕ Z3 ⊕ Z3	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{A_u}$
N18.9.33 Z3 ⊕ Z3 ⊕ Z4	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N18.10.1 GM2 ⊕ S1S2	√	1	1	×	-	-
N18.10.2 GM2 ⊕ R1R2	√	1	1	×	-	-
N18.10.3 GM3 ⊕ S1S2	√	1	1	×	-	-
N18.10.4 GM3 ⊕ R1R2	√	1	1	×	-	-
N18.10.5 Z1 ⊕ S1S2	√	1	1	×	-	-
N18.10.6 Z1 ⊕ R1R2	√	1	1	×	-	-
N18.10.7 Z3 ⊕ S1S2	√	1	1	×	-	-
N18.10.8 Z3 ⊕ R1R2	√	1	1	×	-	-
N18.12.1 GM2 ⊕ T1	√	1	1	×	-	-
N18.12.2 GM2 ⊕ X1	√	1	1	√	$mm2$	B1
N18.12.3 GM3 ⊕ T1	√	1	1	×	-	-
N18.12.4 GM3 ⊕ U1	√	1	1	×	-	-
N18.12.5 GM3 ⊕ X1	√	1	1	√	222	B3
N18.12.6 GM3 ⊕ Y1	√	1	1	√	$mm2$	B2
N18.12.7 Z1 ⊕ T1	√	1	1	√	mmm	$\mathrm{B2_u}$
N18.12.8 Z1 ⊕ X1	√	1	1	√	mmm	$\mathrm{B3_u}$
N18.12.9 Z3 ⊕ T1	√	1	1	√	mmm	$\mathrm{B2_u}$
N18.12.10 Z3 ⊕ X1	√	1	1	√	mmm	$\mathrm{B3_u}$
N18.14.1 GM2 ⊕ DT1	√	1	1	√	$mm2$	B2
N18.14.2 GM2 ⊕ A1	√	1	1	×	-	-
N18.14.3 GM2 ⊕ LD1	√	1	1	√	222	B1
N18.14.4 GM2 ⊕ LD2	√	1	1	√	222	B1
N18.14.5 GM3 ⊕ SM1	√	1	1	√	222	B3
N18.14.6 GM3 ⊕ DT1	√	1	1	√	$mm2$	B2
N18.14.7 GM3 ⊕ A1	√	1	1	×	-	-
N18.14.8 GM3 ⊕ B1	√	1	1	×	-	-
N18.14.9 GM3 ⊕ LD1	√	1	1	√	$mm2$	B2
N18.14.10 GM3 ⊕ LD2	√	1	1	√	$mm2$	B2
N18.14.11 Z1 ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N18.14.12 Z1 ⊕ A1	√	1	1	√	mmm	$\mathrm{B3_u}$
N18.14.13 Z1 ⊕ LD1	√	1	1	√	mmm	$\mathrm{B1_u}$
N18.14.14 Z1 ⊕ LD2	√	1	1	√	mmm	$\mathrm{B1_u}$
N18.14.15 Z3 ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N18.14.16 Z3 ⊕ A1	√	1	1	√	mmm	$\mathrm{B3_u}$
N18.14.17 Z3 ⊕ LD1	√	1	1	√	mmm	$\mathrm{B1_u}$
N18.14.18 Z3 ⊕ LD2	√	1	1	√	mmm	$\mathrm{B1_u}$

TABLE S55: Collinear SSGs with parent space group $P2_12_12_1$ (No. 19).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L19.1.1 GM1	1	mmm	$\mathrm{A_g}$
L19.2.1 GM2	1	mmm	$\mathrm{B1_g}$

TABLE S56: Coplanar SSGs with parent space group $P2_12_12_1$ (No. 19).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P19.1.1 GM1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{A_u}$
P19.2.1 GM2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B1_g}\oplus\mathrm{B1_u}$
P19.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B1_g}\oplus\mathrm{B1_g}$
P19.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B3_g}\oplus\mathrm{B2_u}$
P19.4.1 S1S2	$\surd$	1	1	$\times$	-	-
P19.6.1 X1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P19.8.1 DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$

TABLE S57: Non-coplanar SSGs with parent space group $P2_12_12_1$ (No. 19).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N19.1.1 GM1	$\surd$	3	3	$\surd$	222	A1 $\oplus$ A1 $\oplus$ A1
N19.2.1 GM2	$\surd$	3	3	$\surd$	$mm2$	A1 $\oplus$ A1 $\oplus$ A2
N19.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	222	A1 $\oplus$ B1 $\oplus$ B1
N19.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$mm2$	A1 $\oplus$ B2 $\oplus$ B1
N19.4.1 S1S2	$\surd$	1	1	$\surd$	222	A1
N19.6.1 X1	$\surd$	1	1	$\surd$	$mm2$	A1
N19.8.1 DT1	$\surd$	1	1	$\surd$	$mm2$	A1
N19.9.1 GM2 $\oplus$ GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$mm2$	A2 $\oplus$ A2 $\oplus$ A2
N19.9.2 GM2 $\oplus$ GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$mm2$	A2 $\oplus$ B2 $\oplus$ B2
N19.9.3 GM2 $\oplus$ GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	222	B1 $\oplus$ B3 $\oplus$ B2
N19.10.1 GM2 $\oplus$ T1T3	$\surd$	1	1	$\times$	-	-
N19.10.2 GM2 $\oplus$ S1S2	$\surd$	1	1	$\times$	-	-
N19.12.1 GM2 $\oplus$ X1	$\surd$	1	1	$\surd$	$mm2$	B1
N19.12.2 GM2 $\oplus$ Z1	$\surd$	1	1	$\surd$	222	B1
N19.14.1 GM2 $\oplus$ DT1	$\surd$	1	1	$\surd$	$mm2$	B2
N19.14.2 GM2 $\oplus$ LD1	$\surd$	1	1	$\surd$	222	B1

TABLE S58: Collinear SSGs with parent space group $C222_1$ (No. 20).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L20.1.1 GM1	1	mmm	$\mathrm{A_g}$
L20.2.1 GM2	1	mmm	$\mathrm{B1_g}$
L20.2.2 GM3	1	mmm	$\mathrm{B3_g}$
L20.2.3 Y1	0	-	-
L20.2.4 Y2	0	-	-
L20.2.5 Y3	0	-	-

Coplanar SSGs with parent space group $C222_1$ (No. 20) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation

TABLE S59: Coplanar SSGs with parent space group $C222_1$ (No. 20).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P20.1.1 GM1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{A_u}$
P20.2.1 GM2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B1_g}\oplus\mathrm{B1_u}$
P20.2.2 GM3	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}\oplus\mathrm{B3_u}$
P20.2.3 Y1	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P20.2.4 Y2	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P20.2.5 Y3	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P20.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B1_g}\oplus\mathrm{B1_g}$
P20.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B3_g}\oplus\mathrm{B2_u}$
P20.3.3 GM2 $\oplus$ Y1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
P20.3.4 GM2 $\oplus$ Y2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
P20.3.5 GM2 $\oplus$ Y3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
P20.3.6 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B3_g}\oplus\mathrm{B3_g}$
P20.3.7 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B3_g}\oplus\mathrm{B2_g}$
P20.3.8 GM3 $\oplus$ Y1	$\surd$	1	1	$\times$	-	-
P20.3.9 GM3 $\oplus$ Y2	$\surd$	1	1	$\times$	-	-
P20.3.10 GM3 $\oplus$ Y3	$\surd$	1	1	$\times$	-	-
P20.3.11 GM3 $\oplus$ Y4	$\surd$	1	1	$\times$	-	-
P20.3.12 Y1 $\oplus$ Y1	$\surd$	1	1	$\times$	-	-
P20.3.13 Y1 $\oplus$ Y2	$\surd$	1	1	$\times$	-	-
P20.3.14 Y1 $\oplus$ Y3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P20.3.15 Y2 $\oplus$ Y2	$\surd$	1	1	$\times$	-	-
P20.3.16 Y2 $\oplus$ Y3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P20.3.17 Y3 $\oplus$ Y3	$\surd$	1	1	$\times$	-	-
P20.3.18 Y3 $\oplus$ Y4	$\surd$	1	1	$\times$	-	-
P20.6.1 T1	$\surd$	1	1	$\times$	-	-
P20.6.2 Z1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P20.7.1 S1	$\times$	-	-	-	-	-
P20.8.1 DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P20.8.2 DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P20.8.3 LD1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P20.8.4 H1	$\surd$	1	1	$\times$	-	-

TABLE S60: Non-coplanar SSGs with parent space group $C222_1$ (No. 20).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N20.1.1 GM1	$\surd$	3	3	$\surd$	222	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{A1}$
N20.2.1 GM2	$\surd$	3	3	$\surd$	$mm2$	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{A2}$
N20.2.2 GM3	$\surd$	3	3	$\surd$	$mm2$	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{A2}$
N20.2.3 Y1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{A_u}$
N20.2.4 Y2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{A_u}$
N20.2.5 Y3	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{A_u}$

Non-coplanar SSGs with parent space group $C222_1$ (No. 20) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N20.3.1 GM2 ⊕ GM2	√	3	3	√	222	A1 ⊕ B1 ⊕ B1
N20.3.2 GM2 ⊕ GM3	√	3	3	√	$mm2$	A1 ⊕ B2 ⊕ B1
N20.3.3 GM2 ⊕ Y1	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N20.3.4 GM2 ⊕ Y2	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N20.3.5 GM2 ⊕ Y3	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N20.3.6 GM3 ⊕ GM3	√	3	3	√	222	A1 ⊕ B3 ⊕ B3
N20.3.7 GM3 ⊕ GM4	√	3	3	√	$mm2$	A1 ⊕ B2 ⊕ B1
N20.3.8 GM3 ⊕ Y1	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N20.3.9 GM3 ⊕ Y2	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N20.3.10 GM3 ⊕ Y3	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N20.3.11 GM3 ⊕ Y4	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N20.3.12 Y1 ⊕ Y1	√	1	1	√	222	A1
N20.3.13 Y1 ⊕ Y2	√	1	1	√	$mm2$	A1
N20.3.14 Y1 ⊕ Y3	√	1	1	√	$mm2$	A1
N20.3.15 Y2 ⊕ Y2	√	1	1	√	222	A1
N20.3.16 Y2 ⊕ Y3	√	1	1	√	$mm2$	A1
N20.3.17 Y3 ⊕ Y3	√	1	1	√	222	A1
N20.3.18 Y3 ⊕ Y4	√	1	1	√	$mm2$	A1
N20.6.1 T1	√	1	1	√	$mm2$	A1
N20.6.2 Z1	√	1	1	√	$mm2$	A1
N20.7.1 S1	√	1	1	√	mmm	$\mathrm{A_g}$
N20.8.1 DT1	√	1	1	√	$mm2$	A1
N20.8.2 DT2	√	1	1	√	$mm2$	A1
N20.8.3 LD1	√	1	1	√	$mm2$	A1
N20.8.4 H1	√	1	1	√	$mm2$	A1
N20.9.1 GM2 ⊕ GM2 ⊕ GM2	√	3	3	√	$mm2$	A2 ⊕ A2 ⊕ A2
N20.9.2 GM2 ⊕ GM2 ⊕ GM3	√	3	3	√	$mm2$	A2 ⊕ B2 ⊕ B2
N20.9.3 GM2 ⊕ GM2 ⊕ Y1	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N20.9.4 GM2 ⊕ GM2 ⊕ Y2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N20.9.5 GM2 ⊕ GM2 ⊕ Y3	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N20.9.6 GM2 ⊕ GM3 ⊕ GM3	√	3	3	√	$mm2$	A2 ⊕ B2 ⊕ B2
N20.9.7 GM2 ⊕ GM3 ⊕ GM4	√	3	3	√	222	B1 ⊕ B3 ⊕ B2
N20.9.8 GM2 ⊕ GM3 ⊕ Y1	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N20.9.9 GM2 ⊕ GM3 ⊕ Y2	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N20.9.10 GM2 ⊕ GM3 ⊕ Y3	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N20.9.11 GM2 ⊕ GM3 ⊕ Y4	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N20.9.12 GM2 ⊕ Y1 ⊕ Y1	√	1	1	√	$mm2$	A2
N20.9.13 GM2 ⊕ Y1 ⊕ Y2	√	1	1	√	222	B1
N20.9.14 GM2 ⊕ Y1 ⊕ Y3	√	1	1	√	$mm2$	B1
N20.9.15 GM2 ⊕ Y2 ⊕ Y2	√	1	1	√	$mm2$	A2
N20.9.16 GM2 ⊕ Y2 ⊕ Y3	√	1	1	√	$mm2$	B2
N20.9.17 GM2 ⊕ Y3 ⊕ Y3	√	1	1	√	$mm2$	A2
N20.9.18 GM2 ⊕ Y3 ⊕ Y4	√	1	1	√	222	B1
N20.9.19 GM3 ⊕ GM3 ⊕ GM3	√	3	3	√	$mm2$	A2 ⊕ A2 ⊕ A2
N20.9.20 GM3 ⊕ GM3 ⊕ GM4	√	3	3	√	$mm2$	A2 ⊕ B2 ⊕ B2
N20.9.21 GM3 ⊕ GM3 ⊕ Y1	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$

Non-coplanar SSGs with parent space group $C222_1$ (No. 20) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N20.9.22 GM3 ⊕ GM4 ⊕ Y1	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N20.9.23 GM3 ⊕ GM3 ⊕ Y2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N20.9.24 GM3 ⊕ GM4 ⊕ Y2	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N20.9.25 GM3 ⊕ GM3 ⊕ Y3	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N20.9.26 GM3 ⊕ GM3 ⊕ Y4	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N20.9.27 GM3 ⊕ GM4 ⊕ Y3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N20.9.28 GM3 ⊕ Y1 ⊕ Y1	√	1	1	×	-	-
N20.9.29 GM3 ⊕ Y1 ⊕ Y2	√	1	1	×	-	-
N20.9.30 GM3 ⊕ Y1 ⊕ Y3	√	1	1	√	222	B3
N20.9.31 GM3 ⊕ Y1 ⊕ Y4	√	1	1	√	$mm2$	B2
N20.9.32 GM3 ⊕ Y2 ⊕ Y2	√	1	1	×	-	-
N20.9.33 GM3 ⊕ Y2 ⊕ Y3	√	1	1	√	$mm2$	B2
N20.9.34 GM3 ⊕ Y2 ⊕ Y4	√	1	1	√	222	B3
N20.9.35 GM3 ⊕ Y3 ⊕ Y3	√	1	1	×	-	-
N20.9.36 GM3 ⊕ Y3 ⊕ Y4	√	1	1	×	-	-
N20.9.37 GM3 ⊕ Y4 ⊕ Y4	√	1	1	×	-	-
N20.9.38 Y1 ⊕ Y1 ⊕ Y1	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{A_u}$
N20.9.39 Y1 ⊕ Y1 ⊕ Y2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N20.9.40 Y1 ⊕ Y1 ⊕ Y3	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N20.9.41 Y1 ⊕ Y2 ⊕ Y2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N20.9.42 Y1 ⊕ Y2 ⊕ Y3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N20.9.43 Y1 ⊕ Y3 ⊕ Y3	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N20.9.44 Y1 ⊕ Y3 ⊕ Y4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N20.9.45 Y2 ⊕ Y2 ⊕ Y2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{A_u}$
N20.9.46 Y2 ⊕ Y2 ⊕ Y3	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N20.9.47 Y2 ⊕ Y3 ⊕ Y3	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N20.9.48 Y2 ⊕ Y3 ⊕ Y4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N20.9.49 Y3 ⊕ Y3 ⊕ Y3	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{A_u}$
N20.9.50 Y3 ⊕ Y3 ⊕ Y4	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N20.12.1 GM2 ⊕ T1	√	1	1	√	222	B1
N20.12.2 GM2 ⊕ Z1	√	1	1	√	222	B1
N20.12.3 GM3 ⊕ T1	√	1	1	×	-	-
N20.12.4 GM3 ⊕ Z1	√	1	1	√	$mm2$	B2
N20.12.5 Y1 ⊕ T1	√	1	1	√	mmm	$\mathrm{B1_u}$
N20.12.6 Y1 ⊕ Z1	√	1	1	√	mmm	$\mathrm{B1_u}$
N20.12.7 Y2 ⊕ T1	√	1	1	√	mmm	$\mathrm{B1_u}$
N20.12.8 Y2 ⊕ Z1	√	1	1	√	mmm	$\mathrm{B1_u}$
N20.12.9 Y3 ⊕ T1	√	1	1	√	mmm	$\mathrm{B1_u}$
N20.12.10 Y3 ⊕ Z1	√	1	1	√	mmm	$\mathrm{B1_u}$
N20.13.1 GM2 ⊕ S1	√	1	1	×	-	-
N20.13.2 GM3 ⊕ S1	√	1	1	×	-	-
N20.13.3 Y1 ⊕ S1	×	-	-	-	-	-
N20.13.4 Y2 ⊕ S1	×	-	-	-	-	-
N20.13.5 Y3 ⊕ S1	×	-	-	-	-	-
N20.14.1 GM2 ⊕ DT1	√	1	1	√	$mm2$	B2
N20.14.2 GM2 ⊕ DT2	√	1	1	√	$mm2$	B2

Non-coplanar SSGs with parent space group $C222_1$ (No. 20) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N20.14.3 GM2 $\oplus$ LD1	$\surd$	1	1	$\surd$	222	B1
N20.14.4 GM2 $\oplus$ H1	$\surd$	1	1	$\surd$	222	B1
N20.14.5 GM3 $\oplus$ SM1	$\surd$	1	1	$\surd$	222	B3
N20.14.6 GM3 $\oplus$ DT1	$\surd$	1	1	$\surd$	$mm2$	B2
N20.14.7 GM3 $\oplus$ SM2	$\surd$	1	1	$\surd$	222	B3
N20.14.8 GM3 $\oplus$ DT2	$\surd$	1	1	$\surd$	$mm2$	B2
N20.14.9 GM3 $\oplus$ LD1	$\surd$	1	1	$\surd$	$mm2$	B2
N20.14.10 GM3 $\oplus$ H1	$\surd$	1	1	$\times$	-	-
N20.14.11 Y1 $\oplus$ DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N20.14.12 Y1 $\oplus$ DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N20.14.13 Y1 $\oplus$ LD1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N20.14.14 Y1 $\oplus$ H1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N20.14.15 Y2 $\oplus$ DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N20.14.16 Y2 $\oplus$ DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N20.14.17 Y2 $\oplus$ LD1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N20.14.18 Y2 $\oplus$ H1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N20.14.19 Y3 $\oplus$ SM1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N20.14.20 Y3 $\oplus$ DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N20.14.21 Y3 $\oplus$ SM2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N20.14.22 Y3 $\oplus$ DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N20.14.23 Y3 $\oplus$ LD1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N20.14.24 Y3 $\oplus$ H1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$

TABLE S61: Collinear SSGs with parent space group $C222$ (No. 21).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L21.1.1 GM1	1	mmm	$\mathrm{A_g}$
L21.2.1 GM2	1	mmm	$\mathrm{B1_g}$
L21.2.2 GM3	1	mmm	$\mathrm{B3_g}$
L21.2.3 T1	0	-	-
L21.2.4 T3	0	-	-
L21.2.5 Y1	0	-	-
L21.2.6 Y2	0	-	-
L21.2.7 Y3	0	-	-
L21.2.8 Z1	0	-	-
L21.2.9 Z3	0	-	-

TABLE S62: Coplanar SSGs with parent space group $C222$ (No. 21).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P21.1.1 GM1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{A_u}$
P21.2.1 GM2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
P21.2.2 GM3	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
P21.2.3 T1	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P21.2.4 T3	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P21.2.5 Y1	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$

Coplanar SSGs with parent space group $C222$ (No. 21) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P21.2.6 Y2	√	1	1	√	mmm	$\mathrm{A_g}$
P21.2.7 Y3	√	1	1	√	mmm	$\mathrm{A_g}$
P21.2.8 Z1	√	1	1	√	mmm	$\mathrm{A_g}$
P21.2.9 Z3	√	1	1	√	mmm	$\mathrm{A_g}$
P21.3.1 GM2 ⊕ GM2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
P21.3.2 GM2 ⊕ GM3	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
P21.3.3 GM2 ⊕ T1	√	1	1	×	-	-
P21.3.4 GM2 ⊕ T3	√	1	1	×	-	-
P21.3.5 GM2 ⊕ Y1	√	1	1	√	mmm	$\mathrm{B1_g}$
P21.3.6 GM2 ⊕ Y2	√	1	1	√	mmm	$\mathrm{B1_g}$
P21.3.7 GM2 ⊕ Y3	√	1	1	√	mmm	$\mathrm{B1_g}$
P21.3.8 GM2 ⊕ Z1	√	1	1	×	-	-
P21.3.9 GM2 ⊕ Z3	√	1	1	×	-	-
P21.3.10 GM3 ⊕ GM3	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
P21.3.11 GM3 ⊕ GM4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
P21.3.12 GM3 ⊕ T1	√	1	1	×	-	-
P21.3.13 GM3 ⊕ T3	√	1	1	×	-	-
P21.3.14 GM3 ⊕ Y1	√	1	1	×	-	-
P21.3.15 GM3 ⊕ Y2	√	1	1	×	-	-
P21.3.16 GM3 ⊕ Y3	√	1	1	×	-	-
P21.3.17 GM3 ⊕ Y4	√	1	1	×	-	-
P21.3.18 GM3 ⊕ Z1	√	1	1	×	-	-
P21.3.19 GM3 ⊕ Z3	√	1	1	×	-	-
P21.3.20 T1 ⊕ T1	√	1	1	×	-	-
P21.3.21 T1 ⊕ T2	√	1	1	×	-	-
P21.3.22 T1 ⊕ T3	√	1	1	×	-	-
P21.3.23 T1 ⊕ Y1	×	-	-	-	-	-
P21.3.24 T1 ⊕ Y2	×	-	-	-	-	-
P21.3.25 T1 ⊕ Y3	×	-	-	-	-	-
P21.3.26 T1 ⊕ Z1	×	-	-	-	-	-
P21.3.27 T1 ⊕ Z2	×	-	-	-	-	-
P21.3.28 T1 ⊕ Z3	×	-	-	-	-	-
P21.3.29 T3 ⊕ T3	√	1	1	×	-	-
P21.3.30 T3 ⊕ T4	√	1	1	×	-	-
P21.3.31 T3 ⊕ Y1	×	-	-	-	-	-
P21.3.32 T3 ⊕ Y2	×	-	-	-	-	-
P21.3.33 T3 ⊕ Y3	×	-	-	-	-	-
P21.3.34 T3 ⊕ Z1	×	-	-	-	-	-
P21.3.35 T3 ⊕ Z3	×	-	-	-	-	-
P21.3.36 T3 ⊕ Z4	×	-	-	-	-	-
P21.3.37 Y1 ⊕ Y1	√	1	1	×	-	-
P21.3.38 Y1 ⊕ Y2	√	1	1	×	-	-
P21.3.39 Y1 ⊕ Y3	√	1	1	√	mmm	$\mathrm{B3_u}$
P21.3.40 Y1 ⊕ Z1	×	-	-	-	-	-
P21.3.41 Y1 ⊕ Z3	×	-	-	-	-	-
P21.3.42 Y2 ⊕ Y2	√	1	1	×	-	-

Coplanar SSGs with parent space group $C222$ (No. 21) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P21.3.43 Y2 $\oplus$ Y3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P21.3.44 Y2 $\oplus$ Z1	$\times$	-	-	-	-	-
P21.3.45 Y2 $\oplus$ Z3	$\times$	-	-	-	-	-
P21.3.46 Y3 $\oplus$ Y3	$\surd$	1	1	$\times$	-	-
P21.3.47 Y3 $\oplus$ Y4	$\surd$	1	1	$\times$	-	-
P21.3.48 Y3 $\oplus$ Z1	$\times$	-	-	-	-	-
P21.3.49 Y3 $\oplus$ Z3	$\times$	-	-	-	-	-
P21.3.50 Z1 $\oplus$ Z1	$\surd$	1	1	$\times$	-	-
P21.3.51 Z1 $\oplus$ Z2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P21.3.52 Z1 $\oplus$ Z3	$\surd$	1	1	$\times$	-	-
P21.3.53 Z3 $\oplus$ Z3	$\surd$	1	1	$\times$	-	-
P21.3.54 Z3 $\oplus$ Z4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P21.7.1 S1	$\times$	-	-	-	-	-
P21.7.2 R1	$\times$	-	-	-	-	-
P21.8.1 DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P21.8.2 DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P21.8.3 A1	$\surd$	1	1	$\times$	-	-
P21.8.4 LD1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P21.8.5 LD2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P21.8.6 H1	$\surd$	1	1	$\times$	-	-
P21.8.7 H2	$\surd$	1	1	$\times$	-	-

TABLE S63: Non-coplanar SSGs with parent space group $C222$ (No. 21).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N21.1.1 GM1	$\surd$	3	3	$\surd$	222	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{A1}$
N21.2.1 GM2	$\surd$	3	3	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{A2}$
N21.2.2 GM3	$\surd$	3	3	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{A2}$
N21.2.3 T1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{A_u}$
N21.2.4 T3	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{A_u}$
N21.2.5 Y1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{A_u}$
N21.2.6 Y2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{A_u}$
N21.2.7 Y3	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{A_u}$
N21.2.8 Z1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{A_u}$
N21.2.9 Z3	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{A_u}$
N21.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	222	$\mathrm{A1} \oplus \mathrm{B1} \oplus \mathrm{B1}$
N21.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{B2} \oplus \mathrm{B1}$
N21.3.3 GM2 $\oplus$ T1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N21.3.4 GM2 $\oplus$ T3	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N21.3.5 GM2 $\oplus$ Y1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N21.3.6 GM2 $\oplus$ Y2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N21.3.7 GM2 $\oplus$ Y3	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N21.3.8 GM2 $\oplus$ Z1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N21.3.9 GM2 $\oplus$ Z3	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N21.3.10 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	222	$\mathrm{A1} \oplus \mathrm{B3} \oplus \mathrm{B3}$
N21.3.11 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{B2} \oplus \mathrm{B1}$

Non-coplanar SSGs with parent space group $C222$ (No. 21) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N21.3.12 GM3 ⊕ T1	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N21.3.13 GM3 ⊕ T3	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N21.3.14 GM3 ⊕ Y1	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N21.3.15 GM3 ⊕ Y2	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N21.3.16 GM3 ⊕ Y3	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N21.3.17 GM3 ⊕ Y4	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N21.3.18 GM3 ⊕ Z1	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N21.3.19 GM3 ⊕ Z3	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N21.3.20 T1 ⊕ T1	√	1	1	√	222	A1
N21.3.21 T1 ⊕ T2	√	1	1	√	$mm2$	A1
N21.3.22 T1 ⊕ T3	√	1	1	√	$mm2$	A1
N21.3.23 T1 ⊕ Y1	√	1	1	√	mmm	$\mathrm{A_g}$
N21.3.24 T1 ⊕ Y2	√	1	1	√	mmm	$\mathrm{A_g}$
N21.3.25 T1 ⊕ Y3	√	1	1	√	mmm	$\mathrm{A_g}$
N21.3.26 T1 ⊕ Z1	√	1	1	√	mmm	$\mathrm{A_g}$
N21.3.27 T1 ⊕ Z2	√	1	1	√	mmm	$\mathrm{A_g}$
N21.3.28 T1 ⊕ Z3	√	1	1	√	mmm	$\mathrm{A_g}$
N21.3.29 T3 ⊕ T3	√	1	1	√	222	A1
N21.3.30 T3 ⊕ T4	√	1	1	√	$mm2$	A1
N21.3.31 T3 ⊕ Y1	√	1	1	√	mmm	$\mathrm{A_g}$
N21.3.32 T3 ⊕ Y2	√	1	1	√	mmm	$\mathrm{A_g}$
N21.3.33 T3 ⊕ Y3	√	1	1	√	mmm	$\mathrm{A_g}$
N21.3.34 T3 ⊕ Z1	√	1	1	√	mmm	$\mathrm{A_g}$
N21.3.35 T3 ⊕ Z3	√	1	1	√	mmm	$\mathrm{A_g}$
N21.3.36 T3 ⊕ Z4	√	1	1	√	mmm	$\mathrm{A_g}$
N21.3.37 Y1 ⊕ Y1	√	1	1	√	222	A1
N21.3.38 Y1 ⊕ Y2	√	1	1	√	$mm2$	A1
N21.3.39 Y1 ⊕ Y3	√	1	1	√	$mm2$	A1
N21.3.40 Y1 ⊕ Z1	√	1	1	√	mmm	$\mathrm{A_g}$
N21.3.41 Y1 ⊕ Z3	√	1	1	√	mmm	$\mathrm{A_g}$
N21.3.42 Y2 ⊕ Y2	√	1	1	√	222	A1
N21.3.43 Y2 ⊕ Y3	√	1	1	√	$mm2$	A1
N21.3.44 Y2 ⊕ Z1	√	1	1	√	mmm	$\mathrm{A_g}$
N21.3.45 Y2 ⊕ Z3	√	1	1	√	mmm	$\mathrm{A_g}$
N21.3.46 Y3 ⊕ Y3	√	1	1	√	222	A1
N21.3.47 Y3 ⊕ Y4	√	1	1	√	$mm2$	A1
N21.3.48 Y3 ⊕ Z1	√	1	1	√	mmm	$\mathrm{A_g}$
N21.3.49 Y3 ⊕ Z3	√	1	1	√	mmm	$\mathrm{A_g}$
N21.3.50 Z1 ⊕ Z1	√	1	1	√	222	A1
N21.3.51 Z1 ⊕ Z2	√	1	1	√	$mm2$	A1
N21.3.52 Z1 ⊕ Z3	√	1	1	√	$mm2$	A1
N21.3.53 Z3 ⊕ Z3	√	1	1	√	222	A1
N21.3.54 Z3 ⊕ Z4	√	1	1	√	$mm2$	A1
N21.7.1 S1	√	1	1	√	mmm	$\mathrm{A_g}$
N21.7.2 R1	√	1	1	√	mmm	$\mathrm{A_g}$
N21.8.1 DT1	√	1	1	√	$mm2$	A1

Non-coplanar SSGs with parent space group $C222$ (No. 21) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N21.8.2 DT2	√	1	1	√	$mm2$	A1
N21.8.3 A1	√	1	1	√	$mm2$	A1
N21.8.4 LD1	√	1	1	√	$mm2$	A1
N21.8.5 LD2	√	1	1	√	$mm2$	A1
N21.8.6 H1	√	1	1	√	$mm2$	A1
N21.8.7 H2	√	1	1	√	$mm2$	A1
N21.9.1 GM2 ⊕ GM2 ⊕ GM2	√	3	3	√	$mm2$	A2 ⊕ A2 ⊕ A2
N21.9.2 GM2 ⊕ GM2 ⊕ GM3	√	3	3	√	$mm2$	A2 ⊕ B2 ⊕ B2
N21.9.3 GM2 ⊕ GM2 ⊕ T1	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N21.9.4 GM2 ⊕ GM2 ⊕ T3	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N21.9.5 GM2 ⊕ GM2 ⊕ Y1	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N21.9.6 GM2 ⊕ GM2 ⊕ Y2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N21.9.7 GM2 ⊕ GM2 ⊕ Y3	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N21.9.8 GM2 ⊕ GM2 ⊕ Z1	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N21.9.9 GM2 ⊕ GM2 ⊕ Z3	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N21.9.10 GM2 ⊕ GM3 ⊕ GM3	√	3	3	√	$mm2$	A2 ⊕ B2 ⊕ B2
N21.9.11 GM2 ⊕ GM3 ⊕ GM4	√	3	3	√	222	B1 ⊕ B3 ⊕ B2
N21.9.12 GM2 ⊕ GM3 ⊕ T1	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N21.9.13 GM2 ⊕ GM3 ⊕ T3	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N21.9.14 GM2 ⊕ GM3 ⊕ Y1	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N21.9.15 GM2 ⊕ GM3 ⊕ Y2	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N21.9.16 GM2 ⊕ GM3 ⊕ Y3	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N21.9.17 GM2 ⊕ GM3 ⊕ Y4	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N21.9.18 GM2 ⊕ GM3 ⊕ Z1	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N21.9.19 GM2 ⊕ GM3 ⊕ Z3	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N21.9.20 GM2 ⊕ T1 ⊕ T1	√	1	1	×	-	-
N21.9.21 GM2 ⊕ T1 ⊕ T2	√	1	1	√	222	B1
N21.9.22 GM2 ⊕ T1 ⊕ T3	√	1	1	×	-	-
N21.9.23 GM2 ⊕ T1 ⊕ Y1	√	1	1	√	mmm	$\mathrm{B1_g}$
N21.9.24 GM2 ⊕ T1 ⊕ Y2	√	1	1	√	mmm	$\mathrm{B1_g}$
N21.9.25 GM2 ⊕ T1 ⊕ Y3	√	1	1	√	mmm	$\mathrm{B1_g}$
N21.9.26 GM2 ⊕ T1 ⊕ Z1	√	1	1	×	-	-
N21.9.27 GM2 ⊕ T1 ⊕ Z2	√	1	1	×	-	-
N21.9.28 GM2 ⊕ T1 ⊕ Z3	√	1	1	×	-	-
N21.9.29 GM2 ⊕ T3 ⊕ T3	√	1	1	×	-	-
N21.9.30 GM2 ⊕ T3 ⊕ T4	√	1	1	√	222	B1
N21.9.31 GM2 ⊕ T3 ⊕ Y1	√	1	1	√	mmm	$\mathrm{B1_g}$
N21.9.32 GM2 ⊕ T3 ⊕ Y2	√	1	1	√	mmm	$\mathrm{B1_g}$
N21.9.33 GM2 ⊕ T3 ⊕ Y3	√	1	1	√	mmm	$\mathrm{B1_g}$
N21.9.34 GM2 ⊕ T3 ⊕ Z1	√	1	1	×	-	-
N21.9.35 GM2 ⊕ T3 ⊕ Z3	√	1	1	×	-	-
N21.9.36 GM2 ⊕ T3 ⊕ Z4	√	1	1	×	-	-
N21.9.37 GM2 ⊕ Y1 ⊕ Y1	√	1	1	√	$mm2$	A2
N21.9.38 GM2 ⊕ Y1 ⊕ Y2	√	1	1	√	222	B1
N21.9.39 GM2 ⊕ Y1 ⊕ Y3	√	1	1	√	$mm2$	B1
N21.9.40 GM2 ⊕ Y1 ⊕ Z1	√	1	1	√	mmm	$\mathrm{B1_g}$

Non-coplanar SSGs with parent space group $C222$ (No. 21) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N21.9.41 GM2 ⊕ Y1 ⊕ Z3	√	1	1	√	mmm	$\mathrm{B1_g}$
N21.9.42 GM2 ⊕ Y2 ⊕ Y2	√	1	1	√	$mm2$	A2
N21.9.43 GM2 ⊕ Y2 ⊕ Y3	√	1	1	√	$mm2$	B2
N21.9.44 GM2 ⊕ Y2 ⊕ Z1	√	1	1	√	mmm	$\mathrm{B1_g}$
N21.9.45 GM2 ⊕ Y2 ⊕ Z3	√	1	1	√	mmm	$\mathrm{B1_g}$
N21.9.46 GM2 ⊕ Y3 ⊕ Y3	√	1	1	√	$mm2$	A2
N21.9.47 GM2 ⊕ Y3 ⊕ Y4	√	1	1	√	222	B1
N21.9.48 GM2 ⊕ Y3 ⊕ Z1	√	1	1	√	mmm	$\mathrm{B1_g}$
N21.9.49 GM2 ⊕ Y3 ⊕ Z3	√	1	1	√	mmm	$\mathrm{B1_g}$
N21.9.50 GM2 ⊕ Z1 ⊕ Z1	√	1	1	×	-	-
N21.9.51 GM2 ⊕ Z1 ⊕ Z2	√	1	1	√	222	B1
N21.9.52 GM2 ⊕ Z1 ⊕ Z3	√	1	1	×	-	-
N21.9.53 GM2 ⊕ Z3 ⊕ Z3	√	1	1	×	-	-
N21.9.54 GM2 ⊕ Z3 ⊕ Z4	√	1	1	√	222	B1
N21.9.55 GM3 ⊕ GM3 ⊕ GM3	√	3	3	√	$mm2$	A2 ⊕ A2 ⊕ A2
N21.9.56 GM3 ⊕ GM3 ⊕ GM4	√	3	3	√	$mm2$	A2 ⊕ B2 ⊕ B2
N21.9.57 GM3 ⊕ GM3 ⊕ T1	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N21.9.58 GM3 ⊕ GM4 ⊕ T1	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N21.9.59 GM3 ⊕ GM3 ⊕ T3	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N21.9.60 GM3 ⊕ GM4 ⊕ T3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N21.9.61 GM3 ⊕ GM3 ⊕ Y1	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N21.9.62 GM3 ⊕ GM4 ⊕ Y1	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N21.9.63 GM3 ⊕ GM3 ⊕ Y2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N21.9.64 GM3 ⊕ GM4 ⊕ Y2	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N21.9.65 GM3 ⊕ GM3 ⊕ Y3	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N21.9.66 GM3 ⊕ GM3 ⊕ Y4	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N21.9.67 GM3 ⊕ GM4 ⊕ Y3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N21.9.68 GM3 ⊕ GM3 ⊕ Z1	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N21.9.69 GM3 ⊕ GM4 ⊕ Z1	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N21.9.70 GM3 ⊕ GM3 ⊕ Z3	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N21.9.71 GM3 ⊕ GM4 ⊕ Z3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N21.9.72 GM3 ⊕ T1 ⊕ T1	√	1	1	×	-	-
N21.9.73 GM3 ⊕ T1 ⊕ T2	√	1	1	×	-	-
N21.9.74 GM3 ⊕ T1 ⊕ T3	√	1	1	×	-	-
N21.9.75 GM3 ⊕ T1 ⊕ T4	√	1	1	×	-	-
N21.9.76 GM3 ⊕ T1 ⊕ Y1	√	1	1	×	-	-
N21.9.77 GM3 ⊕ T1 ⊕ Y2	√	1	1	×	-	-
N21.9.78 GM3 ⊕ T1 ⊕ Y3	√	1	1	×	-	-
N21.9.79 GM3 ⊕ T1 ⊕ Y4	√	1	1	×	-	-
N21.9.80 GM3 ⊕ T1 ⊕ Z1	√	1	1	×	-	-
N21.9.81 GM3 ⊕ T1 ⊕ Z2	√	1	1	×	-	-
N21.9.82 GM3 ⊕ T1 ⊕ Z3	√	1	1	×	-	-
N21.9.83 GM3 ⊕ T1 ⊕ Z4	√	1	1	×	-	-
N21.9.84 GM3 ⊕ T3 ⊕ T3	√	1	1	×	-	-
N21.9.85 GM3 ⊕ T3 ⊕ T4	√	1	1	×	-	-
N21.9.86 GM3 ⊕ T3 ⊕ Y1	√	1	1	×	-	-

Non-coplanar SSGs with parent space group $C222$ (No. 21) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N21.9.87 GM3 ⊕ T3 ⊕ Y2	√	1	1	×	-	-
N21.9.88 GM3 ⊕ T3 ⊕ Y3	√	1	1	×	-	-
N21.9.89 GM3 ⊕ T3 ⊕ Y4	√	1	1	×	-	-
N21.9.90 GM3 ⊕ T3 ⊕ Z1	√	1	1	×	-	-
N21.9.91 GM3 ⊕ T3 ⊕ Z2	√	1	1	×	-	-
N21.9.92 GM3 ⊕ T3 ⊕ Z3	√	1	1	×	-	-
N21.9.93 GM3 ⊕ T3 ⊕ Z4	√	1	1	×	-	-
N21.9.94 GM3 ⊕ Y1 ⊕ Y1	√	1	1	×	-	-
N21.9.95 GM3 ⊕ Y1 ⊕ Y2	√	1	1	×	-	-
N21.9.96 GM3 ⊕ Y1 ⊕ Y3	√	1	1	√	222	B3
N21.9.97 GM3 ⊕ Y1 ⊕ Y4	√	1	1	√	$mm2$	B2
N21.9.98 GM3 ⊕ Y1 ⊕ Z1	√	1	1	√	mmm	$\mathrm{B3_g}$
N21.9.99 GM3 ⊕ Y1 ⊕ Z3	√	1	1	√	mmm	$\mathrm{B3_g}$
N21.9.100 GM3 ⊕ Y2 ⊕ Y2	√	1	1	×	-	-
N21.9.101 GM3 ⊕ Y2 ⊕ Y3	√	1	1	√	$mm2$	B2
N21.9.102 GM3 ⊕ Y2 ⊕ Y4	√	1	1	√	222	B3
N21.9.103 GM3 ⊕ Y2 ⊕ Z1	√	1	1	√	mmm	$\mathrm{B3_g}$
N21.9.104 GM3 ⊕ Y2 ⊕ Z3	√	1	1	√	mmm	$\mathrm{B3_g}$
N21.9.105 GM3 ⊕ Y3 ⊕ Y3	√	1	1	×	-	-
N21.9.106 GM3 ⊕ Y3 ⊕ Y4	√	1	1	×	-	-
N21.9.107 GM3 ⊕ Y4 ⊕ Y4	√	1	1	×	-	-
N21.9.108 GM3 ⊕ Y3 ⊕ Z1	√	1	1	√	mmm	$\mathrm{B3_g}$
N21.9.109 GM3 ⊕ Y4 ⊕ Z1	√	1	1	√	mmm	$\mathrm{B3_g}$
N21.9.110 GM3 ⊕ Y3 ⊕ Z3	√	1	1	√	mmm	$\mathrm{B3_g}$
N21.9.111 GM3 ⊕ Y4 ⊕ Z3	√	1	1	√	mmm	$\mathrm{B3_g}$
N21.9.112 GM3 ⊕ Z1 ⊕ Z1	√	1	1	×	-	-
N21.9.113 GM3 ⊕ Z1 ⊕ Z2	√	1	1	√	$mm2$	B2
N21.9.114 GM3 ⊕ Z1 ⊕ Z3	√	1	1	×	-	-
N21.9.115 GM3 ⊕ Z1 ⊕ Z4	√	1	1	×	-	-
N21.9.116 GM3 ⊕ Z3 ⊕ Z3	√	1	1	×	-	-
N21.9.117 GM3 ⊕ Z3 ⊕ Z4	√	1	1	√	$mm2$	B2
N21.9.118 T1 ⊕ T1 ⊕ T1	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{A_u}$
N21.9.119 T1 ⊕ T1 ⊕ T2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N21.9.120 T1 ⊕ T1 ⊕ T3	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N21.9.121 T1 ⊕ T2 ⊕ T3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N21.9.122 T1 ⊕ T1 ⊕ Y1	√	1	1	×	-	-
N21.9.123 T1 ⊕ T2 ⊕ Y1	√	1	1	√	mmm	$\mathrm{B1_u}$
N21.9.124 T1 ⊕ T1 ⊕ Y2	√	1	1	×	-	-
N21.9.125 T1 ⊕ T2 ⊕ Y2	√	1	1	√	mmm	$\mathrm{B1_u}$
N21.9.126 T1 ⊕ T1 ⊕ Y3	√	1	1	×	-	-
N21.9.127 T1 ⊕ T2 ⊕ Y3	√	1	1	√	mmm	$\mathrm{B1_u}$
N21.9.128 T1 ⊕ T1 ⊕ Z1	√	1	1	×	-	-
N21.9.129 T1 ⊕ T1 ⊕ Z2	√	1	1	×	-	-
N21.9.130 T1 ⊕ T2 ⊕ Z1	√	1	1	×	-	-
N21.9.131 T1 ⊕ T1 ⊕ Z3	√	1	1	×	-	-
N21.9.132 T1 ⊕ T2 ⊕ Z3	√	1	1	×	-	-

Non-coplanar SSGs with parent space group $C222$ (No. 21) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N21.9.133 T1 ⊕ T3 ⊕ T3	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N21.9.134 T1 ⊕ T3 ⊕ T4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N21.9.135 T1 ⊕ T3 ⊕ Y1	√	1	1	×	-	-
N21.9.136 T1 ⊕ T3 ⊕ Y2	√	1	1	×	-	-
N21.9.137 T1 ⊕ T3 ⊕ Y3	√	1	1	×	-	-
N21.9.138 T1 ⊕ T3 ⊕ Y4	√	1	1	×	-	-
N21.9.139 T1 ⊕ T3 ⊕ Z1	√	1	1	√	mmm	$\mathrm{B3_u}$
N21.9.140 T1 ⊕ T3 ⊕ Z2	√	1	1	√	mmm	$\mathrm{B3_u}$
N21.9.141 T1 ⊕ T3 ⊕ Z3	√	1	1	√	mmm	$\mathrm{B3_u}$
N21.9.142 T1 ⊕ T3 ⊕ Z4	√	1	1	√	mmm	$\mathrm{B3_u}$
N21.9.143 T1 ⊕ Y1 ⊕ Y1	√	1	1	√	mmm	$\mathrm{A_u}$
N21.9.144 T1 ⊕ Y1 ⊕ Y2	√	1	1	√	mmm	$\mathrm{B1_u}$
N21.9.145 T1 ⊕ Y1 ⊕ Y3	√	1	1	√	mmm	$\mathrm{B3_u}$
N21.9.146 T1 ⊕ Y1 ⊕ Z1	×	-	-	-	-	-
N21.9.147 T1 ⊕ Y1 ⊕ Z2	×	-	-	-	-	-
N21.9.148 T1 ⊕ Y1 ⊕ Z3	×	-	-	-	-	-
N21.9.149 T1 ⊕ Y2 ⊕ Y2	√	1	1	√	mmm	$\mathrm{A_u}$
N21.9.150 T1 ⊕ Y2 ⊕ Y3	√	1	1	√	mmm	$\mathrm{B2_u}$
N21.9.151 T1 ⊕ Y2 ⊕ Z1	×	-	-	-	-	-
N21.9.152 T1 ⊕ Y2 ⊕ Z2	×	-	-	-	-	-
N21.9.153 T1 ⊕ Y2 ⊕ Z3	×	-	-	-	-	-
N21.9.154 T1 ⊕ Y3 ⊕ Y3	√	1	1	√	mmm	$\mathrm{A_u}$
N21.9.155 T1 ⊕ Y3 ⊕ Y4	√	1	1	√	mmm	$\mathrm{B1_u}$
N21.9.156 T1 ⊕ Y3 ⊕ Z1	×	-	-	-	-	-
N21.9.157 T1 ⊕ Y3 ⊕ Z2	×	-	-	-	-	-
N21.9.158 T1 ⊕ Y3 ⊕ Z3	×	-	-	-	-	-
N21.9.159 T1 ⊕ Y3 ⊕ Z4	×	-	-	-	-	-
N21.9.160 T1 ⊕ Z1 ⊕ Z1	√	1	1	√	mmm	$\mathrm{A_u}$
N21.9.161 T1 ⊕ Z1 ⊕ Z2	√	1	1	√	mmm	$\mathrm{B1_u}$
N21.9.162 T1 ⊕ Z2 ⊕ Z2	√	1	1	√	mmm	$\mathrm{A_u}$
N21.9.163 T1 ⊕ Z1 ⊕ Z3	√	1	1	√	mmm	$\mathrm{B3_u}$
N21.9.164 T1 ⊕ Z2 ⊕ Z3	√	1	1	√	mmm	$\mathrm{B2_u}$
N21.9.165 T1 ⊕ Z3 ⊕ Z3	√	1	1	√	mmm	$\mathrm{A_u}$
N21.9.166 T1 ⊕ Z3 ⊕ Z4	√	1	1	√	mmm	$\mathrm{B1_u}$
N21.9.167 T3 ⊕ T3 ⊕ T3	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{A_u}$
N21.9.168 T3 ⊕ T3 ⊕ T4	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N21.9.169 T3 ⊕ T3 ⊕ Y1	√	1	1	×	-	-
N21.9.170 T3 ⊕ T4 ⊕ Y1	√	1	1	√	mmm	$\mathrm{B1_u}$
N21.9.171 T3 ⊕ T3 ⊕ Y2	√	1	1	×	-	-
N21.9.172 T3 ⊕ T4 ⊕ Y2	√	1	1	√	mmm	$\mathrm{B1_u}$
N21.9.173 T3 ⊕ T3 ⊕ Y3	√	1	1	×	-	-
N21.9.174 T3 ⊕ T4 ⊕ Y3	√	1	1	√	mmm	$\mathrm{B1_u}$
N21.9.175 T3 ⊕ T3 ⊕ Z1	√	1	1	×	-	-
N21.9.176 T3 ⊕ T4 ⊕ Z1	√	1	1	×	-	-
N21.9.177 T3 ⊕ T3 ⊕ Z3	√	1	1	×	-	-
N21.9.178 T3 ⊕ T3 ⊕ Z4	√	1	1	×	-	-

Non-coplanar SSGs with parent space group $C222$ (No. 21) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N21.9.179 T3 ⊕ T4 ⊕ Z3	√	1	1	×	-	-
N21.9.180 T3 ⊕ Y1 ⊕ Y1	√	1	1	√	mmm	$\mathrm{A_u}$
N21.9.181 T3 ⊕ Y1 ⊕ Y2	√	1	1	√	mmm	$\mathrm{B1_u}$
N21.9.182 T3 ⊕ Y1 ⊕ Y3	√	1	1	√	mmm	$\mathrm{B3_u}$
N21.9.183 T3 ⊕ Y1 ⊕ Z1	×	-	-	-	-	-
N21.9.184 T3 ⊕ Y1 ⊕ Z3	×	-	-	-	-	-
N21.9.185 T3 ⊕ Y1 ⊕ Z4	×	-	-	-	-	-
N21.9.186 T3 ⊕ Y2 ⊕ Y2	√	1	1	√	mmm	$\mathrm{A_u}$
N21.9.187 T3 ⊕ Y2 ⊕ Y3	√	1	1	√	mmm	$\mathrm{B2_u}$
N21.9.188 T3 ⊕ Y2 ⊕ Z1	×	-	-	-	-	-
N21.9.189 T3 ⊕ Y2 ⊕ Z3	×	-	-	-	-	-
N21.9.190 T3 ⊕ Y2 ⊕ Z4	×	-	-	-	-	-
N21.9.191 T3 ⊕ Y3 ⊕ Y3	√	1	1	√	mmm	$\mathrm{A_u}$
N21.9.192 T3 ⊕ Y3 ⊕ Y4	√	1	1	√	mmm	$\mathrm{B1_u}$
N21.9.193 T3 ⊕ Y3 ⊕ Z1	×	-	-	-	-	-
N21.9.194 T3 ⊕ Y3 ⊕ Z2	×	-	-	-	-	-
N21.9.195 T3 ⊕ Y3 ⊕ Z3	×	-	-	-	-	-
N21.9.196 T3 ⊕ Y3 ⊕ Z4	×	-	-	-	-	-
N21.9.197 T3 ⊕ Z1 ⊕ Z1	√	1	1	√	mmm	$\mathrm{A_u}$
N21.9.198 T3 ⊕ Z1 ⊕ Z2	√	1	1	√	mmm	$\mathrm{B1_u}$
N21.9.199 T3 ⊕ Z1 ⊕ Z3	√	1	1	√	mmm	$\mathrm{B3_u}$
N21.9.200 T3 ⊕ Z1 ⊕ Z4	√	1	1	√	mmm	$\mathrm{B2_u}$
N21.9.201 T3 ⊕ Z3 ⊕ Z3	√	1	1	√	mmm	$\mathrm{A_u}$
N21.9.202 T3 ⊕ Z3 ⊕ Z4	√	1	1	√	mmm	$\mathrm{B1_u}$
N21.9.203 T3 ⊕ Z4 ⊕ Z4	√	1	1	√	mmm	$\mathrm{A_u}$
N21.9.204 Y1 ⊕ Y1 ⊕ Y1	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{A_u}$
N21.9.205 Y1 ⊕ Y1 ⊕ Y2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N21.9.206 Y1 ⊕ Y1 ⊕ Y3	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N21.9.207 Y1 ⊕ Y1 ⊕ Z1	√	1	1	×	-	-
N21.9.208 Y1 ⊕ Y1 ⊕ Z3	√	1	1	×	-	-
N21.9.209 Y1 ⊕ Y2 ⊕ Y2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N21.9.210 Y1 ⊕ Y2 ⊕ Y3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N21.9.211 Y1 ⊕ Y2 ⊕ Z1	√	1	1	×	-	-
N21.9.212 Y1 ⊕ Y2 ⊕ Z3	√	1	1	×	-	-
N21.9.213 Y1 ⊕ Y3 ⊕ Y3	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N21.9.214 Y1 ⊕ Y3 ⊕ Y4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N21.9.215 Y1 ⊕ Y3 ⊕ Z1	√	1	1	√	mmm	$\mathrm{B3_u}$
N21.9.216 Y1 ⊕ Y3 ⊕ Z3	√	1	1	√	mmm	$\mathrm{B3_u}$
N21.9.217 Y1 ⊕ Z1 ⊕ Z1	√	1	1	×	-	-
N21.9.218 Y1 ⊕ Z1 ⊕ Z2	√	1	1	√	mmm	$\mathrm{B1_u}$
N21.9.219 Y1 ⊕ Z1 ⊕ Z3	√	1	1	×	-	-
N21.9.220 Y1 ⊕ Z3 ⊕ Z3	√	1	1	×	-	-
N21.9.221 Y1 ⊕ Z3 ⊕ Z4	√	1	1	√	mmm	$\mathrm{B1_u}$
N21.9.222 Y2 ⊕ Y2 ⊕ Y2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{A_u}$
N21.9.223 Y2 ⊕ Y2 ⊕ Y3	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N21.9.224 Y2 ⊕ Y2 ⊕ Z1	√	1	1	×	-	-

Non-coplanar SSGs with parent space group $C222$ (No. 21) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N21.9.225 Y2 ⊕ Y2 ⊕ Z3	√	1	1	×	-	-
N21.9.226 Y2 ⊕ Y3 ⊕ Y3	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N21.9.227 Y2 ⊕ Y3 ⊕ Y4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N21.9.228 Y2 ⊕ Y3 ⊕ Z1	√	1	1	√	mmm	$\mathrm{B2_u}$
N21.9.229 Y2 ⊕ Y3 ⊕ Z3	√	1	1	√	mmm	$\mathrm{B2_u}$
N21.9.230 Y2 ⊕ Z1 ⊕ Z1	√	1	1	×	-	-
N21.9.231 Y2 ⊕ Z1 ⊕ Z2	√	1	1	√	mmm	$\mathrm{B1_u}$
N21.9.232 Y2 ⊕ Z1 ⊕ Z3	√	1	1	×	-	-
N21.9.233 Y2 ⊕ Z3 ⊕ Z3	√	1	1	×	-	-
N21.9.234 Y2 ⊕ Z3 ⊕ Z4	√	1	1	√	mmm	$\mathrm{B1_u}$
N21.9.235 Y3 ⊕ Y3 ⊕ Y3	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{A_u}$
N21.9.236 Y3 ⊕ Y3 ⊕ Y4	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N21.9.237 Y3 ⊕ Y3 ⊕ Z1	√	1	1	×	-	-
N21.9.238 Y3 ⊕ Y4 ⊕ Z1	√	1	1	×	-	-
N21.9.239 Y3 ⊕ Y3 ⊕ Z3	√	1	1	×	-	-
N21.9.240 Y3 ⊕ Y4 ⊕ Z3	√	1	1	×	-	-
N21.9.241 Y3 ⊕ Z1 ⊕ Z1	√	1	1	×	-	-
N21.9.242 Y3 ⊕ Z1 ⊕ Z2	√	1	1	√	mmm	$\mathrm{B1_u}$
N21.9.243 Y3 ⊕ Z1 ⊕ Z3	√	1	1	×	-	-
N21.9.244 Y3 ⊕ Z1 ⊕ Z4	√	1	1	×	-	-
N21.9.245 Y3 ⊕ Z3 ⊕ Z3	√	1	1	×	-	-
N21.9.246 Y3 ⊕ Z3 ⊕ Z4	√	1	1	√	mmm	$\mathrm{B1_u}$
N21.9.247 Z1 ⊕ Z1 ⊕ Z1	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{A_u}$
N21.9.248 Z1 ⊕ Z1 ⊕ Z2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N21.9.249 Z1 ⊕ Z1 ⊕ Z3	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N21.9.250 Z1 ⊕ Z2 ⊕ Z3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N21.9.251 Z1 ⊕ Z3 ⊕ Z3	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N21.9.252 Z1 ⊕ Z3 ⊕ Z4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N21.9.253 Z3 ⊕ Z3 ⊕ Z3	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{A_u}$
N21.9.254 Z3 ⊕ Z3 ⊕ Z4	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N21.13.1 GM2 ⊕ S1	√	1	1	×	-	-
N21.13.2 GM2 ⊕ R1	√	1	1	×	-	-
N21.13.3 GM3 ⊕ S1	√	1	1	×	-	-
N21.13.4 GM3 ⊕ R1	√	1	1	×	-	-
N21.13.5 T1 ⊕ S1	×	-	-	-	-	-
N21.13.6 T1 ⊕ R1	×	-	-	-	-	-
N21.13.7 T3 ⊕ S1	×	-	-	-	-	-
N21.13.8 T3 ⊕ R1	×	-	-	-	-	-
N21.13.9 Y1 ⊕ S1	×	-	-	-	-	-
N21.13.10 Y1 ⊕ R1	×	-	-	-	-	-
N21.13.11 Y2 ⊕ S1	×	-	-	-	-	-
N21.13.12 Y2 ⊕ R1	×	-	-	-	-	-
N21.13.13 Y3 ⊕ S1	×	-	-	-	-	-
N21.13.14 Y3 ⊕ R1	×	-	-	-	-	-
N21.13.15 Z1 ⊕ S1	×	-	-	-	-	-
N21.13.16 Z1 ⊕ R1	×	-	-	-	-	-

Non-coplanar SSGs with parent space group $C222$ (No. 21) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N21.13.17 Z3 $\oplus$ S1	$\times$	-	-	-	-	-
N21.13.18 Z3 $\oplus$ R1	$\times$	-	-	-	-	-
N21.14.1 GM2 $\oplus$ DT1	$\surd$	1	1	$\surd$	$mm2$	B2
N21.14.2 GM2 $\oplus$ DT2	$\surd$	1	1	$\surd$	$mm2$	B2
N21.14.3 GM2 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
N21.14.4 GM2 $\oplus$ LD1	$\surd$	1	1	$\surd$	222	B1
N21.14.5 GM2 $\oplus$ LD2	$\surd$	1	1	$\surd$	222	B1
N21.14.6 GM2 $\oplus$ H1	$\surd$	1	1	$\surd$	222	B1
N21.14.7 GM2 $\oplus$ H2	$\surd$	1	1	$\surd$	222	B1
N21.14.8 GM3 $\oplus$ SM1	$\surd$	1	1	$\surd$	222	B3
N21.14.9 GM3 $\oplus$ DT1	$\surd$	1	1	$\surd$	$mm2$	B2
N21.14.10 GM3 $\oplus$ SM2	$\surd$	1	1	$\surd$	222	B3
N21.14.11 GM3 $\oplus$ DT2	$\surd$	1	1	$\surd$	$mm2$	B2
N21.14.12 GM3 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
N21.14.13 GM3 $\oplus$ B1	$\surd$	1	1	$\times$	-	-
N21.14.14 GM3 $\oplus$ LD1	$\surd$	1	1	$\surd$	$mm2$	B2
N21.14.15 GM3 $\oplus$ LD2	$\surd$	1	1	$\surd$	$mm2$	B2
N21.14.16 GM3 $\oplus$ H1	$\surd$	1	1	$\times$	-	-
N21.14.17 GM3 $\oplus$ H2	$\surd$	1	1	$\times$	-	-
N21.14.18 T1 $\oplus$ DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N21.14.19 T1 $\oplus$ DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N21.14.20 T1 $\oplus$ A1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N21.14.21 T1 $\oplus$ A2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N21.14.22 T1 $\oplus$ LD1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N21.14.23 T1 $\oplus$ LD2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N21.14.24 T1 $\oplus$ H1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N21.14.25 T1 $\oplus$ H2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N21.14.26 T3 $\oplus$ DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N21.14.27 T3 $\oplus$ DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N21.14.28 T3 $\oplus$ A1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N21.14.29 T3 $\oplus$ A2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N21.14.30 T3 $\oplus$ LD1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N21.14.31 T3 $\oplus$ LD2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N21.14.32 T3 $\oplus$ H1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N21.14.33 T3 $\oplus$ H2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N21.14.34 Y1 $\oplus$ DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N21.14.35 Y1 $\oplus$ DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N21.14.36 Y1 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
N21.14.37 Y1 $\oplus$ LD1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N21.14.38 Y1 $\oplus$ LD2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N21.14.39 Y1 $\oplus$ H1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N21.14.40 Y1 $\oplus$ H2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N21.14.41 Y2 $\oplus$ DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N21.14.42 Y2 $\oplus$ DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N21.14.43 Y2 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
N21.14.44 Y2 $\oplus$ LD1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$

Non-coplanar SSGs with parent space group $C222$ (No. 21) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N21.14.45 Y2 ⊕ LD2	√	1	1	√	mmm	$\mathrm{B1_u}$
N21.14.46 Y2 ⊕ H1	√	1	1	√	mmm	$\mathrm{B1_u}$
N21.14.47 Y2 ⊕ H2	√	1	1	√	mmm	$\mathrm{B1_u}$
N21.14.48 Y3 ⊕ SM1	√	1	1	√	mmm	$\mathrm{B3_u}$
N21.14.49 Y3 ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N21.14.50 Y3 ⊕ SM2	√	1	1	√	mmm	$\mathrm{B3_u}$
N21.14.51 Y3 ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
N21.14.52 Y3 ⊕ A1	√	1	1	×	-	-
N21.14.53 Y3 ⊕ B1	√	1	1	×	-	-
N21.14.54 Y3 ⊕ LD1	√	1	1	√	mmm	$\mathrm{B1_u}$
N21.14.55 Y3 ⊕ LD2	√	1	1	√	mmm	$\mathrm{B1_u}$
N21.14.56 Y3 ⊕ H1	√	1	1	√	mmm	$\mathrm{B1_u}$
N21.14.57 Y3 ⊕ H2	√	1	1	√	mmm	$\mathrm{B1_u}$
N21.14.58 Z1 ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N21.14.59 Z1 ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
N21.14.60 Z1 ⊕ A1	√	1	1	√	mmm	$\mathrm{B3_u}$
N21.14.61 Z1 ⊕ A2	√	1	1	√	mmm	$\mathrm{B3_u}$
N21.14.62 Z1 ⊕ LD1	√	1	1	√	mmm	$\mathrm{B1_u}$
N21.14.63 Z1 ⊕ LD2	√	1	1	√	mmm	$\mathrm{B1_u}$
N21.14.64 Z1 ⊕ H1	√	1	1	×	-	-
N21.14.65 Z1 ⊕ H2	√	1	1	×	-	-
N21.14.66 Z3 ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N21.14.67 Z3 ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
N21.14.68 Z3 ⊕ A1	√	1	1	√	mmm	$\mathrm{B3_u}$
N21.14.69 Z3 ⊕ A2	√	1	1	√	mmm	$\mathrm{B3_u}$
N21.14.70 Z3 ⊕ LD1	√	1	1	√	mmm	$\mathrm{B1_u}$
N21.14.71 Z3 ⊕ LD2	√	1	1	√	mmm	$\mathrm{B1_u}$
N21.14.72 Z3 ⊕ H1	√	1	1	×	-	-
N21.14.73 Z3 ⊕ H2	√	1	1	×	-	-

TABLE S64: Collinear SSGs with parent space group $F222$ (No. 22).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L22.1.1 GM1	1	mmm	$\mathrm{A_g}$
L22.2.1 GM2	1	mmm	$\mathrm{B1_g}$
L22.2.2 T1	0	-	-
L22.2.3 T2	0	-	-

TABLE S65: Coplanar SSGs with parent space group $F222$ (No. 22).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P22.1.1 GM1	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{A_u}$
P22.2.1 GM2	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
P22.2.2 T1	√	1	1	√	mmm	$\mathrm{A_g}$
P22.2.3 T2	√	1	1	√	mmm	$\mathrm{A_g}$

Coplanar SSGs with parent space group $F222$ (No. 22) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P22.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
P22.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
P22.3.3 GM2 $\oplus$ T1	$\surd$	1	1	$\times$	-	-
P22.3.4 GM2 $\oplus$ Z1	$\surd$	1	1	$\times$	-	-
P22.3.5 GM2 $\oplus$ T2	$\surd$	1	1	$\times$	-	-
P22.3.6 GM2 $\oplus$ Z3	$\surd$	1	1	$\times$	-	-
P22.3.7 T1 $\oplus$ T1	$\surd$	1	1	$\times$	-	-
P22.3.8 T1 $\oplus$ T3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P22.3.9 T1 $\oplus$ Y1	$\times$	-	-	-	-	-
P22.3.10 T1 $\oplus$ Y4	$\times$	-	-	-	-	-
P22.3.11 T1 $\oplus$ T2	$\surd$	1	1	$\times$	-	-
P22.3.12 T1 $\oplus$ Y2	$\times$	-	-	-	-	-
P22.3.13 T1 $\oplus$ Y3	$\times$	-	-	-	-	-
P22.3.14 T2 $\oplus$ T2	$\surd$	1	1	$\times$	-	-
P22.3.15 T2 $\oplus$ T4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P22.3.16 T2 $\oplus$ Y2	$\times$	-	-	-	-	-
P22.3.17 T2 $\oplus$ Y3	$\times$	-	-	-	-	-
P22.8.1 DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P22.8.2 DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P22.8.3 A1	$\surd$	1	1	$\times$	-	-

TABLE S66: Non-coplanar SSGs with parent space group $F222$ (No. 22).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N22.1.1 GM1	$\surd$	3	3	$\surd$	222	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{A1}$
N22.2.1 GM2	$\surd$	3	3	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{A2}$
N22.2.2 T1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{A_u}$
N22.2.3 T2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{A_u}$
N22.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	222	$\mathrm{A1} \oplus \mathrm{B1} \oplus \mathrm{B1}$
N22.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{B2} \oplus \mathrm{B1}$
N22.3.3 GM2 $\oplus$ T1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N22.3.4 GM2 $\oplus$ Z1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N22.3.5 GM2 $\oplus$ T2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N22.3.6 GM2 $\oplus$ Z3	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N22.3.7 T1 $\oplus$ T1	$\surd$	1	1	$\surd$	222	A1
N22.3.8 T1 $\oplus$ T3	$\surd$	1	1	$\surd$	$mm2$	A1
N22.3.9 T1 $\oplus$ Y1	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N22.3.10 T1 $\oplus$ Y4	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N22.3.11 T1 $\oplus$ T2	$\surd$	1	1	$\surd$	$mm2$	A1
N22.3.12 T1 $\oplus$ Y2	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N22.3.13 T1 $\oplus$ Y3	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N22.3.14 T2 $\oplus$ T2	$\surd$	1	1	$\surd$	222	A1
N22.3.15 T2 $\oplus$ T4	$\surd$	1	1	$\surd$	$mm2$	A1
N22.3.16 T2 $\oplus$ Y2	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N22.3.17 T2 $\oplus$ Y3	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$

Non-coplanar SSGs with parent space group $F222$ (No. 22) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N22.8.1 DT1	√	1	1	√	$mm2$	A1
N22.8.2 DT2	√	1	1	√	$mm2$	A1
N22.8.3 A1	√	1	1	√	$mm2$	A1
N22.9.1 GM2 ⊕ GM2 ⊕ GM2	√	3	3	√	$mm2$	A2 ⊕ A2 ⊕ A2
N22.9.2 GM2 ⊕ GM2 ⊕ GM3	√	3	3	√	$mm2$	A2 ⊕ B2 ⊕ B2
N22.9.3 GM2 ⊕ GM3 ⊕ GM4	√	3	3	√	222	B1 ⊕ B3 ⊕ B2
N22.9.4 GM2 ⊕ GM2 ⊕ T1	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N22.9.5 GM2 ⊕ GM2 ⊕ Z1	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N22.9.6 GM2 ⊕ GM3 ⊕ T1	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N22.9.7 GM2 ⊕ GM3 ⊕ Y1	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N22.9.8 GM2 ⊕ GM2 ⊕ T2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N22.9.9 GM2 ⊕ GM2 ⊕ Z3	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N22.9.10 GM2 ⊕ GM3 ⊕ T2	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N22.9.11 GM2 ⊕ GM3 ⊕ Y2	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N22.9.12 GM2 ⊕ T1 ⊕ T1	√	1	1	×	-	-
N22.9.13 GM2 ⊕ T1 ⊕ T3	√	1	1	√	$mm2$	B1
N22.9.14 GM2 ⊕ T1 ⊕ Y1	√	1	1	√	mmm	$\mathrm{B1_g}$
N22.9.15 GM2 ⊕ T1 ⊕ Y4	√	1	1	√	mmm	$\mathrm{B1_g}$
N22.9.16 GM2 ⊕ T1 ⊕ Z1	√	1	1	×	-	-
N22.9.17 GM2 ⊕ T1 ⊕ Z2	√	1	1	×	-	-
N22.9.18 GM2 ⊕ Z1 ⊕ Z1	√	1	1	×	-	-
N22.9.19 GM2 ⊕ Z1 ⊕ Z2	√	1	1	√	222	B1
N22.9.20 GM2 ⊕ T1 ⊕ T2	√	1	1	×	-	-
N22.9.21 GM2 ⊕ T1 ⊕ T4	√	1	1	×	-	-
N22.9.22 GM2 ⊕ T1 ⊕ Y2	√	1	1	√	mmm	$\mathrm{B1_g}$
N22.9.23 GM2 ⊕ T1 ⊕ Y3	√	1	1	√	mmm	$\mathrm{B1_g}$
N22.9.24 GM2 ⊕ T1 ⊕ Z3	√	1	1	×	-	-
N22.9.25 GM2 ⊕ T1 ⊕ Z4	√	1	1	×	-	-
N22.9.26 GM2 ⊕ Z1 ⊕ T2	√	1	1	×	-	-
N22.9.27 GM2 ⊕ Z1 ⊕ T4	√	1	1	×	-	-
N22.9.28 GM2 ⊕ Z1 ⊕ Z3	√	1	1	×	-	-
N22.9.29 GM2 ⊕ T2 ⊕ T2	√	1	1	×	-	-
N22.9.30 GM2 ⊕ T2 ⊕ T4	√	1	1	√	$mm2$	B1
N22.9.31 GM2 ⊕ T2 ⊕ Y2	√	1	1	√	mmm	$\mathrm{B1_g}$
N22.9.32 GM2 ⊕ T2 ⊕ Y3	√	1	1	√	mmm	$\mathrm{B1_g}$
N22.9.33 GM2 ⊕ T2 ⊕ Z3	√	1	1	×	-	-
N22.9.34 GM2 ⊕ T2 ⊕ Z4	√	1	1	×	-	-
N22.9.35 GM2 ⊕ Z3 ⊕ Z3	√	1	1	×	-	-
N22.9.36 GM2 ⊕ Z3 ⊕ Z4	√	1	1	√	222	B1
N22.9.37 T1 ⊕ T1 ⊕ T1	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{A_u}$
N22.9.38 T1 ⊕ T1 ⊕ T3	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N22.9.39 T1 ⊕ T1 ⊕ Y1	√	1	1	×	-	-
N22.9.40 T1 ⊕ T1 ⊕ Y4	√	1	1	×	-	-
N22.9.41 T1 ⊕ T3 ⊕ Y1	√	1	1	√	mmm	$\mathrm{B3_u}$
N22.9.42 T1 ⊕ Y1 ⊕ Z1	×	-	-	-	-	-
N22.9.43 T1 ⊕ Y1 ⊕ Z2	×	-	-	-	-	-

Non-coplanar SSGs with parent space group $F222$ (No. 22) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N22.9.44 T1 ⊕ T1 ⊕ T2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N22.9.45 T1 ⊕ T1 ⊕ Y2	√	1	1	×	-	-
N22.9.46 T1 ⊕ T1 ⊕ Y3	√	1	1	×	-	-
N22.9.47 T1 ⊕ T3 ⊕ T2	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N22.9.48 T1 ⊕ T3 ⊕ Y2	√	1	1	√	mmm	$\mathrm{B3_u}$
N22.9.49 T1 ⊕ Y1 ⊕ T2	√	1	1	√	mmm	$\mathrm{B1_u}$
N22.9.50 T1 ⊕ Y1 ⊕ T4	√	1	1	×	-	-
N22.9.51 T1 ⊕ Y1 ⊕ Z3	×	-	-	-	-	-
N22.9.52 T1 ⊕ Y4 ⊕ T2	√	1	1	√	mmm	$\mathrm{B1_u}$
N22.9.53 T1 ⊕ Y4 ⊕ T4	√	1	1	×	-	-
N22.9.54 T1 ⊕ Y4 ⊕ Z3	×	-	-	-	-	-
N22.9.55 T1 ⊕ Y4 ⊕ Z4	×	-	-	-	-	-
N22.9.56 T1 ⊕ T2 ⊕ T2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N22.9.57 T1 ⊕ T2 ⊕ T4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N22.9.58 T1 ⊕ T2 ⊕ Y2	√	1	1	√	mmm	$\mathrm{B1_u}$
N22.9.59 T1 ⊕ T2 ⊕ Y3	√	1	1	√	mmm	$\mathrm{B1_u}$
N22.9.60 T1 ⊕ T2 ⊕ Z3	√	1	1	×	-	-
N22.9.61 T1 ⊕ T2 ⊕ Z4	√	1	1	×	-	-
N22.9.62 T1 ⊕ Y2 ⊕ Y2	√	1	1	×	-	-
N22.9.63 T1 ⊕ Y2 ⊕ Y3	√	1	1	√	mmm	$\mathrm{B2_u}$
N22.9.64 T1 ⊕ Y2 ⊕ Z3	×	-	-	-	-	-
N22.9.65 T1 ⊕ Y2 ⊕ Z4	×	-	-	-	-	-
N22.9.66 T1 ⊕ Y3 ⊕ Y3	√	1	1	×	-	-
N22.9.67 T1 ⊕ Y3 ⊕ Z3	×	-	-	-	-	-
N22.9.68 T2 ⊕ T2 ⊕ T2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{A_u}$
N22.9.69 T2 ⊕ T2 ⊕ T4	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N22.9.70 T2 ⊕ T2 ⊕ Y2	√	1	1	×	-	-
N22.9.71 T2 ⊕ T2 ⊕ Y3	√	1	1	×	-	-
N22.9.72 T2 ⊕ T4 ⊕ Y2	√	1	1	√	mmm	$\mathrm{B3_u}$
N22.9.73 T2 ⊕ Y2 ⊕ Z3	×	-	-	-	-	-
N22.9.74 T2 ⊕ Y3 ⊕ Z4	×	-	-	-	-	-
N22.14.1 GM2 ⊕ DT1	√	1	1	√	$mm2$	B2
N22.14.2 GM2 ⊕ LD1	√	1	1	√	222	B1
N22.14.3 GM2 ⊕ DT2	√	1	1	√	$mm2$	B2
N22.14.4 GM2 ⊕ LD2	√	1	1	√	222	B1
N22.14.5 GM2 ⊕ A1	√	1	1	×	-	-
N22.14.6 GM2 ⊕ H1	√	1	1	×	-	-
N22.14.7 T1 ⊕ SM1	√	1	1	√	mmm	$\mathrm{B3_u}$
N22.14.8 T1 ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N22.14.9 T1 ⊕ SM2	√	1	1	√	mmm	$\mathrm{B3_u}$
N22.14.10 T1 ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
N22.14.11 T1 ⊕ A1	√	1	1	×	-	-
N22.14.12 T1 ⊕ A2	√	1	1	×	-	-
N22.14.13 T1 ⊕ B1	√	1	1	√	mmm	$\mathrm{B2_u}$
N22.14.14 T1 ⊕ B2	√	1	1	√	mmm	$\mathrm{B2_u}$
N22.14.15 T2 ⊕ SM1	√	1	1	√	mmm	$\mathrm{B3_u}$

Non-coplanar SSGs with parent space group $F222$ (No. 22) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N22.14.16 T2 $\oplus$ DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N22.14.17 T2 $\oplus$ SM2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N22.14.18 T2 $\oplus$ DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N22.14.19 T2 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
N22.14.20 T2 $\oplus$ B1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N22.14.21 T2 $\oplus$ B2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$

TABLE S67: Collinear SSGs with parent space group $I222$ (No. 23).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L23.1.1 GM1	1	mmm	$\mathrm{A_g}$
L23.2.1 GM2	1	mmm	$\mathrm{B1_g}$
L23.2.2 X1	0	-	-
L23.2.3 X2	0	-	-

TABLE S68: Coplanar SSGs with parent space group $I222$ (No. 23).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P23.1.1 GM1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{A_u}$
P23.2.1 GM2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
P23.2.2 X1	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P23.2.3 X2	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P23.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
P23.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
P23.3.3 GM2 $\oplus$ X1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
P23.3.4 GM2 $\oplus$ X2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
P23.3.5 GM2 $\oplus$ X3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
P23.3.6 X1 $\oplus$ X1	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_u}$
P23.3.7 X1 $\oplus$ X2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P23.3.8 X2 $\oplus$ X2	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_u}$
P23.3.9 X2 $\oplus$ X3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P23.4.1 W1WA1	$\surd$	1	1	$\times$	-	-
P23.7.1 R1	$\times$	-	-	-	-	-
P23.8.1 DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P23.8.2 DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$

TABLE S69: Non-coplanar SSGs with parent space group $I222$ (No. 23).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N23.1.1 GM1	$\surd$	3	3	$\surd$	222	A1 $\oplus$ A1 $\oplus$ A1
N23.2.1 GM2	$\surd$	3	3	$\surd$	$mm2$	A1 $\oplus$ A1 $\oplus$ A2
N23.2.2 X1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{A_u}$
N23.2.3 X2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{A_u}$

Non-coplanar SSGs with parent space group $I222$ (No. 23) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N23.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	222	A1 $\oplus$ B1 $\oplus$ B1
N23.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$mm2$	A1 $\oplus$ B2 $\oplus$ B1
N23.3.3 GM2 $\oplus$ X1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N23.3.4 GM2 $\oplus$ X2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N23.3.5 GM2 $\oplus$ X3	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N23.3.6 X1 $\oplus$ X1	$\surd$	1	1	$\surd$	222	A1
N23.3.7 X1 $\oplus$ X2	$\surd$	1	1	$\surd$	$mm2$	A1
N23.3.8 X2 $\oplus$ X2	$\surd$	1	1	$\surd$	222	A1
N23.3.9 X2 $\oplus$ X3	$\surd$	1	1	$\surd$	$mm2$	A1
N23.4.1 W1WA1	$\surd$	1	1	$\surd$	222	A1
N23.7.1 R1	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N23.8.1 DT1	$\surd$	1	1	$\surd$	$mm2$	A1
N23.8.2 DT2	$\surd$	1	1	$\surd$	$mm2$	A1
N23.9.1 GM2 $\oplus$ GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$mm2$	A2 $\oplus$ A2 $\oplus$ A2
N23.9.2 GM2 $\oplus$ GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$mm2$	A2 $\oplus$ B2 $\oplus$ B2
N23.9.3 GM2 $\oplus$ GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	222	B1 $\oplus$ B3 $\oplus$ B2
N23.9.4 GM2 $\oplus$ GM2 $\oplus$ X1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N23.9.5 GM2 $\oplus$ GM3 $\oplus$ X1	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N23.9.6 GM2 $\oplus$ GM2 $\oplus$ X2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N23.9.7 GM2 $\oplus$ GM2 $\oplus$ X3	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N23.9.8 GM2 $\oplus$ GM3 $\oplus$ X2	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N23.9.9 GM2 $\oplus$ GM3 $\oplus$ X4	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N23.9.10 GM2 $\oplus$ X1 $\oplus$ X1	$\surd$	1	1	$\surd$	$mm2$	A2
N23.9.11 GM2 $\oplus$ X1 $\oplus$ X2	$\surd$	1	1	$\surd$	222	B1
N23.9.12 GM2 $\oplus$ X1 $\oplus$ X3	$\surd$	1	1	$\surd$	$mm2$	B1
N23.9.13 GM2 $\oplus$ X2 $\oplus$ X2	$\surd$	1	1	$\surd$	$mm2$	A2
N23.9.14 GM2 $\oplus$ X2 $\oplus$ X3	$\surd$	1	1	$\surd$	$mm2$	B2
N23.9.15 GM2 $\oplus$ X3 $\oplus$ X3	$\surd$	1	1	$\surd$	$mm2$	A2
N23.9.16 GM2 $\oplus$ X3 $\oplus$ X4	$\surd$	1	1	$\surd$	222	B1
N23.9.17 X1 $\oplus$ X1 $\oplus$ X1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{A_u}$
N23.9.18 X1 $\oplus$ X1 $\oplus$ X2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N23.9.19 X1 $\oplus$ X2 $\oplus$ X2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N23.9.20 X1 $\oplus$ X2 $\oplus$ X3	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N23.9.21 X2 $\oplus$ X2 $\oplus$ X2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{A_u}$
N23.9.22 X2 $\oplus$ X2 $\oplus$ X3	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N23.9.23 X2 $\oplus$ X3 $\oplus$ X4	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N23.10.1 GM2 $\oplus$ W1WA1	$\surd$	1	1	$\times$	-	-
N23.10.2 X1 $\oplus$ W1WA1	$\surd$	1	1	$\times$	-	-
N23.10.3 X2 $\oplus$ W1WA1	$\surd$	1	1	$\times$	-	-
N23.13.1 GM2 $\oplus$ R1	$\surd$	1	1	$\times$	-	-
N23.13.2 GM2 $\oplus$ T1	$\surd$	1	1	$\times$	-	-
N23.13.3 X1 $\oplus$ R1	$\times$	-	-	-	-	-
N23.13.4 X2 $\oplus$ R1	$\times$	-	-	-	-	-
N23.13.5 X2 $\oplus$ T1	$\times$	-	-	-	-	-
N23.14.1 GM2 $\oplus$ DT1	$\surd$	1	1	$\surd$	$mm2$	B2
N23.14.2 GM2 $\oplus$ LD1	$\surd$	1	1	$\surd$	222	B1

Non-coplanar SSGs with parent space group $I222$ (No. 23) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N23.14.3 GM2 $\oplus$ DT2	$\surd$	1	1	$\surd$	$mm2$	B2
N23.14.4 GM2 $\oplus$ LD2	$\surd$	1	1	$\surd$	222	B1
N23.14.5 X1 $\oplus$ DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N23.14.6 X1 $\oplus$ DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N23.14.7 X2 $\oplus$ DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N23.14.8 X2 $\oplus$ LD1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N23.14.9 X2 $\oplus$ DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N23.14.10 X2 $\oplus$ LD2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$

TABLE S70: Collinear SSGs with parent space group $I2_12_12_1$ (No. 24).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L24.1.1 GM1	1	mmm	$\mathrm{A_g}$
L24.2.1 GM2	1	mmm	$\mathrm{B1_g}$
L24.2.2 X1	0	-	-
L24.2.3 X4	0	-	-

TABLE S71: Coplanar SSGs with parent space group $I2_12_12_1$ (No. 24).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P24.1.1 GM1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{A_u}$
P24.2.1 GM2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
P24.2.2 X1	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P24.2.3 X4	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P24.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
P24.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
P24.3.3 GM2 $\oplus$ X1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
P24.3.4 GM2 $\oplus$ X3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
P24.3.5 GM2 $\oplus$ X4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
P24.3.6 X1 $\oplus$ X1	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_u}$
P24.3.7 X1 $\oplus$ X2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P24.3.8 X1 $\oplus$ X4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P24.3.9 X4 $\oplus$ X4	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_u}$
P24.7.1 R1	$\times$	-	-	-	-	-
P24.8.1 DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P24.8.2 DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$

TABLE S72: Non-coplanar SSGs with parent space group $I2_12_12_1$ (No. 24).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N24.1.1 GM1	$\surd$	3	3	$\surd$	222	A1 $\oplus$ A1 $\oplus$ A1
N24.2.1 GM2	$\surd$	3	3	$\surd$	$mm2$	A1 $\oplus$ A1 $\oplus$ A2
N24.2.2 X1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{A_u}$
N24.2.3 X4	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{A_u}$

Non-coplanar SSGs with parent space group $I2_12_12_1$ (No. 24) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N24.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	222	A1 $\oplus$ B1 $\oplus$ B1
N24.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$mm2$	A1 $\oplus$ B2 $\oplus$ B1
N24.3.3 GM2 $\oplus$ X1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N24.3.4 GM2 $\oplus$ X3	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N24.3.5 GM2 $\oplus$ X4	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N24.3.6 X1 $\oplus$ X1	$\surd$	1	1	$\surd$	222	A1
N24.3.7 X1 $\oplus$ X2	$\surd$	1	1	$\surd$	$mm2$	A1
N24.3.8 X1 $\oplus$ X4	$\surd$	1	1	$\surd$	$mm2$	A1
N24.3.9 X4 $\oplus$ X4	$\surd$	1	1	$\surd$	222	A1
N24.7.1 R1	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N24.8.1 DT1	$\surd$	1	1	$\surd$	$mm2$	A1
N24.8.2 DT2	$\surd$	1	1	$\surd$	$mm2$	A1
N24.9.1 GM2 $\oplus$ GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$mm2$	A2 $\oplus$ A2 $\oplus$ A2
N24.9.2 GM2 $\oplus$ GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$mm2$	A2 $\oplus$ B2 $\oplus$ B2
N24.9.3 GM2 $\oplus$ GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	222	B1 $\oplus$ B3 $\oplus$ B2
N24.9.4 GM2 $\oplus$ GM2 $\oplus$ X1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N24.9.5 GM2 $\oplus$ GM2 $\oplus$ X3	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N24.9.6 GM2 $\oplus$ GM3 $\oplus$ X1	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N24.9.7 GM2 $\oplus$ GM3 $\oplus$ X2	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N24.9.8 GM2 $\oplus$ GM2 $\oplus$ X4	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N24.9.9 GM2 $\oplus$ GM3 $\oplus$ X4	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N24.9.10 GM2 $\oplus$ X1 $\oplus$ X1	$\surd$	1	1	$\surd$	$mm2$	A2
N24.9.11 GM2 $\oplus$ X1 $\oplus$ X2	$\surd$	1	1	$\surd$	222	B1
N24.9.12 GM2 $\oplus$ X1 $\oplus$ X3	$\surd$	1	1	$\surd$	$mm2$	B1
N24.9.13 GM2 $\oplus$ X3 $\oplus$ X3	$\surd$	1	1	$\surd$	$mm2$	A2
N24.9.14 GM2 $\oplus$ X1 $\oplus$ X4	$\surd$	1	1	$\surd$	$mm2$	B2
N24.9.15 GM2 $\oplus$ X3 $\oplus$ X4	$\surd$	1	1	$\surd$	222	B1
N24.9.16 GM2 $\oplus$ X4 $\oplus$ X4	$\surd$	1	1	$\surd$	$mm2$	A2
N24.9.17 X1 $\oplus$ X1 $\oplus$ X1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{A_u}$
N24.9.18 X1 $\oplus$ X1 $\oplus$ X2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N24.9.19 X1 $\oplus$ X2 $\oplus$ X3	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N24.9.20 X1 $\oplus$ X1 $\oplus$ X4	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N24.9.21 X1 $\oplus$ X2 $\oplus$ X4	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N24.9.22 X1 $\oplus$ X4 $\oplus$ X4	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N24.9.23 X4 $\oplus$ X4 $\oplus$ X4	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{A_u}$
N24.13.1 GM2 $\oplus$ R1	$\surd$	1	1	$\times$	-	-
N24.13.2 GM2 $\oplus$ T1	$\surd$	1	1	$\times$	-	-
N24.13.3 X1 $\oplus$ S1	$\times$	-	-	-	-	-
N24.13.4 X1 $\oplus$ R1	$\times$	-	-	-	-	-
N24.13.5 X4 $\oplus$ R1	$\times$	-	-	-	-	-
N24.14.1 GM2 $\oplus$ DT1	$\surd$	1	1	$\surd$	$mm2$	B2
N24.14.2 GM2 $\oplus$ LD1	$\surd$	1	1	$\surd$	222	B1
N24.14.3 GM2 $\oplus$ DT2	$\surd$	1	1	$\surd$	$mm2$	B2
N24.14.4 GM2 $\oplus$ LD2	$\surd$	1	1	$\surd$	222	B1
N24.14.5 X1 $\oplus$ LD1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N24.14.6 X1 $\oplus$ DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$

Non-coplanar SSGs with parent space group $I2_12_12_1$ (No. 24) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N24.14.7 X1 $\oplus$ LD2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N24.14.8 X1 $\oplus$ DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N24.14.9 X4 $\oplus$ DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N24.14.10 X4 $\oplus$ DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$

TABLE S73: Collinear SSGs with parent space group $Pmm2$ (No. 25).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L25.1.1 GM1	1	mmm	$\mathrm{A_g}$
L25.2.1 GM2	1	mmm	$\mathrm{B1_g}$
L25.2.2 GM3	1	mmm	$\mathrm{B3_g}$
L25.2.3 R1	0	-	-
L25.2.4 S1	0	-	-
L25.2.5 T1	0	-	-
L25.2.6 T2	0	-	-
L25.2.7 X1	0	-	-
L25.2.8 X2	0	-	-
L25.2.9 Z1	0	-	-
L25.2.10 Z2	0	-	-
L25.2.11 Z3	0	-	-

TABLE S74: Coplanar SSGs with parent space group $Pmm2$ (No. 25).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P25.1.1 GM1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B1_u}$
P25.2.1 GM2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$
P25.2.2 GM3	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
P25.2.3 R1	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P25.2.4 S1	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P25.2.5 T1	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P25.2.6 T2	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P25.2.7 X1	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P25.2.8 X2	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P25.2.9 Z1	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P25.2.10 Z2	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P25.2.11 Z3	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P25.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
P25.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
P25.3.3 GM2 $\oplus$ R1	$\surd$	1	1	$\times$	-	-
P25.3.4 GM2 $\oplus$ S1	$\surd$	1	1	$\times$	-	-
P25.3.5 GM2 $\oplus$ T1	$\surd$	1	1	$\times$	-	-
P25.3.6 GM2 $\oplus$ T2	$\surd$	1	1	$\times$	-	-
P25.3.7 GM2 $\oplus$ X1	$\surd$	1	1	$\times$	-	-
P25.3.8 GM2 $\oplus$ X2	$\surd$	1	1	$\times$	-	-
P25.3.9 GM2 $\oplus$ Z1	$\surd$	1	1	$\times$	-	-

Coplanar SSGs with parent space group $Pmm2$ (No. 25) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P25.3.10 GM2 $\oplus$ Z2	$\surd$	1	1	$\times$	-	-
P25.3.11 GM2 $\oplus$ Z3	$\surd$	1	1	$\times$	-	-
P25.3.12 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
P25.3.13 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
P25.3.14 GM3 $\oplus$ R1	$\surd$	1	1	$\times$	-	-
P25.3.15 GM3 $\oplus$ S1	$\surd$	1	1	$\times$	-	-
P25.3.16 GM3 $\oplus$ T1	$\surd$	1	1	$\times$	-	-
P25.3.17 GM3 $\oplus$ U1	$\surd$	1	1	$\times$	-	-
P25.3.18 GM3 $\oplus$ T2	$\surd$	1	1	$\times$	-	-
P25.3.19 GM3 $\oplus$ U2	$\surd$	1	1	$\times$	-	-
P25.3.20 GM3 $\oplus$ X1	$\surd$	1	1	$\times$	-	-
P25.3.21 GM3 $\oplus$ Y1	$\surd$	1	1	$\times$	-	-
P25.3.22 GM3 $\oplus$ X2	$\surd$	1	1	$\times$	-	-
P25.3.23 GM3 $\oplus$ Y2	$\surd$	1	1	$\times$	-	-
P25.3.24 GM3 $\oplus$ Z1	$\surd$	1	1	$\times$	-	-
P25.3.25 GM3 $\oplus$ Z2	$\surd$	1	1	$\times$	-	-
P25.3.26 GM3 $\oplus$ Z3	$\surd$	1	1	$\times$	-	-
P25.3.27 GM3 $\oplus$ Z4	$\surd$	1	1	$\times$	-	-
P25.3.28 R1 $\oplus$ R1	$\surd$	1	1	$\times$	-	-
P25.3.29 R1 $\oplus$ R2	$\surd$	1	1	$\times$	-	-
P25.3.30 R1 $\oplus$ R3	$\surd$	1	1	$\times$	-	-
P25.3.31 R1 $\oplus$ S1	$\times$	-	-	-	-	-
P25.3.32 R1 $\oplus$ S2	$\times$	-	-	-	-	-
P25.3.33 R1 $\oplus$ S3	$\times$	-	-	-	-	-
P25.3.34 R1 $\oplus$ T1	$\times$	-	-	-	-	-
P25.3.35 R1 $\oplus$ T3	$\times$	-	-	-	-	-
P25.3.36 R1 $\oplus$ T2	$\times$	-	-	-	-	-
P25.3.37 R1 $\oplus$ T4	$\times$	-	-	-	-	-
P25.3.38 R1 $\oplus$ X1	$\times$	-	-	-	-	-
P25.3.39 R1 $\oplus$ X4	$\times$	-	-	-	-	-
P25.3.40 R1 $\oplus$ X2	$\times$	-	-	-	-	-
P25.3.41 R1 $\oplus$ X3	$\times$	-	-	-	-	-
P25.3.42 R1 $\oplus$ Z1	$\times$	-	-	-	-	-
P25.3.43 R1 $\oplus$ Z2	$\times$	-	-	-	-	-
P25.3.44 R1 $\oplus$ Z3	$\times$	-	-	-	-	-
P25.3.45 S1 $\oplus$ S1	$\surd$	1	1	$\times$	-	-
P25.3.46 S1 $\oplus$ S2	$\surd$	1	1	$\times$	-	-
P25.3.47 S1 $\oplus$ S3	$\surd$	1	1	$\times$	-	-
P25.3.48 S1 $\oplus$ T1	$\times$	-	-	-	-	-
P25.3.49 S1 $\oplus$ T3	$\times$	-	-	-	-	-
P25.3.50 S1 $\oplus$ T2	$\times$	-	-	-	-	-
P25.3.51 S1 $\oplus$ T4	$\times$	-	-	-	-	-
P25.3.52 S1 $\oplus$ X1	$\times$	-	-	-	-	-
P25.3.53 S1 $\oplus$ X4	$\times$	-	-	-	-	-
P25.3.54 S1 $\oplus$ X2	$\times$	-	-	-	-	-
P25.3.55 S1 $\oplus$ X3	$\times$	-	-	-	-	-

Coplanar SSGs with parent space group $Pmm2$ (No. 25) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P25.3.56 S1 ⊕ Z1	×	-	-	-	-	-
P25.3.57 S1 ⊕ Z2	×	-	-	-	-	-
P25.3.58 S1 ⊕ Z3	×	-	-	-	-	-
P25.3.59 T1 ⊕ T1	√	1	1	×	-	-
P25.3.60 T1 ⊕ T3	√	1	1	×	-	-
P25.3.61 T1 ⊕ U1	×	-	-	-	-	-
P25.3.62 T1 ⊕ T2	√	1	1	×	-	-
P25.3.63 T1 ⊕ T4	√	1	1	×	-	-
P25.3.64 T1 ⊕ U2	×	-	-	-	-	-
P25.3.65 T1 ⊕ X1	×	-	-	-	-	-
P25.3.66 T1 ⊕ Y1	×	-	-	-	-	-
P25.3.67 T1 ⊕ Y3	×	-	-	-	-	-
P25.3.68 T1 ⊕ X2	×	-	-	-	-	-
P25.3.69 T1 ⊕ Y2	×	-	-	-	-	-
P25.3.70 T1 ⊕ Y4	×	-	-	-	-	-
P25.3.71 T1 ⊕ Z1	×	-	-	-	-	-
P25.3.72 T1 ⊕ Z2	×	-	-	-	-	-
P25.3.73 T1 ⊕ Z3	×	-	-	-	-	-
P25.3.74 T1 ⊕ Z4	×	-	-	-	-	-
P25.3.75 T2 ⊕ T2	√	1	1	×	-	-
P25.3.76 T2 ⊕ T4	√	1	1	×	-	-
P25.3.77 T2 ⊕ U2	×	-	-	-	-	-
P25.3.78 T2 ⊕ X1	×	-	-	-	-	-
P25.3.79 T2 ⊕ Y1	×	-	-	-	-	-
P25.3.80 T2 ⊕ Y3	×	-	-	-	-	-
P25.3.81 T2 ⊕ X2	×	-	-	-	-	-
P25.3.82 T2 ⊕ Y2	×	-	-	-	-	-
P25.3.83 T2 ⊕ Y4	×	-	-	-	-	-
P25.3.84 T2 ⊕ Z1	×	-	-	-	-	-
P25.3.85 T2 ⊕ Z2	×	-	-	-	-	-
P25.3.86 T2 ⊕ Z3	×	-	-	-	-	-
P25.3.87 T2 ⊕ Z4	×	-	-	-	-	-
P25.3.88 X1 ⊕ X1	√	1	1	×	-	-
P25.3.89 X1 ⊕ X4	√	1	1	√	mmm	$\mathrm{B3_u}$
P25.3.90 X1 ⊕ Y1	×	-	-	-	-	-
P25.3.91 X1 ⊕ X2	√	1	1	×	-	-
P25.3.92 X1 ⊕ X3	√	1	1	×	-	-
P25.3.93 X1 ⊕ Y2	×	-	-	-	-	-
P25.3.94 X1 ⊕ Z1	×	-	-	-	-	-
P25.3.95 X1 ⊕ Z2	×	-	-	-	-	-
P25.3.96 X1 ⊕ Z3	×	-	-	-	-	-
P25.3.97 X1 ⊕ Z4	×	-	-	-	-	-
P25.3.98 X2 ⊕ X2	√	1	1	×	-	-
P25.3.99 X2 ⊕ X3	√	1	1	√	mmm	$\mathrm{B3_u}$
P25.3.100 X2 ⊕ Y2	×	-	-	-	-	-
P25.3.101 X2 ⊕ Z1	×	-	-	-	-	-

Coplanar SSGs with parent space group $Pmm2$ (No. 25) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P25.3.102 X2 $\oplus$ Z2	$\times$	-	-	-	-	-
P25.3.103 X2 $\oplus$ Z3	$\times$	-	-	-	-	-
P25.3.104 X2 $\oplus$ Z4	$\times$	-	-	-	-	-
P25.3.105 Z1 $\oplus$ Z1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P25.3.106 Z1 $\oplus$ Z2	$\surd$	1	1	$\times$	-	-
P25.3.107 Z1 $\oplus$ Z3	$\surd$	1	1	$\times$	-	-
P25.3.108 Z2 $\oplus$ Z2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P25.3.109 Z2 $\oplus$ Z3	$\surd$	1	1	$\times$	-	-
P25.3.110 Z3 $\oplus$ Z3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P25.3.111 Z3 $\oplus$ Z4	$\surd$	1	1	$\times$	-	-
P25.5.1 LD1LE1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P25.5.2 LD2LE2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P25.5.3 LD3LE3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P25.5.4 G1GA1	$\surd$	1	1	$\times$	-	-
P25.5.5 G2GA2	$\surd$	1	1	$\times$	-	-
P25.5.6 Q1QA1	$\surd$	1	1	$\times$	-	-
P25.8.1 DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P25.8.2 DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P25.8.3 A1	$\surd$	1	1	$\times$	-	-
P25.8.4 A2	$\surd$	1	1	$\times$	-	-
P25.8.5 C1	$\surd$	1	1	$\times$	-	-
P25.8.6 E1	$\surd$	1	1	$\times$	-	-

TABLE S75: Non-coplanar SSGs with parent space group $Pmm2$ (No. 25).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N25.1.1 GM1	$\surd$	3	3	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{A1}$
N25.2.1 GM2	$\surd$	3	3	$\surd$	222	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{B1}$
N25.2.2 GM3	$\surd$	3	3	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{B2}$
N25.2.3 R1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B1_u}$
N25.2.4 S1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B1_u}$
N25.2.5 T1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B1_u}$
N25.2.6 T2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B1_u}$
N25.2.7 X1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B1_u}$
N25.2.8 X2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B1_u}$
N25.2.9 Z1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B1_u}$
N25.2.10 Z2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B1_u}$
N25.2.11 Z3	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B1_u}$
N25.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{A2} \oplus \mathrm{A2}$
N25.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{A2} \oplus \mathrm{B2}$
N25.3.3 GM2 $\oplus$ R1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$
N25.3.4 GM2 $\oplus$ S1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$
N25.3.5 GM2 $\oplus$ T1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$
N25.3.6 GM2 $\oplus$ T2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$
N25.3.7 GM2 $\oplus$ X1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$
N25.3.8 GM2 $\oplus$ X2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$

Non-coplanar SSGs with parent space group $Pmm2$ (No. 25) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N25.3.9 GM2 $\oplus$ Z1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$
N25.3.10 GM2 $\oplus$ Z2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$
N25.3.11 GM2 $\oplus$ Z3	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$
N25.3.12 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	$mm2$	A1 $\oplus$ B2 $\oplus$ B2
N25.3.13 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	222	A1 $\oplus$ B3 $\oplus$ B2
N25.3.14 GM3 $\oplus$ R1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N25.3.15 GM3 $\oplus$ S1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N25.3.16 GM3 $\oplus$ T1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N25.3.17 GM3 $\oplus$ U1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N25.3.18 GM3 $\oplus$ T2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N25.3.19 GM3 $\oplus$ U2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N25.3.20 GM3 $\oplus$ X1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N25.3.21 GM3 $\oplus$ Y1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N25.3.22 GM3 $\oplus$ X2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N25.3.23 GM3 $\oplus$ Y2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N25.3.24 GM3 $\oplus$ Z1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N25.3.25 GM3 $\oplus$ Z2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N25.3.26 GM3 $\oplus$ Z3	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N25.3.27 GM3 $\oplus$ Z4	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N25.3.28 R1 $\oplus$ R1	$\surd$	1	1	$\surd$	$mm2$	A1
N25.3.29 R1 $\oplus$ R2	$\surd$	1	1	$\surd$	222	A1
N25.3.30 R1 $\oplus$ R3	$\surd$	1	1	$\surd$	$mm2$	A1
N25.3.31 R1 $\oplus$ S1	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N25.3.32 R1 $\oplus$ S2	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N25.3.33 R1 $\oplus$ S3	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N25.3.34 R1 $\oplus$ T1	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N25.3.35 R1 $\oplus$ T3	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N25.3.36 R1 $\oplus$ T2	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N25.3.37 R1 $\oplus$ T4	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N25.3.38 R1 $\oplus$ X1	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N25.3.39 R1 $\oplus$ X4	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N25.3.40 R1 $\oplus$ X2	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N25.3.41 R1 $\oplus$ X3	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N25.3.42 R1 $\oplus$ Z1	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N25.3.43 R1 $\oplus$ Z2	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N25.3.44 R1 $\oplus$ Z3	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N25.3.45 S1 $\oplus$ S1	$\surd$	1	1	$\surd$	$mm2$	A1
N25.3.46 S1 $\oplus$ S2	$\surd$	1	1	$\surd$	222	A1
N25.3.47 S1 $\oplus$ S3	$\surd$	1	1	$\surd$	$mm2$	A1
N25.3.48 S1 $\oplus$ T1	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N25.3.49 S1 $\oplus$ T3	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N25.3.50 S1 $\oplus$ T2	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N25.3.51 S1 $\oplus$ T4	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N25.3.52 S1 $\oplus$ X1	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N25.3.53 S1 $\oplus$ X4	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N25.3.54 S1 $\oplus$ X2	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$

Non-coplanar SSGs with parent space group $Pmm2$ (No. 25) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N25.3.55 S1 ⊕ X3	√	1	1	√	mmm	$\mathrm{A_g}$
N25.3.56 S1 ⊕ Z1	√	1	1	√	mmm	$\mathrm{A_g}$
N25.3.57 S1 ⊕ Z2	√	1	1	√	mmm	$\mathrm{A_g}$
N25.3.58 S1 ⊕ Z3	√	1	1	√	mmm	$\mathrm{A_g}$
N25.3.59 T1 ⊕ T1	√	1	1	√	$mm2$	A1
N25.3.60 T1 ⊕ T3	√	1	1	√	$mm2$	A1
N25.3.61 T1 ⊕ U1	√	1	1	√	mmm	$\mathrm{A_g}$
N25.3.62 T1 ⊕ T2	√	1	1	√	222	A1
N25.3.63 T1 ⊕ T4	√	1	1	√	$mm2$	A1
N25.3.64 T1 ⊕ U2	√	1	1	√	mmm	$\mathrm{A_g}$
N25.3.65 T1 ⊕ X1	√	1	1	√	mmm	$\mathrm{A_g}$
N25.3.66 T1 ⊕ Y1	√	1	1	√	mmm	$\mathrm{A_g}$
N25.3.67 T1 ⊕ Y3	√	1	1	√	mmm	$\mathrm{A_g}$
N25.3.68 T1 ⊕ X2	√	1	1	√	mmm	$\mathrm{A_g}$
N25.3.69 T1 ⊕ Y2	√	1	1	√	mmm	$\mathrm{A_g}$
N25.3.70 T1 ⊕ Y4	√	1	1	√	mmm	$\mathrm{A_g}$
N25.3.71 T1 ⊕ Z1	√	1	1	√	mmm	$\mathrm{A_g}$
N25.3.72 T1 ⊕ Z2	√	1	1	√	mmm	$\mathrm{A_g}$
N25.3.73 T1 ⊕ Z3	√	1	1	√	mmm	$\mathrm{A_g}$
N25.3.74 T1 ⊕ Z4	√	1	1	√	mmm	$\mathrm{A_g}$
N25.3.75 T2 ⊕ T2	√	1	1	√	$mm2$	A1
N25.3.76 T2 ⊕ T4	√	1	1	√	$mm2$	A1
N25.3.77 T2 ⊕ U2	√	1	1	√	mmm	$\mathrm{A_g}$
N25.3.78 T2 ⊕ X1	√	1	1	√	mmm	$\mathrm{A_g}$
N25.3.79 T2 ⊕ Y1	√	1	1	√	mmm	$\mathrm{A_g}$
N25.3.80 T2 ⊕ Y3	√	1	1	√	mmm	$\mathrm{A_g}$
N25.3.81 T2 ⊕ X2	√	1	1	√	mmm	$\mathrm{A_g}$
N25.3.82 T2 ⊕ Y2	√	1	1	√	mmm	$\mathrm{A_g}$
N25.3.83 T2 ⊕ Y4	√	1	1	√	mmm	$\mathrm{A_g}$
N25.3.84 T2 ⊕ Z1	√	1	1	√	mmm	$\mathrm{A_g}$
N25.3.85 T2 ⊕ Z2	√	1	1	√	mmm	$\mathrm{A_g}$
N25.3.86 T2 ⊕ Z3	√	1	1	√	mmm	$\mathrm{A_g}$
N25.3.87 T2 ⊕ Z4	√	1	1	√	mmm	$\mathrm{A_g}$
N25.3.88 X1 ⊕ X1	√	1	1	√	$mm2$	A1
N25.3.89 X1 ⊕ X4	√	1	1	√	$mm2$	A1
N25.3.90 X1 ⊕ Y1	√	1	1	√	mmm	$\mathrm{A_g}$
N25.3.91 X1 ⊕ X2	√	1	1	√	222	A1
N25.3.92 X1 ⊕ X3	√	1	1	√	$mm2$	A1
N25.3.93 X1 ⊕ Y2	√	1	1	√	mmm	$\mathrm{A_g}$
N25.3.94 X1 ⊕ Z1	√	1	1	√	mmm	$\mathrm{A_g}$
N25.3.95 X1 ⊕ Z2	√	1	1	√	mmm	$\mathrm{A_g}$
N25.3.96 X1 ⊕ Z3	√	1	1	√	mmm	$\mathrm{A_g}$
N25.3.97 X1 ⊕ Z4	√	1	1	√	mmm	$\mathrm{A_g}$
N25.3.98 X2 ⊕ X2	√	1	1	√	$mm2$	A1
N25.3.99 X2 ⊕ X3	√	1	1	√	$mm2$	A1
N25.3.100 X2 ⊕ Y2	√	1	1	√	mmm	$\mathrm{A_g}$

Non-coplanar SSGs with parent space group $Pmm2$ (No. 25) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N25.3.101 X2 $\oplus$ Z1	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N25.3.102 X2 $\oplus$ Z2	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N25.3.103 X2 $\oplus$ Z3	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N25.3.104 X2 $\oplus$ Z4	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N25.3.105 Z1 $\oplus$ Z1	$\surd$	1	1	$\surd$	$mm2$	A1
N25.3.106 Z1 $\oplus$ Z2	$\surd$	1	1	$\surd$	222	A1
N25.3.107 Z1 $\oplus$ Z3	$\surd$	1	1	$\surd$	$mm2$	A1
N25.3.108 Z2 $\oplus$ Z2	$\surd$	1	1	$\surd$	$mm2$	A1
N25.3.109 Z2 $\oplus$ Z3	$\surd$	1	1	$\surd$	$mm2$	A1
N25.3.110 Z3 $\oplus$ Z3	$\surd$	1	1	$\surd$	$mm2$	A1
N25.3.111 Z3 $\oplus$ Z4	$\surd$	1	1	$\surd$	222	A1
N25.5.1 LD1LE1	$\surd$	1	1	$\surd$	$mm2$	A1
N25.5.2 LD2LE2	$\surd$	1	1	$\surd$	$mm2$	A1
N25.5.3 LD3LE3	$\surd$	1	1	$\surd$	$mm2$	A1
N25.5.4 G1GA1	$\surd$	1	1	$\surd$	$mm2$	A1
N25.5.5 G2GA2	$\surd$	1	1	$\surd$	$mm2$	A1
N25.5.6 Q1QA1	$\surd$	1	1	$\surd$	$mm2$	A1
N25.8.1 DT1	$\surd$	1	1	$\surd$	$mm2$	A1
N25.8.2 DT2	$\surd$	1	1	$\surd$	$mm2$	A1
N25.8.3 A1	$\surd$	1	1	$\surd$	$mm2$	A1
N25.8.4 A2	$\surd$	1	1	$\surd$	$mm2$	A1
N25.8.5 C1	$\surd$	1	1	$\surd$	$mm2$	A1
N25.8.6 E1	$\surd$	1	1	$\surd$	$mm2$	A1
N25.9.1 GM2 $\oplus$ GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	222	B1 $\oplus$ B1 $\oplus$ B1
N25.9.2 GM2 $\oplus$ GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$mm2$	B2 $\oplus$ B1 $\oplus$ B1
N25.9.3 GM2 $\oplus$ GM2 $\oplus$ R1	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N25.9.4 GM2 $\oplus$ GM2 $\oplus$ S1	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N25.9.5 GM2 $\oplus$ GM2 $\oplus$ T1	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N25.9.6 GM2 $\oplus$ GM2 $\oplus$ T2	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N25.9.7 GM2 $\oplus$ GM2 $\oplus$ X1	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N25.9.8 GM2 $\oplus$ GM2 $\oplus$ X2	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N25.9.9 GM2 $\oplus$ GM2 $\oplus$ Z1	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N25.9.10 GM2 $\oplus$ GM2 $\oplus$ Z2	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N25.9.11 GM2 $\oplus$ GM2 $\oplus$ Z3	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N25.9.12 GM2 $\oplus$ GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	222	B1 $\oplus$ B3 $\oplus$ B3
N25.9.13 GM2 $\oplus$ GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	$mm2$	A2 $\oplus$ B2 $\oplus$ B1
N25.9.14 GM2 $\oplus$ GM3 $\oplus$ R1	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N25.9.15 GM2 $\oplus$ GM3 $\oplus$ S1	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N25.9.16 GM2 $\oplus$ GM3 $\oplus$ T1	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N25.9.17 GM2 $\oplus$ GM3 $\oplus$ U1	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N25.9.18 GM2 $\oplus$ GM3 $\oplus$ T2	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N25.9.19 GM2 $\oplus$ GM3 $\oplus$ U2	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N25.9.20 GM2 $\oplus$ GM3 $\oplus$ X1	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N25.9.21 GM2 $\oplus$ GM3 $\oplus$ Y1	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N25.9.22 GM2 $\oplus$ GM3 $\oplus$ X2	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N25.9.23 GM2 $\oplus$ GM3 $\oplus$ Y2	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$

Non-coplanar SSGs with parent space group $Pmm2$ (No. 25) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N25.9.24 GM2 ⊕ GM3 ⊕ Z1	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N25.9.25 GM2 ⊕ GM3 ⊕ Z2	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N25.9.26 GM2 ⊕ GM3 ⊕ Z3	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N25.9.27 GM2 ⊕ GM3 ⊕ Z4	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N25.9.28 GM2 ⊕ R1 ⊕ R1	√	1	1	×	-	-
N25.9.29 GM2 ⊕ R1 ⊕ R2	√	1	1	×	-	-
N25.9.30 GM2 ⊕ R1 ⊕ R3	√	1	1	×	-	-
N25.9.31 GM2 ⊕ R1 ⊕ S1	√	1	1	×	-	-
N25.9.32 GM2 ⊕ R1 ⊕ S2	√	1	1	×	-	-
N25.9.33 GM2 ⊕ R1 ⊕ S3	√	1	1	×	-	-
N25.9.34 GM2 ⊕ R1 ⊕ T1	√	1	1	×	-	-
N25.9.35 GM2 ⊕ R1 ⊕ T3	√	1	1	×	-	-
N25.9.36 GM2 ⊕ R1 ⊕ T2	√	1	1	×	-	-
N25.9.37 GM2 ⊕ R1 ⊕ T4	√	1	1	×	-	-
N25.9.38 GM2 ⊕ R1 ⊕ X1	√	1	1	×	-	-
N25.9.39 GM2 ⊕ R1 ⊕ X4	√	1	1	×	-	-
N25.9.40 GM2 ⊕ R1 ⊕ X2	√	1	1	×	-	-
N25.9.41 GM2 ⊕ R1 ⊕ X3	√	1	1	×	-	-
N25.9.42 GM2 ⊕ R1 ⊕ Z1	√	1	1	×	-	-
N25.9.43 GM2 ⊕ R1 ⊕ Z2	√	1	1	×	-	-
N25.9.44 GM2 ⊕ R1 ⊕ Z3	√	1	1	×	-	-
N25.9.45 GM2 ⊕ S1 ⊕ S1	√	1	1	×	-	-
N25.9.46 GM2 ⊕ S1 ⊕ S2	√	1	1	×	-	-
N25.9.47 GM2 ⊕ S1 ⊕ S3	√	1	1	×	-	-
N25.9.48 GM2 ⊕ S1 ⊕ T1	√	1	1	×	-	-
N25.9.49 GM2 ⊕ S1 ⊕ T3	√	1	1	×	-	-
N25.9.50 GM2 ⊕ S1 ⊕ T2	√	1	1	×	-	-
N25.9.51 GM2 ⊕ S1 ⊕ T4	√	1	1	×	-	-
N25.9.52 GM2 ⊕ S1 ⊕ X1	√	1	1	×	-	-
N25.9.53 GM2 ⊕ S1 ⊕ X4	√	1	1	×	-	-
N25.9.54 GM2 ⊕ S1 ⊕ X2	√	1	1	×	-	-
N25.9.55 GM2 ⊕ S1 ⊕ X3	√	1	1	×	-	-
N25.9.56 GM2 ⊕ S1 ⊕ Z1	√	1	1	×	-	-
N25.9.57 GM2 ⊕ S1 ⊕ Z2	√	1	1	×	-	-
N25.9.58 GM2 ⊕ S1 ⊕ Z3	√	1	1	×	-	-
N25.9.59 GM2 ⊕ T1 ⊕ T1	√	1	1	×	-	-
N25.9.60 GM2 ⊕ T1 ⊕ T3	√	1	1	×	-	-
N25.9.61 GM2 ⊕ T1 ⊕ U1	√	1	1	×	-	-
N25.9.62 GM2 ⊕ T1 ⊕ T2	√	1	1	×	-	-
N25.9.63 GM2 ⊕ T1 ⊕ T4	√	1	1	×	-	-
N25.9.64 GM2 ⊕ T1 ⊕ U2	√	1	1	×	-	-
N25.9.65 GM2 ⊕ T1 ⊕ X1	√	1	1	×	-	-
N25.9.66 GM2 ⊕ T1 ⊕ Y1	√	1	1	×	-	-
N25.9.67 GM2 ⊕ T1 ⊕ Y3	√	1	1	×	-	-
N25.9.68 GM2 ⊕ T1 ⊕ X2	√	1	1	×	-	-
N25.9.69 GM2 ⊕ T1 ⊕ Y2	√	1	1	×	-	-

Non-coplanar SSGs with parent space group $Pmm2$ (No. 25) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N25.9.70 GM2 ⊕ T1 ⊕ Y4	√	1	1	×	-	-
N25.9.71 GM2 ⊕ T1 ⊕ Z1	√	1	1	×	-	-
N25.9.72 GM2 ⊕ T1 ⊕ Z2	√	1	1	×	-	-
N25.9.73 GM2 ⊕ T1 ⊕ Z3	√	1	1	×	-	-
N25.9.74 GM2 ⊕ T1 ⊕ Z4	√	1	1	×	-	-
N25.9.75 GM2 ⊕ T2 ⊕ T2	√	1	1	×	-	-
N25.9.76 GM2 ⊕ T2 ⊕ T4	√	1	1	×	-	-
N25.9.77 GM2 ⊕ T2 ⊕ U2	√	1	1	×	-	-
N25.9.78 GM2 ⊕ T2 ⊕ X1	√	1	1	×	-	-
N25.9.79 GM2 ⊕ T2 ⊕ Y1	√	1	1	×	-	-
N25.9.80 GM2 ⊕ T2 ⊕ Y3	√	1	1	×	-	-
N25.9.81 GM2 ⊕ T2 ⊕ X2	√	1	1	×	-	-
N25.9.82 GM2 ⊕ T2 ⊕ Y2	√	1	1	×	-	-
N25.9.83 GM2 ⊕ T2 ⊕ Y4	√	1	1	×	-	-
N25.9.84 GM2 ⊕ T2 ⊕ Z1	√	1	1	×	-	-
N25.9.85 GM2 ⊕ T2 ⊕ Z2	√	1	1	×	-	-
N25.9.86 GM2 ⊕ T2 ⊕ Z3	√	1	1	×	-	-
N25.9.87 GM2 ⊕ T2 ⊕ Z4	√	1	1	×	-	-
N25.9.88 GM2 ⊕ X1 ⊕ X1	√	1	1	×	-	-
N25.9.89 GM2 ⊕ X1 ⊕ X4	√	1	1	√	$mm2$	B1
N25.9.90 GM2 ⊕ X1 ⊕ Y1	√	1	1	√	mmm	$\mathrm{B1_g}$
N25.9.91 GM2 ⊕ X1 ⊕ X2	√	1	1	×	-	-
N25.9.92 GM2 ⊕ X1 ⊕ X3	√	1	1	×	-	-
N25.9.93 GM2 ⊕ X1 ⊕ Y2	√	1	1	√	mmm	$\mathrm{B1_g}$
N25.9.94 GM2 ⊕ X1 ⊕ Z1	√	1	1	×	-	-
N25.9.95 GM2 ⊕ X1 ⊕ Z2	√	1	1	×	-	-
N25.9.96 GM2 ⊕ X1 ⊕ Z3	√	1	1	×	-	-
N25.9.97 GM2 ⊕ X1 ⊕ Z4	√	1	1	×	-	-
N25.9.98 GM2 ⊕ X2 ⊕ X2	√	1	1	×	-	-
N25.9.99 GM2 ⊕ X2 ⊕ X3	√	1	1	√	$mm2$	B1
N25.9.100 GM2 ⊕ X2 ⊕ Y2	√	1	1	√	mmm	$\mathrm{B1_g}$
N25.9.101 GM2 ⊕ X2 ⊕ Z1	√	1	1	×	-	-
N25.9.102 GM2 ⊕ X2 ⊕ Z2	√	1	1	×	-	-
N25.9.103 GM2 ⊕ X2 ⊕ Z3	√	1	1	×	-	-
N25.9.104 GM2 ⊕ X2 ⊕ Z4	√	1	1	×	-	-
N25.9.105 GM2 ⊕ Z1 ⊕ Z1	√	1	1	√	222	B1
N25.9.106 GM2 ⊕ Z1 ⊕ Z2	√	1	1	×	-	-
N25.9.107 GM2 ⊕ Z1 ⊕ Z3	√	1	1	×	-	-
N25.9.108 GM2 ⊕ Z2 ⊕ Z2	√	1	1	√	222	B1
N25.9.109 GM2 ⊕ Z2 ⊕ Z3	√	1	1	×	-	-
N25.9.110 GM2 ⊕ Z3 ⊕ Z3	√	1	1	√	222	B1
N25.9.111 GM2 ⊕ Z3 ⊕ Z4	√	1	1	×	-	-
N25.9.112 GM3 ⊕ GM3 ⊕ GM3	√	3	3	√	$mm2$	B2 ⊕ B2 ⊕ B2
N25.9.113 GM3 ⊕ GM3 ⊕ GM4	√	3	3	√	$mm2$	A2 ⊕ A2 ⊕ B1
N25.9.114 GM3 ⊕ GM3 ⊕ R1	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N25.9.115 GM3 ⊕ GM4 ⊕ R1	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$

Non-coplanar SSGs with parent space group $Pmm2$ (No. 25) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N25.9.116 GM3 $\oplus$ GM3 $\oplus$ S1	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N25.9.117 GM3 $\oplus$ GM4 $\oplus$ S1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N25.9.118 GM3 $\oplus$ GM3 $\oplus$ T1	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N25.9.119 GM3 $\oplus$ GM3 $\oplus$ U1	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N25.9.120 GM3 $\oplus$ GM4 $\oplus$ T1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N25.9.121 GM3 $\oplus$ GM3 $\oplus$ T2	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N25.9.122 GM3 $\oplus$ GM3 $\oplus$ U2	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N25.9.123 GM3 $\oplus$ GM4 $\oplus$ T2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N25.9.124 GM3 $\oplus$ GM3 $\oplus$ X1	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N25.9.125 GM3 $\oplus$ GM3 $\oplus$ Y1	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N25.9.126 GM3 $\oplus$ GM4 $\oplus$ X1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N25.9.127 GM3 $\oplus$ GM3 $\oplus$ X2	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N25.9.128 GM3 $\oplus$ GM3 $\oplus$ Y2	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N25.9.129 GM3 $\oplus$ GM4 $\oplus$ X2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N25.9.130 GM3 $\oplus$ GM3 $\oplus$ Z1	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N25.9.131 GM3 $\oplus$ GM4 $\oplus$ Z1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N25.9.132 GM3 $\oplus$ GM3 $\oplus$ Z2	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N25.9.133 GM3 $\oplus$ GM4 $\oplus$ Z2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N25.9.134 GM3 $\oplus$ GM3 $\oplus$ Z3	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N25.9.135 GM3 $\oplus$ GM3 $\oplus$ Z4	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N25.9.136 GM3 $\oplus$ GM4 $\oplus$ Z3	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N25.9.137 GM3 $\oplus$ R1 $\oplus$ R1	$\surd$	1	1	$\times$	-	-
N25.9.138 GM3 $\oplus$ R1 $\oplus$ R2	$\surd$	1	1	$\times$	-	-
N25.9.139 GM3 $\oplus$ R1 $\oplus$ R3	$\surd$	1	1	$\times$	-	-
N25.9.140 GM3 $\oplus$ R1 $\oplus$ R4	$\surd$	1	1	$\times$	-	-
N25.9.141 GM3 $\oplus$ R1 $\oplus$ S1	$\surd$	1	1	$\times$	-	-
N25.9.142 GM3 $\oplus$ R1 $\oplus$ S2	$\surd$	1	1	$\times$	-	-
N25.9.143 GM3 $\oplus$ R1 $\oplus$ S3	$\surd$	1	1	$\times$	-	-
N25.9.144 GM3 $\oplus$ R1 $\oplus$ S4	$\surd$	1	1	$\times$	-	-
N25.9.145 GM3 $\oplus$ R1 $\oplus$ T1	$\surd$	1	1	$\times$	-	-
N25.9.146 GM3 $\oplus$ R1 $\oplus$ T3	$\surd$	1	1	$\times$	-	-
N25.9.147 GM3 $\oplus$ R1 $\oplus$ U1	$\surd$	1	1	$\times$	-	-
N25.9.148 GM3 $\oplus$ R1 $\oplus$ U4	$\surd$	1	1	$\times$	-	-
N25.9.149 GM3 $\oplus$ R1 $\oplus$ T2	$\surd$	1	1	$\times$	-	-
N25.9.150 GM3 $\oplus$ R1 $\oplus$ T4	$\surd$	1	1	$\times$	-	-
N25.9.151 GM3 $\oplus$ R1 $\oplus$ U2	$\surd$	1	1	$\times$	-	-
N25.9.152 GM3 $\oplus$ R1 $\oplus$ U3	$\surd$	1	1	$\times$	-	-
N25.9.153 GM3 $\oplus$ R1 $\oplus$ X1	$\surd$	1	1	$\times$	-	-
N25.9.154 GM3 $\oplus$ R1 $\oplus$ X4	$\surd$	1	1	$\times$	-	-
N25.9.155 GM3 $\oplus$ R1 $\oplus$ Y1	$\surd$	1	1	$\times$	-	-
N25.9.156 GM3 $\oplus$ R1 $\oplus$ Y3	$\surd$	1	1	$\times$	-	-
N25.9.157 GM3 $\oplus$ R1 $\oplus$ X2	$\surd$	1	1	$\times$	-	-
N25.9.158 GM3 $\oplus$ R1 $\oplus$ X3	$\surd$	1	1	$\times$	-	-
N25.9.159 GM3 $\oplus$ R1 $\oplus$ Y2	$\surd$	1	1	$\times$	-	-
N25.9.160 GM3 $\oplus$ R1 $\oplus$ Y4	$\surd$	1	1	$\times$	-	-
N25.9.161 GM3 $\oplus$ R1 $\oplus$ Z1	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $Pmm2$ (No. 25) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N25.9.162 GM3 ⊕ R1 ⊕ Z2	√	1	1	×	-	-
N25.9.163 GM3 ⊕ R1 ⊕ Z3	√	1	1	×	-	-
N25.9.164 GM3 ⊕ R1 ⊕ Z4	√	1	1	×	-	-
N25.9.165 GM3 ⊕ S1 ⊕ S1	√	1	1	×	-	-
N25.9.166 GM3 ⊕ S1 ⊕ S2	√	1	1	×	-	-
N25.9.167 GM3 ⊕ S1 ⊕ S3	√	1	1	×	-	-
N25.9.168 GM3 ⊕ S1 ⊕ S4	√	1	1	×	-	-
N25.9.169 GM3 ⊕ S1 ⊕ T1	√	1	1	×	-	-
N25.9.170 GM3 ⊕ S1 ⊕ T3	√	1	1	×	-	-
N25.9.171 GM3 ⊕ S1 ⊕ U1	√	1	1	×	-	-
N25.9.172 GM3 ⊕ S1 ⊕ U4	√	1	1	×	-	-
N25.9.173 GM3 ⊕ S1 ⊕ T2	√	1	1	×	-	-
N25.9.174 GM3 ⊕ S1 ⊕ T4	√	1	1	×	-	-
N25.9.175 GM3 ⊕ S1 ⊕ U2	√	1	1	×	-	-
N25.9.176 GM3 ⊕ S1 ⊕ U3	√	1	1	×	-	-
N25.9.177 GM3 ⊕ S1 ⊕ X1	√	1	1	×	-	-
N25.9.178 GM3 ⊕ S1 ⊕ X4	√	1	1	×	-	-
N25.9.179 GM3 ⊕ S1 ⊕ Y1	√	1	1	×	-	-
N25.9.180 GM3 ⊕ S1 ⊕ Y3	√	1	1	×	-	-
N25.9.181 GM3 ⊕ S1 ⊕ X2	√	1	1	×	-	-
N25.9.182 GM3 ⊕ S1 ⊕ X3	√	1	1	×	-	-
N25.9.183 GM3 ⊕ S1 ⊕ Y2	√	1	1	×	-	-
N25.9.184 GM3 ⊕ S1 ⊕ Y4	√	1	1	×	-	-
N25.9.185 GM3 ⊕ S1 ⊕ Z1	√	1	1	×	-	-
N25.9.186 GM3 ⊕ S1 ⊕ Z2	√	1	1	×	-	-
N25.9.187 GM3 ⊕ S1 ⊕ Z3	√	1	1	×	-	-
N25.9.188 GM3 ⊕ S1 ⊕ Z4	√	1	1	×	-	-
N25.9.189 GM3 ⊕ T1 ⊕ T1	√	1	1	×	-	-
N25.9.190 GM3 ⊕ T1 ⊕ T3	√	1	1	×	-	-
N25.9.191 GM3 ⊕ T1 ⊕ U1	√	1	1	×	-	-
N25.9.192 GM3 ⊕ U1 ⊕ U1	√	1	1	×	-	-
N25.9.193 GM3 ⊕ U1 ⊕ U4	√	1	1	×	-	-
N25.9.194 GM3 ⊕ T1 ⊕ T2	√	1	1	×	-	-
N25.9.195 GM3 ⊕ T1 ⊕ T4	√	1	1	×	-	-
N25.9.196 GM3 ⊕ T1 ⊕ U2	√	1	1	×	-	-
N25.9.197 GM3 ⊕ U1 ⊕ T2	√	1	1	×	-	-
N25.9.198 GM3 ⊕ U1 ⊕ U2	√	1	1	×	-	-
N25.9.199 GM3 ⊕ U1 ⊕ U3	√	1	1	×	-	-
N25.9.200 GM3 ⊕ T1 ⊕ X1	√	1	1	×	-	-
N25.9.201 GM3 ⊕ T1 ⊕ Y1	√	1	1	×	-	-
N25.9.202 GM3 ⊕ T1 ⊕ Y3	√	1	1	×	-	-
N25.9.203 GM3 ⊕ U1 ⊕ X1	√	1	1	×	-	-
N25.9.204 GM3 ⊕ U1 ⊕ X4	√	1	1	×	-	-
N25.9.205 GM3 ⊕ U1 ⊕ Y1	√	1	1	×	-	-
N25.9.206 GM3 ⊕ T1 ⊕ X2	√	1	1	×	-	-
N25.9.207 GM3 ⊕ T1 ⊕ Y2	√	1	1	×	-	-

Non-coplanar SSGs with parent space group $Pmm2$ (No. 25) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N25.9.208 GM3 $\oplus$ T1 $\oplus$ Y4	$\surd$	1	1	$\times$	-	-
N25.9.209 GM3 $\oplus$ U1 $\oplus$ X2	$\surd$	1	1	$\times$	-	-
N25.9.210 GM3 $\oplus$ U1 $\oplus$ X3	$\surd$	1	1	$\times$	-	-
N25.9.211 GM3 $\oplus$ U1 $\oplus$ Y2	$\surd$	1	1	$\times$	-	-
N25.9.212 GM3 $\oplus$ T1 $\oplus$ Z1	$\surd$	1	1	$\times$	-	-
N25.9.213 GM3 $\oplus$ U1 $\oplus$ Z1	$\surd$	1	1	$\times$	-	-
N25.9.214 GM3 $\oplus$ T1 $\oplus$ Z2	$\surd$	1	1	$\times$	-	-
N25.9.215 GM3 $\oplus$ U1 $\oplus$ Z2	$\surd$	1	1	$\times$	-	-
N25.9.216 GM3 $\oplus$ T1 $\oplus$ Z3	$\surd$	1	1	$\times$	-	-
N25.9.217 GM3 $\oplus$ T1 $\oplus$ Z4	$\surd$	1	1	$\times$	-	-
N25.9.218 GM3 $\oplus$ U1 $\oplus$ Z3	$\surd$	1	1	$\times$	-	-
N25.9.219 GM3 $\oplus$ U1 $\oplus$ Z4	$\surd$	1	1	$\times$	-	-
N25.9.220 GM3 $\oplus$ T2 $\oplus$ T2	$\surd$	1	1	$\times$	-	-
N25.9.221 GM3 $\oplus$ T2 $\oplus$ T4	$\surd$	1	1	$\times$	-	-
N25.9.222 GM3 $\oplus$ T2 $\oplus$ U2	$\surd$	1	1	$\times$	-	-
N25.9.223 GM3 $\oplus$ U2 $\oplus$ U2	$\surd$	1	1	$\times$	-	-
N25.9.224 GM3 $\oplus$ U2 $\oplus$ U3	$\surd$	1	1	$\times$	-	-
N25.9.225 GM3 $\oplus$ T2 $\oplus$ X1	$\surd$	1	1	$\times$	-	-
N25.9.226 GM3 $\oplus$ T2 $\oplus$ Y1	$\surd$	1	1	$\times$	-	-
N25.9.227 GM3 $\oplus$ T2 $\oplus$ Y3	$\surd$	1	1	$\times$	-	-
N25.9.228 GM3 $\oplus$ U2 $\oplus$ X1	$\surd$	1	1	$\times$	-	-
N25.9.229 GM3 $\oplus$ U2 $\oplus$ X4	$\surd$	1	1	$\times$	-	-
N25.9.230 GM3 $\oplus$ U2 $\oplus$ Y1	$\surd$	1	1	$\times$	-	-
N25.9.231 GM3 $\oplus$ T2 $\oplus$ X2	$\surd$	1	1	$\times$	-	-
N25.9.232 GM3 $\oplus$ T2 $\oplus$ Y2	$\surd$	1	1	$\times$	-	-
N25.9.233 GM3 $\oplus$ T2 $\oplus$ Y4	$\surd$	1	1	$\times$	-	-
N25.9.234 GM3 $\oplus$ U2 $\oplus$ X2	$\surd$	1	1	$\times$	-	-
N25.9.235 GM3 $\oplus$ U2 $\oplus$ X3	$\surd$	1	1	$\times$	-	-
N25.9.236 GM3 $\oplus$ U2 $\oplus$ Y2	$\surd$	1	1	$\times$	-	-
N25.9.237 GM3 $\oplus$ T2 $\oplus$ Z1	$\surd$	1	1	$\times$	-	-
N25.9.238 GM3 $\oplus$ U2 $\oplus$ Z1	$\surd$	1	1	$\times$	-	-
N25.9.239 GM3 $\oplus$ T2 $\oplus$ Z2	$\surd$	1	1	$\times$	-	-
N25.9.240 GM3 $\oplus$ U2 $\oplus$ Z2	$\surd$	1	1	$\times$	-	-
N25.9.241 GM3 $\oplus$ T2 $\oplus$ Z3	$\surd$	1	1	$\times$	-	-
N25.9.242 GM3 $\oplus$ T2 $\oplus$ Z4	$\surd$	1	1	$\times$	-	-
N25.9.243 GM3 $\oplus$ U2 $\oplus$ Z3	$\surd$	1	1	$\times$	-	-
N25.9.244 GM3 $\oplus$ U2 $\oplus$ Z4	$\surd$	1	1	$\times$	-	-
N25.9.245 GM3 $\oplus$ X1 $\oplus$ X1	$\surd$	1	1	$\times$	-	-
N25.9.246 GM3 $\oplus$ X1 $\oplus$ X4	$\surd$	1	1	$\surd$	222	B3
N25.9.247 GM3 $\oplus$ X1 $\oplus$ Y1	$\surd$	1	1	$\times$	-	-
N25.9.248 GM3 $\oplus$ Y1 $\oplus$ Y1	$\surd$	1	1	$\times$	-	-
N25.9.249 GM3 $\oplus$ Y1 $\oplus$ Y3	$\surd$	1	1	$\surd$	$mm2$	B2
N25.9.250 GM3 $\oplus$ X1 $\oplus$ X2	$\surd$	1	1	$\times$	-	-
N25.9.251 GM3 $\oplus$ X1 $\oplus$ X3	$\surd$	1	1	$\times$	-	-
N25.9.252 GM3 $\oplus$ X1 $\oplus$ Y2	$\surd$	1	1	$\times$	-	-
N25.9.253 GM3 $\oplus$ Y1 $\oplus$ X2	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $Pmm2$ (No. 25) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N25.9.254 GM3 $\oplus$ Y1 $\oplus$ Y2	$\surd$	1	1	$\times$	-	-
N25.9.255 GM3 $\oplus$ Y1 $\oplus$ Y4	$\surd$	1	1	$\times$	-	-
N25.9.256 GM3 $\oplus$ X1 $\oplus$ Z1	$\surd$	1	1	$\times$	-	-
N25.9.257 GM3 $\oplus$ Y1 $\oplus$ Z1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N25.9.258 GM3 $\oplus$ X1 $\oplus$ Z2	$\surd$	1	1	$\times$	-	-
N25.9.259 GM3 $\oplus$ Y1 $\oplus$ Z2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N25.9.260 GM3 $\oplus$ X1 $\oplus$ Z3	$\surd$	1	1	$\times$	-	-
N25.9.261 GM3 $\oplus$ X1 $\oplus$ Z4	$\surd$	1	1	$\times$	-	-
N25.9.262 GM3 $\oplus$ Y1 $\oplus$ Z3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N25.9.263 GM3 $\oplus$ Y1 $\oplus$ Z4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N25.9.264 GM3 $\oplus$ X2 $\oplus$ X2	$\surd$	1	1	$\times$	-	-
N25.9.265 GM3 $\oplus$ X2 $\oplus$ X3	$\surd$	1	1	$\surd$	222	B3
N25.9.266 GM3 $\oplus$ X2 $\oplus$ Y2	$\surd$	1	1	$\times$	-	-
N25.9.267 GM3 $\oplus$ Y2 $\oplus$ Y2	$\surd$	1	1	$\times$	-	-
N25.9.268 GM3 $\oplus$ Y2 $\oplus$ Y4	$\surd$	1	1	$\surd$	$mm2$	B2
N25.9.269 GM3 $\oplus$ X2 $\oplus$ Z1	$\surd$	1	1	$\times$	-	-
N25.9.270 GM3 $\oplus$ Y2 $\oplus$ Z1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N25.9.271 GM3 $\oplus$ X2 $\oplus$ Z2	$\surd$	1	1	$\times$	-	-
N25.9.272 GM3 $\oplus$ Y2 $\oplus$ Z2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N25.9.273 GM3 $\oplus$ X2 $\oplus$ Z3	$\surd$	1	1	$\times$	-	-
N25.9.274 GM3 $\oplus$ X2 $\oplus$ Z4	$\surd$	1	1	$\times$	-	-
N25.9.275 GM3 $\oplus$ Y2 $\oplus$ Z3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N25.9.276 GM3 $\oplus$ Y2 $\oplus$ Z4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N25.9.277 GM3 $\oplus$ Z1 $\oplus$ Z1	$\surd$	1	1	$\surd$	$mm2$	B2
N25.9.278 GM3 $\oplus$ Z1 $\oplus$ Z2	$\surd$	1	1	$\times$	-	-
N25.9.279 GM3 $\oplus$ Z1 $\oplus$ Z3	$\surd$	1	1	$\times$	-	-
N25.9.280 GM3 $\oplus$ Z1 $\oplus$ Z4	$\surd$	1	1	$\times$	-	-
N25.9.281 GM3 $\oplus$ Z2 $\oplus$ Z2	$\surd$	1	1	$\surd$	$mm2$	B2
N25.9.282 GM3 $\oplus$ Z2 $\oplus$ Z3	$\surd$	1	1	$\times$	-	-
N25.9.283 GM3 $\oplus$ Z2 $\oplus$ Z4	$\surd$	1	1	$\times$	-	-
N25.9.284 GM3 $\oplus$ Z3 $\oplus$ Z3	$\surd$	1	1	$\surd$	$mm2$	B2
N25.9.285 GM3 $\oplus$ Z3 $\oplus$ Z4	$\surd$	1	1	$\times$	-	-
N25.9.286 GM3 $\oplus$ Z4 $\oplus$ Z4	$\surd$	1	1	$\surd$	$mm2$	B2
N25.9.287 R1 $\oplus$ R1 $\oplus$ R1	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N25.9.288 R1 $\oplus$ R1 $\oplus$ R2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N25.9.289 R1 $\oplus$ R1 $\oplus$ R3	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N25.9.290 R1 $\oplus$ R2 $\oplus$ R3	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N25.9.291 R1 $\oplus$ R1 $\oplus$ S1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N25.9.292 R1 $\oplus$ R1 $\oplus$ S2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N25.9.293 R1 $\oplus$ R1 $\oplus$ S3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N25.9.294 R1 $\oplus$ R2 $\oplus$ S1	$\surd$	1	1	$\times$	-	-
N25.9.295 R1 $\oplus$ R2 $\oplus$ S3	$\surd$	1	1	$\times$	-	-
N25.9.296 R1 $\oplus$ R3 $\oplus$ S1	$\surd$	1	1	$\times$	-	-
N25.9.297 R1 $\oplus$ R3 $\oplus$ S2	$\surd$	1	1	$\times$	-	-
N25.9.298 R1 $\oplus$ R1 $\oplus$ T1	$\surd$	1	1	$\times$	-	-
N25.9.299 R1 $\oplus$ R1 $\oplus$ T3	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $Pmm2$ (No. 25) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N25.9.300 R1 ⊕ R2 ⊕ T1	√	1	1	×	-	-
N25.9.301 R1 ⊕ R3 ⊕ T1	√	1	1	×	-	-
N25.9.302 R1 ⊕ R3 ⊕ U1	√	1	1	√	mmm	$\mathrm{B2_u}$
N25.9.303 R1 ⊕ R3 ⊕ U4	√	1	1	√	mmm	$\mathrm{B2_u}$
N25.9.304 R1 ⊕ R1 ⊕ T2	√	1	1	×	-	-
N25.9.305 R1 ⊕ R1 ⊕ T4	√	1	1	×	-	-
N25.9.306 R1 ⊕ R2 ⊕ T2	√	1	1	×	-	-
N25.9.307 R1 ⊕ R3 ⊕ T2	√	1	1	×	-	-
N25.9.308 R1 ⊕ R3 ⊕ U2	√	1	1	√	mmm	$\mathrm{B2_u}$
N25.9.309 R1 ⊕ R3 ⊕ U3	√	1	1	√	mmm	$\mathrm{B2_u}$
N25.9.310 R1 ⊕ R1 ⊕ X1	√	1	1	×	-	-
N25.9.311 R1 ⊕ R1 ⊕ X4	√	1	1	×	-	-
N25.9.312 R1 ⊕ R2 ⊕ X1	√	1	1	×	-	-
N25.9.313 R1 ⊕ R3 ⊕ X1	√	1	1	×	-	-
N25.9.314 R1 ⊕ R3 ⊕ X4	√	1	1	×	-	-
N25.9.315 R1 ⊕ R3 ⊕ Y1	√	1	1	×	-	-
N25.9.316 R1 ⊕ R1 ⊕ X2	√	1	1	×	-	-
N25.9.317 R1 ⊕ R1 ⊕ X3	√	1	1	×	-	-
N25.9.318 R1 ⊕ R2 ⊕ X2	√	1	1	×	-	-
N25.9.319 R1 ⊕ R3 ⊕ X2	√	1	1	×	-	-
N25.9.320 R1 ⊕ R3 ⊕ X3	√	1	1	×	-	-
N25.9.321 R1 ⊕ R3 ⊕ Y2	√	1	1	×	-	-
N25.9.322 R1 ⊕ R1 ⊕ Z1	√	1	1	×	-	-
N25.9.323 R1 ⊕ R2 ⊕ Z1	√	1	1	×	-	-
N25.9.324 R1 ⊕ R3 ⊕ Z1	√	1	1	×	-	-
N25.9.325 R1 ⊕ R1 ⊕ Z2	√	1	1	×	-	-
N25.9.326 R1 ⊕ R2 ⊕ Z2	√	1	1	×	-	-
N25.9.327 R1 ⊕ R3 ⊕ Z2	√	1	1	×	-	-
N25.9.328 R1 ⊕ R1 ⊕ Z3	√	1	1	×	-	-
N25.9.329 R1 ⊕ R2 ⊕ Z3	√	1	1	×	-	-
N25.9.330 R1 ⊕ R3 ⊕ Z3	√	1	1	×	-	-
N25.9.331 R1 ⊕ R3 ⊕ Z4	√	1	1	×	-	-
N25.9.332 R1 ⊕ S1 ⊕ S1	√	1	1	√	mmm	$\mathrm{B1_u}$
N25.9.333 R1 ⊕ S1 ⊕ S2	√	1	1	×	-	-
N25.9.334 R1 ⊕ S1 ⊕ S3	√	1	1	×	-	-
N25.9.335 R1 ⊕ S2 ⊕ S2	√	1	1	√	mmm	$\mathrm{B1_u}$
N25.9.336 R1 ⊕ S2 ⊕ S3	√	1	1	×	-	-
N25.9.337 R1 ⊕ S3 ⊕ S3	√	1	1	√	mmm	$\mathrm{B1_u}$
N25.9.338 R1 ⊕ S3 ⊕ S4	√	1	1	×	-	-
N25.9.339 R1 ⊕ S1 ⊕ T1	×	-	-	-	-	-
N25.9.340 R1 ⊕ S1 ⊕ T3	×	-	-	-	-	-
N25.9.341 R1 ⊕ S2 ⊕ T1	×	-	-	-	-	-
N25.9.342 R1 ⊕ S2 ⊕ T3	×	-	-	-	-	-
N25.9.343 R1 ⊕ S3 ⊕ T1	×	-	-	-	-	-
N25.9.344 R1 ⊕ S3 ⊕ T3	×	-	-	-	-	-
N25.9.345 R1 ⊕ S3 ⊕ U1	×	-	-	-	-	-

Non-coplanar SSGs with parent space group $Pmm2$ (No. 25) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N25.9.346 R1 ⊕ S3 ⊕ U4	×	-	-	-	-	-
N25.9.347 R1 ⊕ S1 ⊕ T2	×	-	-	-	-	-
N25.9.348 R1 ⊕ S1 ⊕ T4	×	-	-	-	-	-
N25.9.349 R1 ⊕ S2 ⊕ T2	×	-	-	-	-	-
N25.9.350 R1 ⊕ S2 ⊕ T4	×	-	-	-	-	-
N25.9.351 R1 ⊕ S3 ⊕ T2	×	-	-	-	-	-
N25.9.352 R1 ⊕ S3 ⊕ T4	×	-	-	-	-	-
N25.9.353 R1 ⊕ S3 ⊕ U2	×	-	-	-	-	-
N25.9.354 R1 ⊕ S3 ⊕ U3	×	-	-	-	-	-
N25.9.355 R1 ⊕ S1 ⊕ X1	×	-	-	-	-	-
N25.9.356 R1 ⊕ S1 ⊕ X4	×	-	-	-	-	-
N25.9.357 R1 ⊕ S2 ⊕ X1	×	-	-	-	-	-
N25.9.358 R1 ⊕ S2 ⊕ X4	×	-	-	-	-	-
N25.9.359 R1 ⊕ S3 ⊕ X1	×	-	-	-	-	-
N25.9.360 R1 ⊕ S3 ⊕ X4	×	-	-	-	-	-
N25.9.361 R1 ⊕ S3 ⊕ Y1	×	-	-	-	-	-
N25.9.362 R1 ⊕ S3 ⊕ Y3	×	-	-	-	-	-
N25.9.363 R1 ⊕ S1 ⊕ X2	×	-	-	-	-	-
N25.9.364 R1 ⊕ S1 ⊕ X3	×	-	-	-	-	-
N25.9.365 R1 ⊕ S2 ⊕ X2	×	-	-	-	-	-
N25.9.366 R1 ⊕ S2 ⊕ X3	×	-	-	-	-	-
N25.9.367 R1 ⊕ S3 ⊕ X2	×	-	-	-	-	-
N25.9.368 R1 ⊕ S3 ⊕ X3	×	-	-	-	-	-
N25.9.369 R1 ⊕ S3 ⊕ Y2	×	-	-	-	-	-
N25.9.370 R1 ⊕ S3 ⊕ Y4	×	-	-	-	-	-
N25.9.371 R1 ⊕ S1 ⊕ Z1	×	-	-	-	-	-
N25.9.372 R1 ⊕ S2 ⊕ Z1	×	-	-	-	-	-
N25.9.373 R1 ⊕ S3 ⊕ Z1	×	-	-	-	-	-
N25.9.374 R1 ⊕ S1 ⊕ Z2	×	-	-	-	-	-
N25.9.375 R1 ⊕ S2 ⊕ Z2	×	-	-	-	-	-
N25.9.376 R1 ⊕ S3 ⊕ Z2	×	-	-	-	-	-
N25.9.377 R1 ⊕ S1 ⊕ Z3	×	-	-	-	-	-
N25.9.378 R1 ⊕ S2 ⊕ Z3	×	-	-	-	-	-
N25.9.379 R1 ⊕ S3 ⊕ Z3	×	-	-	-	-	-
N25.9.380 R1 ⊕ S3 ⊕ Z4	×	-	-	-	-	-
N25.9.381 R1 ⊕ T1 ⊕ T1	√	1	1	×	-	-
N25.9.382 R1 ⊕ T1 ⊕ T3	√	1	1	×	-	-
N25.9.383 R1 ⊕ T1 ⊕ U1	×	-	-	-	-	-
N25.9.384 R1 ⊕ T1 ⊕ U4	×	-	-	-	-	-
N25.9.385 R1 ⊕ T3 ⊕ T3	√	1	1	×	-	-
N25.9.386 R1 ⊕ T3 ⊕ U4	×	-	-	-	-	-
N25.9.387 R1 ⊕ T1 ⊕ T2	√	1	1	×	-	-
N25.9.388 R1 ⊕ T1 ⊕ T4	√	1	1	√	mmm	$\mathrm{B3_u}$
N25.9.389 R1 ⊕ T1 ⊕ U2	×	-	-	-	-	-
N25.9.390 R1 ⊕ T1 ⊕ U3	×	-	-	-	-	-
N25.9.391 R1 ⊕ T3 ⊕ T2	√	1	1	√	mmm	$\mathrm{B3_u}$

Non-coplanar SSGs with parent space group $Pmm2$ (No. 25) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N25.9.392 R1 ⊕ T3 ⊕ T4	√	1	1	×	-	-
N25.9.393 R1 ⊕ T3 ⊕ U2	×	-	-	-	-	-
N25.9.394 R1 ⊕ T3 ⊕ U3	×	-	-	-	-	-
N25.9.395 R1 ⊕ T1 ⊕ X1	×	-	-	-	-	-
N25.9.396 R1 ⊕ T1 ⊕ X4	×	-	-	-	-	-
N25.9.397 R1 ⊕ T1 ⊕ Y1	×	-	-	-	-	-
N25.9.398 R1 ⊕ T1 ⊕ Y3	×	-	-	-	-	-
N25.9.399 R1 ⊕ T3 ⊕ X1	×	-	-	-	-	-
N25.9.400 R1 ⊕ T3 ⊕ X4	×	-	-	-	-	-
N25.9.401 R1 ⊕ T3 ⊕ Y1	×	-	-	-	-	-
N25.9.402 R1 ⊕ T3 ⊕ Y3	×	-	-	-	-	-
N25.9.403 R1 ⊕ T1 ⊕ X2	×	-	-	-	-	-
N25.9.404 R1 ⊕ T1 ⊕ X3	×	-	-	-	-	-
N25.9.405 R1 ⊕ T1 ⊕ Y2	×	-	-	-	-	-
N25.9.406 R1 ⊕ T1 ⊕ Y4	×	-	-	-	-	-
N25.9.407 R1 ⊕ T3 ⊕ X2	×	-	-	-	-	-
N25.9.408 R1 ⊕ T3 ⊕ X3	×	-	-	-	-	-
N25.9.409 R1 ⊕ T3 ⊕ Y2	×	-	-	-	-	-
N25.9.410 R1 ⊕ T3 ⊕ Y4	×	-	-	-	-	-
N25.9.411 R1 ⊕ T1 ⊕ Z1	×	-	-	-	-	-
N25.9.412 R1 ⊕ T3 ⊕ Z1	×	-	-	-	-	-
N25.9.413 R1 ⊕ T1 ⊕ Z2	×	-	-	-	-	-
N25.9.414 R1 ⊕ T3 ⊕ Z2	×	-	-	-	-	-
N25.9.415 R1 ⊕ T1 ⊕ Z3	×	-	-	-	-	-
N25.9.416 R1 ⊕ T1 ⊕ Z4	×	-	-	-	-	-
N25.9.417 R1 ⊕ T3 ⊕ Z3	×	-	-	-	-	-
N25.9.418 R1 ⊕ T3 ⊕ Z4	×	-	-	-	-	-
N25.9.419 R1 ⊕ T2 ⊕ T2	√	1	1	×	-	-
N25.9.420 R1 ⊕ T2 ⊕ T4	√	1	1	×	-	-
N25.9.421 R1 ⊕ T2 ⊕ U2	×	-	-	-	-	-
N25.9.422 R1 ⊕ T2 ⊕ U3	×	-	-	-	-	-
N25.9.423 R1 ⊕ T4 ⊕ T4	√	1	1	×	-	-
N25.9.424 R1 ⊕ T4 ⊕ U3	×	-	-	-	-	-
N25.9.425 R1 ⊕ T2 ⊕ X1	×	-	-	-	-	-
N25.9.426 R1 ⊕ T2 ⊕ X4	×	-	-	-	-	-
N25.9.427 R1 ⊕ T2 ⊕ Y1	×	-	-	-	-	-
N25.9.428 R1 ⊕ T2 ⊕ Y3	×	-	-	-	-	-
N25.9.429 R1 ⊕ T4 ⊕ X1	×	-	-	-	-	-
N25.9.430 R1 ⊕ T4 ⊕ X4	×	-	-	-	-	-
N25.9.431 R1 ⊕ T4 ⊕ Y1	×	-	-	-	-	-
N25.9.432 R1 ⊕ T4 ⊕ Y3	×	-	-	-	-	-
N25.9.433 R1 ⊕ T2 ⊕ X2	×	-	-	-	-	-
N25.9.434 R1 ⊕ T2 ⊕ X3	×	-	-	-	-	-
N25.9.435 R1 ⊕ T2 ⊕ Y2	×	-	-	-	-	-
N25.9.436 R1 ⊕ T2 ⊕ Y4	×	-	-	-	-	-
N25.9.437 R1 ⊕ T4 ⊕ X2	×	-	-	-	-	-

Non-coplanar SSGs with parent space group $Pmm2$ (No. 25) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N25.9.438 R1 ⊕ T4 ⊕ X3	×	-	-	-	-	-
N25.9.439 R1 ⊕ T4 ⊕ Y2	×	-	-	-	-	-
N25.9.440 R1 ⊕ T4 ⊕ Y4	×	-	-	-	-	-
N25.9.441 R1 ⊕ T2 ⊕ Z1	×	-	-	-	-	-
N25.9.442 R1 ⊕ T4 ⊕ Z1	×	-	-	-	-	-
N25.9.443 R1 ⊕ T2 ⊕ Z2	×	-	-	-	-	-
N25.9.444 R1 ⊕ T4 ⊕ Z2	×	-	-	-	-	-
N25.9.445 R1 ⊕ T2 ⊕ Z3	×	-	-	-	-	-
N25.9.446 R1 ⊕ T2 ⊕ Z4	×	-	-	-	-	-
N25.9.447 R1 ⊕ T4 ⊕ Z3	×	-	-	-	-	-
N25.9.448 R1 ⊕ T4 ⊕ Z4	×	-	-	-	-	-
N25.9.449 R1 ⊕ X1 ⊕ X1	√	1	1	×	-	-
N25.9.450 R1 ⊕ X1 ⊕ X4	√	1	1	√	mmm	$\mathrm{B3_u}$
N25.9.451 R1 ⊕ X1 ⊕ Y1	×	-	-	-	-	-
N25.9.452 R1 ⊕ X1 ⊕ Y3	×	-	-	-	-	-
N25.9.453 R1 ⊕ X4 ⊕ X4	√	1	1	×	-	-
N25.9.454 R1 ⊕ X4 ⊕ Y3	×	-	-	-	-	-
N25.9.455 R1 ⊕ X1 ⊕ X2	√	1	1	×	-	-
N25.9.456 R1 ⊕ X1 ⊕ X3	√	1	1	×	-	-
N25.9.457 R1 ⊕ X1 ⊕ Y2	×	-	-	-	-	-
N25.9.458 R1 ⊕ X1 ⊕ Y4	×	-	-	-	-	-
N25.9.459 R1 ⊕ X4 ⊕ X2	√	1	1	×	-	-
N25.9.460 R1 ⊕ X4 ⊕ X3	√	1	1	×	-	-
N25.9.461 R1 ⊕ X4 ⊕ Y2	×	-	-	-	-	-
N25.9.462 R1 ⊕ X4 ⊕ Y4	×	-	-	-	-	-
N25.9.463 R1 ⊕ X1 ⊕ Z1	×	-	-	-	-	-
N25.9.464 R1 ⊕ X4 ⊕ Z1	×	-	-	-	-	-
N25.9.465 R1 ⊕ X1 ⊕ Z2	×	-	-	-	-	-
N25.9.466 R1 ⊕ X4 ⊕ Z2	×	-	-	-	-	-
N25.9.467 R1 ⊕ X1 ⊕ Z3	×	-	-	-	-	-
N25.9.468 R1 ⊕ X1 ⊕ Z4	×	-	-	-	-	-
N25.9.469 R1 ⊕ X4 ⊕ Z3	×	-	-	-	-	-
N25.9.470 R1 ⊕ X4 ⊕ Z4	×	-	-	-	-	-
N25.9.471 R1 ⊕ X2 ⊕ X2	√	1	1	×	-	-
N25.9.472 R1 ⊕ X2 ⊕ X3	√	1	1	√	mmm	$\mathrm{B3_u}$
N25.9.473 R1 ⊕ X2 ⊕ Y2	×	-	-	-	-	-
N25.9.474 R1 ⊕ X2 ⊕ Y4	×	-	-	-	-	-
N25.9.475 R1 ⊕ X3 ⊕ X3	√	1	1	×	-	-
N25.9.476 R1 ⊕ X3 ⊕ Y4	×	-	-	-	-	-
N25.9.477 R1 ⊕ X2 ⊕ Z1	×	-	-	-	-	-
N25.9.478 R1 ⊕ X3 ⊕ Z1	×	-	-	-	-	-
N25.9.479 R1 ⊕ X2 ⊕ Z2	×	-	-	-	-	-
N25.9.480 R1 ⊕ X3 ⊕ Z2	×	-	-	-	-	-
N25.9.481 R1 ⊕ X2 ⊕ Z3	×	-	-	-	-	-
N25.9.482 R1 ⊕ X2 ⊕ Z4	×	-	-	-	-	-
N25.9.483 R1 ⊕ X3 ⊕ Z3	×	-	-	-	-	-

Non-coplanar SSGs with parent space group $Pmm2$ (No. 25) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N25.9.484 R1 ⊕ X3 ⊕ Z4	×	-	-	-	-	-
N25.9.485 R1 ⊕ Z1 ⊕ Z1	√	1	1	√	mmm	$\mathrm{B1_u}$
N25.9.486 R1 ⊕ Z1 ⊕ Z2	√	1	1	×	-	-
N25.9.487 R1 ⊕ Z1 ⊕ Z3	√	1	1	×	-	-
N25.9.488 R1 ⊕ Z2 ⊕ Z2	√	1	1	√	mmm	$\mathrm{B1_u}$
N25.9.489 R1 ⊕ Z2 ⊕ Z3	√	1	1	×	-	-
N25.9.490 R1 ⊕ Z3 ⊕ Z3	√	1	1	√	mmm	$\mathrm{B1_u}$
N25.9.491 R1 ⊕ Z3 ⊕ Z4	√	1	1	×	-	-
N25.9.492 S1 ⊕ S1 ⊕ S1	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N25.9.493 S1 ⊕ S1 ⊕ S2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N25.9.494 S1 ⊕ S1 ⊕ S3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N25.9.495 S1 ⊕ S2 ⊕ S3	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N25.9.496 S1 ⊕ S1 ⊕ T1	√	1	1	×	-	-
N25.9.497 S1 ⊕ S1 ⊕ T3	√	1	1	×	-	-
N25.9.498 S1 ⊕ S2 ⊕ T1	√	1	1	×	-	-
N25.9.499 S1 ⊕ S3 ⊕ T1	√	1	1	×	-	-
N25.9.500 S1 ⊕ S3 ⊕ U1	√	1	1	×	-	-
N25.9.501 S1 ⊕ S3 ⊕ U4	√	1	1	×	-	-
N25.9.502 S1 ⊕ S1 ⊕ T2	√	1	1	×	-	-
N25.9.503 S1 ⊕ S1 ⊕ T4	√	1	1	×	-	-
N25.9.504 S1 ⊕ S2 ⊕ T2	√	1	1	×	-	-
N25.9.505 S1 ⊕ S3 ⊕ T2	√	1	1	×	-	-
N25.9.506 S1 ⊕ S3 ⊕ U2	√	1	1	×	-	-
N25.9.507 S1 ⊕ S3 ⊕ U3	√	1	1	×	-	-
N25.9.508 S1 ⊕ S1 ⊕ X1	√	1	1	×	-	-
N25.9.509 S1 ⊕ S1 ⊕ X4	√	1	1	×	-	-
N25.9.510 S1 ⊕ S2 ⊕ X1	√	1	1	×	-	-
N25.9.511 S1 ⊕ S3 ⊕ X1	√	1	1	√	mmm	$\mathrm{B2_u}$
N25.9.512 S1 ⊕ S3 ⊕ X4	√	1	1	√	mmm	$\mathrm{B2_u}$
N25.9.513 S1 ⊕ S3 ⊕ Y1	√	1	1	×	-	-
N25.9.514 S1 ⊕ S1 ⊕ X2	√	1	1	×	-	-
N25.9.515 S1 ⊕ S1 ⊕ X3	√	1	1	×	-	-
N25.9.516 S1 ⊕ S2 ⊕ X2	√	1	1	×	-	-
N25.9.517 S1 ⊕ S3 ⊕ X2	√	1	1	√	mmm	$\mathrm{B2_u}$
N25.9.518 S1 ⊕ S3 ⊕ X3	√	1	1	√	mmm	$\mathrm{B2_u}$
N25.9.519 S1 ⊕ S3 ⊕ Y2	√	1	1	×	-	-
N25.9.520 S1 ⊕ S1 ⊕ Z1	√	1	1	×	-	-
N25.9.521 S1 ⊕ S2 ⊕ Z1	√	1	1	×	-	-
N25.9.522 S1 ⊕ S3 ⊕ Z1	√	1	1	×	-	-
N25.9.523 S1 ⊕ S1 ⊕ Z2	√	1	1	×	-	-
N25.9.524 S1 ⊕ S2 ⊕ Z2	√	1	1	×	-	-
N25.9.525 S1 ⊕ S3 ⊕ Z2	√	1	1	×	-	-
N25.9.526 S1 ⊕ S1 ⊕ Z3	√	1	1	×	-	-
N25.9.527 S1 ⊕ S2 ⊕ Z3	√	1	1	×	-	-
N25.9.528 S1 ⊕ S3 ⊕ Z3	√	1	1	×	-	-
N25.9.529 S1 ⊕ S3 ⊕ Z4	√	1	1	×	-	-

Non-coplanar SSGs with parent space group $Pmm2$ (No. 25) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N25.9.530 S1 ⊕ T1 ⊕ T1	√	1	1	×	-	-
N25.9.531 S1 ⊕ T1 ⊕ T3	√	1	1	×	-	-
N25.9.532 S1 ⊕ T1 ⊕ U1	×	-	-	-	-	-
N25.9.533 S1 ⊕ T1 ⊕ U4	×	-	-	-	-	-
N25.9.534 S1 ⊕ T3 ⊕ T3	√	1	1	×	-	-
N25.9.535 S1 ⊕ T3 ⊕ U4	×	-	-	-	-	-
N25.9.536 S1 ⊕ T1 ⊕ T2	√	1	1	×	-	-
N25.9.537 S1 ⊕ T1 ⊕ T4	√	1	1	×	-	-
N25.9.538 S1 ⊕ T1 ⊕ U2	×	-	-	-	-	-
N25.9.539 S1 ⊕ T1 ⊕ U3	×	-	-	-	-	-
N25.9.540 S1 ⊕ T3 ⊕ T2	√	1	1	×	-	-
N25.9.541 S1 ⊕ T3 ⊕ T4	√	1	1	×	-	-
N25.9.542 S1 ⊕ T3 ⊕ U2	×	-	-	-	-	-
N25.9.543 S1 ⊕ T3 ⊕ U3	×	-	-	-	-	-
N25.9.544 S1 ⊕ T1 ⊕ X1	×	-	-	-	-	-
N25.9.545 S1 ⊕ T1 ⊕ X4	×	-	-	-	-	-
N25.9.546 S1 ⊕ T1 ⊕ Y1	×	-	-	-	-	-
N25.9.547 S1 ⊕ T1 ⊕ Y3	×	-	-	-	-	-
N25.9.548 S1 ⊕ T3 ⊕ X1	×	-	-	-	-	-
N25.9.549 S1 ⊕ T3 ⊕ X4	×	-	-	-	-	-
N25.9.550 S1 ⊕ T3 ⊕ Y1	×	-	-	-	-	-
N25.9.551 S1 ⊕ T3 ⊕ Y3	×	-	-	-	-	-
N25.9.552 S1 ⊕ T1 ⊕ X2	×	-	-	-	-	-
N25.9.553 S1 ⊕ T1 ⊕ X3	×	-	-	-	-	-
N25.9.554 S1 ⊕ T1 ⊕ Y2	×	-	-	-	-	-
N25.9.555 S1 ⊕ T1 ⊕ Y4	×	-	-	-	-	-
N25.9.556 S1 ⊕ T3 ⊕ X2	×	-	-	-	-	-
N25.9.557 S1 ⊕ T3 ⊕ X3	×	-	-	-	-	-
N25.9.558 S1 ⊕ T3 ⊕ Y2	×	-	-	-	-	-
N25.9.559 S1 ⊕ T3 ⊕ Y4	×	-	-	-	-	-
N25.9.560 S1 ⊕ T1 ⊕ Z1	×	-	-	-	-	-
N25.9.561 S1 ⊕ T3 ⊕ Z1	×	-	-	-	-	-
N25.9.562 S1 ⊕ T1 ⊕ Z2	×	-	-	-	-	-
N25.9.563 S1 ⊕ T3 ⊕ Z2	×	-	-	-	-	-
N25.9.564 S1 ⊕ T1 ⊕ Z3	×	-	-	-	-	-
N25.9.565 S1 ⊕ T1 ⊕ Z4	×	-	-	-	-	-
N25.9.566 S1 ⊕ T3 ⊕ Z3	×	-	-	-	-	-
N25.9.567 S1 ⊕ T3 ⊕ Z4	×	-	-	-	-	-
N25.9.568 S1 ⊕ T2 ⊕ T2	√	1	1	×	-	-
N25.9.569 S1 ⊕ T2 ⊕ T4	√	1	1	×	-	-
N25.9.570 S1 ⊕ T2 ⊕ U2	×	-	-	-	-	-
N25.9.571 S1 ⊕ T2 ⊕ U3	×	-	-	-	-	-
N25.9.572 S1 ⊕ T4 ⊕ T4	√	1	1	×	-	-
N25.9.573 S1 ⊕ T4 ⊕ U3	×	-	-	-	-	-
N25.9.574 S1 ⊕ T2 ⊕ X1	×	-	-	-	-	-
N25.9.575 S1 ⊕ T2 ⊕ X4	×	-	-	-	-	-

Non-coplanar SSGs with parent space group $Pmm2$ (No. 25) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N25.9.576 S1 $\oplus$ T2 $\oplus$ Y1	$\times$	-	-	-	-	-
N25.9.577 S1 $\oplus$ T2 $\oplus$ Y3	$\times$	-	-	-	-	-
N25.9.578 S1 $\oplus$ T4 $\oplus$ X1	$\times$	-	-	-	-	-
N25.9.579 S1 $\oplus$ T4 $\oplus$ X4	$\times$	-	-	-	-	-
N25.9.580 S1 $\oplus$ T4 $\oplus$ Y1	$\times$	-	-	-	-	-
N25.9.581 S1 $\oplus$ T4 $\oplus$ Y3	$\times$	-	-	-	-	-
N25.9.582 S1 $\oplus$ T2 $\oplus$ X2	$\times$	-	-	-	-	-
N25.9.583 S1 $\oplus$ T2 $\oplus$ X3	$\times$	-	-	-	-	-
N25.9.584 S1 $\oplus$ T2 $\oplus$ Y2	$\times$	-	-	-	-	-
N25.9.585 S1 $\oplus$ T2 $\oplus$ Y4	$\times$	-	-	-	-	-
N25.9.586 S1 $\oplus$ T4 $\oplus$ X2	$\times$	-	-	-	-	-
N25.9.587 S1 $\oplus$ T4 $\oplus$ X3	$\times$	-	-	-	-	-
N25.9.588 S1 $\oplus$ T4 $\oplus$ Y2	$\times$	-	-	-	-	-
N25.9.589 S1 $\oplus$ T4 $\oplus$ Y4	$\times$	-	-	-	-	-
N25.9.590 S1 $\oplus$ T2 $\oplus$ Z1	$\times$	-	-	-	-	-
N25.9.591 S1 $\oplus$ T4 $\oplus$ Z1	$\times$	-	-	-	-	-
N25.9.592 S1 $\oplus$ T2 $\oplus$ Z2	$\times$	-	-	-	-	-
N25.9.593 S1 $\oplus$ T4 $\oplus$ Z2	$\times$	-	-	-	-	-
N25.9.594 S1 $\oplus$ T2 $\oplus$ Z3	$\times$	-	-	-	-	-
N25.9.595 S1 $\oplus$ T2 $\oplus$ Z4	$\times$	-	-	-	-	-
N25.9.596 S1 $\oplus$ T4 $\oplus$ Z3	$\times$	-	-	-	-	-
N25.9.597 S1 $\oplus$ T4 $\oplus$ Z4	$\times$	-	-	-	-	-
N25.9.598 S1 $\oplus$ X1 $\oplus$ X1	$\surd$	1	1	$\times$	-	-
N25.9.599 S1 $\oplus$ X1 $\oplus$ X4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N25.9.600 S1 $\oplus$ X1 $\oplus$ Y1	$\times$	-	-	-	-	-
N25.9.601 S1 $\oplus$ X1 $\oplus$ Y3	$\times$	-	-	-	-	-
N25.9.602 S1 $\oplus$ X4 $\oplus$ X4	$\surd$	1	1	$\times$	-	-
N25.9.603 S1 $\oplus$ X4 $\oplus$ Y3	$\times$	-	-	-	-	-
N25.9.604 S1 $\oplus$ X1 $\oplus$ X2	$\surd$	1	1	$\times$	-	-
N25.9.605 S1 $\oplus$ X1 $\oplus$ X3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N25.9.606 S1 $\oplus$ X1 $\oplus$ Y2	$\times$	-	-	-	-	-
N25.9.607 S1 $\oplus$ X1 $\oplus$ Y4	$\times$	-	-	-	-	-
N25.9.608 S1 $\oplus$ X4 $\oplus$ X2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N25.9.609 S1 $\oplus$ X4 $\oplus$ X3	$\surd$	1	1	$\times$	-	-
N25.9.610 S1 $\oplus$ X4 $\oplus$ Y2	$\times$	-	-	-	-	-
N25.9.611 S1 $\oplus$ X4 $\oplus$ Y4	$\times$	-	-	-	-	-
N25.9.612 S1 $\oplus$ X1 $\oplus$ Z1	$\times$	-	-	-	-	-
N25.9.613 S1 $\oplus$ X4 $\oplus$ Z1	$\times$	-	-	-	-	-
N25.9.614 S1 $\oplus$ X1 $\oplus$ Z2	$\times$	-	-	-	-	-
N25.9.615 S1 $\oplus$ X4 $\oplus$ Z2	$\times$	-	-	-	-	-
N25.9.616 S1 $\oplus$ X1 $\oplus$ Z3	$\times$	-	-	-	-	-
N25.9.617 S1 $\oplus$ X1 $\oplus$ Z4	$\times$	-	-	-	-	-
N25.9.618 S1 $\oplus$ X4 $\oplus$ Z3	$\times$	-	-	-	-	-
N25.9.619 S1 $\oplus$ X4 $\oplus$ Z4	$\times$	-	-	-	-	-
N25.9.620 S1 $\oplus$ X2 $\oplus$ X2	$\surd$	1	1	$\times$	-	-
N25.9.621 S1 $\oplus$ X2 $\oplus$ X3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$

Non-coplanar SSGs with parent space group $Pmm2$ (No. 25) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N25.9.622 S1 ⊕ X2 ⊕ Y2	×	-	-	-	-	-
N25.9.623 S1 ⊕ X2 ⊕ Y4	×	-	-	-	-	-
N25.9.624 S1 ⊕ X3 ⊕ X3	√	1	1	×	-	-
N25.9.625 S1 ⊕ X3 ⊕ Y4	×	-	-	-	-	-
N25.9.626 S1 ⊕ X2 ⊕ Z1	×	-	-	-	-	-
N25.9.627 S1 ⊕ X3 ⊕ Z1	×	-	-	-	-	-
N25.9.628 S1 ⊕ X2 ⊕ Z2	×	-	-	-	-	-
N25.9.629 S1 ⊕ X3 ⊕ Z2	×	-	-	-	-	-
N25.9.630 S1 ⊕ X2 ⊕ Z3	×	-	-	-	-	-
N25.9.631 S1 ⊕ X2 ⊕ Z4	×	-	-	-	-	-
N25.9.632 S1 ⊕ X3 ⊕ Z3	×	-	-	-	-	-
N25.9.633 S1 ⊕ X3 ⊕ Z4	×	-	-	-	-	-
N25.9.634 S1 ⊕ Z1 ⊕ Z1	√	1	1	√	mmm	$\mathrm{B1_u}$
N25.9.635 S1 ⊕ Z1 ⊕ Z2	√	1	1	×	-	-
N25.9.636 S1 ⊕ Z1 ⊕ Z3	√	1	1	×	-	-
N25.9.637 S1 ⊕ Z2 ⊕ Z2	√	1	1	√	mmm	$\mathrm{B1_u}$
N25.9.638 S1 ⊕ Z2 ⊕ Z3	√	1	1	×	-	-
N25.9.639 S1 ⊕ Z3 ⊕ Z3	√	1	1	√	mmm	$\mathrm{B1_u}$
N25.9.640 S1 ⊕ Z3 ⊕ Z4	√	1	1	×	-	-
N25.9.641 T1 ⊕ T1 ⊕ T1	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N25.9.642 T1 ⊕ T1 ⊕ T3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N25.9.643 T1 ⊕ T1 ⊕ U1	√	1	1	×	-	-
N25.9.644 T1 ⊕ T3 ⊕ U1	√	1	1	×	-	-
N25.9.645 T1 ⊕ T1 ⊕ T2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N25.9.646 T1 ⊕ T1 ⊕ T4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N25.9.647 T1 ⊕ T1 ⊕ U2	√	1	1	×	-	-
N25.9.648 T1 ⊕ T3 ⊕ T2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N25.9.649 T1 ⊕ T3 ⊕ U2	√	1	1	×	-	-
N25.9.650 T1 ⊕ U1 ⊕ T2	√	1	1	×	-	-
N25.9.651 T1 ⊕ U1 ⊕ T4	√	1	1	×	-	-
N25.9.652 T1 ⊕ T1 ⊕ X1	√	1	1	×	-	-
N25.9.653 T1 ⊕ T1 ⊕ Y1	√	1	1	√	mmm	$\mathrm{B1_u}$
N25.9.654 T1 ⊕ T1 ⊕ Y3	√	1	1	√	mmm	$\mathrm{B1_u}$
N25.9.655 T1 ⊕ T3 ⊕ X1	√	1	1	×	-	-
N25.9.656 T1 ⊕ T3 ⊕ Y1	√	1	1	×	-	-
N25.9.657 T1 ⊕ U1 ⊕ X1	×	-	-	-	-	-
N25.9.658 T1 ⊕ U1 ⊕ X4	×	-	-	-	-	-
N25.9.659 T1 ⊕ T1 ⊕ X2	√	1	1	×	-	-
N25.9.660 T1 ⊕ T1 ⊕ Y2	√	1	1	√	mmm	$\mathrm{B1_u}$
N25.9.661 T1 ⊕ T1 ⊕ Y4	√	1	1	√	mmm	$\mathrm{B1_u}$
N25.9.662 T1 ⊕ T3 ⊕ X2	√	1	1	×	-	-
N25.9.663 T1 ⊕ T3 ⊕ Y2	√	1	1	×	-	-
N25.9.664 T1 ⊕ U1 ⊕ X2	×	-	-	-	-	-
N25.9.665 T1 ⊕ U1 ⊕ X3	×	-	-	-	-	-
N25.9.666 T1 ⊕ T1 ⊕ Z1	√	1	1	×	-	-
N25.9.667 T1 ⊕ T3 ⊕ Z1	√	1	1	√	mmm	$\mathrm{B2_u}$

Non-coplanar SSGs with parent space group $Pmm2$ (No. 25) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N25.9.668 T1 ⊕ U1 ⊕ Z1	×	-	-	-	-	-
N25.9.669 T1 ⊕ T1 ⊕ Z2	√	1	1	×	-	-
N25.9.670 T1 ⊕ T3 ⊕ Z2	√	1	1	√	mmm	$\mathrm{B2_u}$
N25.9.671 T1 ⊕ U1 ⊕ Z2	×	-	-	-	-	-
N25.9.672 T1 ⊕ T1 ⊕ Z3	√	1	1	×	-	-
N25.9.673 T1 ⊕ T1 ⊕ Z4	√	1	1	×	-	-
N25.9.674 T1 ⊕ T3 ⊕ Z3	√	1	1	√	mmm	$\mathrm{B2_u}$
N25.9.675 T1 ⊕ T3 ⊕ Z4	√	1	1	√	mmm	$\mathrm{B2_u}$
N25.9.676 T1 ⊕ U1 ⊕ Z3	×	-	-	-	-	-
N25.9.677 T1 ⊕ T2 ⊕ T2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N25.9.678 T1 ⊕ T2 ⊕ T4	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N25.9.679 T1 ⊕ T2 ⊕ U2	√	1	1	×	-	-
N25.9.680 T1 ⊕ T4 ⊕ T4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N25.9.681 T1 ⊕ T4 ⊕ U2	√	1	1	×	-	-
N25.9.682 T1 ⊕ U2 ⊕ U2	√	1	1	×	-	-
N25.9.683 T1 ⊕ U2 ⊕ U3	√	1	1	×	-	-
N25.9.684 T1 ⊕ T2 ⊕ X1	√	1	1	×	-	-
N25.9.685 T1 ⊕ T2 ⊕ Y1	√	1	1	×	-	-
N25.9.686 T1 ⊕ T2 ⊕ Y3	√	1	1	×	-	-
N25.9.687 T1 ⊕ T4 ⊕ X1	√	1	1	×	-	-
N25.9.688 T1 ⊕ T4 ⊕ Y1	√	1	1	×	-	-
N25.9.689 T1 ⊕ T4 ⊕ Y3	√	1	1	×	-	-
N25.9.690 T1 ⊕ U2 ⊕ X1	×	-	-	-	-	-
N25.9.691 T1 ⊕ U2 ⊕ X4	×	-	-	-	-	-
N25.9.692 T1 ⊕ U2 ⊕ Y1	×	-	-	-	-	-
N25.9.693 T1 ⊕ U2 ⊕ Y3	×	-	-	-	-	-
N25.9.694 T1 ⊕ T2 ⊕ X2	√	1	1	×	-	-
N25.9.695 T1 ⊕ T2 ⊕ Y2	√	1	1	×	-	-
N25.9.696 T1 ⊕ T2 ⊕ Y4	√	1	1	×	-	-
N25.9.697 T1 ⊕ T4 ⊕ X2	√	1	1	×	-	-
N25.9.698 T1 ⊕ T4 ⊕ Y2	√	1	1	×	-	-
N25.9.699 T1 ⊕ T4 ⊕ Y4	√	1	1	×	-	-
N25.9.700 T1 ⊕ U2 ⊕ X2	×	-	-	-	-	-
N25.9.701 T1 ⊕ U2 ⊕ X3	×	-	-	-	-	-
N25.9.702 T1 ⊕ U2 ⊕ Y2	×	-	-	-	-	-
N25.9.703 T1 ⊕ U2 ⊕ Y4	×	-	-	-	-	-
N25.9.704 T1 ⊕ T2 ⊕ Z1	√	1	1	×	-	-
N25.9.705 T1 ⊕ T4 ⊕ Z1	√	1	1	×	-	-
N25.9.706 T1 ⊕ U2 ⊕ Z1	×	-	-	-	-	-
N25.9.707 T1 ⊕ T2 ⊕ Z2	√	1	1	×	-	-
N25.9.708 T1 ⊕ T4 ⊕ Z2	√	1	1	×	-	-
N25.9.709 T1 ⊕ U2 ⊕ Z2	×	-	-	-	-	-
N25.9.710 T1 ⊕ T2 ⊕ Z3	√	1	1	×	-	-
N25.9.711 T1 ⊕ T2 ⊕ Z4	√	1	1	×	-	-
N25.9.712 T1 ⊕ T4 ⊕ Z3	√	1	1	×	-	-
N25.9.713 T1 ⊕ T4 ⊕ Z4	√	1	1	×	-	-

Non-coplanar SSGs with parent space group $Pmm2$ (No. 25) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N25.9.714 T1 ⊕ U2 ⊕ Z3	×	-	-	-	-	-
N25.9.715 T1 ⊕ U2 ⊕ Z4	×	-	-	-	-	-
N25.9.716 T1 ⊕ X1 ⊕ X1	√	1	1	×	-	-
N25.9.717 T1 ⊕ X1 ⊕ X4	√	1	1	√	mmm	$\mathrm{B3_u}$
N25.9.718 T1 ⊕ X1 ⊕ Y1	×	-	-	-	-	-
N25.9.719 T1 ⊕ X1 ⊕ Y3	×	-	-	-	-	-
N25.9.720 T1 ⊕ Y1 ⊕ Y1	√	1	1	√	mmm	$\mathrm{B1_u}$
N25.9.721 T1 ⊕ Y1 ⊕ Y3	√	1	1	√	mmm	$\mathrm{B2_u}$
N25.9.722 T1 ⊕ Y3 ⊕ Y3	√	1	1	√	mmm	$\mathrm{B1_u}$
N25.9.723 T1 ⊕ X1 ⊕ X2	√	1	1	×	-	-
N25.9.724 T1 ⊕ X1 ⊕ X3	√	1	1	×	-	-
N25.9.725 T1 ⊕ X1 ⊕ Y2	×	-	-	-	-	-
N25.9.726 T1 ⊕ X1 ⊕ Y4	×	-	-	-	-	-
N25.9.727 T1 ⊕ Y1 ⊕ X2	×	-	-	-	-	-
N25.9.728 T1 ⊕ Y1 ⊕ Y2	√	1	1	×	-	-
N25.9.729 T1 ⊕ Y1 ⊕ Y4	√	1	1	×	-	-
N25.9.730 T1 ⊕ Y3 ⊕ X2	×	-	-	-	-	-
N25.9.731 T1 ⊕ Y3 ⊕ Y2	√	1	1	×	-	-
N25.9.732 T1 ⊕ Y3 ⊕ Y4	√	1	1	×	-	-
N25.9.733 T1 ⊕ X1 ⊕ Z1	×	-	-	-	-	-
N25.9.734 T1 ⊕ Y1 ⊕ Z1	×	-	-	-	-	-
N25.9.735 T1 ⊕ Y3 ⊕ Z1	×	-	-	-	-	-
N25.9.736 T1 ⊕ X1 ⊕ Z2	×	-	-	-	-	-
N25.9.737 T1 ⊕ Y1 ⊕ Z2	×	-	-	-	-	-
N25.9.738 T1 ⊕ Y3 ⊕ Z2	×	-	-	-	-	-
N25.9.739 T1 ⊕ X1 ⊕ Z3	×	-	-	-	-	-
N25.9.740 T1 ⊕ X1 ⊕ Z4	×	-	-	-	-	-
N25.9.741 T1 ⊕ Y1 ⊕ Z3	×	-	-	-	-	-
N25.9.742 T1 ⊕ Y1 ⊕ Z4	×	-	-	-	-	-
N25.9.743 T1 ⊕ Y3 ⊕ Z3	×	-	-	-	-	-
N25.9.744 T1 ⊕ Y3 ⊕ Z4	×	-	-	-	-	-
N25.9.745 T1 ⊕ X2 ⊕ X2	√	1	1	×	-	-
N25.9.746 T1 ⊕ X2 ⊕ X3	√	1	1	√	mmm	$\mathrm{B3_u}$
N25.9.747 T1 ⊕ X2 ⊕ Y2	×	-	-	-	-	-
N25.9.748 T1 ⊕ X2 ⊕ Y4	×	-	-	-	-	-
N25.9.749 T1 ⊕ Y2 ⊕ Y2	√	1	1	√	mmm	$\mathrm{B1_u}$
N25.9.750 T1 ⊕ Y2 ⊕ Y4	√	1	1	√	mmm	$\mathrm{B2_u}$
N25.9.751 T1 ⊕ Y4 ⊕ Y4	√	1	1	√	mmm	$\mathrm{B1_u}$
N25.9.752 T1 ⊕ X2 ⊕ Z1	×	-	-	-	-	-
N25.9.753 T1 ⊕ Y2 ⊕ Z1	×	-	-	-	-	-
N25.9.754 T1 ⊕ Y4 ⊕ Z1	×	-	-	-	-	-
N25.9.755 T1 ⊕ X2 ⊕ Z2	×	-	-	-	-	-
N25.9.756 T1 ⊕ Y2 ⊕ Z2	×	-	-	-	-	-
N25.9.757 T1 ⊕ Y4 ⊕ Z2	×	-	-	-	-	-
N25.9.758 T1 ⊕ X2 ⊕ Z3	×	-	-	-	-	-
N25.9.759 T1 ⊕ X2 ⊕ Z4	×	-	-	-	-	-

Non-coplanar SSGs with parent space group $Pmm2$ (No. 25) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N25.9.760 T1 $\oplus$ Y2 $\oplus$ Z3	$\times$	-	-	-	-	-
N25.9.761 T1 $\oplus$ Y2 $\oplus$ Z4	$\times$	-	-	-	-	-
N25.9.762 T1 $\oplus$ Y4 $\oplus$ Z3	$\times$	-	-	-	-	-
N25.9.763 T1 $\oplus$ Y4 $\oplus$ Z4	$\times$	-	-	-	-	-
N25.9.764 T1 $\oplus$ Z1 $\oplus$ Z1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N25.9.765 T1 $\oplus$ Z1 $\oplus$ Z2	$\surd$	1	1	$\times$	-	-
N25.9.766 T1 $\oplus$ Z1 $\oplus$ Z3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N25.9.767 T1 $\oplus$ Z1 $\oplus$ Z4	$\surd$	1	1	$\times$	-	-
N25.9.768 T1 $\oplus$ Z2 $\oplus$ Z2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N25.9.769 T1 $\oplus$ Z2 $\oplus$ Z3	$\surd$	1	1	$\times$	-	-
N25.9.770 T1 $\oplus$ Z2 $\oplus$ Z4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N25.9.771 T1 $\oplus$ Z3 $\oplus$ Z3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N25.9.772 T1 $\oplus$ Z3 $\oplus$ Z4	$\surd$	1	1	$\times$	-	-
N25.9.773 T1 $\oplus$ Z4 $\oplus$ Z4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N25.9.774 T2 $\oplus$ T2 $\oplus$ T2	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N25.9.775 T2 $\oplus$ T2 $\oplus$ T4	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N25.9.776 T2 $\oplus$ T2 $\oplus$ U2	$\surd$	1	1	$\times$	-	-
N25.9.777 T2 $\oplus$ T4 $\oplus$ U2	$\surd$	1	1	$\times$	-	-
N25.9.778 T2 $\oplus$ T2 $\oplus$ X1	$\surd$	1	1	$\times$	-	-
N25.9.779 T2 $\oplus$ T2 $\oplus$ Y1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N25.9.780 T2 $\oplus$ T2 $\oplus$ Y3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N25.9.781 T2 $\oplus$ T4 $\oplus$ X1	$\surd$	1	1	$\times$	-	-
N25.9.782 T2 $\oplus$ T4 $\oplus$ Y1	$\surd$	1	1	$\times$	-	-
N25.9.783 T2 $\oplus$ U2 $\oplus$ X1	$\times$	-	-	-	-	-
N25.9.784 T2 $\oplus$ U2 $\oplus$ X4	$\times$	-	-	-	-	-
N25.9.785 T2 $\oplus$ T2 $\oplus$ X2	$\surd$	1	1	$\times$	-	-
N25.9.786 T2 $\oplus$ T2 $\oplus$ Y2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N25.9.787 T2 $\oplus$ T2 $\oplus$ Y4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N25.9.788 T2 $\oplus$ T4 $\oplus$ X2	$\surd$	1	1	$\times$	-	-
N25.9.789 T2 $\oplus$ T4 $\oplus$ Y2	$\surd$	1	1	$\times$	-	-
N25.9.790 T2 $\oplus$ U2 $\oplus$ X2	$\times$	-	-	-	-	-
N25.9.791 T2 $\oplus$ U2 $\oplus$ X3	$\times$	-	-	-	-	-
N25.9.792 T2 $\oplus$ T2 $\oplus$ Z1	$\surd$	1	1	$\times$	-	-
N25.9.793 T2 $\oplus$ T4 $\oplus$ Z1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N25.9.794 T2 $\oplus$ U2 $\oplus$ Z1	$\times$	-	-	-	-	-
N25.9.795 T2 $\oplus$ T2 $\oplus$ Z2	$\surd$	1	1	$\times$	-	-
N25.9.796 T2 $\oplus$ T4 $\oplus$ Z2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N25.9.797 T2 $\oplus$ U2 $\oplus$ Z2	$\times$	-	-	-	-	-
N25.9.798 T2 $\oplus$ T2 $\oplus$ Z3	$\surd$	1	1	$\times$	-	-
N25.9.799 T2 $\oplus$ T2 $\oplus$ Z4	$\surd$	1	1	$\times$	-	-
N25.9.800 T2 $\oplus$ T4 $\oplus$ Z3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N25.9.801 T2 $\oplus$ T4 $\oplus$ Z4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N25.9.802 T2 $\oplus$ U2 $\oplus$ Z3	$\times$	-	-	-	-	-
N25.9.803 T2 $\oplus$ X1 $\oplus$ X1	$\surd$	1	1	$\times$	-	-
N25.9.804 T2 $\oplus$ X1 $\oplus$ X4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N25.9.805 T2 $\oplus$ X1 $\oplus$ Y1	$\times$	-	-	-	-	-

Non-coplanar SSGs with parent space group $Pmm2$ (No. 25) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N25.9.806 T2 ⊕ X1 ⊕ Y3	×	-	-	-	-	-
N25.9.807 T2 ⊕ Y1 ⊕ Y1	√	1	1	√	mmm	$\mathrm{B1_u}$
N25.9.808 T2 ⊕ Y1 ⊕ Y3	√	1	1	√	mmm	$\mathrm{B2_u}$
N25.9.809 T2 ⊕ Y3 ⊕ Y3	√	1	1	√	mmm	$\mathrm{B1_u}$
N25.9.810 T2 ⊕ X1 ⊕ X2	√	1	1	×	-	-
N25.9.811 T2 ⊕ X1 ⊕ X3	√	1	1	×	-	-
N25.9.812 T2 ⊕ X1 ⊕ Y2	×	-	-	-	-	-
N25.9.813 T2 ⊕ X1 ⊕ Y4	×	-	-	-	-	-
N25.9.814 T2 ⊕ Y1 ⊕ X2	×	-	-	-	-	-
N25.9.815 T2 ⊕ Y1 ⊕ Y2	√	1	1	×	-	-
N25.9.816 T2 ⊕ Y1 ⊕ Y4	√	1	1	×	-	-
N25.9.817 T2 ⊕ Y3 ⊕ X2	×	-	-	-	-	-
N25.9.818 T2 ⊕ Y3 ⊕ Y2	√	1	1	×	-	-
N25.9.819 T2 ⊕ Y3 ⊕ Y4	√	1	1	×	-	-
N25.9.820 T2 ⊕ X1 ⊕ Z1	×	-	-	-	-	-
N25.9.821 T2 ⊕ Y1 ⊕ Z1	×	-	-	-	-	-
N25.9.822 T2 ⊕ Y3 ⊕ Z1	×	-	-	-	-	-
N25.9.823 T2 ⊕ X1 ⊕ Z2	×	-	-	-	-	-
N25.9.824 T2 ⊕ Y1 ⊕ Z2	×	-	-	-	-	-
N25.9.825 T2 ⊕ Y3 ⊕ Z2	×	-	-	-	-	-
N25.9.826 T2 ⊕ X1 ⊕ Z3	×	-	-	-	-	-
N25.9.827 T2 ⊕ X1 ⊕ Z4	×	-	-	-	-	-
N25.9.828 T2 ⊕ Y1 ⊕ Z3	×	-	-	-	-	-
N25.9.829 T2 ⊕ Y1 ⊕ Z4	×	-	-	-	-	-
N25.9.830 T2 ⊕ Y3 ⊕ Z3	×	-	-	-	-	-
N25.9.831 T2 ⊕ Y3 ⊕ Z4	×	-	-	-	-	-
N25.9.832 T2 ⊕ X2 ⊕ X2	√	1	1	×	-	-
N25.9.833 T2 ⊕ X2 ⊕ X3	√	1	1	√	mmm	$\mathrm{B3_u}$
N25.9.834 T2 ⊕ X2 ⊕ Y2	×	-	-	-	-	-
N25.9.835 T2 ⊕ X2 ⊕ Y4	×	-	-	-	-	-
N25.9.836 T2 ⊕ Y2 ⊕ Y2	√	1	1	√	mmm	$\mathrm{B1_u}$
N25.9.837 T2 ⊕ Y2 ⊕ Y4	√	1	1	√	mmm	$\mathrm{B2_u}$
N25.9.838 T2 ⊕ Y4 ⊕ Y4	√	1	1	√	mmm	$\mathrm{B1_u}$
N25.9.839 T2 ⊕ X2 ⊕ Z1	×	-	-	-	-	-
N25.9.840 T2 ⊕ Y2 ⊕ Z1	×	-	-	-	-	-
N25.9.841 T2 ⊕ Y4 ⊕ Z1	×	-	-	-	-	-
N25.9.842 T2 ⊕ X2 ⊕ Z2	×	-	-	-	-	-
N25.9.843 T2 ⊕ Y2 ⊕ Z2	×	-	-	-	-	-
N25.9.844 T2 ⊕ Y4 ⊕ Z2	×	-	-	-	-	-
N25.9.845 T2 ⊕ X2 ⊕ Z3	×	-	-	-	-	-
N25.9.846 T2 ⊕ X2 ⊕ Z4	×	-	-	-	-	-
N25.9.847 T2 ⊕ Y2 ⊕ Z3	×	-	-	-	-	-
N25.9.848 T2 ⊕ Y2 ⊕ Z4	×	-	-	-	-	-
N25.9.849 T2 ⊕ Y4 ⊕ Z3	×	-	-	-	-	-
N25.9.850 T2 ⊕ Y4 ⊕ Z4	×	-	-	-	-	-
N25.9.851 T2 ⊕ Z1 ⊕ Z1	√	1	1	√	mmm	$\mathrm{B1_u}$

Non-coplanar SSGs with parent space group $Pmm2$ (No. 25) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N25.9.852 T2 ⊕ Z1 ⊕ Z2	√	1	1	×	-	-
N25.9.853 T2 ⊕ Z1 ⊕ Z3	√	1	1	√	mmm	$\mathrm{B2_u}$
N25.9.854 T2 ⊕ Z1 ⊕ Z4	√	1	1	×	-	-
N25.9.855 T2 ⊕ Z2 ⊕ Z2	√	1	1	√	mmm	$\mathrm{B1_u}$
N25.9.856 T2 ⊕ Z2 ⊕ Z3	√	1	1	×	-	-
N25.9.857 T2 ⊕ Z2 ⊕ Z4	√	1	1	√	mmm	$\mathrm{B2_u}$
N25.9.858 T2 ⊕ Z3 ⊕ Z3	√	1	1	√	mmm	$\mathrm{B1_u}$
N25.9.859 T2 ⊕ Z3 ⊕ Z4	√	1	1	×	-	-
N25.9.860 T2 ⊕ Z4 ⊕ Z4	√	1	1	√	mmm	$\mathrm{B1_u}$
N25.9.861 X1 ⊕ X1 ⊕ X1	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N25.9.862 X1 ⊕ X1 ⊕ X4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N25.9.863 X1 ⊕ X1 ⊕ Y1	√	1	1	×	-	-
N25.9.864 X1 ⊕ X4 ⊕ Y1	√	1	1	√	mmm	$\mathrm{B3_u}$
N25.9.865 X1 ⊕ X1 ⊕ X2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N25.9.866 X1 ⊕ X1 ⊕ X3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N25.9.867 X1 ⊕ X1 ⊕ Y2	√	1	1	×	-	-
N25.9.868 X1 ⊕ X4 ⊕ X2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N25.9.869 X1 ⊕ X4 ⊕ Y2	√	1	1	√	mmm	$\mathrm{B3_u}$
N25.9.870 X1 ⊕ Y1 ⊕ X2	√	1	1	×	-	-
N25.9.871 X1 ⊕ Y1 ⊕ X3	√	1	1	×	-	-
N25.9.872 X1 ⊕ X1 ⊕ Z1	√	1	1	×	-	-
N25.9.873 X1 ⊕ X4 ⊕ Z1	√	1	1	√	mmm	$\mathrm{B3_u}$
N25.9.874 X1 ⊕ Y1 ⊕ Z1	×	-	-	-	-	-
N25.9.875 X1 ⊕ X1 ⊕ Z2	√	1	1	×	-	-
N25.9.876 X1 ⊕ X4 ⊕ Z2	√	1	1	√	mmm	$\mathrm{B3_u}$
N25.9.877 X1 ⊕ Y1 ⊕ Z2	×	-	-	-	-	-
N25.9.878 X1 ⊕ X1 ⊕ Z3	√	1	1	×	-	-
N25.9.879 X1 ⊕ X1 ⊕ Z4	√	1	1	×	-	-
N25.9.880 X1 ⊕ X4 ⊕ Z3	√	1	1	√	mmm	$\mathrm{B3_u}$
N25.9.881 X1 ⊕ X4 ⊕ Z4	√	1	1	√	mmm	$\mathrm{B3_u}$
N25.9.882 X1 ⊕ Y1 ⊕ Z3	×	-	-	-	-	-
N25.9.883 X1 ⊕ X2 ⊕ X2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N25.9.884 X1 ⊕ X2 ⊕ X3	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N25.9.885 X1 ⊕ X2 ⊕ Y2	√	1	1	×	-	-
N25.9.886 X1 ⊕ X3 ⊕ X3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N25.9.887 X1 ⊕ X3 ⊕ Y2	√	1	1	×	-	-
N25.9.888 X1 ⊕ Y2 ⊕ Y2	√	1	1	×	-	-
N25.9.889 X1 ⊕ Y2 ⊕ Y4	√	1	1	√	mmm	$\mathrm{B2_u}$
N25.9.890 X1 ⊕ X2 ⊕ Z1	√	1	1	×	-	-
N25.9.891 X1 ⊕ X3 ⊕ Z1	√	1	1	×	-	-
N25.9.892 X1 ⊕ Y2 ⊕ Z1	×	-	-	-	-	-
N25.9.893 X1 ⊕ X2 ⊕ Z2	√	1	1	×	-	-
N25.9.894 X1 ⊕ X3 ⊕ Z2	√	1	1	×	-	-
N25.9.895 X1 ⊕ Y2 ⊕ Z2	×	-	-	-	-	-
N25.9.896 X1 ⊕ X2 ⊕ Z3	√	1	1	×	-	-
N25.9.897 X1 ⊕ X2 ⊕ Z4	√	1	1	×	-	-

Non-coplanar SSGs with parent space group $Pmm2$ (No. 25) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N25.9.898 X1 ⊕ X3 ⊕ Z3	√	1	1	×	-	-
N25.9.899 X1 ⊕ X3 ⊕ Z4	√	1	1	×	-	-
N25.9.900 X1 ⊕ Y2 ⊕ Z3	×	-	-	-	-	-
N25.9.901 X1 ⊕ Y2 ⊕ Z4	×	-	-	-	-	-
N25.9.902 X1 ⊕ Z1 ⊕ Z1	√	1	1	√	mmm	$\mathrm{B1_u}$
N25.9.903 X1 ⊕ Z1 ⊕ Z2	√	1	1	×	-	-
N25.9.904 X1 ⊕ Z1 ⊕ Z3	√	1	1	×	-	-
N25.9.905 X1 ⊕ Z1 ⊕ Z4	√	1	1	×	-	-
N25.9.906 X1 ⊕ Z2 ⊕ Z2	√	1	1	√	mmm	$\mathrm{B1_u}$
N25.9.907 X1 ⊕ Z2 ⊕ Z3	√	1	1	×	-	-
N25.9.908 X1 ⊕ Z2 ⊕ Z4	√	1	1	×	-	-
N25.9.909 X1 ⊕ Z3 ⊕ Z3	√	1	1	√	mmm	$\mathrm{B1_u}$
N25.9.910 X1 ⊕ Z3 ⊕ Z4	√	1	1	×	-	-
N25.9.911 X1 ⊕ Z4 ⊕ Z4	√	1	1	√	mmm	$\mathrm{B1_u}$
N25.9.912 X2 ⊕ X2 ⊕ X2	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N25.9.913 X2 ⊕ X2 ⊕ X3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N25.9.914 X2 ⊕ X2 ⊕ Y2	√	1	1	×	-	-
N25.9.915 X2 ⊕ X3 ⊕ Y2	√	1	1	√	mmm	$\mathrm{B3_u}$
N25.9.916 X2 ⊕ X2 ⊕ Z1	√	1	1	×	-	-
N25.9.917 X2 ⊕ X3 ⊕ Z1	√	1	1	√	mmm	$\mathrm{B3_u}$
N25.9.918 X2 ⊕ Y2 ⊕ Z1	×	-	-	-	-	-
N25.9.919 X2 ⊕ X2 ⊕ Z2	√	1	1	×	-	-
N25.9.920 X2 ⊕ X3 ⊕ Z2	√	1	1	√	mmm	$\mathrm{B3_u}$
N25.9.921 X2 ⊕ Y2 ⊕ Z2	×	-	-	-	-	-
N25.9.922 X2 ⊕ X2 ⊕ Z3	√	1	1	×	-	-
N25.9.923 X2 ⊕ X2 ⊕ Z4	√	1	1	×	-	-
N25.9.924 X2 ⊕ X3 ⊕ Z3	√	1	1	√	mmm	$\mathrm{B3_u}$
N25.9.925 X2 ⊕ X3 ⊕ Z4	√	1	1	√	mmm	$\mathrm{B3_u}$
N25.9.926 X2 ⊕ Y2 ⊕ Z3	×	-	-	-	-	-
N25.9.927 X2 ⊕ Z1 ⊕ Z1	√	1	1	√	mmm	$\mathrm{B1_u}$
N25.9.928 X2 ⊕ Z1 ⊕ Z2	√	1	1	×	-	-
N25.9.929 X2 ⊕ Z1 ⊕ Z3	√	1	1	×	-	-
N25.9.930 X2 ⊕ Z1 ⊕ Z4	√	1	1	×	-	-
N25.9.931 X2 ⊕ Z2 ⊕ Z2	√	1	1	√	mmm	$\mathrm{B1_u}$
N25.9.932 X2 ⊕ Z2 ⊕ Z3	√	1	1	×	-	-
N25.9.933 X2 ⊕ Z2 ⊕ Z4	√	1	1	×	-	-
N25.9.934 X2 ⊕ Z3 ⊕ Z3	√	1	1	√	mmm	$\mathrm{B1_u}$
N25.9.935 X2 ⊕ Z3 ⊕ Z4	√	1	1	×	-	-
N25.9.936 X2 ⊕ Z4 ⊕ Z4	√	1	1	√	mmm	$\mathrm{B1_u}$
N25.9.937 Z1 ⊕ Z1 ⊕ Z1	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N25.9.938 Z1 ⊕ Z1 ⊕ Z2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N25.9.939 Z1 ⊕ Z1 ⊕ Z3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N25.9.940 Z1 ⊕ Z2 ⊕ Z2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N25.9.941 Z1 ⊕ Z2 ⊕ Z3	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N25.9.942 Z1 ⊕ Z3 ⊕ Z3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N25.9.943 Z1 ⊕ Z3 ⊕ Z4	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$

Non-coplanar SSGs with parent space group $Pmm2$ (No. 25) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N25.9.944 Z2 $\oplus$ Z2 $\oplus$ Z2	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N25.9.945 Z2 $\oplus$ Z2 $\oplus$ Z3	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N25.9.946 Z2 $\oplus$ Z3 $\oplus$ Z3	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N25.9.947 Z2 $\oplus$ Z3 $\oplus$ Z4	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N25.9.948 Z3 $\oplus$ Z3 $\oplus$ Z3	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N25.9.949 Z3 $\oplus$ Z3 $\oplus$ Z4	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N25.11.1 GM2 $\oplus$ LD1LE1	$\surd$	1	1	$\surd$	222	B1
N25.11.2 GM2 $\oplus$ LD2LE2	$\surd$	1	1	$\surd$	222	B1
N25.11.3 GM2 $\oplus$ LD3LE3	$\surd$	1	1	$\surd$	222	B1
N25.11.4 GM2 $\oplus$ G1GA1	$\surd$	1	1	$\times$	-	-
N25.11.5 GM2 $\oplus$ G2GA2	$\surd$	1	1	$\times$	-	-
N25.11.6 GM2 $\oplus$ Q1QA1	$\surd$	1	1	$\times$	-	-
N25.11.7 GM3 $\oplus$ LD1LE1	$\surd$	1	1	$\surd$	$mm2$	B2
N25.11.8 GM3 $\oplus$ LD2LE2	$\surd$	1	1	$\surd$	$mm2$	B2
N25.11.9 GM3 $\oplus$ LD3LE3	$\surd$	1	1	$\surd$	$mm2$	B2
N25.11.10 GM3 $\oplus$ LD4LE4	$\surd$	1	1	$\surd$	$mm2$	B2
N25.11.11 GM3 $\oplus$ H1HA1	$\surd$	1	1	$\times$	-	-
N25.11.12 GM3 $\oplus$ G1GA1	$\surd$	1	1	$\times$	-	-
N25.11.13 GM3 $\oplus$ H2HA2	$\surd$	1	1	$\times$	-	-
N25.11.14 GM3 $\oplus$ G2GA2	$\surd$	1	1	$\times$	-	-
N25.11.15 GM3 $\oplus$ Q1QA1	$\surd$	1	1	$\times$	-	-
N25.11.16 R1 $\oplus$ LD1LE1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N25.11.17 R1 $\oplus$ LD2LE2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N25.11.18 R1 $\oplus$ LD3LE3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N25.11.19 R1 $\oplus$ G1GA1	$\surd$	1	1	$\times$	-	-
N25.11.20 R1 $\oplus$ G4GA4	$\surd$	1	1	$\times$	-	-
N25.11.21 R1 $\oplus$ G2GA2	$\surd$	1	1	$\times$	-	-
N25.11.22 R1 $\oplus$ G3GA3	$\surd$	1	1	$\times$	-	-
N25.11.23 R1 $\oplus$ Q1QA1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N25.11.24 R1 $\oplus$ Q2QA2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N25.11.25 R1 $\oplus$ Q3QA3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N25.11.26 S1 $\oplus$ LD1LE1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N25.11.27 S1 $\oplus$ LD2LE2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N25.11.28 S1 $\oplus$ LD3LE3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N25.11.29 S1 $\oplus$ G1GA1	$\surd$	1	1	$\times$	-	-
N25.11.30 S1 $\oplus$ G4GA4	$\surd$	1	1	$\times$	-	-
N25.11.31 S1 $\oplus$ G2GA2	$\surd$	1	1	$\times$	-	-
N25.11.32 S1 $\oplus$ G3GA3	$\surd$	1	1	$\times$	-	-
N25.11.33 S1 $\oplus$ Q1QA1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N25.11.34 S1 $\oplus$ Q2QA2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N25.11.35 S1 $\oplus$ Q3QA3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N25.11.36 T1 $\oplus$ LD1LE1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N25.11.37 T1 $\oplus$ LD2LE2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N25.11.38 T1 $\oplus$ LD3LE3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N25.11.39 T1 $\oplus$ LD4LE4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N25.11.40 T1 $\oplus$ H1HA1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$

Non-coplanar SSGs with parent space group $Pmm2$ (No. 25) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N25.11.41 T1 $\oplus$ H3HA3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N25.11.42 T1 $\oplus$ G1GA1	$\surd$	1	1	$\times$	-	-
N25.11.43 T1 $\oplus$ H2HA2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N25.11.44 T1 $\oplus$ H4HA4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N25.11.45 T1 $\oplus$ G2GA2	$\surd$	1	1	$\times$	-	-
N25.11.46 T1 $\oplus$ Q1QA1	$\surd$	1	1	$\times$	-	-
N25.11.47 T1 $\oplus$ Q2QA2	$\surd$	1	1	$\times$	-	-
N25.11.48 T2 $\oplus$ LD1LE1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N25.11.49 T2 $\oplus$ LD2LE2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N25.11.50 T2 $\oplus$ LD3LE3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N25.11.51 T2 $\oplus$ LD4LE4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N25.11.52 T2 $\oplus$ H1HA1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N25.11.53 T2 $\oplus$ H3HA3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N25.11.54 T2 $\oplus$ G1GA1	$\surd$	1	1	$\times$	-	-
N25.11.55 T2 $\oplus$ H2HA2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N25.11.56 T2 $\oplus$ H4HA4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N25.11.57 T2 $\oplus$ G2GA2	$\surd$	1	1	$\times$	-	-
N25.11.58 T2 $\oplus$ Q1QA1	$\surd$	1	1	$\times$	-	-
N25.11.59 T2 $\oplus$ Q2QA2	$\surd$	1	1	$\times$	-	-
N25.11.60 X1 $\oplus$ LD1LE1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N25.11.61 X1 $\oplus$ LD2LE2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N25.11.62 X1 $\oplus$ LD3LE3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N25.11.63 X1 $\oplus$ LD4LE4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N25.11.64 X1 $\oplus$ H1HA1	$\surd$	1	1	$\times$	-	-
N25.11.65 X1 $\oplus$ G1GA1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N25.11.66 X1 $\oplus$ G4GA4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N25.11.67 X1 $\oplus$ H2HA2	$\surd$	1	1	$\times$	-	-
N25.11.68 X1 $\oplus$ G2GA2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N25.11.69 X1 $\oplus$ G3GA3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N25.11.70 X1 $\oplus$ Q1QA1	$\surd$	1	1	$\times$	-	-
N25.11.71 X1 $\oplus$ Q2QA2	$\surd$	1	1	$\times$	-	-
N25.11.72 X2 $\oplus$ LD1LE1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N25.11.73 X2 $\oplus$ LD2LE2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N25.11.74 X2 $\oplus$ LD3LE3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N25.11.75 X2 $\oplus$ LD4LE4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N25.11.76 X2 $\oplus$ H1HA1	$\surd$	1	1	$\times$	-	-
N25.11.77 X2 $\oplus$ G1GA1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N25.11.78 X2 $\oplus$ G4GA4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N25.11.79 X2 $\oplus$ H2HA2	$\surd$	1	1	$\times$	-	-
N25.11.80 X2 $\oplus$ G2GA2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N25.11.81 X2 $\oplus$ G3GA3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N25.11.82 X2 $\oplus$ Q1QA1	$\surd$	1	1	$\times$	-	-
N25.11.83 X2 $\oplus$ Q2QA2	$\surd$	1	1	$\times$	-	-
N25.11.84 Z1 $\oplus$ LD1LE1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N25.11.85 Z1 $\oplus$ LD2LE2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N25.11.86 Z1 $\oplus$ LD3LE3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$

Non-coplanar SSGs with parent space group $Pmm2$ (No. 25) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N25.11.87 Z1 ⊕ G1GA1	√	1	1	×	-	-
N25.11.88 Z1 ⊕ G2GA2	√	1	1	×	-	-
N25.11.89 Z1 ⊕ Q1QA1	√	1	1	×	-	-
N25.11.90 Z2 ⊕ LD1LE1	√	1	1	√	mmm	$\mathrm{B1_u}$
N25.11.91 Z2 ⊕ LD2LE2	√	1	1	√	mmm	$\mathrm{B1_u}$
N25.11.92 Z2 ⊕ LD3LE3	√	1	1	√	mmm	$\mathrm{B1_u}$
N25.11.93 Z2 ⊕ G1GA1	√	1	1	×	-	-
N25.11.94 Z2 ⊕ G2GA2	√	1	1	×	-	-
N25.11.95 Z2 ⊕ Q1QA1	√	1	1	×	-	-
N25.11.96 Z3 ⊕ LD1LE1	√	1	1	√	mmm	$\mathrm{B1_u}$
N25.11.97 Z3 ⊕ LD2LE2	√	1	1	√	mmm	$\mathrm{B1_u}$
N25.11.98 Z3 ⊕ LD3LE3	√	1	1	√	mmm	$\mathrm{B1_u}$
N25.11.99 Z3 ⊕ LD4LE4	√	1	1	√	mmm	$\mathrm{B1_u}$
N25.11.100 Z3 ⊕ H1HA1	√	1	1	×	-	-
N25.11.101 Z3 ⊕ G1GA1	√	1	1	×	-	-
N25.11.102 Z3 ⊕ H2HA2	√	1	1	×	-	-
N25.11.103 Z3 ⊕ G2GA2	√	1	1	×	-	-
N25.11.104 Z3 ⊕ Q1QA1	√	1	1	×	-	-
N25.14.1 GM2 ⊕ DT1	√	1	1	√	$mm2$	B2
N25.14.2 GM2 ⊕ DT2	√	1	1	√	$mm2$	B2
N25.14.3 GM2 ⊕ A1	√	1	1	×	-	-
N25.14.4 GM2 ⊕ A2	√	1	1	×	-	-
N25.14.5 GM2 ⊕ C1	√	1	1	×	-	-
N25.14.6 GM2 ⊕ E1	√	1	1	×	-	-
N25.14.7 GM3 ⊕ SM1	√	1	1	√	222	B3
N25.14.8 GM3 ⊕ DT1	√	1	1	√	$mm2$	B2
N25.14.9 GM3 ⊕ SM2	√	1	1	√	222	B3
N25.14.10 GM3 ⊕ DT2	√	1	1	√	$mm2$	B2
N25.14.11 GM3 ⊕ A1	√	1	1	×	-	-
N25.14.12 GM3 ⊕ B1	√	1	1	×	-	-
N25.14.13 GM3 ⊕ A2	√	1	1	×	-	-
N25.14.14 GM3 ⊕ B2	√	1	1	×	-	-
N25.14.15 GM3 ⊕ C1	√	1	1	×	-	-
N25.14.16 GM3 ⊕ D1	√	1	1	×	-	-
N25.14.17 GM3 ⊕ E1	√	1	1	×	-	-
N25.14.18 GM3 ⊕ P1	√	1	1	×	-	-
N25.14.19 R1 ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N25.14.20 R1 ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
N25.14.21 R1 ⊕ A1	√	1	1	×	-	-
N25.14.22 R1 ⊕ A2	√	1	1	×	-	-
N25.14.23 R1 ⊕ C1	√	1	1	×	-	-
N25.14.24 R1 ⊕ C2	√	1	1	×	-	-
N25.14.25 R1 ⊕ E1	√	1	1	√	mmm	$\mathrm{B3_u}$
N25.14.26 R1 ⊕ E2	√	1	1	√	mmm	$\mathrm{B3_u}$
N25.14.27 S1 ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N25.14.28 S1 ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$

Non-coplanar SSGs with parent space group $Pmm2$ (No. 25) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N25.14.29 S1 ⊕ A1	√	1	1	×	-	-
N25.14.30 S1 ⊕ A2	√	1	1	×	-	-
N25.14.31 S1 ⊕ C1	√	1	1	√	mmm	$\mathrm{B3_u}$
N25.14.32 S1 ⊕ C2	√	1	1	√	mmm	$\mathrm{B3_u}$
N25.14.33 S1 ⊕ E1	√	1	1	×	-	-
N25.14.34 S1 ⊕ E2	√	1	1	×	-	-
N25.14.35 T1 ⊕ SM1	√	1	1	√	mmm	$\mathrm{B3_u}$
N25.14.36 T1 ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N25.14.37 T1 ⊕ SM2	√	1	1	√	mmm	$\mathrm{B3_u}$
N25.14.38 T1 ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
N25.14.39 T1 ⊕ A1	√	1	1	×	-	-
N25.14.40 T1 ⊕ B1	√	1	1	√	mmm	$\mathrm{B2_u}$
N25.14.41 T1 ⊕ A2	√	1	1	×	-	-
N25.14.42 T1 ⊕ B2	√	1	1	√	mmm	$\mathrm{B2_u}$
N25.14.43 T1 ⊕ C1	√	1	1	×	-	-
N25.14.44 T1 ⊕ C2	√	1	1	×	-	-
N25.14.45 T1 ⊕ D1	√	1	1	×	-	-
N25.14.46 T1 ⊕ E1	√	1	1	√	mmm	$\mathrm{B3_u}$
N25.14.47 T1 ⊕ E2	√	1	1	√	mmm	$\mathrm{B3_u}$
N25.14.48 T1 ⊕ P1	√	1	1	×	-	-
N25.14.49 T2 ⊕ SM1	√	1	1	√	mmm	$\mathrm{B3_u}$
N25.14.50 T2 ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N25.14.51 T2 ⊕ SM2	√	1	1	√	mmm	$\mathrm{B3_u}$
N25.14.52 T2 ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
N25.14.53 T2 ⊕ A1	√	1	1	×	-	-
N25.14.54 T2 ⊕ B1	√	1	1	√	mmm	$\mathrm{B2_u}$
N25.14.55 T2 ⊕ A2	√	1	1	×	-	-
N25.14.56 T2 ⊕ B2	√	1	1	√	mmm	$\mathrm{B2_u}$
N25.14.57 T2 ⊕ C1	√	1	1	×	-	-
N25.14.58 T2 ⊕ C2	√	1	1	×	-	-
N25.14.59 T2 ⊕ D1	√	1	1	×	-	-
N25.14.60 T2 ⊕ E1	√	1	1	√	mmm	$\mathrm{B3_u}$
N25.14.61 T2 ⊕ E2	√	1	1	√	mmm	$\mathrm{B3_u}$
N25.14.62 T2 ⊕ P1	√	1	1	×	-	-
N25.14.63 X1 ⊕ SM1	√	1	1	√	mmm	$\mathrm{B3_u}$
N25.14.64 X1 ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N25.14.65 X1 ⊕ SM2	√	1	1	√	mmm	$\mathrm{B3_u}$
N25.14.66 X1 ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
N25.14.67 X1 ⊕ A1	√	1	1	×	-	-
N25.14.68 X1 ⊕ B1	√	1	1	×	-	-
N25.14.69 X1 ⊕ A2	√	1	1	×	-	-
N25.14.70 X1 ⊕ B2	√	1	1	×	-	-
N25.14.71 X1 ⊕ C1	√	1	1	×	-	-
N25.14.72 X1 ⊕ D1	√	1	1	√	mmm	$\mathrm{B2_u}$
N25.14.73 X1 ⊕ D2	√	1	1	√	mmm	$\mathrm{B2_u}$
N25.14.74 X1 ⊕ E1	√	1	1	×	-	-

Non-coplanar SSGs with parent space group $Pmm2$ (No. 25) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N25.14.75 X1 ⊕ P1	√	1	1	×	-	-
N25.14.76 X1 ⊕ P2	√	1	1	×	-	-
N25.14.77 X2 ⊕ SM1	√	1	1	√	mmm	$\mathrm{B3_u}$
N25.14.78 X2 ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N25.14.79 X2 ⊕ SM2	√	1	1	√	mmm	$\mathrm{B3_u}$
N25.14.80 X2 ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
N25.14.81 X2 ⊕ A1	√	1	1	×	-	-
N25.14.82 X2 ⊕ B1	√	1	1	×	-	-
N25.14.83 X2 ⊕ A2	√	1	1	×	-	-
N25.14.84 X2 ⊕ B2	√	1	1	×	-	-
N25.14.85 X2 ⊕ C1	√	1	1	×	-	-
N25.14.86 X2 ⊕ D1	√	1	1	√	mmm	$\mathrm{B2_u}$
N25.14.87 X2 ⊕ D2	√	1	1	√	mmm	$\mathrm{B2_u}$
N25.14.88 X2 ⊕ E1	√	1	1	×	-	-
N25.14.89 X2 ⊕ P1	√	1	1	×	-	-
N25.14.90 X2 ⊕ P2	√	1	1	×	-	-
N25.14.91 Z1 ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N25.14.92 Z1 ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
N25.14.93 Z1 ⊕ A1	√	1	1	√	mmm	$\mathrm{B3_u}$
N25.14.94 Z1 ⊕ A2	√	1	1	√	mmm	$\mathrm{B3_u}$
N25.14.95 Z1 ⊕ C1	√	1	1	×	-	-
N25.14.96 Z1 ⊕ E1	√	1	1	×	-	-
N25.14.97 Z2 ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N25.14.98 Z2 ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
N25.14.99 Z2 ⊕ A1	√	1	1	√	mmm	$\mathrm{B3_u}$
N25.14.100 Z2 ⊕ A2	√	1	1	√	mmm	$\mathrm{B3_u}$
N25.14.101 Z2 ⊕ C1	√	1	1	×	-	-
N25.14.102 Z2 ⊕ E1	√	1	1	×	-	-
N25.14.103 Z3 ⊕ SM1	√	1	1	√	mmm	$\mathrm{B3_u}$
N25.14.104 Z3 ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N25.14.105 Z3 ⊕ SM2	√	1	1	√	mmm	$\mathrm{B3_u}$
N25.14.106 Z3 ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
N25.14.107 Z3 ⊕ A1	√	1	1	√	mmm	$\mathrm{B3_u}$
N25.14.108 Z3 ⊕ B1	√	1	1	√	mmm	$\mathrm{B2_u}$
N25.14.109 Z3 ⊕ A2	√	1	1	√	mmm	$\mathrm{B3_u}$
N25.14.110 Z3 ⊕ B2	√	1	1	√	mmm	$\mathrm{B2_u}$
N25.14.111 Z3 ⊕ C1	√	1	1	×	-	-
N25.14.112 Z3 ⊕ D1	√	1	1	×	-	-
N25.14.113 Z3 ⊕ E1	√	1	1	×	-	-
N25.14.114 Z3 ⊕ P1	√	1	1	×	-	-

TABLE S76: Collinear SSGs with parent space group $Pmc2_1$ (No. 26).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L26.1.1 GM1	1	mmm	$\mathrm{A_g}$
L26.2.1 GM2	1	mmm	$\mathrm{B1_g}$

Collinear SSGs with parent space group $Pmc2_1$ (No. 26)(continued)

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L26.2.2 GM3	1	mmm	$\mathrm{B3_g}$
L26.2.3 GM4	1	mmm	$\mathrm{B2_g}$
L26.2.4 S1	0	-	-
L26.2.5 X1	0	-	-
L26.2.6 X2	0	-	-
L26.2.7 Y1	0	-	-
L26.2.8 Y2	0	-	-

TABLE S77: Coplanar SSGs with parent space group $Pmc2_1$ (No. 26).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P26.1.1 GM1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{B1_u}$
P26.2.1 GM2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_u}\oplus\mathrm{B1_g}$
P26.2.2 GM3	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}\oplus\mathrm{B2_u}$
P26.2.3 GM4	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}\oplus\mathrm{B2_g}$
P26.2.4 S1	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P26.2.5 X1	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P26.2.6 X2	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P26.2.7 Y1	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P26.2.8 Y2	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P26.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B1_u}$
P26.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B3_g}\oplus\mathrm{B3_u}$
P26.3.3 GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B2_g}\oplus\mathrm{B2_u}$
P26.3.4 GM2 $\oplus$ S1	$\surd$	1	1	$\times$	-	-
P26.3.5 GM2 $\oplus$ X1	$\surd$	1	1	$\times$	-	-
P26.3.6 GM2 $\oplus$ X2	$\surd$	1	1	$\times$	-	-
P26.3.7 GM2 $\oplus$ Y1	$\surd$	1	1	$\times$	-	-
P26.3.8 GM2 $\oplus$ Y2	$\surd$	1	1	$\times$	-	-
P26.3.9 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B3_g}\oplus\mathrm{B3_g}$
P26.3.10 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B3_g}\oplus\mathrm{B2_g}$
P26.3.11 GM3 $\oplus$ S1	$\surd$	1	1	$\times$	-	-
P26.3.12 GM3 $\oplus$ X1	$\surd$	1	1	$\times$	-	-
P26.3.13 GM3 $\oplus$ X2	$\surd$	1	1	$\times$	-	-
P26.3.14 GM3 $\oplus$ Y1	$\surd$	1	1	$\times$	-	-
P26.3.15 GM3 $\oplus$ Y2	$\surd$	1	1	$\times$	-	-
P26.3.16 GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B2_g}\oplus\mathrm{B2_g}$
P26.3.17 GM4 $\oplus$ S1	$\surd$	1	1	$\times$	-	-
P26.3.18 GM4 $\oplus$ X1	$\surd$	1	1	$\times$	-	-
P26.3.19 GM4 $\oplus$ X2	$\surd$	1	1	$\times$	-	-
P26.3.20 GM4 $\oplus$ Y1	$\surd$	1	1	$\times$	-	-
P26.3.21 GM4 $\oplus$ Y2	$\surd$	1	1	$\times$	-	-
P26.3.22 S1 $\oplus$ S1	$\surd$	1	1	$\times$	-	-
P26.3.23 S1 $\oplus$ S2	$\surd$	1	1	$\times$	-	-
P26.3.24 S1 $\oplus$ S3	$\surd$	1	1	$\times$	-	-
P26.3.25 S1 $\oplus$ S4	$\surd$	1	1	$\times$	-	-
P26.3.26 S1 $\oplus$ X1	$\times$	-	-	-	-	-

Coplanar SSGs with parent space group $Pmc2_1$ (No. 26) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P26.3.27 S1 $\oplus$ X4	$\times$	-	-	-	-	-
P26.3.28 S1 $\oplus$ X2	$\times$	-	-	-	-	-
P26.3.29 S1 $\oplus$ X3	$\times$	-	-	-	-	-
P26.3.30 S1 $\oplus$ Y1	$\times$	-	-	-	-	-
P26.3.31 S1 $\oplus$ Y3	$\times$	-	-	-	-	-
P26.3.32 S1 $\oplus$ Y2	$\times$	-	-	-	-	-
P26.3.33 S1 $\oplus$ Y4	$\times$	-	-	-	-	-
P26.3.34 X1 $\oplus$ X1	$\surd$	1	1	$\times$	-	-
P26.3.35 X1 $\oplus$ X4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P26.3.36 X1 $\oplus$ X2	$\surd$	1	1	$\times$	-	-
P26.3.37 X1 $\oplus$ X3	$\surd$	1	1	$\times$	-	-
P26.3.38 X1 $\oplus$ Y1	$\times$	-	-	-	-	-
P26.3.39 X1 $\oplus$ Y2	$\times$	-	-	-	-	-
P26.3.40 X2 $\oplus$ X2	$\surd$	1	1	$\times$	-	-
P26.3.41 X2 $\oplus$ X3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P26.3.42 X2 $\oplus$ Y1	$\times$	-	-	-	-	-
P26.3.43 X2 $\oplus$ Y2	$\times$	-	-	-	-	-
P26.3.44 Y1 $\oplus$ Y1	$\surd$	1	1	$\times$	-	-
P26.3.45 Y1 $\oplus$ Y3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P26.3.46 Y1 $\oplus$ Y2	$\surd$	1	1	$\times$	-	-
P26.3.47 Y1 $\oplus$ Y4	$\surd$	1	1	$\times$	-	-
P26.3.48 Y2 $\oplus$ Y2	$\surd$	1	1	$\times$	-	-
P26.3.49 Y2 $\oplus$ Y4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P26.4.1 Z1Z3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P26.4.2 Z2Z4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P26.4.3 U1U3	$\surd$	1	1	$\times$	-	-
P26.4.4 T1T3	$\surd$	1	1	$\times$	-	-
P26.4.5 T2T4	$\surd$	1	1	$\times$	-	-
P26.4.6 R1R3	$\surd$	1	1	$\times$	-	-
P26.5.1 LD1LE1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P26.5.2 LD2LE2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P26.5.3 H1HA1	$\surd$	1	1	$\times$	-	-
P26.5.4 H2HA2	$\surd$	1	1	$\times$	-	-
P26.5.5 G1GA1	$\surd$	1	1	$\times$	-	-
P26.5.6 Q1QA1	$\surd$	1	1	$\times$	-	-
P26.8.1 SM1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P26.8.2 SM2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P26.8.3 C1	$\surd$	1	1	$\times$	-	-
P26.8.4 DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P26.8.5 DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P26.8.6 D1	$\surd$	1	1	$\times$	-	-

TABLE S78: Non-coplanar SSGs with parent space group $Pmc2_1$ (No. 26).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N26.1.1 GM1	$\surd$	3	3	$\surd$	$mm2$	A1 $\oplus$ A1 $\oplus$ A1

Non-coplanar SSGs with parent space group $Pmc2_1$ (No. 26) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N26.2.1 GM2	√	3	3	√	222	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{B1}$
N26.2.2 GM3	√	3	3	√	$mm2$	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{B2}$
N26.2.3 GM4	√	3	3	√	$mm2$	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{B1}$
N26.2.4 S1	√	3	3	√	mmm	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{B1_u}$
N26.2.5 X1	√	3	3	√	mmm	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{B1_u}$
N26.2.6 X2	√	3	3	√	mmm	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{B1_u}$
N26.2.7 Y1	√	3	3	√	mmm	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{B1_u}$
N26.2.8 Y2	√	3	3	√	mmm	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{B1_u}$
N26.3.1 GM2 ⊕ GM2	√	3	3	√	$mm2$	$\mathrm{A1}\oplus\mathrm{A2}\oplus\mathrm{A2}$
N26.3.2 GM2 ⊕ GM3	√	3	3	√	$mm2$	$\mathrm{A1}\oplus\mathrm{A2}\oplus\mathrm{B2}$
N26.3.3 GM2 ⊕ GM4	√	3	3	√	$mm2$	$\mathrm{A1}\oplus\mathrm{A2}\oplus\mathrm{B1}$
N26.3.4 GM2 ⊕ S1	√	3	3	√	mmm	$\mathrm{A_g}\oplus\mathrm{A_u}\oplus\mathrm{B1_g}$
N26.3.5 GM2 ⊕ X1	√	3	3	√	mmm	$\mathrm{A_g}\oplus\mathrm{A_u}\oplus\mathrm{B1_g}$
N26.3.6 GM2 ⊕ X2	√	3	3	√	mmm	$\mathrm{A_g}\oplus\mathrm{A_u}\oplus\mathrm{B1_g}$
N26.3.7 GM2 ⊕ Y1	√	3	3	√	mmm	$\mathrm{A_g}\oplus\mathrm{A_u}\oplus\mathrm{B1_g}$
N26.3.8 GM2 ⊕ Y2	√	3	3	√	mmm	$\mathrm{A_g}\oplus\mathrm{A_u}\oplus\mathrm{B1_g}$
N26.3.9 GM3 ⊕ GM3	√	3	3	√	$mm2$	$\mathrm{A1}\oplus\mathrm{B2}\oplus\mathrm{B2}$
N26.3.10 GM3 ⊕ GM4	√	3	3	√	222	$\mathrm{A1}\oplus\mathrm{B3}\oplus\mathrm{B2}$
N26.3.11 GM3 ⊕ S1	√	3	3	√	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}\oplus\mathrm{B2_u}$
N26.3.12 GM3 ⊕ X1	√	3	3	√	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}\oplus\mathrm{B2_u}$
N26.3.13 GM3 ⊕ X2	√	3	3	√	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}\oplus\mathrm{B2_u}$
N26.3.14 GM3 ⊕ Y1	√	3	3	√	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}\oplus\mathrm{B2_u}$
N26.3.15 GM3 ⊕ Y2	√	3	3	√	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}\oplus\mathrm{B2_u}$
N26.3.16 GM4 ⊕ GM4	√	3	3	√	$mm2$	$\mathrm{A1}\oplus\mathrm{B1}\oplus\mathrm{B1}$
N26.3.17 GM4 ⊕ S1	√	3	3	√	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}\oplus\mathrm{B2_g}$
N26.3.18 GM4 ⊕ X1	√	3	3	√	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}\oplus\mathrm{B2_g}$
N26.3.19 GM4 ⊕ X2	√	3	3	√	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}\oplus\mathrm{B2_g}$
N26.3.20 GM4 ⊕ Y1	√	3	3	√	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}\oplus\mathrm{B2_g}$
N26.3.21 GM4 ⊕ Y2	√	3	3	√	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}\oplus\mathrm{B2_g}$
N26.3.22 S1 ⊕ S1	√	1	1	√	$mm2$	A1
N26.3.23 S1 ⊕ S2	√	1	1	√	222	A1
N26.3.24 S1 ⊕ S3	√	1	1	√	$mm2$	A1
N26.3.25 S1 ⊕ S4	√	1	1	√	$mm2$	A1
N26.3.26 S1 ⊕ X1	√	1	1	√	mmm	$\mathrm{A_g}$
N26.3.27 S1 ⊕ X4	√	1	1	√	mmm	$\mathrm{A_g}$
N26.3.28 S1 ⊕ X2	√	1	1	√	mmm	$\mathrm{A_g}$
N26.3.29 S1 ⊕ X3	√	1	1	√	mmm	$\mathrm{A_g}$
N26.3.30 S1 ⊕ Y1	√	1	1	√	mmm	$\mathrm{A_g}$
N26.3.31 S1 ⊕ Y3	√	1	1	√	mmm	$\mathrm{A_g}$
N26.3.32 S1 ⊕ Y2	√	1	1	√	mmm	$\mathrm{A_g}$
N26.3.33 S1 ⊕ Y4	√	1	1	√	mmm	$\mathrm{A_g}$
N26.3.34 X1 ⊕ X1	√	1	1	√	$mm2$	A1
N26.3.35 X1 ⊕ X4	√	1	1	√	$mm2$	A1
N26.3.36 X1 ⊕ X2	√	1	1	√	222	A1
N26.3.37 X1 ⊕ X3	√	1	1	√	$mm2$	A1
N26.3.38 X1 ⊕ Y1	√	1	1	√	mmm	$\mathrm{A_g}$

Non-coplanar SSGs with parent space group $Pmc2_1$ (No. 26) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N26.3.39 X1 ⊕ Y2	√	1	1	√	mmm	$\mathrm{A_g}$
N26.3.40 X2 ⊕ X2	√	1	1	√	$mm2$	A1
N26.3.41 X2 ⊕ X3	√	1	1	√	$mm2$	A1
N26.3.42 X2 ⊕ Y1	√	1	1	√	mmm	$\mathrm{A_g}$
N26.3.43 X2 ⊕ Y2	√	1	1	√	mmm	$\mathrm{A_g}$
N26.3.44 Y1 ⊕ Y1	√	1	1	√	$mm2$	A1
N26.3.45 Y1 ⊕ Y3	√	1	1	√	$mm2$	A1
N26.3.46 Y1 ⊕ Y2	√	1	1	√	222	A1
N26.3.47 Y1 ⊕ Y4	√	1	1	√	$mm2$	A1
N26.3.48 Y2 ⊕ Y2	√	1	1	√	$mm2$	A1
N26.3.49 Y2 ⊕ Y4	√	1	1	√	$mm2$	A1
N26.4.1 Z1Z3	√	1	1	√	$mm2$	A1
N26.4.2 Z2Z4	√	1	1	√	$mm2$	A1
N26.4.3 U1U3	√	1	1	√	$mm2$	A1
N26.4.4 T1T3	√	1	1	√	$mm2$	A1
N26.4.5 T2T4	√	1	1	√	$mm2$	A1
N26.4.6 R1R3	√	1	1	√	$mm2$	A1
N26.5.1 LD1LE1	√	1	1	√	$mm2$	A1
N26.5.2 LD2LE2	√	1	1	√	$mm2$	A1
N26.5.3 H1HA1	√	1	1	√	$mm2$	A1
N26.5.4 H2HA2	√	1	1	√	$mm2$	A1
N26.5.5 G1GA1	√	1	1	√	$mm2$	A1
N26.5.6 Q1QA1	√	1	1	√	$mm2$	A1
N26.8.1 SM1	√	1	1	√	$mm2$	A1
N26.8.2 SM2	√	1	1	√	$mm2$	A1
N26.8.3 C1	√	1	1	√	$mm2$	A1
N26.8.4 DT1	√	1	1	√	$mm2$	A1
N26.8.5 DT2	√	1	1	√	$mm2$	A1
N26.8.6 D1	√	1	1	√	$mm2$	A1
N26.9.1 GM2 ⊕ GM2 ⊕ GM2	√	3	3	√	222	B1 ⊕ B1 ⊕ B1
N26.9.2 GM2 ⊕ GM2 ⊕ GM3	√	3	3	√	$mm2$	B2 ⊕ B1 ⊕ B1
N26.9.3 GM2 ⊕ GM2 ⊕ GM4	√	3	3	√	$mm2$	B2 ⊕ B2 ⊕ B1
N26.9.4 GM2 ⊕ GM2 ⊕ S1	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N26.9.5 GM2 ⊕ GM2 ⊕ X1	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N26.9.6 GM2 ⊕ GM2 ⊕ X2	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N26.9.7 GM2 ⊕ GM2 ⊕ Y1	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N26.9.8 GM2 ⊕ GM2 ⊕ Y2	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N26.9.9 GM2 ⊕ GM3 ⊕ GM3	√	3	3	√	222	B1 ⊕ B3 ⊕ B3
N26.9.10 GM2 ⊕ GM3 ⊕ GM4	√	3	3	√	$mm2$	A2 ⊕ B2 ⊕ B1
N26.9.11 GM2 ⊕ GM3 ⊕ S1	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N26.9.12 GM2 ⊕ GM3 ⊕ X1	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N26.9.13 GM2 ⊕ GM3 ⊕ X2	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N26.9.14 GM2 ⊕ GM3 ⊕ Y1	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N26.9.15 GM2 ⊕ GM3 ⊕ Y2	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N26.9.16 GM2 ⊕ GM4 ⊕ GM4	√	3	3	√	222	B1 ⊕ B2 ⊕ B2
N26.9.17 GM2 ⊕ GM4 ⊕ S1	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$

Non-coplanar SSGs with parent space group $Pmc2_1$ (No. 26) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N26.9.18 GM2 ⊕ GM4 ⊕ X1	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N26.9.19 GM2 ⊕ GM4 ⊕ X2	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N26.9.20 GM2 ⊕ GM4 ⊕ Y1	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N26.9.21 GM2 ⊕ GM4 ⊕ Y2	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N26.9.22 GM2 ⊕ S1 ⊕ S1	√	1	1	×	-	-
N26.9.23 GM2 ⊕ S1 ⊕ S2	√	1	1	×	-	-
N26.9.24 GM2 ⊕ S1 ⊕ S3	√	1	1	×	-	-
N26.9.25 GM2 ⊕ S1 ⊕ S4	√	1	1	×	-	-
N26.9.26 GM2 ⊕ S1 ⊕ X1	√	1	1	×	-	-
N26.9.27 GM2 ⊕ S1 ⊕ X4	√	1	1	×	-	-
N26.9.28 GM2 ⊕ S1 ⊕ X2	√	1	1	×	-	-
N26.9.29 GM2 ⊕ S1 ⊕ X3	√	1	1	×	-	-
N26.9.30 GM2 ⊕ S1 ⊕ Y1	√	1	1	×	-	-
N26.9.31 GM2 ⊕ S1 ⊕ Y3	√	1	1	×	-	-
N26.9.32 GM2 ⊕ S1 ⊕ Y2	√	1	1	×	-	-
N26.9.33 GM2 ⊕ S1 ⊕ Y4	√	1	1	×	-	-
N26.9.34 GM2 ⊕ X1 ⊕ X1	√	1	1	×	-	-
N26.9.35 GM2 ⊕ X1 ⊕ X4	√	1	1	√	$mm2$	B1
N26.9.36 GM2 ⊕ X1 ⊕ X2	√	1	1	×	-	-
N26.9.37 GM2 ⊕ X1 ⊕ X3	√	1	1	×	-	-
N26.9.38 GM2 ⊕ X1 ⊕ Y1	√	1	1	√	mmm	$\mathrm{B1_g}$
N26.9.39 GM2 ⊕ X1 ⊕ Y2	√	1	1	√	mmm	$\mathrm{B1_g}$
N26.9.40 GM2 ⊕ X2 ⊕ X2	√	1	1	×	-	-
N26.9.41 GM2 ⊕ X2 ⊕ X3	√	1	1	√	$mm2$	B1
N26.9.42 GM2 ⊕ X2 ⊕ Y1	√	1	1	√	mmm	$\mathrm{B1_g}$
N26.9.43 GM2 ⊕ X2 ⊕ Y2	√	1	1	√	mmm	$\mathrm{B1_g}$
N26.9.44 GM2 ⊕ Y1 ⊕ Y1	√	1	1	×	-	-
N26.9.45 GM2 ⊕ Y1 ⊕ Y3	√	1	1	√	$mm2$	B2
N26.9.46 GM2 ⊕ Y1 ⊕ Y2	√	1	1	×	-	-
N26.9.47 GM2 ⊕ Y1 ⊕ Y4	√	1	1	×	-	-
N26.9.48 GM2 ⊕ Y2 ⊕ Y2	√	1	1	×	-	-
N26.9.49 GM2 ⊕ Y2 ⊕ Y4	√	1	1	√	$mm2$	B2
N26.9.50 GM3 ⊕ GM3 ⊕ GM3	√	3	3	√	$mm2$	B2 ⊕ B2 ⊕ B2
N26.9.51 GM3 ⊕ GM3 ⊕ GM4	√	3	3	√	$mm2$	A2 ⊕ A2 ⊕ B1
N26.9.52 GM3 ⊕ GM3 ⊕ S1	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N26.9.53 GM3 ⊕ GM3 ⊕ X1	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N26.9.54 GM3 ⊕ GM3 ⊕ X2	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N26.9.55 GM3 ⊕ GM3 ⊕ Y1	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N26.9.56 GM3 ⊕ GM3 ⊕ Y2	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N26.9.57 GM3 ⊕ GM4 ⊕ GM4	√	3	3	√	$mm2$	A2 ⊕ A2 ⊕ B2
N26.9.58 GM3 ⊕ GM4 ⊕ S1	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N26.9.59 GM3 ⊕ GM4 ⊕ X1	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N26.9.60 GM3 ⊕ GM4 ⊕ X2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N26.9.61 GM3 ⊕ GM4 ⊕ Y1	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N26.9.62 GM3 ⊕ GM4 ⊕ Y2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N26.9.63 GM3 ⊕ S1 ⊕ S1	√	1	1	×	-	-

Non-coplanar SSGs with parent space group $Pmc2_1$ (No. 26) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N26.9.64 GM3 ⊕ S1 ⊕ S2	√	1	1	×	-	-
N26.9.65 GM3 ⊕ S1 ⊕ S3	√	1	1	×	-	-
N26.9.66 GM3 ⊕ S1 ⊕ S4	√	1	1	×	-	-
N26.9.67 GM3 ⊕ S1 ⊕ X1	√	1	1	×	-	-
N26.9.68 GM3 ⊕ S1 ⊕ X4	√	1	1	×	-	-
N26.9.69 GM3 ⊕ S1 ⊕ X2	√	1	1	×	-	-
N26.9.70 GM3 ⊕ S1 ⊕ X3	√	1	1	×	-	-
N26.9.71 GM3 ⊕ S1 ⊕ Y1	√	1	1	×	-	-
N26.9.72 GM3 ⊕ S1 ⊕ Y3	√	1	1	×	-	-
N26.9.73 GM3 ⊕ S1 ⊕ Y2	√	1	1	×	-	-
N26.9.74 GM3 ⊕ S1 ⊕ Y4	√	1	1	×	-	-
N26.9.75 GM3 ⊕ X1 ⊕ X1	√	1	1	×	-	-
N26.9.76 GM3 ⊕ X1 ⊕ X4	√	1	1	√	222	B3
N26.9.77 GM3 ⊕ X1 ⊕ X2	√	1	1	×	-	-
N26.9.78 GM3 ⊕ X1 ⊕ X3	√	1	1	×	-	-
N26.9.79 GM3 ⊕ X1 ⊕ Y1	√	1	1	×	-	-
N26.9.80 GM3 ⊕ X1 ⊕ Y2	√	1	1	×	-	-
N26.9.81 GM3 ⊕ X2 ⊕ X2	√	1	1	×	-	-
N26.9.82 GM3 ⊕ X2 ⊕ X3	√	1	1	√	222	B3
N26.9.83 GM3 ⊕ X2 ⊕ Y1	√	1	1	×	-	-
N26.9.84 GM3 ⊕ X2 ⊕ Y2	√	1	1	×	-	-
N26.9.85 GM3 ⊕ Y1 ⊕ Y1	√	1	1	×	-	-
N26.9.86 GM3 ⊕ Y1 ⊕ Y3	√	1	1	√	$mm2$	B2
N26.9.87 GM3 ⊕ Y1 ⊕ Y2	√	1	1	×	-	-
N26.9.88 GM3 ⊕ Y1 ⊕ Y4	√	1	1	×	-	-
N26.9.89 GM3 ⊕ Y2 ⊕ Y2	√	1	1	×	-	-
N26.9.90 GM3 ⊕ Y2 ⊕ Y4	√	1	1	√	$mm2$	B2
N26.9.91 GM4 ⊕ GM4 ⊕ GM4	√	3	3	√	$mm2$	B1 ⊕ B1 ⊕ B1
N26.9.92 GM4 ⊕ GM4 ⊕ S1	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N26.9.93 GM4 ⊕ GM4 ⊕ X1	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N26.9.94 GM4 ⊕ GM4 ⊕ X2	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N26.9.95 GM4 ⊕ GM4 ⊕ Y1	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N26.9.96 GM4 ⊕ GM4 ⊕ Y2	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N26.9.97 GM4 ⊕ S1 ⊕ S1	√	1	1	×	-	-
N26.9.98 GM4 ⊕ S1 ⊕ S2	√	1	1	×	-	-
N26.9.99 GM4 ⊕ S1 ⊕ S3	√	1	1	×	-	-
N26.9.100 GM4 ⊕ S1 ⊕ S4	√	1	1	×	-	-
N26.9.101 GM4 ⊕ S1 ⊕ X1	√	1	1	×	-	-
N26.9.102 GM4 ⊕ S1 ⊕ X4	√	1	1	×	-	-
N26.9.103 GM4 ⊕ S1 ⊕ X2	√	1	1	×	-	-
N26.9.104 GM4 ⊕ S1 ⊕ X3	√	1	1	×	-	-
N26.9.105 GM4 ⊕ S1 ⊕ Y1	√	1	1	×	-	-
N26.9.106 GM4 ⊕ S1 ⊕ Y3	√	1	1	×	-	-
N26.9.107 GM4 ⊕ S1 ⊕ Y2	√	1	1	×	-	-
N26.9.108 GM4 ⊕ S1 ⊕ Y4	√	1	1	×	-	-
N26.9.109 GM4 ⊕ X1 ⊕ X1	√	1	1	×	-	-

Non-coplanar SSGs with parent space group $Pmc2_1$ (No. 26) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N26.9.110 GM4 ⊕ X1 ⊕ X4	√	1	1	√	$mm2$	B1
N26.9.111 GM4 ⊕ X1 ⊕ X2	√	1	1	×	-	-
N26.9.112 GM4 ⊕ X1 ⊕ X3	√	1	1	×	-	-
N26.9.113 GM4 ⊕ X1 ⊕ Y1	√	1	1	×	-	-
N26.9.114 GM4 ⊕ X1 ⊕ Y2	√	1	1	×	-	-
N26.9.115 GM4 ⊕ X2 ⊕ X2	√	1	1	×	-	-
N26.9.116 GM4 ⊕ X2 ⊕ X3	√	1	1	√	$mm2$	B1
N26.9.117 GM4 ⊕ X2 ⊕ Y1	√	1	1	×	-	-
N26.9.118 GM4 ⊕ X2 ⊕ Y2	√	1	1	×	-	-
N26.9.119 GM4 ⊕ Y1 ⊕ Y1	√	1	1	×	-	-
N26.9.120 GM4 ⊕ Y1 ⊕ Y3	√	1	1	√	222	B2
N26.9.121 GM4 ⊕ Y1 ⊕ Y2	√	1	1	×	-	-
N26.9.122 GM4 ⊕ Y1 ⊕ Y4	√	1	1	×	-	-
N26.9.123 GM4 ⊕ Y2 ⊕ Y2	√	1	1	×	-	-
N26.9.124 GM4 ⊕ Y2 ⊕ Y4	√	1	1	√	222	B2
N26.9.125 S1 ⊕ S1 ⊕ S1	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N26.9.126 S1 ⊕ S1 ⊕ S2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N26.9.127 S1 ⊕ S1 ⊕ S3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N26.9.128 S1 ⊕ S1 ⊕ S4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N26.9.129 S1 ⊕ S2 ⊕ S3	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N26.9.130 S1 ⊕ S1 ⊕ X1	√	1	1	×	-	-
N26.9.131 S1 ⊕ S1 ⊕ X4	√	1	1	×	-	-
N26.9.132 S1 ⊕ S2 ⊕ X1	√	1	1	×	-	-
N26.9.133 S1 ⊕ S3 ⊕ X1	√	1	1	√	mmm	$\mathrm{B2_u}$
N26.9.134 S1 ⊕ S3 ⊕ X4	√	1	1	√	mmm	$\mathrm{B2_u}$
N26.9.135 S1 ⊕ S4 ⊕ X1	√	1	1	×	-	-
N26.9.136 S1 ⊕ S1 ⊕ X2	√	1	1	×	-	-
N26.9.137 S1 ⊕ S1 ⊕ X3	√	1	1	×	-	-
N26.9.138 S1 ⊕ S2 ⊕ X2	√	1	1	×	-	-
N26.9.139 S1 ⊕ S3 ⊕ X2	√	1	1	√	mmm	$\mathrm{B2_u}$
N26.9.140 S1 ⊕ S3 ⊕ X3	√	1	1	√	mmm	$\mathrm{B2_u}$
N26.9.141 S1 ⊕ S4 ⊕ X2	√	1	1	×	-	-
N26.9.142 S1 ⊕ S1 ⊕ Y1	√	1	1	×	-	-
N26.9.143 S1 ⊕ S1 ⊕ Y3	√	1	1	×	-	-
N26.9.144 S1 ⊕ S2 ⊕ Y1	√	1	1	×	-	-
N26.9.145 S1 ⊕ S3 ⊕ Y1	√	1	1	×	-	-
N26.9.146 S1 ⊕ S4 ⊕ Y1	√	1	1	√	mmm	$\mathrm{B3_u}$
N26.9.147 S1 ⊕ S4 ⊕ Y3	√	1	1	√	mmm	$\mathrm{B3_u}$
N26.9.148 S1 ⊕ S1 ⊕ Y2	√	1	1	×	-	-
N26.9.149 S1 ⊕ S1 ⊕ Y4	√	1	1	×	-	-
N26.9.150 S1 ⊕ S2 ⊕ Y2	√	1	1	×	-	-
N26.9.151 S1 ⊕ S3 ⊕ Y2	√	1	1	×	-	-
N26.9.152 S1 ⊕ S4 ⊕ Y2	√	1	1	√	mmm	$\mathrm{B3_u}$
N26.9.153 S1 ⊕ S4 ⊕ Y4	√	1	1	√	mmm	$\mathrm{B3_u}$
N26.9.154 S1 ⊕ X1 ⊕ X1	√	1	1	×	-	-
N26.9.155 S1 ⊕ X1 ⊕ X4	√	1	1	√	mmm	$\mathrm{B3_u}$

Non-coplanar SSGs with parent space group $Pmc2_1$ (No. 26) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N26.9.156 S1 ⊕ X4 ⊕ X4	√	1	1	×	-	-
N26.9.157 S1 ⊕ X1 ⊕ X2	√	1	1	×	-	-
N26.9.158 S1 ⊕ X1 ⊕ X3	√	1	1	√	mmm	$\mathrm{B2_u}$
N26.9.159 S1 ⊕ X4 ⊕ X2	√	1	1	√	mmm	$\mathrm{B2_u}$
N26.9.160 S1 ⊕ X4 ⊕ X3	√	1	1	×	-	-
N26.9.161 S1 ⊕ X1 ⊕ Y1	×	-	-	-	-	-
N26.9.162 S1 ⊕ X1 ⊕ Y3	×	-	-	-	-	-
N26.9.163 S1 ⊕ X4 ⊕ Y1	×	-	-	-	-	-
N26.9.164 S1 ⊕ X4 ⊕ Y3	×	-	-	-	-	-
N26.9.165 S1 ⊕ X1 ⊕ Y2	×	-	-	-	-	-
N26.9.166 S1 ⊕ X1 ⊕ Y4	×	-	-	-	-	-
N26.9.167 S1 ⊕ X4 ⊕ Y2	×	-	-	-	-	-
N26.9.168 S1 ⊕ X4 ⊕ Y4	×	-	-	-	-	-
N26.9.169 S1 ⊕ X2 ⊕ X2	√	1	1	×	-	-
N26.9.170 S1 ⊕ X2 ⊕ X3	√	1	1	√	mmm	$\mathrm{B3_u}$
N26.9.171 S1 ⊕ X3 ⊕ X3	√	1	1	×	-	-
N26.9.172 S1 ⊕ X2 ⊕ Y1	×	-	-	-	-	-
N26.9.173 S1 ⊕ X2 ⊕ Y3	×	-	-	-	-	-
N26.9.174 S1 ⊕ X3 ⊕ Y1	×	-	-	-	-	-
N26.9.175 S1 ⊕ X3 ⊕ Y3	×	-	-	-	-	-
N26.9.176 S1 ⊕ X2 ⊕ Y2	×	-	-	-	-	-
N26.9.177 S1 ⊕ X2 ⊕ Y4	×	-	-	-	-	-
N26.9.178 S1 ⊕ X3 ⊕ Y2	×	-	-	-	-	-
N26.9.179 S1 ⊕ X3 ⊕ Y4	×	-	-	-	-	-
N26.9.180 S1 ⊕ Y1 ⊕ Y1	√	1	1	×	-	-
N26.9.181 S1 ⊕ Y1 ⊕ Y3	√	1	1	√	mmm	$\mathrm{B2_u}$
N26.9.182 S1 ⊕ Y3 ⊕ Y3	√	1	1	×	-	-
N26.9.183 S1 ⊕ Y1 ⊕ Y2	√	1	1	×	-	-
N26.9.184 S1 ⊕ Y1 ⊕ Y4	√	1	1	√	mmm	$\mathrm{B3_u}$
N26.9.185 S1 ⊕ Y3 ⊕ Y2	√	1	1	√	mmm	$\mathrm{B3_u}$
N26.9.186 S1 ⊕ Y3 ⊕ Y4	√	1	1	×	-	-
N26.9.187 S1 ⊕ Y2 ⊕ Y2	√	1	1	×	-	-
N26.9.188 S1 ⊕ Y2 ⊕ Y4	√	1	1	√	mmm	$\mathrm{B2_u}$
N26.9.189 S1 ⊕ Y4 ⊕ Y4	√	1	1	×	-	-
N26.9.190 X1 ⊕ X1 ⊕ X1	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N26.9.191 X1 ⊕ X1 ⊕ X4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N26.9.192 X1 ⊕ X1 ⊕ X2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N26.9.193 X1 ⊕ X1 ⊕ X3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N26.9.194 X1 ⊕ X4 ⊕ X2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N26.9.195 X1 ⊕ X1 ⊕ Y1	√	1	1	×	-	-
N26.9.196 X1 ⊕ X4 ⊕ Y1	√	1	1	√	mmm	$\mathrm{B3_u}$
N26.9.197 X1 ⊕ X1 ⊕ Y2	√	1	1	×	-	-
N26.9.198 X1 ⊕ X4 ⊕ Y2	√	1	1	√	mmm	$\mathrm{B3_u}$
N26.9.199 X1 ⊕ X2 ⊕ X2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N26.9.200 X1 ⊕ X2 ⊕ X3	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N26.9.201 X1 ⊕ X3 ⊕ X3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$

Non-coplanar SSGs with parent space group $Pmc2_1$ (No. 26) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N26.9.202 X1 ⊕ X2 ⊕ Y1	√	1	1	×	-	-
N26.9.203 X1 ⊕ X3 ⊕ Y1	√	1	1	×	-	-
N26.9.204 X1 ⊕ X2 ⊕ Y2	√	1	1	×	-	-
N26.9.205 X1 ⊕ X3 ⊕ Y2	√	1	1	×	-	-
N26.9.206 X1 ⊕ Y1 ⊕ Y1	√	1	1	×	-	-
N26.9.207 X1 ⊕ Y1 ⊕ Y3	√	1	1	√	mmm	$\mathrm{B2_u}$
N26.9.208 X1 ⊕ Y1 ⊕ Y2	√	1	1	×	-	-
N26.9.209 X1 ⊕ Y1 ⊕ Y4	√	1	1	×	-	-
N26.9.210 X1 ⊕ Y2 ⊕ Y2	√	1	1	×	-	-
N26.9.211 X1 ⊕ Y2 ⊕ Y4	√	1	1	√	mmm	$\mathrm{B2_u}$
N26.9.212 X2 ⊕ X2 ⊕ X2	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N26.9.213 X2 ⊕ X2 ⊕ X3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N26.9.214 X2 ⊕ X2 ⊕ Y1	√	1	1	×	-	-
N26.9.215 X2 ⊕ X3 ⊕ Y1	√	1	1	√	mmm	$\mathrm{B3_u}$
N26.9.216 X2 ⊕ X2 ⊕ Y2	√	1	1	×	-	-
N26.9.217 X2 ⊕ X3 ⊕ Y2	√	1	1	√	mmm	$\mathrm{B3_u}$
N26.9.218 X2 ⊕ Y1 ⊕ Y1	√	1	1	×	-	-
N26.9.219 X2 ⊕ Y1 ⊕ Y3	√	1	1	√	mmm	$\mathrm{B2_u}$
N26.9.220 X2 ⊕ Y1 ⊕ Y2	√	1	1	×	-	-
N26.9.221 X2 ⊕ Y1 ⊕ Y4	√	1	1	×	-	-
N26.9.222 X2 ⊕ Y2 ⊕ Y2	√	1	1	×	-	-
N26.9.223 X2 ⊕ Y2 ⊕ Y4	√	1	1	√	mmm	$\mathrm{B2_u}$
N26.9.224 Y1 ⊕ Y1 ⊕ Y1	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N26.9.225 Y1 ⊕ Y1 ⊕ Y3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N26.9.226 Y1 ⊕ Y1 ⊕ Y2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N26.9.227 Y1 ⊕ Y1 ⊕ Y4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N26.9.228 Y1 ⊕ Y3 ⊕ Y2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N26.9.229 Y1 ⊕ Y2 ⊕ Y2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N26.9.230 Y1 ⊕ Y2 ⊕ Y4	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N26.9.231 Y1 ⊕ Y4 ⊕ Y4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N26.9.232 Y2 ⊕ Y2 ⊕ Y2	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N26.9.233 Y2 ⊕ Y2 ⊕ Y4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N26.10.1 GM2 ⊕ Z1Z3	√	1	1	√	222	B1
N26.10.2 GM2 ⊕ Z2Z4	√	1	1	√	222	B1
N26.10.3 GM2 ⊕ U1U3	√	1	1	×	-	-
N26.10.4 GM2 ⊕ T1T3	√	1	1	×	-	-
N26.10.5 GM2 ⊕ T2T4	√	1	1	×	-	-
N26.10.6 GM2 ⊕ R1R3	√	1	1	×	-	-
N26.10.7 GM3 ⊕ Z1Z3	√	1	1	√	$mm2$	B2
N26.10.8 GM3 ⊕ Z2Z4	√	1	1	√	$mm2$	B2
N26.10.9 GM3 ⊕ U1U3	√	1	1	×	-	-
N26.10.10 GM3 ⊕ T1T3	√	1	1	×	-	-
N26.10.11 GM3 ⊕ T2T4	√	1	1	×	-	-
N26.10.12 GM3 ⊕ R1R3	√	1	1	×	-	-
N26.10.13 GM4 ⊕ Z1Z3	√	1	1	√	$mm2$	B1
N26.10.14 GM4 ⊕ Z2Z4	√	1	1	√	$mm2$	B1

Non-coplanar SSGs with parent space group $Pmc2_1$ (No. 26) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N26.10.15 GM4 ⊕ U1U3	√	1	1	×	-	-
N26.10.16 GM4 ⊕ T1T3	√	1	1	×	-	-
N26.10.17 GM4 ⊕ T2T4	√	1	1	×	-	-
N26.10.18 GM4 ⊕ R1R3	√	1	1	×	-	-
N26.10.19 S1 ⊕ Z1Z3	√	1	1	√	mmm	$\mathrm{B1_u}$
N26.10.20 S1 ⊕ Z2Z4	√	1	1	√	mmm	$\mathrm{B1_u}$
N26.10.21 S1 ⊕ U1U3	√	1	1	×	-	-
N26.10.22 S1 ⊕ U2U4	√	1	1	×	-	-
N26.10.23 S1 ⊕ T1T3	√	1	1	×	-	-
N26.10.24 S1 ⊕ T2T4	√	1	1	×	-	-
N26.10.25 S1 ⊕ R1R3	√	1	1	√	mmm	$\mathrm{B1_u}$
N26.10.26 S1 ⊕ R2R4	√	1	1	√	mmm	$\mathrm{B1_u}$
N26.10.27 X1 ⊕ Z1Z3	√	1	1	√	mmm	$\mathrm{B1_u}$
N26.10.28 X1 ⊕ Z2Z4	√	1	1	√	mmm	$\mathrm{B1_u}$
N26.10.29 X1 ⊕ U1U3	√	1	1	√	mmm	$\mathrm{B1_u}$
N26.10.30 X1 ⊕ U2U4	√	1	1	√	mmm	$\mathrm{B1_u}$
N26.10.31 X1 ⊕ T1T3	√	1	1	×	-	-
N26.10.32 X1 ⊕ T2T4	√	1	1	×	-	-
N26.10.33 X1 ⊕ R1R3	√	1	1	×	-	-
N26.10.34 X1 ⊕ R2R4	√	1	1	×	-	-
N26.10.35 X2 ⊕ Z1Z3	√	1	1	√	mmm	$\mathrm{B1_u}$
N26.10.36 X2 ⊕ Z2Z4	√	1	1	√	mmm	$\mathrm{B1_u}$
N26.10.37 X2 ⊕ U1U3	√	1	1	√	mmm	$\mathrm{B1_u}$
N26.10.38 X2 ⊕ U2U4	√	1	1	√	mmm	$\mathrm{B1_u}$
N26.10.39 X2 ⊕ T1T3	√	1	1	×	-	-
N26.10.40 X2 ⊕ T2T4	√	1	1	×	-	-
N26.10.41 X2 ⊕ R1R3	√	1	1	×	-	-
N26.10.42 X2 ⊕ R2R4	√	1	1	×	-	-
N26.10.43 Y1 ⊕ Z1Z3	√	1	1	√	mmm	$\mathrm{B1_u}$
N26.10.44 Y1 ⊕ Z2Z4	√	1	1	√	mmm	$\mathrm{B1_u}$
N26.10.45 Y1 ⊕ U1U3	√	1	1	×	-	-
N26.10.46 Y1 ⊕ T1T3	√	1	1	√	mmm	$\mathrm{B1_u}$
N26.10.47 Y1 ⊕ T2T4	√	1	1	√	mmm	$\mathrm{B1_u}$
N26.10.48 Y1 ⊕ R1R3	√	1	1	×	-	-
N26.10.49 Y2 ⊕ Z1Z3	√	1	1	√	mmm	$\mathrm{B1_u}$
N26.10.50 Y2 ⊕ Z2Z4	√	1	1	√	mmm	$\mathrm{B1_u}$
N26.10.51 Y2 ⊕ U1U3	√	1	1	×	-	-
N26.10.52 Y2 ⊕ T1T3	√	1	1	√	mmm	$\mathrm{B1_u}$
N26.10.53 Y2 ⊕ T2T4	√	1	1	√	mmm	$\mathrm{B1_u}$
N26.10.54 Y2 ⊕ R1R3	√	1	1	×	-	-
N26.11.1 GM2 ⊕ LD1LE1	√	1	1	√	222	B1
N26.11.2 GM2 ⊕ LD2LE2	√	1	1	√	222	B1
N26.11.3 GM2 ⊕ H1HA1	√	1	1	×	-	-
N26.11.4 GM2 ⊕ H2HA2	√	1	1	×	-	-
N26.11.5 GM2 ⊕ G1GA1	√	1	1	×	-	-
N26.11.6 GM2 ⊕ Q1QA1	√	1	1	×	-	-

Non-coplanar SSGs with parent space group $Pmc2_1$ (No. 26) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N26.11.7 GM3 ⊕ LD1LE1	√	1	1	√	$mm2$	B2
N26.11.8 GM3 ⊕ LD2LE2	√	1	1	√	$mm2$	B2
N26.11.9 GM3 ⊕ H1HA1	√	1	1	×	-	-
N26.11.10 GM3 ⊕ H2HA2	√	1	1	×	-	-
N26.11.11 GM3 ⊕ G1GA1	√	1	1	×	-	-
N26.11.12 GM3 ⊕ Q1QA1	√	1	1	×	-	-
N26.11.13 GM4 ⊕ LD1LE1	√	1	1	√	$mm2$	B1
N26.11.14 GM4 ⊕ LD2LE2	√	1	1	√	$mm2$	B1
N26.11.15 GM4 ⊕ H1HA1	√	1	1	×	-	-
N26.11.16 GM4 ⊕ H2HA2	√	1	1	×	-	-
N26.11.17 GM4 ⊕ G1GA1	√	1	1	×	-	-
N26.11.18 GM4 ⊕ Q1QA1	√	1	1	×	-	-
N26.11.19 S1 ⊕ LD1LE1	√	1	1	√	mmm	$\mathrm{B1_u}$
N26.11.20 S1 ⊕ LD2LE2	√	1	1	√	mmm	$\mathrm{B1_u}$
N26.11.21 S1 ⊕ H1HA1	√	1	1	×	-	-
N26.11.22 S1 ⊕ H2HA2	√	1	1	×	-	-
N26.11.23 S1 ⊕ G1GA1	√	1	1	×	-	-
N26.11.24 S1 ⊕ G2GA2	√	1	1	×	-	-
N26.11.25 S1 ⊕ Q1QA1	√	1	1	√	mmm	$\mathrm{B1_u}$
N26.11.26 S1 ⊕ Q2QA2	√	1	1	√	mmm	$\mathrm{B1_u}$
N26.11.27 X1 ⊕ LD1LE1	√	1	1	√	mmm	$\mathrm{B1_u}$
N26.11.28 X1 ⊕ LD2LE2	√	1	1	√	mmm	$\mathrm{B1_u}$
N26.11.29 X1 ⊕ H1HA1	√	1	1	×	-	-
N26.11.30 X1 ⊕ H2HA2	√	1	1	×	-	-
N26.11.31 X1 ⊕ G1GA1	√	1	1	√	mmm	$\mathrm{B1_u}$
N26.11.32 X1 ⊕ G2GA2	√	1	1	√	mmm	$\mathrm{B1_u}$
N26.11.33 X1 ⊕ Q1QA1	√	1	1	×	-	-
N26.11.34 X1 ⊕ Q2QA2	√	1	1	×	-	-
N26.11.35 X2 ⊕ LD1LE1	√	1	1	√	mmm	$\mathrm{B1_u}$
N26.11.36 X2 ⊕ LD2LE2	√	1	1	√	mmm	$\mathrm{B1_u}$
N26.11.37 X2 ⊕ H1HA1	√	1	1	×	-	-
N26.11.38 X2 ⊕ H2HA2	√	1	1	×	-	-
N26.11.39 X2 ⊕ G1GA1	√	1	1	√	mmm	$\mathrm{B1_u}$
N26.11.40 X2 ⊕ G2GA2	√	1	1	√	mmm	$\mathrm{B1_u}$
N26.11.41 X2 ⊕ Q1QA1	√	1	1	×	-	-
N26.11.42 X2 ⊕ Q2QA2	√	1	1	×	-	-
N26.11.43 Y1 ⊕ LD1LE1	√	1	1	√	mmm	$\mathrm{B1_u}$
N26.11.44 Y1 ⊕ LD2LE2	√	1	1	√	mmm	$\mathrm{B1_u}$
N26.11.45 Y1 ⊕ H1HA1	√	1	1	√	mmm	$\mathrm{B1_u}$
N26.11.46 Y1 ⊕ H2HA2	√	1	1	√	mmm	$\mathrm{B1_u}$
N26.11.47 Y1 ⊕ G1GA1	√	1	1	×	-	-
N26.11.48 Y1 ⊕ Q1QA1	√	1	1	×	-	-
N26.11.49 Y2 ⊕ LD1LE1	√	1	1	√	mmm	$\mathrm{B1_u}$
N26.11.50 Y2 ⊕ LD2LE2	√	1	1	√	mmm	$\mathrm{B1_u}$
N26.11.51 Y2 ⊕ H1HA1	√	1	1	√	mmm	$\mathrm{B1_u}$
N26.11.52 Y2 ⊕ H2HA2	√	1	1	√	mmm	$\mathrm{B1_u}$

Non-coplanar SSGs with parent space group $Pmc2_1$ (No. 26) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N26.11.53 Y2 ⊕ G1GA1	√	1	1	×	-	-
N26.11.54 Y2 ⊕ Q1QA1	√	1	1	×	-	-
N26.14.1 GM2 ⊕ SM1	√	1	1	√	$mm2$	B1
N26.14.2 GM2 ⊕ SM2	√	1	1	√	$mm2$	B1
N26.14.3 GM2 ⊕ C1	√	1	1	×	-	-
N26.14.4 GM2 ⊕ DT1	√	1	1	√	$mm2$	B2
N26.14.5 GM2 ⊕ DT2	√	1	1	√	$mm2$	B2
N26.14.6 GM2 ⊕ D1	√	1	1	×	-	-
N26.14.7 GM3 ⊕ SM1	√	1	1	√	222	B3
N26.14.8 GM3 ⊕ SM2	√	1	1	√	222	B3
N26.14.9 GM3 ⊕ C1	√	1	1	×	-	-
N26.14.10 GM3 ⊕ DT1	√	1	1	√	$mm2$	B2
N26.14.11 GM3 ⊕ DT2	√	1	1	√	$mm2$	B2
N26.14.12 GM3 ⊕ D1	√	1	1	×	-	-
N26.14.13 GM4 ⊕ SM1	√	1	1	√	$mm2$	B1
N26.14.14 GM4 ⊕ SM2	√	1	1	√	$mm2$	B1
N26.14.15 GM4 ⊕ C1	√	1	1	×	-	-
N26.14.16 GM4 ⊕ DT1	√	1	1	√	222	B2
N26.14.17 GM4 ⊕ DT2	√	1	1	√	222	B2
N26.14.18 GM4 ⊕ D1	√	1	1	×	-	-
N26.14.19 S1 ⊕ SM1	√	1	1	√	mmm	$B3_u$
N26.14.20 S1 ⊕ SM2	√	1	1	√	mmm	$B3_u$
N26.14.21 S1 ⊕ C1	√	1	1	√	mmm	$B3_u$
N26.14.22 S1 ⊕ C2	√	1	1	√	mmm	$B3_u$
N26.14.23 S1 ⊕ DT1	√	1	1	√	mmm	$B2_u$
N26.14.24 S1 ⊕ DT2	√	1	1	√	mmm	$B2_u$
N26.14.25 S1 ⊕ D1	√	1	1	√	mmm	$B2_u$
N26.14.26 S1 ⊕ D2	√	1	1	√	mmm	$B2_u$
N26.14.27 X1 ⊕ SM1	√	1	1	√	mmm	$B3_u$
N26.14.28 X1 ⊕ SM2	√	1	1	√	mmm	$B3_u$
N26.14.29 X1 ⊕ C1	√	1	1	×	-	-
N26.14.30 X1 ⊕ DT1	√	1	1	√	mmm	$B2_u$
N26.14.31 X1 ⊕ DT2	√	1	1	√	mmm	$B2_u$
N26.14.32 X1 ⊕ D1	√	1	1	√	mmm	$B2_u$
N26.14.33 X1 ⊕ D2	√	1	1	√	mmm	$B2_u$
N26.14.34 X2 ⊕ SM1	√	1	1	√	mmm	$B3_u$
N26.14.35 X2 ⊕ SM2	√	1	1	√	mmm	$B3_u$
N26.14.36 X2 ⊕ C1	√	1	1	×	-	-
N26.14.37 X2 ⊕ DT1	√	1	1	√	mmm	$B2_u$
N26.14.38 X2 ⊕ DT2	√	1	1	√	mmm	$B2_u$
N26.14.39 X2 ⊕ D1	√	1	1	√	mmm	$B2_u$
N26.14.40 X2 ⊕ D2	√	1	1	√	mmm	$B2_u$
N26.14.41 Y1 ⊕ SM1	√	1	1	√	mmm	$B3_u$
N26.14.42 Y1 ⊕ SM2	√	1	1	√	mmm	$B3_u$
N26.14.43 Y1 ⊕ C1	√	1	1	√	mmm	$B3_u$
N26.14.44 Y1 ⊕ C2	√	1	1	√	mmm	$B3_u$

Non-coplanar SSGs with parent space group $Pmc2_1$ (No. 26) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N26.14.45 Y1 $\oplus$ DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N26.14.46 Y1 $\oplus$ DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N26.14.47 Y1 $\oplus$ D1	$\surd$	1	1	$\times$	-	-
N26.14.48 Y2 $\oplus$ SM1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N26.14.49 Y2 $\oplus$ SM2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N26.14.50 Y2 $\oplus$ C1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N26.14.51 Y2 $\oplus$ C2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N26.14.52 Y2 $\oplus$ DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N26.14.53 Y2 $\oplus$ DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N26.14.54 Y2 $\oplus$ D1	$\surd$	1	1	$\times$	-	-

TABLE S79: Collinear SSGs with parent space group $Pcc2$ (No. 27).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L27.1.1 GM1	1	mmm	$\mathrm{A_g}$
L27.2.1 GM2	1	mmm	$\mathrm{B1_g}$
L27.2.2 GM3	1	mmm	$\mathrm{B3_g}$
L27.2.3 S1	0	-	-
L27.2.4 X1	0	-	-
L27.2.5 X2	0	-	-

TABLE S80: Coplanar SSGs with parent space group $Pcc2$ (No. 27).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P27.1.1 GM1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B1_u}$
P27.2.1 GM2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$
P27.2.2 GM3	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
P27.2.3 S1	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P27.2.4 X1	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P27.2.5 X2	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P27.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
P27.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
P27.3.3 GM2 $\oplus$ S1	$\surd$	1	1	$\times$	-	-
P27.3.4 GM2 $\oplus$ X1	$\surd$	1	1	$\times$	-	-
P27.3.5 GM2 $\oplus$ X2	$\surd$	1	1	$\times$	-	-
P27.3.6 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
P27.3.7 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
P27.3.8 GM3 $\oplus$ S1	$\surd$	1	1	$\times$	-	-
P27.3.9 GM3 $\oplus$ X1	$\surd$	1	1	$\times$	-	-
P27.3.10 GM3 $\oplus$ Y1	$\surd$	1	1	$\times$	-	-
P27.3.11 GM3 $\oplus$ X2	$\surd$	1	1	$\times$	-	-
P27.3.12 GM3 $\oplus$ Y2	$\surd$	1	1	$\times$	-	-
P27.3.13 S1 $\oplus$ S1	$\surd$	1	1	$\times$	-	-
P27.3.14 S1 $\oplus$ S2	$\surd$	1	1	$\times$	-	-
P27.3.15 S1 $\oplus$ S3	$\surd$	1	1	$\times$	-	-

Coplanar SSGs with parent space group $Pcc2$ (No. 27) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P27.3.16 S1 ⊕ X1	×	-	-	-	-	-
P27.3.17 S1 ⊕ X4	×	-	-	-	-	-
P27.3.18 S1 ⊕ X2	×	-	-	-	-	-
P27.3.19 S1 ⊕ X3	×	-	-	-	-	-
P27.3.20 X1 ⊕ X1	√	1	1	×	-	-
P27.3.21 X1 ⊕ X4	√	1	1	√	mmm	$\mathrm{B3_u}$
P27.3.22 X1 ⊕ Y1	×	-	-	-	-	-
P27.3.23 X1 ⊕ X2	√	1	1	×	-	-
P27.3.24 X1 ⊕ X3	√	1	1	×	-	-
P27.3.25 X1 ⊕ Y2	×	-	-	-	-	-
P27.3.26 X2 ⊕ X2	√	1	1	×	-	-
P27.3.27 X2 ⊕ X3	√	1	1	√	mmm	$\mathrm{B3_u}$
P27.3.28 X2 ⊕ Y2	×	-	-	-	-	-
P27.4.1 Z1Z2	√	1	1	√	mmm	$\mathrm{B1_u}$
P27.4.2 Z3Z4	√	1	1	√	mmm	$\mathrm{B1_u}$
P27.4.3 T1T2	√	1	1	×	-	-
P27.4.4 R1R2	√	1	1	×	-	-
P27.5.1 LD1LE1	√	1	1	√	mmm	$\mathrm{B1_u}$
P27.5.2 LD3LE3	√	1	1	√	mmm	$\mathrm{B1_u}$
P27.5.3 G1GA1	√	1	1	×	-	-
P27.5.4 Q1QA1	√	1	1	×	-	-
P27.8.1 DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
P27.8.2 DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
P27.8.3 C1	√	1	1	×	-	-

TABLE S81: Non-coplanar SSGs with parent space group $Pcc2$ (No. 27).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N27.1.1 GM1	√	3	3	√	$mm2$	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{A1}$
N27.2.1 GM2	√	3	3	√	222	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{B1}$
N27.2.2 GM3	√	3	3	√	$mm2$	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{B2}$
N27.2.3 S1	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B1_u}$
N27.2.4 X1	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B1_u}$
N27.2.5 X2	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B1_u}$
N27.3.1 GM2 ⊕ GM2	√	3	3	√	$mm2$	$\mathrm{A1} \oplus \mathrm{A2} \oplus \mathrm{A2}$
N27.3.2 GM2 ⊕ GM3	√	3	3	√	$mm2$	$\mathrm{A1} \oplus \mathrm{A2} \oplus \mathrm{B2}$
N27.3.3 GM2 ⊕ S1	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$
N27.3.4 GM2 ⊕ X1	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$
N27.3.5 GM2 ⊕ X2	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$
N27.3.6 GM3 ⊕ GM3	√	3	3	√	$mm2$	$\mathrm{A1} \oplus \mathrm{B2} \oplus \mathrm{B2}$
N27.3.7 GM3 ⊕ GM4	√	3	3	√	222	$\mathrm{A1} \oplus \mathrm{B3} \oplus \mathrm{B2}$
N27.3.8 GM3 ⊕ S1	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N27.3.9 GM3 ⊕ X1	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N27.3.10 GM3 ⊕ Y1	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N27.3.11 GM3 ⊕ X2	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N27.3.12 GM3 ⊕ Y2	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$

Non-coplanar SSGs with parent space group $Pcc2$ (No. 27) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N27.3.13 S1 ⊕ S1	√	1	1	√	$mm2$	A1
N27.3.14 S1 ⊕ S2	√	1	1	√	222	A1
N27.3.15 S1 ⊕ S3	√	1	1	√	$mm2$	A1
N27.3.16 S1 ⊕ X1	√	1	1	√	mmm	$\mathrm{A_g}$
N27.3.17 S1 ⊕ X4	√	1	1	√	mmm	$\mathrm{A_g}$
N27.3.18 S1 ⊕ X2	√	1	1	√	mmm	$\mathrm{A_g}$
N27.3.19 S1 ⊕ X3	√	1	1	√	mmm	$\mathrm{A_g}$
N27.3.20 X1 ⊕ X1	√	1	1	√	$mm2$	A1
N27.3.21 X1 ⊕ X4	√	1	1	√	$mm2$	A1
N27.3.22 X1 ⊕ Y1	√	1	1	√	mmm	$\mathrm{A_g}$
N27.3.23 X1 ⊕ X2	√	1	1	√	222	A1
N27.3.24 X1 ⊕ X3	√	1	1	√	$mm2$	A1
N27.3.25 X1 ⊕ Y2	√	1	1	√	mmm	$\mathrm{A_g}$
N27.3.26 X2 ⊕ X2	√	1	1	√	$mm2$	A1
N27.3.27 X2 ⊕ X3	√	1	1	√	$mm2$	A1
N27.3.28 X2 ⊕ Y2	√	1	1	√	mmm	$\mathrm{A_g}$
N27.4.1 Z1Z2	√	1	1	√	$mm2$	A1
N27.4.2 Z3Z4	√	1	1	√	$mm2$	A1
N27.4.3 T1T2	√	1	1	√	$mm2$	A1
N27.4.4 R1R2	√	1	1	√	$mm2$	A1
N27.5.1 LD1LE1	√	1	1	√	$mm2$	A1
N27.5.2 LD3LE3	√	1	1	√	$mm2$	A1
N27.5.3 G1GA1	√	1	1	√	$mm2$	A1
N27.5.4 Q1QA1	√	1	1	√	$mm2$	A1
N27.8.1 DT1	√	1	1	√	$mm2$	A1
N27.8.2 DT2	√	1	1	√	$mm2$	A1
N27.8.3 C1	√	1	1	√	$mm2$	A1
N27.9.1 GM2 ⊕ GM2 ⊕ GM2	√	3	3	√	222	B1 ⊕ B1 ⊕ B1
N27.9.2 GM2 ⊕ GM2 ⊕ GM3	√	3	3	√	$mm2$	B2 ⊕ B1 ⊕ B1
N27.9.3 GM2 ⊕ GM2 ⊕ S1	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N27.9.4 GM2 ⊕ GM2 ⊕ X1	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N27.9.5 GM2 ⊕ GM2 ⊕ X2	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N27.9.6 GM2 ⊕ GM3 ⊕ GM3	√	3	3	√	222	B1 ⊕ B3 ⊕ B3
N27.9.7 GM2 ⊕ GM3 ⊕ GM4	√	3	3	√	$mm2$	A2 ⊕ B2 ⊕ B1
N27.9.8 GM2 ⊕ GM3 ⊕ S1	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N27.9.9 GM2 ⊕ GM3 ⊕ X1	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N27.9.10 GM2 ⊕ GM3 ⊕ Y1	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N27.9.11 GM2 ⊕ GM3 ⊕ X2	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N27.9.12 GM2 ⊕ GM3 ⊕ Y2	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N27.9.13 GM2 ⊕ S1 ⊕ S1	√	1	1	×	-	-
N27.9.14 GM2 ⊕ S1 ⊕ S2	√	1	1	×	-	-
N27.9.15 GM2 ⊕ S1 ⊕ S3	√	1	1	×	-	-
N27.9.16 GM2 ⊕ S1 ⊕ X1	√	1	1	×	-	-
N27.9.17 GM2 ⊕ S1 ⊕ X4	√	1	1	×	-	-
N27.9.18 GM2 ⊕ S1 ⊕ X2	√	1	1	×	-	-
N27.9.19 GM2 ⊕ S1 ⊕ X3	√	1	1	×	-	-

Non-coplanar SSGs with parent space group $Pcc2$ (No. 27) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N27.9.20 GM2 ⊕ X1 ⊕ X1	√	1	1	×	-	-
N27.9.21 GM2 ⊕ X1 ⊕ X4	√	1	1	√	$mm2$	B1
N27.9.22 GM2 ⊕ X1 ⊕ Y1	√	1	1	√	mmm	$\mathrm{B1_g}$
N27.9.23 GM2 ⊕ X1 ⊕ X2	√	1	1	×	-	-
N27.9.24 GM2 ⊕ X1 ⊕ X3	√	1	1	×	-	-
N27.9.25 GM2 ⊕ X1 ⊕ Y2	√	1	1	√	mmm	$\mathrm{B1_g}$
N27.9.26 GM2 ⊕ X2 ⊕ X2	√	1	1	×	-	-
N27.9.27 GM2 ⊕ X2 ⊕ X3	√	1	1	√	$mm2$	B1
N27.9.28 GM2 ⊕ X2 ⊕ Y2	√	1	1	√	mmm	$\mathrm{B1_g}$
N27.9.29 GM3 ⊕ GM3 ⊕ GM3	√	3	3	√	$mm2$	B2 ⊕ B2 ⊕ B2
N27.9.30 GM3 ⊕ GM3 ⊕ GM4	√	3	3	√	$mm2$	A2 ⊕ A2 ⊕ B1
N27.9.31 GM3 ⊕ GM3 ⊕ S1	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N27.9.32 GM3 ⊕ GM4 ⊕ S1	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N27.9.33 GM3 ⊕ GM3 ⊕ X1	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N27.9.34 GM3 ⊕ GM3 ⊕ Y1	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N27.9.35 GM3 ⊕ GM4 ⊕ X1	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N27.9.36 GM3 ⊕ GM3 ⊕ X2	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N27.9.37 GM3 ⊕ GM3 ⊕ Y2	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N27.9.38 GM3 ⊕ GM4 ⊕ X2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N27.9.39 GM3 ⊕ S1 ⊕ S1	√	1	1	×	-	-
N27.9.40 GM3 ⊕ S1 ⊕ S2	√	1	1	×	-	-
N27.9.41 GM3 ⊕ S1 ⊕ S3	√	1	1	×	-	-
N27.9.42 GM3 ⊕ S1 ⊕ S4	√	1	1	×	-	-
N27.9.43 GM3 ⊕ S1 ⊕ X1	√	1	1	×	-	-
N27.9.44 GM3 ⊕ S1 ⊕ X4	√	1	1	×	-	-
N27.9.45 GM3 ⊕ S1 ⊕ Y1	√	1	1	×	-	-
N27.9.46 GM3 ⊕ S1 ⊕ Y3	√	1	1	×	-	-
N27.9.47 GM3 ⊕ S1 ⊕ X2	√	1	1	×	-	-
N27.9.48 GM3 ⊕ S1 ⊕ X3	√	1	1	×	-	-
N27.9.49 GM3 ⊕ S1 ⊕ Y2	√	1	1	×	-	-
N27.9.50 GM3 ⊕ S1 ⊕ Y4	√	1	1	×	-	-
N27.9.51 GM3 ⊕ X1 ⊕ X1	√	1	1	×	-	-
N27.9.52 GM3 ⊕ X1 ⊕ X4	√	1	1	√	222	B3
N27.9.53 GM3 ⊕ X1 ⊕ Y1	√	1	1	×	-	-
N27.9.54 GM3 ⊕ Y1 ⊕ Y1	√	1	1	×	-	-
N27.9.55 GM3 ⊕ Y1 ⊕ Y3	√	1	1	√	$mm2$	B2
N27.9.56 GM3 ⊕ X1 ⊕ X2	√	1	1	×	-	-
N27.9.57 GM3 ⊕ X1 ⊕ X3	√	1	1	×	-	-
N27.9.58 GM3 ⊕ X1 ⊕ Y2	√	1	1	×	-	-
N27.9.59 GM3 ⊕ Y1 ⊕ X2	√	1	1	×	-	-
N27.9.60 GM3 ⊕ Y1 ⊕ Y2	√	1	1	×	-	-
N27.9.61 GM3 ⊕ Y1 ⊕ Y4	√	1	1	×	-	-
N27.9.62 GM3 ⊕ X2 ⊕ X2	√	1	1	×	-	-
N27.9.63 GM3 ⊕ X2 ⊕ X3	√	1	1	√	222	B3
N27.9.64 GM3 ⊕ X2 ⊕ Y2	√	1	1	×	-	-
N27.9.65 GM3 ⊕ Y2 ⊕ Y2	√	1	1	×	-	-

Non-coplanar SSGs with parent space group $Pcc2$ (No. 27) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N27.9.66 GM3 ⊕ Y2 ⊕ Y4	√	1	1	√	$m2$	$\mathrm{B2}$
N27.9.67 S1 ⊕ S1 ⊕ S1	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N27.9.68 S1 ⊕ S1 ⊕ S2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N27.9.69 S1 ⊕ S1 ⊕ S3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N27.9.70 S1 ⊕ S2 ⊕ S3	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N27.9.71 S1 ⊕ S1 ⊕ X1	√	1	1	×	-	-
N27.9.72 S1 ⊕ S1 ⊕ X4	√	1	1	×	-	-
N27.9.73 S1 ⊕ S2 ⊕ X1	√	1	1	×	-	-
N27.9.74 S1 ⊕ S3 ⊕ X1	√	1	1	√	mmm	$\mathrm{B2_u}$
N27.9.75 S1 ⊕ S3 ⊕ X4	√	1	1	√	mmm	$\mathrm{B2_u}$
N27.9.76 S1 ⊕ S3 ⊕ Y1	√	1	1	×	-	-
N27.9.77 S1 ⊕ S1 ⊕ X2	√	1	1	×	-	-
N27.9.78 S1 ⊕ S1 ⊕ X3	√	1	1	×	-	-
N27.9.79 S1 ⊕ S2 ⊕ X2	√	1	1	×	-	-
N27.9.80 S1 ⊕ S3 ⊕ X2	√	1	1	√	mmm	$\mathrm{B2_u}$
N27.9.81 S1 ⊕ S3 ⊕ X3	√	1	1	√	mmm	$\mathrm{B2_u}$
N27.9.82 S1 ⊕ S3 ⊕ Y2	√	1	1	×	-	-
N27.9.83 S1 ⊕ X1 ⊕ X1	√	1	1	×	-	-
N27.9.84 S1 ⊕ X1 ⊕ X4	√	1	1	√	mmm	$\mathrm{B3_u}$
N27.9.85 S1 ⊕ X1 ⊕ Y1	×	-	-	-	-	-
N27.9.86 S1 ⊕ X1 ⊕ Y3	×	-	-	-	-	-
N27.9.87 S1 ⊕ X4 ⊕ X4	√	1	1	×	-	-
N27.9.88 S1 ⊕ X4 ⊕ Y3	×	-	-	-	-	-
N27.9.89 S1 ⊕ X1 ⊕ X2	√	1	1	×	-	-
N27.9.90 S1 ⊕ X1 ⊕ X3	√	1	1	√	mmm	$\mathrm{B2_u}$
N27.9.91 S1 ⊕ X1 ⊕ Y2	×	-	-	-	-	-
N27.9.92 S1 ⊕ X1 ⊕ Y4	×	-	-	-	-	-
N27.9.93 S1 ⊕ X4 ⊕ X2	√	1	1	√	mmm	$\mathrm{B2_u}$
N27.9.94 S1 ⊕ X4 ⊕ X3	√	1	1	×	-	-
N27.9.95 S1 ⊕ X4 ⊕ Y2	×	-	-	-	-	-
N27.9.96 S1 ⊕ X4 ⊕ Y4	×	-	-	-	-	-
N27.9.97 S1 ⊕ X2 ⊕ X2	√	1	1	×	-	-
N27.9.98 S1 ⊕ X2 ⊕ X3	√	1	1	√	mmm	$\mathrm{B3_u}$
N27.9.99 S1 ⊕ X2 ⊕ Y2	×	-	-	-	-	-
N27.9.100 S1 ⊕ X2 ⊕ Y4	×	-	-	-	-	-
N27.9.101 S1 ⊕ X3 ⊕ X3	√	1	1	×	-	-
N27.9.102 S1 ⊕ X3 ⊕ Y4	×	-	-	-	-	-
N27.9.103 X1 ⊕ X1 ⊕ X1	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N27.9.104 X1 ⊕ X1 ⊕ X4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N27.9.105 X1 ⊕ X1 ⊕ Y1	√	1	1	×	-	-
N27.9.106 X1 ⊕ X4 ⊕ Y1	√	1	1	√	mmm	$\mathrm{B3_u}$
N27.9.107 X1 ⊕ X1 ⊕ X2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N27.9.108 X1 ⊕ X1 ⊕ X3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N27.9.109 X1 ⊕ X1 ⊕ Y2	√	1	1	×	-	-
N27.9.110 X1 ⊕ X4 ⊕ X2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N27.9.111 X1 ⊕ X4 ⊕ Y2	√	1	1	√	mmm	$\mathrm{B3_u}$

Non-coplanar SSGs with parent space group $Pcc2$ (No. 27) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N27.9.112 X1 ⊕ Y1 ⊕ X2	√	1	1	×	-	-
N27.9.113 X1 ⊕ Y1 ⊕ X3	√	1	1	×	-	-
N27.9.114 X1 ⊕ X2 ⊕ X2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N27.9.115 X1 ⊕ X2 ⊕ X3	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N27.9.116 X1 ⊕ X2 ⊕ Y2	√	1	1	×	-	-
N27.9.117 X1 ⊕ X3 ⊕ X3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N27.9.118 X1 ⊕ X3 ⊕ Y2	√	1	1	×	-	-
N27.9.119 X1 ⊕ Y2 ⊕ Y2	√	1	1	×	-	-
N27.9.120 X1 ⊕ Y2 ⊕ Y4	√	1	1	√	mmm	$\mathrm{B2_u}$
N27.9.121 X2 ⊕ X2 ⊕ X2	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N27.9.122 X2 ⊕ X2 ⊕ X3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N27.9.123 X2 ⊕ X2 ⊕ Y2	√	1	1	×	-	-
N27.9.124 X2 ⊕ X3 ⊕ Y2	√	1	1	√	mmm	$\mathrm{B3_u}$
N27.10.1 GM2 ⊕ Z1Z2	√	1	1	√	222	B1
N27.10.2 GM2 ⊕ Z3Z4	√	1	1	√	222	B1
N27.10.3 GM2 ⊕ T1T2	√	1	1	×	-	-
N27.10.4 GM2 ⊕ R1R2	√	1	1	×	-	-
N27.10.5 GM3 ⊕ Z1Z2	√	1	1	√	$mm2$	B2
N27.10.6 GM3 ⊕ Z3Z4	√	1	1	√	$mm2$	B2
N27.10.7 GM3 ⊕ U1U2	√	1	1	×	-	-
N27.10.8 GM3 ⊕ T1T2	√	1	1	×	-	-
N27.10.9 GM3 ⊕ R1R2	√	1	1	×	-	-
N27.10.10 S1 ⊕ Z1Z2	√	1	1	√	mmm	$\mathrm{B1_u}$
N27.10.11 S1 ⊕ Z3Z4	√	1	1	√	mmm	$\mathrm{B1_u}$
N27.10.12 S1 ⊕ T1T2	√	1	1	×	-	-
N27.10.13 S1 ⊕ T3T4	√	1	1	×	-	-
N27.10.14 S1 ⊕ R1R2	√	1	1	√	mmm	$\mathrm{B1_u}$
N27.10.15 S1 ⊕ R3R4	√	1	1	√	mmm	$\mathrm{B1_u}$
N27.10.16 X1 ⊕ Z1Z2	√	1	1	√	mmm	$\mathrm{B1_u}$
N27.10.17 X1 ⊕ Z3Z4	√	1	1	√	mmm	$\mathrm{B1_u}$
N27.10.18 X1 ⊕ U1U2	√	1	1	√	mmm	$\mathrm{B1_u}$
N27.10.19 X1 ⊕ U3U4	√	1	1	√	mmm	$\mathrm{B1_u}$
N27.10.20 X1 ⊕ T1T2	√	1	1	×	-	-
N27.10.21 X1 ⊕ R1R2	√	1	1	×	-	-
N27.10.22 X2 ⊕ Z1Z2	√	1	1	√	mmm	$\mathrm{B1_u}$
N27.10.23 X2 ⊕ Z3Z4	√	1	1	√	mmm	$\mathrm{B1_u}$
N27.10.24 X2 ⊕ U1U2	√	1	1	√	mmm	$\mathrm{B1_u}$
N27.10.25 X2 ⊕ U3U4	√	1	1	√	mmm	$\mathrm{B1_u}$
N27.10.26 X2 ⊕ T1T2	√	1	1	×	-	-
N27.10.27 X2 ⊕ R1R2	√	1	1	×	-	-
N27.11.1 GM2 ⊕ LD1LE1	√	1	1	√	222	B1
N27.11.2 GM2 ⊕ LD3LE3	√	1	1	√	222	B1
N27.11.3 GM2 ⊕ G1GA1	√	1	1	×	-	-
N27.11.4 GM2 ⊕ Q1QA1	√	1	1	×	-	-
N27.11.5 GM3 ⊕ LD1LE1	√	1	1	√	$mm2$	B2
N27.11.6 GM3 ⊕ LD3LE3	√	1	1	√	$mm2$	B2

Non-coplanar SSGs with parent space group $Pcc2$ (No. 27) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N27.11.7 GM3 ⊕ H1HA1	√	1	1	×	-	-
N27.11.8 GM3 ⊕ G1GA1	√	1	1	×	-	-
N27.11.9 GM3 ⊕ Q1QA1	√	1	1	×	-	-
N27.11.10 S1 ⊕ LD1LE1	√	1	1	√	mmm	$\mathrm{B1_u}$
N27.11.11 S1 ⊕ LD3LE3	√	1	1	√	mmm	$\mathrm{B1_u}$
N27.11.12 S1 ⊕ G1GA1	√	1	1	×	-	-
N27.11.13 S1 ⊕ G3GA3	√	1	1	×	-	-
N27.11.14 S1 ⊕ Q1QA1	√	1	1	√	mmm	$\mathrm{B1_u}$
N27.11.15 S1 ⊕ Q3QA3	√	1	1	√	mmm	$\mathrm{B1_u}$
N27.11.16 X1 ⊕ LD1LE1	√	1	1	√	mmm	$\mathrm{B1_u}$
N27.11.17 X1 ⊕ LD3LE3	√	1	1	√	mmm	$\mathrm{B1_u}$
N27.11.18 X1 ⊕ H1HA1	√	1	1	×	-	-
N27.11.19 X1 ⊕ G1GA1	√	1	1	√	mmm	$\mathrm{B1_u}$
N27.11.20 X1 ⊕ G3GA3	√	1	1	√	mmm	$\mathrm{B1_u}$
N27.11.21 X1 ⊕ Q1QA1	√	1	1	×	-	-
N27.11.22 X2 ⊕ LD1LE1	√	1	1	√	mmm	$\mathrm{B1_u}$
N27.11.23 X2 ⊕ LD3LE3	√	1	1	√	mmm	$\mathrm{B1_u}$
N27.11.24 X2 ⊕ H1HA1	√	1	1	×	-	-
N27.11.25 X2 ⊕ G1GA1	√	1	1	√	mmm	$\mathrm{B1_u}$
N27.11.26 X2 ⊕ G3GA3	√	1	1	√	mmm	$\mathrm{B1_u}$
N27.11.27 X2 ⊕ Q1QA1	√	1	1	×	-	-
N27.14.1 GM2 ⊕ DT1	√	1	1	√	$mm2$	B2
N27.14.2 GM2 ⊕ DT2	√	1	1	√	$mm2$	B2
N27.14.3 GM2 ⊕ C1	√	1	1	×	-	-
N27.14.4 GM3 ⊕ SM1	√	1	1	√	222	B3
N27.14.5 GM3 ⊕ DT1	√	1	1	√	$mm2$	B2
N27.14.6 GM3 ⊕ SM2	√	1	1	√	222	B3
N27.14.7 GM3 ⊕ DT2	√	1	1	√	$mm2$	B2
N27.14.8 GM3 ⊕ C1	√	1	1	×	-	-
N27.14.9 GM3 ⊕ D1	√	1	1	×	-	-
N27.14.10 S1 ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N27.14.11 S1 ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
N27.14.12 S1 ⊕ C1	√	1	1	√	mmm	$\mathrm{B3_u}$
N27.14.13 S1 ⊕ C2	√	1	1	√	mmm	$\mathrm{B3_u}$
N27.14.14 X1 ⊕ SM1	√	1	1	√	mmm	$\mathrm{B3_u}$
N27.14.15 X1 ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N27.14.16 X1 ⊕ SM2	√	1	1	√	mmm	$\mathrm{B3_u}$
N27.14.17 X1 ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
N27.14.18 X1 ⊕ C1	√	1	1	×	-	-
N27.14.19 X1 ⊕ D1	√	1	1	√	mmm	$\mathrm{B2_u}$
N27.14.20 X1 ⊕ D2	√	1	1	√	mmm	$\mathrm{B2_u}$
N27.14.21 X2 ⊕ SM1	√	1	1	√	mmm	$\mathrm{B3_u}$
N27.14.22 X2 ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N27.14.23 X2 ⊕ SM2	√	1	1	√	mmm	$\mathrm{B3_u}$
N27.14.24 X2 ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
N27.14.25 X2 ⊕ C1	√	1	1	×	-	-

Non-coplanar SSGs with parent space group $Pcc2$ (No. 27) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N27.14.26 X2 $\oplus$ D1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N27.14.27 X2 $\oplus$ D2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$

TABLE S82: Collinear SSGs with parent space group $Pma2$ (No. 28).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L28.1.1 GM1	1	mmm	$\mathrm{A_g}$
L28.2.1 GM2	1	mmm	$\mathrm{B1_g}$
L28.2.2 GM3	1	mmm	$\mathrm{B3_g}$
L28.2.3 GM4	1	mmm	$\mathrm{B2_g}$
L28.2.4 T1	0	-	-
L28.2.5 T2	0	-	-
L28.2.6 Y1	0	-	-
L28.2.7 Y2	0	-	-
L28.2.8 Z1	0	-	-
L28.2.9 Z2	0	-	-
L28.2.10 Z3	0	-	-
L28.2.11 Z4	0	-	-

TABLE S83: Coplanar SSGs with parent space group $Pma2$ (No. 28).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P28.1.1 GM1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B1_u}$
P28.2.1 GM2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$
P28.2.2 GM3	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
P28.2.3 GM4	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u} \oplus \mathrm{B2_g}$
P28.2.4 T1	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P28.2.5 T2	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P28.2.6 Y1	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P28.2.7 Y2	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P28.2.8 Z1	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P28.2.9 Z2	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P28.2.10 Z3	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P28.2.11 Z4	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P28.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
P28.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
P28.3.3 GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
P28.3.4 GM2 $\oplus$ T1	$\surd$	1	1	$\times$	-	-
P28.3.5 GM2 $\oplus$ T2	$\surd$	1	1	$\times$	-	-
P28.3.6 GM2 $\oplus$ Y1	$\surd$	1	1	$\times$	-	-
P28.3.7 GM2 $\oplus$ Y2	$\surd$	1	1	$\times$	-	-
P28.3.8 GM2 $\oplus$ Z1	$\surd$	1	1	$\times$	-	-
P28.3.9 GM2 $\oplus$ Z2	$\surd$	1	1	$\times$	-	-
P28.3.10 GM2 $\oplus$ Z3	$\surd$	1	1	$\times$	-	-
P28.3.11 GM2 $\oplus$ Z4	$\surd$	1	1	$\times$	-	-

Coplanar SSGs with parent space group $Pma2$ (No. 28) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P28.3.12 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
P28.3.13 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
P28.3.14 GM3 $\oplus$ T1	$\surd$	1	1	$\times$	-	-
P28.3.15 GM3 $\oplus$ T2	$\surd$	1	1	$\times$	-	-
P28.3.16 GM3 $\oplus$ Y1	$\surd$	1	1	$\times$	-	-
P28.3.17 GM3 $\oplus$ Y2	$\surd$	1	1	$\times$	-	-
P28.3.18 GM3 $\oplus$ Z1	$\surd$	1	1	$\times$	-	-
P28.3.19 GM3 $\oplus$ Z2	$\surd$	1	1	$\times$	-	-
P28.3.20 GM3 $\oplus$ Z3	$\surd$	1	1	$\times$	-	-
P28.3.21 GM3 $\oplus$ Z4	$\surd$	1	1	$\times$	-	-
P28.3.22 GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
P28.3.23 GM4 $\oplus$ T1	$\surd$	1	1	$\times$	-	-
P28.3.24 GM4 $\oplus$ T2	$\surd$	1	1	$\times$	-	-
P28.3.25 GM4 $\oplus$ Y1	$\surd$	1	1	$\times$	-	-
P28.3.26 GM4 $\oplus$ Y2	$\surd$	1	1	$\times$	-	-
P28.3.27 GM4 $\oplus$ Z1	$\surd$	1	1	$\times$	-	-
P28.3.28 GM4 $\oplus$ Z2	$\surd$	1	1	$\times$	-	-
P28.3.29 GM4 $\oplus$ Z3	$\surd$	1	1	$\times$	-	-
P28.3.30 GM4 $\oplus$ Z4	$\surd$	1	1	$\times$	-	-
P28.3.31 T1 $\oplus$ T1	$\surd$	1	1	$\times$	-	-
P28.3.32 T1 $\oplus$ T3	$\surd$	1	1	$\times$	-	-
P28.3.33 T1 $\oplus$ T2	$\surd$	1	1	$\times$	-	-
P28.3.34 T1 $\oplus$ T4	$\surd$	1	1	$\times$	-	-
P28.3.35 T1 $\oplus$ Y1	$\times$	-	-	-	-	-
P28.3.36 T1 $\oplus$ Y3	$\times$	-	-	-	-	-
P28.3.37 T1 $\oplus$ Y2	$\times$	-	-	-	-	-
P28.3.38 T1 $\oplus$ Y4	$\times$	-	-	-	-	-
P28.3.39 T1 $\oplus$ Z1	$\times$	-	-	-	-	-
P28.3.40 T1 $\oplus$ Z2	$\times$	-	-	-	-	-
P28.3.41 T1 $\oplus$ Z3	$\times$	-	-	-	-	-
P28.3.42 T1 $\oplus$ Z4	$\times$	-	-	-	-	-
P28.3.43 T2 $\oplus$ T2	$\surd$	1	1	$\times$	-	-
P28.3.44 T2 $\oplus$ T4	$\surd$	1	1	$\times$	-	-
P28.3.45 T2 $\oplus$ Y1	$\times$	-	-	-	-	-
P28.3.46 T2 $\oplus$ Y3	$\times$	-	-	-	-	-
P28.3.47 T2 $\oplus$ Y2	$\times$	-	-	-	-	-
P28.3.48 T2 $\oplus$ Y4	$\times$	-	-	-	-	-
P28.3.49 T2 $\oplus$ Z1	$\times$	-	-	-	-	-
P28.3.50 T2 $\oplus$ Z2	$\times$	-	-	-	-	-
P28.3.51 T2 $\oplus$ Z3	$\times$	-	-	-	-	-
P28.3.52 T2 $\oplus$ Z4	$\times$	-	-	-	-	-
P28.3.53 Y1 $\oplus$ Y1	$\surd$	1	1	$\times$	-	-
P28.3.54 Y1 $\oplus$ Y3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P28.3.55 Y1 $\oplus$ Y2	$\surd$	1	1	$\times$	-	-
P28.3.56 Y1 $\oplus$ Y4	$\surd$	1	1	$\times$	-	-
P28.3.57 Y1 $\oplus$ Z1	$\times$	-	-	-	-	-

Coplanar SSGs with parent space group $Pma2$ (No. 28) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P28.3.58 Y1 $\oplus$ Z2	$\times$	-	-	-	-	-
P28.3.59 Y1 $\oplus$ Z3	$\times$	-	-	-	-	-
P28.3.60 Y1 $\oplus$ Z4	$\times$	-	-	-	-	-
P28.3.61 Y2 $\oplus$ Y2	$\surd$	1	1	$\times$	-	-
P28.3.62 Y2 $\oplus$ Y4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P28.3.63 Y2 $\oplus$ Z1	$\times$	-	-	-	-	-
P28.3.64 Y2 $\oplus$ Z2	$\times$	-	-	-	-	-
P28.3.65 Y2 $\oplus$ Z3	$\times$	-	-	-	-	-
P28.3.66 Y2 $\oplus$ Z4	$\times$	-	-	-	-	-
P28.3.67 Z1 $\oplus$ Z1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P28.3.68 Z1 $\oplus$ Z2	$\surd$	1	1	$\times$	-	-
P28.3.69 Z1 $\oplus$ Z3	$\surd$	1	1	$\times$	-	-
P28.3.70 Z1 $\oplus$ Z4	$\surd$	1	1	$\times$	-	-
P28.3.71 Z2 $\oplus$ Z2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P28.3.72 Z2 $\oplus$ Z3	$\surd$	1	1	$\times$	-	-
P28.3.73 Z2 $\oplus$ Z4	$\surd$	1	1	$\times$	-	-
P28.3.74 Z3 $\oplus$ Z3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P28.3.75 Z3 $\oplus$ Z4	$\surd$	1	1	$\times$	-	-
P28.3.76 Z4 $\oplus$ Z4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P28.5.1 LD1LE1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P28.5.2 LD2LE2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P28.5.3 LD3LE3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P28.5.4 LD4LE4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P28.5.5 H1HA1	$\surd$	1	1	$\times$	-	-
P28.5.6 H2HA2	$\surd$	1	1	$\times$	-	-
P28.6.1 R1	$\surd$	1	1	$\times$	-	-
P28.6.2 S1	$\surd$	1	1	$\times$	-	-
P28.6.3 U1	$\surd$	1	1	$\times$	-	-
P28.6.4 X1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P28.8.1 SM1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P28.8.2 A1	$\surd$	1	1	$\times$	-	-
P28.8.3 C1	$\surd$	1	1	$\times$	-	-
P28.8.4 E1	$\surd$	1	1	$\times$	-	-
P28.8.5 DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P28.8.6 DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P28.8.7 B1	$\surd$	1	1	$\times$	-	-
P28.8.8 B2	$\surd$	1	1	$\times$	-	-

TABLE S84: Non-coplanar SSGs with parent space group $Pma2$ (No. 28).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N28.1.1 GM1	$\surd$	3	3	$\surd$	$mm2$	A1 $\oplus$ A1 $\oplus$ A1
N28.2.1 GM2	$\surd$	3	3	$\surd$	222	A1 $\oplus$ A1 $\oplus$ B1
N28.2.2 GM3	$\surd$	3	3	$\surd$	$mm2$	A1 $\oplus$ A1 $\oplus$ B2
N28.2.3 GM4	$\surd$	3	3	$\surd$	$mm2$	A1 $\oplus$ A1 $\oplus$ B1
N28.2.4 T1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B1_u}$

Non-coplanar SSGs with parent space group $Pma2$ (No. 28) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N28.2.5 T2	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B1_u}$
N28.2.6 Y1	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B1_u}$
N28.2.7 Y2	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B1_u}$
N28.2.8 Z1	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B1_u}$
N28.2.9 Z2	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B1_u}$
N28.2.10 Z3	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B1_u}$
N28.2.11 Z4	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B1_u}$
N28.3.1 GM2 ⊕ GM2	√	3	3	√	$mm2$	A1 ⊕ A2 ⊕ A2
N28.3.2 GM2 ⊕ GM3	√	3	3	√	$mm2$	A1 ⊕ A2 ⊕ B2
N28.3.3 GM2 ⊕ GM4	√	3	3	√	$mm2$	A1 ⊕ A2 ⊕ B1
N28.3.4 GM2 ⊕ T1	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$
N28.3.5 GM2 ⊕ T2	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$
N28.3.6 GM2 ⊕ Y1	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$
N28.3.7 GM2 ⊕ Y2	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$
N28.3.8 GM2 ⊕ Z1	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$
N28.3.9 GM2 ⊕ Z2	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$
N28.3.10 GM2 ⊕ Z3	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$
N28.3.11 GM2 ⊕ Z4	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$
N28.3.12 GM3 ⊕ GM3	√	3	3	√	$mm2$	A1 ⊕ B2 ⊕ B2
N28.3.13 GM3 ⊕ GM4	√	3	3	√	222	A1 ⊕ B3 ⊕ B2
N28.3.14 GM3 ⊕ T1	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N28.3.15 GM3 ⊕ T2	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N28.3.16 GM3 ⊕ Y1	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N28.3.17 GM3 ⊕ Y2	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N28.3.18 GM3 ⊕ Z1	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N28.3.19 GM3 ⊕ Z2	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N28.3.20 GM3 ⊕ Z3	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N28.3.21 GM3 ⊕ Z4	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N28.3.22 GM4 ⊕ GM4	√	3	3	√	$mm2$	A1 ⊕ B1 ⊕ B1
N28.3.23 GM4 ⊕ T1	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u} \oplus \mathrm{B2_g}$
N28.3.24 GM4 ⊕ T2	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u} \oplus \mathrm{B2_g}$
N28.3.25 GM4 ⊕ Y1	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u} \oplus \mathrm{B2_g}$
N28.3.26 GM4 ⊕ Y2	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u} \oplus \mathrm{B2_g}$
N28.3.27 GM4 ⊕ Z1	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u} \oplus \mathrm{B2_g}$
N28.3.28 GM4 ⊕ Z2	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u} \oplus \mathrm{B2_g}$
N28.3.29 GM4 ⊕ Z3	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u} \oplus \mathrm{B2_g}$
N28.3.30 GM4 ⊕ Z4	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u} \oplus \mathrm{B2_g}$
N28.3.31 T1 ⊕ T1	√	1	1	√	$mm2$	A1
N28.3.32 T1 ⊕ T3	√	1	1	√	$mm2$	A1
N28.3.33 T1 ⊕ T2	√	1	1	√	222	A1
N28.3.34 T1 ⊕ T4	√	1	1	√	$mm2$	A1
N28.3.35 T1 ⊕ Y1	√	1	1	√	mmm	$\mathrm{A_g}$
N28.3.36 T1 ⊕ Y3	√	1	1	√	mmm	$\mathrm{A_g}$
N28.3.37 T1 ⊕ Y2	√	1	1	√	mmm	$\mathrm{A_g}$
N28.3.38 T1 ⊕ Y4	√	1	1	√	mmm	$\mathrm{A_g}$
N28.3.39 T1 ⊕ Z1	√	1	1	√	mmm	$\mathrm{A_g}$

Non-coplanar SSGs with parent space group $Pma2$ (No. 28) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N28.3.40 T1 ⊕ Z2	√	1	1	√	mmm	$\mathrm{A_g}$
N28.3.41 T1 ⊕ Z3	√	1	1	√	mmm	$\mathrm{A_g}$
N28.3.42 T1 ⊕ Z4	√	1	1	√	mmm	$\mathrm{A_g}$
N28.3.43 T2 ⊕ T2	√	1	1	√	$mm2$	A1
N28.3.44 T2 ⊕ T4	√	1	1	√	$mm2$	A1
N28.3.45 T2 ⊕ Y1	√	1	1	√	mmm	$\mathrm{A_g}$
N28.3.46 T2 ⊕ Y3	√	1	1	√	mmm	$\mathrm{A_g}$
N28.3.47 T2 ⊕ Y2	√	1	1	√	mmm	$\mathrm{A_g}$
N28.3.48 T2 ⊕ Y4	√	1	1	√	mmm	$\mathrm{A_g}$
N28.3.49 T2 ⊕ Z1	√	1	1	√	mmm	$\mathrm{A_g}$
N28.3.50 T2 ⊕ Z2	√	1	1	√	mmm	$\mathrm{A_g}$
N28.3.51 T2 ⊕ Z3	√	1	1	√	mmm	$\mathrm{A_g}$
N28.3.52 T2 ⊕ Z4	√	1	1	√	mmm	$\mathrm{A_g}$
N28.3.53 Y1 ⊕ Y1	√	1	1	√	$mm2$	A1
N28.3.54 Y1 ⊕ Y3	√	1	1	√	$mm2$	A1
N28.3.55 Y1 ⊕ Y2	√	1	1	√	222	A1
N28.3.56 Y1 ⊕ Y4	√	1	1	√	$mm2$	A1
N28.3.57 Y1 ⊕ Z1	√	1	1	√	mmm	$\mathrm{A_g}$
N28.3.58 Y1 ⊕ Z2	√	1	1	√	mmm	$\mathrm{A_g}$
N28.3.59 Y1 ⊕ Z3	√	1	1	√	mmm	$\mathrm{A_g}$
N28.3.60 Y1 ⊕ Z4	√	1	1	√	mmm	$\mathrm{A_g}$
N28.3.61 Y2 ⊕ Y2	√	1	1	√	$mm2$	A1
N28.3.62 Y2 ⊕ Y4	√	1	1	√	$mm2$	A1
N28.3.63 Y2 ⊕ Z1	√	1	1	√	mmm	$\mathrm{A_g}$
N28.3.64 Y2 ⊕ Z2	√	1	1	√	mmm	$\mathrm{A_g}$
N28.3.65 Y2 ⊕ Z3	√	1	1	√	mmm	$\mathrm{A_g}$
N28.3.66 Y2 ⊕ Z4	√	1	1	√	mmm	$\mathrm{A_g}$
N28.3.67 Z1 ⊕ Z1	√	1	1	√	$mm2$	A1
N28.3.68 Z1 ⊕ Z2	√	1	1	√	222	A1
N28.3.69 Z1 ⊕ Z3	√	1	1	√	$mm2$	A1
N28.3.70 Z1 ⊕ Z4	√	1	1	√	$mm2$	A1
N28.3.71 Z2 ⊕ Z2	√	1	1	√	$mm2$	A1
N28.3.72 Z2 ⊕ Z3	√	1	1	√	$mm2$	A1
N28.3.73 Z2 ⊕ Z4	√	1	1	√	$mm2$	A1
N28.3.74 Z3 ⊕ Z3	√	1	1	√	$mm2$	A1
N28.3.75 Z3 ⊕ Z4	√	1	1	√	222	A1
N28.3.76 Z4 ⊕ Z4	√	1	1	√	$mm2$	A1
N28.5.1 LD1LE1	√	1	1	√	$mm2$	A1
N28.5.2 LD2LE2	√	1	1	√	$mm2$	A1
N28.5.3 LD3LE3	√	1	1	√	$mm2$	A1
N28.5.4 LD4LE4	√	1	1	√	$mm2$	A1
N28.5.5 H1HA1	√	1	1	√	$mm2$	A1
N28.5.6 H2HA2	√	1	1	√	$mm2$	A1
N28.6.1 R1	√	1	1	√	$mm2$	A1
N28.6.2 S1	√	1	1	√	$mm2$	A1
N28.6.3 U1	√	1	1	√	$mm2$	A1

Non-coplanar SSGs with parent space group $Pma2$ (No. 28) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N28.6.4 X1	$\surd$	1	1	$\surd$	$mm2$	A1
N28.8.1 SM1	$\surd$	1	1	$\surd$	$mm2$	A1
N28.8.2 A1	$\surd$	1	1	$\surd$	$mm2$	A1
N28.8.3 C1	$\surd$	1	1	$\surd$	$mm2$	A1
N28.8.4 E1	$\surd$	1	1	$\surd$	$mm2$	A1
N28.8.5 DT1	$\surd$	1	1	$\surd$	$mm2$	A1
N28.8.6 DT2	$\surd$	1	1	$\surd$	$mm2$	A1
N28.8.7 B1	$\surd$	1	1	$\surd$	$mm2$	A1
N28.8.8 B2	$\surd$	1	1	$\surd$	$mm2$	A1
N28.9.1 GM2 $\oplus$ GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	222	B1 $\oplus$ B1 $\oplus$ B1
N28.9.2 GM2 $\oplus$ GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$mm2$	B2 $\oplus$ B1 $\oplus$ B1
N28.9.3 GM2 $\oplus$ GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	$mm2$	B2 $\oplus$ B2 $\oplus$ B1
N28.9.4 GM2 $\oplus$ GM2 $\oplus$ T1	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N28.9.5 GM2 $\oplus$ GM2 $\oplus$ T2	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N28.9.6 GM2 $\oplus$ GM2 $\oplus$ Y1	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N28.9.7 GM2 $\oplus$ GM2 $\oplus$ Y2	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N28.9.8 GM2 $\oplus$ GM2 $\oplus$ Z1	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N28.9.9 GM2 $\oplus$ GM2 $\oplus$ Z2	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N28.9.10 GM2 $\oplus$ GM2 $\oplus$ Z3	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N28.9.11 GM2 $\oplus$ GM2 $\oplus$ Z4	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N28.9.12 GM2 $\oplus$ GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	222	B1 $\oplus$ B3 $\oplus$ B3
N28.9.13 GM2 $\oplus$ GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	$mm2$	A2 $\oplus$ B2 $\oplus$ B1
N28.9.14 GM2 $\oplus$ GM3 $\oplus$ T1	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N28.9.15 GM2 $\oplus$ GM3 $\oplus$ T2	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N28.9.16 GM2 $\oplus$ GM3 $\oplus$ Y1	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N28.9.17 GM2 $\oplus$ GM3 $\oplus$ Y2	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N28.9.18 GM2 $\oplus$ GM3 $\oplus$ Z1	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N28.9.19 GM2 $\oplus$ GM3 $\oplus$ Z2	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N28.9.20 GM2 $\oplus$ GM3 $\oplus$ Z3	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N28.9.21 GM2 $\oplus$ GM3 $\oplus$ Z4	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N28.9.22 GM2 $\oplus$ GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	222	B1 $\oplus$ B2 $\oplus$ B2
N28.9.23 GM2 $\oplus$ GM4 $\oplus$ T1	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N28.9.24 GM2 $\oplus$ GM4 $\oplus$ T2	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N28.9.25 GM2 $\oplus$ GM4 $\oplus$ Y1	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N28.9.26 GM2 $\oplus$ GM4 $\oplus$ Y2	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N28.9.27 GM2 $\oplus$ GM4 $\oplus$ Z1	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N28.9.28 GM2 $\oplus$ GM4 $\oplus$ Z2	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N28.9.29 GM2 $\oplus$ GM4 $\oplus$ Z3	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N28.9.30 GM2 $\oplus$ GM4 $\oplus$ Z4	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N28.9.31 GM2 $\oplus$ T1 $\oplus$ T1	$\surd$	1	1	$\times$	-	-
N28.9.32 GM2 $\oplus$ T1 $\oplus$ T3	$\surd$	1	1	$\times$	-	-
N28.9.33 GM2 $\oplus$ T1 $\oplus$ T2	$\surd$	1	1	$\times$	-	-
N28.9.34 GM2 $\oplus$ T1 $\oplus$ T4	$\surd$	1	1	$\times$	-	-
N28.9.35 GM2 $\oplus$ T1 $\oplus$ Y1	$\surd$	1	1	$\times$	-	-
N28.9.36 GM2 $\oplus$ T1 $\oplus$ Y3	$\surd$	1	1	$\times$	-	-
N28.9.37 GM2 $\oplus$ T1 $\oplus$ Y2	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $Pma2$ (No. 28) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N28.9.38 GM2 ⊕ T1 ⊕ Y4	√	1	1	×	-	-
N28.9.39 GM2 ⊕ T1 ⊕ Z1	√	1	1	×	-	-
N28.9.40 GM2 ⊕ T1 ⊕ Z2	√	1	1	×	-	-
N28.9.41 GM2 ⊕ T1 ⊕ Z3	√	1	1	×	-	-
N28.9.42 GM2 ⊕ T1 ⊕ Z4	√	1	1	×	-	-
N28.9.43 GM2 ⊕ T2 ⊕ T2	√	1	1	×	-	-
N28.9.44 GM2 ⊕ T2 ⊕ T4	√	1	1	×	-	-
N28.9.45 GM2 ⊕ T2 ⊕ Y1	√	1	1	×	-	-
N28.9.46 GM2 ⊕ T2 ⊕ Y3	√	1	1	×	-	-
N28.9.47 GM2 ⊕ T2 ⊕ Y2	√	1	1	×	-	-
N28.9.48 GM2 ⊕ T2 ⊕ Y4	√	1	1	×	-	-
N28.9.49 GM2 ⊕ T2 ⊕ Z1	√	1	1	×	-	-
N28.9.50 GM2 ⊕ T2 ⊕ Z2	√	1	1	×	-	-
N28.9.51 GM2 ⊕ T2 ⊕ Z3	√	1	1	×	-	-
N28.9.52 GM2 ⊕ T2 ⊕ Z4	√	1	1	×	-	-
N28.9.53 GM2 ⊕ Y1 ⊕ Y1	√	1	1	×	-	-
N28.9.54 GM2 ⊕ Y1 ⊕ Y3	√	1	1	√	$mm2$	B2
N28.9.55 GM2 ⊕ Y1 ⊕ Y2	√	1	1	×	-	-
N28.9.56 GM2 ⊕ Y1 ⊕ Y4	√	1	1	×	-	-
N28.9.57 GM2 ⊕ Y1 ⊕ Z1	√	1	1	×	-	-
N28.9.58 GM2 ⊕ Y1 ⊕ Z2	√	1	1	×	-	-
N28.9.59 GM2 ⊕ Y1 ⊕ Z3	√	1	1	×	-	-
N28.9.60 GM2 ⊕ Y1 ⊕ Z4	√	1	1	×	-	-
N28.9.61 GM2 ⊕ Y2 ⊕ Y2	√	1	1	×	-	-
N28.9.62 GM2 ⊕ Y2 ⊕ Y4	√	1	1	√	$mm2$	B2
N28.9.63 GM2 ⊕ Y2 ⊕ Z1	√	1	1	×	-	-
N28.9.64 GM2 ⊕ Y2 ⊕ Z2	√	1	1	×	-	-
N28.9.65 GM2 ⊕ Y2 ⊕ Z3	√	1	1	×	-	-
N28.9.66 GM2 ⊕ Y2 ⊕ Z4	√	1	1	×	-	-
N28.9.67 GM2 ⊕ Z1 ⊕ Z1	√	1	1	√	222	B1
N28.9.68 GM2 ⊕ Z1 ⊕ Z2	√	1	1	×	-	-
N28.9.69 GM2 ⊕ Z1 ⊕ Z3	√	1	1	×	-	-
N28.9.70 GM2 ⊕ Z1 ⊕ Z4	√	1	1	×	-	-
N28.9.71 GM2 ⊕ Z2 ⊕ Z2	√	1	1	√	222	B1
N28.9.72 GM2 ⊕ Z2 ⊕ Z3	√	1	1	×	-	-
N28.9.73 GM2 ⊕ Z2 ⊕ Z4	√	1	1	×	-	-
N28.9.74 GM2 ⊕ Z3 ⊕ Z3	√	1	1	√	222	B1
N28.9.75 GM2 ⊕ Z3 ⊕ Z4	√	1	1	×	-	-
N28.9.76 GM2 ⊕ Z4 ⊕ Z4	√	1	1	√	222	B1
N28.9.77 GM3 ⊕ GM3 ⊕ GM3	√	3	3	√	$mm2$	B2 ⊕ B2 ⊕ B2
N28.9.78 GM3 ⊕ GM3 ⊕ GM4	√	3	3	√	$mm2$	A2 ⊕ A2 ⊕ B1
N28.9.79 GM3 ⊕ GM3 ⊕ T1	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N28.9.80 GM3 ⊕ GM3 ⊕ T2	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N28.9.81 GM3 ⊕ GM3 ⊕ Y1	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N28.9.82 GM3 ⊕ GM3 ⊕ Y2	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N28.9.83 GM3 ⊕ GM3 ⊕ Z1	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$

Non-coplanar SSGs with parent space group $Pma2$ (No. 28) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N28.9.84 GM3 ⊕ GM3 ⊕ Z2	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N28.9.85 GM3 ⊕ GM3 ⊕ Z3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N28.9.86 GM3 ⊕ GM3 ⊕ Z4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N28.9.87 GM3 ⊕ GM4 ⊕ GM4	√	3	3	√	$mm2$	$\mathrm{A2} \oplus \mathrm{A2} \oplus \mathrm{B2}$
N28.9.88 GM3 ⊕ GM4 ⊕ T1	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N28.9.89 GM3 ⊕ GM4 ⊕ T2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N28.9.90 GM3 ⊕ GM4 ⊕ Y1	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N28.9.91 GM3 ⊕ GM4 ⊕ Y2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N28.9.92 GM3 ⊕ GM4 ⊕ Z1	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N28.9.93 GM3 ⊕ GM4 ⊕ Z2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N28.9.94 GM3 ⊕ GM4 ⊕ Z3	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N28.9.95 GM3 ⊕ GM4 ⊕ Z4	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N28.9.96 GM3 ⊕ T1 ⊕ T1	√	1	1	×	-	-
N28.9.97 GM3 ⊕ T1 ⊕ T3	√	1	1	×	-	-
N28.9.98 GM3 ⊕ T1 ⊕ T2	√	1	1	×	-	-
N28.9.99 GM3 ⊕ T1 ⊕ T4	√	1	1	×	-	-
N28.9.100 GM3 ⊕ T1 ⊕ Y1	√	1	1	×	-	-
N28.9.101 GM3 ⊕ T1 ⊕ Y3	√	1	1	×	-	-
N28.9.102 GM3 ⊕ T1 ⊕ Y2	√	1	1	×	-	-
N28.9.103 GM3 ⊕ T1 ⊕ Y4	√	1	1	×	-	-
N28.9.104 GM3 ⊕ T1 ⊕ Z1	√	1	1	×	-	-
N28.9.105 GM3 ⊕ T1 ⊕ Z2	√	1	1	×	-	-
N28.9.106 GM3 ⊕ T1 ⊕ Z3	√	1	1	×	-	-
N28.9.107 GM3 ⊕ T1 ⊕ Z4	√	1	1	×	-	-
N28.9.108 GM3 ⊕ T2 ⊕ T2	√	1	1	×	-	-
N28.9.109 GM3 ⊕ T2 ⊕ T4	√	1	1	×	-	-
N28.9.110 GM3 ⊕ T2 ⊕ Y1	√	1	1	×	-	-
N28.9.111 GM3 ⊕ T2 ⊕ Y3	√	1	1	×	-	-
N28.9.112 GM3 ⊕ T2 ⊕ Y2	√	1	1	×	-	-
N28.9.113 GM3 ⊕ T2 ⊕ Y4	√	1	1	×	-	-
N28.9.114 GM3 ⊕ T2 ⊕ Z1	√	1	1	×	-	-
N28.9.115 GM3 ⊕ T2 ⊕ Z2	√	1	1	×	-	-
N28.9.116 GM3 ⊕ T2 ⊕ Z3	√	1	1	×	-	-
N28.9.117 GM3 ⊕ T2 ⊕ Z4	√	1	1	×	-	-
N28.9.118 GM3 ⊕ Y1 ⊕ Y1	√	1	1	×	-	-
N28.9.119 GM3 ⊕ Y1 ⊕ Y3	√	1	1	√	$mm2$	B2
N28.9.120 GM3 ⊕ Y1 ⊕ Y2	√	1	1	×	-	-
N28.9.121 GM3 ⊕ Y1 ⊕ Y4	√	1	1	×	-	-
N28.9.122 GM3 ⊕ Y1 ⊕ Z1	√	1	1	√	mmm	$\mathrm{B3_g}$
N28.9.123 GM3 ⊕ Y1 ⊕ Z2	√	1	1	√	mmm	$\mathrm{B3_g}$
N28.9.124 GM3 ⊕ Y1 ⊕ Z3	√	1	1	√	mmm	$\mathrm{B3_g}$
N28.9.125 GM3 ⊕ Y1 ⊕ Z4	√	1	1	√	mmm	$\mathrm{B3_g}$
N28.9.126 GM3 ⊕ Y2 ⊕ Y2	√	1	1	×	-	-
N28.9.127 GM3 ⊕ Y2 ⊕ Y4	√	1	1	√	$mm2$	B2
N28.9.128 GM3 ⊕ Y2 ⊕ Z1	√	1	1	√	mmm	$\mathrm{B3_g}$
N28.9.129 GM3 ⊕ Y2 ⊕ Z2	√	1	1	√	mmm	$\mathrm{B3_g}$

Non-coplanar SSGs with parent space group $Pma2$ (No. 28) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N28.9.130 GM3 ⊕ Y2 ⊕ Z3	√	1	1	√	mmm	$\mathrm{B3_g}$
N28.9.131 GM3 ⊕ Y2 ⊕ Z4	√	1	1	√	mmm	$\mathrm{B3_g}$
N28.9.132 GM3 ⊕ Z1 ⊕ Z1	√	1	1	√	$mm2$	B2
N28.9.133 GM3 ⊕ Z1 ⊕ Z2	√	1	1	×	-	-
N28.9.134 GM3 ⊕ Z1 ⊕ Z3	√	1	1	×	-	-
N28.9.135 GM3 ⊕ Z1 ⊕ Z4	√	1	1	×	-	-
N28.9.136 GM3 ⊕ Z2 ⊕ Z2	√	1	1	√	$mm2$	B2
N28.9.137 GM3 ⊕ Z2 ⊕ Z3	√	1	1	×	-	-
N28.9.138 GM3 ⊕ Z2 ⊕ Z4	√	1	1	×	-	-
N28.9.139 GM3 ⊕ Z3 ⊕ Z3	√	1	1	√	$mm2$	B2
N28.9.140 GM3 ⊕ Z3 ⊕ Z4	√	1	1	×	-	-
N28.9.141 GM3 ⊕ Z4 ⊕ Z4	√	1	1	√	$mm2$	B2
N28.9.142 GM4 ⊕ GM4 ⊕ GM4	√	3	3	√	$mm2$	B1 ⊕ B1 ⊕ B1
N28.9.143 GM4 ⊕ GM4 ⊕ T1	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N28.9.144 GM4 ⊕ GM4 ⊕ T2	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N28.9.145 GM4 ⊕ GM4 ⊕ Y1	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N28.9.146 GM4 ⊕ GM4 ⊕ Y2	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N28.9.147 GM4 ⊕ GM4 ⊕ Z1	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N28.9.148 GM4 ⊕ GM4 ⊕ Z2	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N28.9.149 GM4 ⊕ GM4 ⊕ Z3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N28.9.150 GM4 ⊕ GM4 ⊕ Z4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N28.9.151 GM4 ⊕ T1 ⊕ T1	√	1	1	×	-	-
N28.9.152 GM4 ⊕ T1 ⊕ T3	√	1	1	×	-	-
N28.9.153 GM4 ⊕ T1 ⊕ T2	√	1	1	×	-	-
N28.9.154 GM4 ⊕ T1 ⊕ T4	√	1	1	×	-	-
N28.9.155 GM4 ⊕ T1 ⊕ Y1	√	1	1	×	-	-
N28.9.156 GM4 ⊕ T1 ⊕ Y3	√	1	1	×	-	-
N28.9.157 GM4 ⊕ T1 ⊕ Y2	√	1	1	×	-	-
N28.9.158 GM4 ⊕ T1 ⊕ Y4	√	1	1	×	-	-
N28.9.159 GM4 ⊕ T1 ⊕ Z1	√	1	1	×	-	-
N28.9.160 GM4 ⊕ T1 ⊕ Z2	√	1	1	×	-	-
N28.9.161 GM4 ⊕ T1 ⊕ Z3	√	1	1	×	-	-
N28.9.162 GM4 ⊕ T1 ⊕ Z4	√	1	1	×	-	-
N28.9.163 GM4 ⊕ T2 ⊕ T2	√	1	1	×	-	-
N28.9.164 GM4 ⊕ T2 ⊕ T4	√	1	1	×	-	-
N28.9.165 GM4 ⊕ T2 ⊕ Y1	√	1	1	×	-	-
N28.9.166 GM4 ⊕ T2 ⊕ Y3	√	1	1	×	-	-
N28.9.167 GM4 ⊕ T2 ⊕ Y2	√	1	1	×	-	-
N28.9.168 GM4 ⊕ T2 ⊕ Y4	√	1	1	×	-	-
N28.9.169 GM4 ⊕ T2 ⊕ Z1	√	1	1	×	-	-
N28.9.170 GM4 ⊕ T2 ⊕ Z2	√	1	1	×	-	-
N28.9.171 GM4 ⊕ T2 ⊕ Z3	√	1	1	×	-	-
N28.9.172 GM4 ⊕ T2 ⊕ Z4	√	1	1	×	-	-
N28.9.173 GM4 ⊕ Y1 ⊕ Y1	√	1	1	×	-	-
N28.9.174 GM4 ⊕ Y1 ⊕ Y3	√	1	1	√	222	B2
N28.9.175 GM4 ⊕ Y1 ⊕ Y2	√	1	1	×	-	-

Non-coplanar SSGs with parent space group $Pma2$ (No. 28) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N28.9.176 GM4 ⊕ Y1 ⊕ Y4	√	1	1	×	-	-
N28.9.177 GM4 ⊕ Y1 ⊕ Z1	√	1	1	×	-	-
N28.9.178 GM4 ⊕ Y1 ⊕ Z2	√	1	1	×	-	-
N28.9.179 GM4 ⊕ Y1 ⊕ Z3	√	1	1	×	-	-
N28.9.180 GM4 ⊕ Y1 ⊕ Z4	√	1	1	×	-	-
N28.9.181 GM4 ⊕ Y2 ⊕ Y2	√	1	1	×	-	-
N28.9.182 GM4 ⊕ Y2 ⊕ Y4	√	1	1	√	222	B2
N28.9.183 GM4 ⊕ Y2 ⊕ Z1	√	1	1	×	-	-
N28.9.184 GM4 ⊕ Y2 ⊕ Z2	√	1	1	×	-	-
N28.9.185 GM4 ⊕ Y2 ⊕ Z3	√	1	1	×	-	-
N28.9.186 GM4 ⊕ Y2 ⊕ Z4	√	1	1	×	-	-
N28.9.187 GM4 ⊕ Z1 ⊕ Z1	√	1	1	√	$mm2$	B1
N28.9.188 GM4 ⊕ Z1 ⊕ Z2	√	1	1	×	-	-
N28.9.189 GM4 ⊕ Z1 ⊕ Z3	√	1	1	×	-	-
N28.9.190 GM4 ⊕ Z1 ⊕ Z4	√	1	1	×	-	-
N28.9.191 GM4 ⊕ Z2 ⊕ Z2	√	1	1	√	$mm2$	B1
N28.9.192 GM4 ⊕ Z2 ⊕ Z3	√	1	1	×	-	-
N28.9.193 GM4 ⊕ Z2 ⊕ Z4	√	1	1	×	-	-
N28.9.194 GM4 ⊕ Z3 ⊕ Z3	√	1	1	√	$mm2$	B1
N28.9.195 GM4 ⊕ Z3 ⊕ Z4	√	1	1	×	-	-
N28.9.196 GM4 ⊕ Z4 ⊕ Z4	√	1	1	√	$mm2$	B1
N28.9.197 T1 ⊕ T1 ⊕ T1	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N28.9.198 T1 ⊕ T1 ⊕ T3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N28.9.199 T1 ⊕ T1 ⊕ T2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N28.9.200 T1 ⊕ T1 ⊕ T4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N28.9.201 T1 ⊕ T3 ⊕ T2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N28.9.202 T1 ⊕ T1 ⊕ Y1	√	1	1	√	mmm	$\mathrm{B1_u}$
N28.9.203 T1 ⊕ T1 ⊕ Y3	√	1	1	√	mmm	$\mathrm{B1_u}$
N28.9.204 T1 ⊕ T3 ⊕ Y1	√	1	1	×	-	-
N28.9.205 T1 ⊕ T1 ⊕ Y2	√	1	1	√	mmm	$\mathrm{B1_u}$
N28.9.206 T1 ⊕ T1 ⊕ Y4	√	1	1	√	mmm	$\mathrm{B1_u}$
N28.9.207 T1 ⊕ T3 ⊕ Y2	√	1	1	×	-	-
N28.9.208 T1 ⊕ T1 ⊕ Z1	√	1	1	×	-	-
N28.9.209 T1 ⊕ T3 ⊕ Z1	√	1	1	√	mmm	$\mathrm{B2_u}$
N28.9.210 T1 ⊕ T1 ⊕ Z2	√	1	1	×	-	-
N28.9.211 T1 ⊕ T3 ⊕ Z2	√	1	1	√	mmm	$\mathrm{B2_u}$
N28.9.212 T1 ⊕ T1 ⊕ Z3	√	1	1	×	-	-
N28.9.213 T1 ⊕ T3 ⊕ Z3	√	1	1	√	mmm	$\mathrm{B2_u}$
N28.9.214 T1 ⊕ T1 ⊕ Z4	√	1	1	×	-	-
N28.9.215 T1 ⊕ T3 ⊕ Z4	√	1	1	√	mmm	$\mathrm{B2_u}$
N28.9.216 T1 ⊕ T2 ⊕ T2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N28.9.217 T1 ⊕ T2 ⊕ T4	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N28.9.218 T1 ⊕ T4 ⊕ T4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N28.9.219 T1 ⊕ T2 ⊕ Y1	√	1	1	×	-	-
N28.9.220 T1 ⊕ T2 ⊕ Y3	√	1	1	×	-	-
N28.9.221 T1 ⊕ T4 ⊕ Y1	√	1	1	×	-	-

Non-coplanar SSGs with parent space group $Pma2$ (No. 28) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N28.9.222 T1 ⊕ T4 ⊕ Y3	√	1	1	×	-	-
N28.9.223 T1 ⊕ T2 ⊕ Y2	√	1	1	×	-	-
N28.9.224 T1 ⊕ T2 ⊕ Y4	√	1	1	×	-	-
N28.9.225 T1 ⊕ T4 ⊕ Y2	√	1	1	×	-	-
N28.9.226 T1 ⊕ T4 ⊕ Y4	√	1	1	×	-	-
N28.9.227 T1 ⊕ T2 ⊕ Z1	√	1	1	×	-	-
N28.9.228 T1 ⊕ T4 ⊕ Z1	√	1	1	×	-	-
N28.9.229 T1 ⊕ T2 ⊕ Z2	√	1	1	×	-	-
N28.9.230 T1 ⊕ T4 ⊕ Z2	√	1	1	×	-	-
N28.9.231 T1 ⊕ T2 ⊕ Z3	√	1	1	×	-	-
N28.9.232 T1 ⊕ T4 ⊕ Z3	√	1	1	×	-	-
N28.9.233 T1 ⊕ T2 ⊕ Z4	√	1	1	×	-	-
N28.9.234 T1 ⊕ T4 ⊕ Z4	√	1	1	×	-	-
N28.9.235 T1 ⊕ Y1 ⊕ Y1	√	1	1	√	mmm	$\mathrm{B1_u}$
N28.9.236 T1 ⊕ Y1 ⊕ Y3	√	1	1	√	mmm	$\mathrm{B2_u}$
N28.9.237 T1 ⊕ Y3 ⊕ Y3	√	1	1	√	mmm	$\mathrm{B1_u}$
N28.9.238 T1 ⊕ Y1 ⊕ Y2	√	1	1	×	-	-
N28.9.239 T1 ⊕ Y1 ⊕ Y4	√	1	1	×	-	-
N28.9.240 T1 ⊕ Y3 ⊕ Y2	√	1	1	×	-	-
N28.9.241 T1 ⊕ Y3 ⊕ Y4	√	1	1	×	-	-
N28.9.242 T1 ⊕ Y1 ⊕ Z1	×	-	-	-	-	-
N28.9.243 T1 ⊕ Y3 ⊕ Z1	×	-	-	-	-	-
N28.9.244 T1 ⊕ Y1 ⊕ Z2	×	-	-	-	-	-
N28.9.245 T1 ⊕ Y3 ⊕ Z2	×	-	-	-	-	-
N28.9.246 T1 ⊕ Y1 ⊕ Z3	×	-	-	-	-	-
N28.9.247 T1 ⊕ Y3 ⊕ Z3	×	-	-	-	-	-
N28.9.248 T1 ⊕ Y1 ⊕ Z4	×	-	-	-	-	-
N28.9.249 T1 ⊕ Y3 ⊕ Z4	×	-	-	-	-	-
N28.9.250 T1 ⊕ Y2 ⊕ Y2	√	1	1	√	mmm	$\mathrm{B1_u}$
N28.9.251 T1 ⊕ Y2 ⊕ Y4	√	1	1	√	mmm	$\mathrm{B2_u}$
N28.9.252 T1 ⊕ Y4 ⊕ Y4	√	1	1	√	mmm	$\mathrm{B1_u}$
N28.9.253 T1 ⊕ Y2 ⊕ Z1	×	-	-	-	-	-
N28.9.254 T1 ⊕ Y4 ⊕ Z1	×	-	-	-	-	-
N28.9.255 T1 ⊕ Y2 ⊕ Z2	×	-	-	-	-	-
N28.9.256 T1 ⊕ Y4 ⊕ Z2	×	-	-	-	-	-
N28.9.257 T1 ⊕ Y2 ⊕ Z3	×	-	-	-	-	-
N28.9.258 T1 ⊕ Y4 ⊕ Z3	×	-	-	-	-	-
N28.9.259 T1 ⊕ Y2 ⊕ Z4	×	-	-	-	-	-
N28.9.260 T1 ⊕ Y4 ⊕ Z4	×	-	-	-	-	-
N28.9.261 T1 ⊕ Z1 ⊕ Z1	√	1	1	√	mmm	$\mathrm{B1_u}$
N28.9.262 T1 ⊕ Z1 ⊕ Z2	√	1	1	×	-	-
N28.9.263 T1 ⊕ Z1 ⊕ Z3	√	1	1	√	mmm	$\mathrm{B2_u}$
N28.9.264 T1 ⊕ Z1 ⊕ Z4	√	1	1	×	-	-
N28.9.265 T1 ⊕ Z2 ⊕ Z2	√	1	1	√	mmm	$\mathrm{B1_u}$
N28.9.266 T1 ⊕ Z2 ⊕ Z3	√	1	1	×	-	-
N28.9.267 T1 ⊕ Z2 ⊕ Z4	√	1	1	√	mmm	$\mathrm{B2_u}$

Non-coplanar SSGs with parent space group $Pma2$ (No. 28) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N28.9.268 T1 ⊕ Z3 ⊕ Z3	√	1	1	√	mmm	$\mathrm{B1_u}$
N28.9.269 T1 ⊕ Z3 ⊕ Z4	√	1	1	×	-	-
N28.9.270 T1 ⊕ Z4 ⊕ Z4	√	1	1	√	mmm	$\mathrm{B1_u}$
N28.9.271 T2 ⊕ T2 ⊕ T2	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N28.9.272 T2 ⊕ T2 ⊕ T4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N28.9.273 T2 ⊕ T2 ⊕ Y1	√	1	1	√	mmm	$\mathrm{B1_u}$
N28.9.274 T2 ⊕ T2 ⊕ Y3	√	1	1	√	mmm	$\mathrm{B1_u}$
N28.9.275 T2 ⊕ T4 ⊕ Y1	√	1	1	×	-	-
N28.9.276 T2 ⊕ T2 ⊕ Y2	√	1	1	√	mmm	$\mathrm{B1_u}$
N28.9.277 T2 ⊕ T2 ⊕ Y4	√	1	1	√	mmm	$\mathrm{B1_u}$
N28.9.278 T2 ⊕ T4 ⊕ Y2	√	1	1	×	-	-
N28.9.279 T2 ⊕ T2 ⊕ Z1	√	1	1	×	-	-
N28.9.280 T2 ⊕ T4 ⊕ Z1	√	1	1	√	mmm	$\mathrm{B2_u}$
N28.9.281 T2 ⊕ T2 ⊕ Z2	√	1	1	×	-	-
N28.9.282 T2 ⊕ T4 ⊕ Z2	√	1	1	√	mmm	$\mathrm{B2_u}$
N28.9.283 T2 ⊕ T2 ⊕ Z3	√	1	1	×	-	-
N28.9.284 T2 ⊕ T4 ⊕ Z3	√	1	1	√	mmm	$\mathrm{B2_u}$
N28.9.285 T2 ⊕ T2 ⊕ Z4	√	1	1	×	-	-
N28.9.286 T2 ⊕ T4 ⊕ Z4	√	1	1	√	mmm	$\mathrm{B2_u}$
N28.9.287 T2 ⊕ Y1 ⊕ Y1	√	1	1	√	mmm	$\mathrm{B1_u}$
N28.9.288 T2 ⊕ Y1 ⊕ Y3	√	1	1	√	mmm	$\mathrm{B2_u}$
N28.9.289 T2 ⊕ Y3 ⊕ Y3	√	1	1	√	mmm	$\mathrm{B1_u}$
N28.9.290 T2 ⊕ Y1 ⊕ Y2	√	1	1	×	-	-
N28.9.291 T2 ⊕ Y1 ⊕ Y4	√	1	1	×	-	-
N28.9.292 T2 ⊕ Y3 ⊕ Y2	√	1	1	×	-	-
N28.9.293 T2 ⊕ Y3 ⊕ Y4	√	1	1	×	-	-
N28.9.294 T2 ⊕ Y1 ⊕ Z1	×	-	-	-	-	-
N28.9.295 T2 ⊕ Y3 ⊕ Z1	×	-	-	-	-	-
N28.9.296 T2 ⊕ Y1 ⊕ Z2	×	-	-	-	-	-
N28.9.297 T2 ⊕ Y3 ⊕ Z2	×	-	-	-	-	-
N28.9.298 T2 ⊕ Y1 ⊕ Z3	×	-	-	-	-	-
N28.9.299 T2 ⊕ Y3 ⊕ Z3	×	-	-	-	-	-
N28.9.300 T2 ⊕ Y1 ⊕ Z4	×	-	-	-	-	-
N28.9.301 T2 ⊕ Y3 ⊕ Z4	×	-	-	-	-	-
N28.9.302 T2 ⊕ Y2 ⊕ Y2	√	1	1	√	mmm	$\mathrm{B1_u}$
N28.9.303 T2 ⊕ Y2 ⊕ Y4	√	1	1	√	mmm	$\mathrm{B2_u}$
N28.9.304 T2 ⊕ Y4 ⊕ Y4	√	1	1	√	mmm	$\mathrm{B1_u}$
N28.9.305 T2 ⊕ Y2 ⊕ Z1	×	-	-	-	-	-
N28.9.306 T2 ⊕ Y4 ⊕ Z1	×	-	-	-	-	-
N28.9.307 T2 ⊕ Y2 ⊕ Z2	×	-	-	-	-	-
N28.9.308 T2 ⊕ Y4 ⊕ Z2	×	-	-	-	-	-
N28.9.309 T2 ⊕ Y2 ⊕ Z3	×	-	-	-	-	-
N28.9.310 T2 ⊕ Y4 ⊕ Z3	×	-	-	-	-	-
N28.9.311 T2 ⊕ Y2 ⊕ Z4	×	-	-	-	-	-
N28.9.312 T2 ⊕ Y4 ⊕ Z4	×	-	-	-	-	-
N28.9.313 T2 ⊕ Z1 ⊕ Z1	√	1	1	√	mmm	$\mathrm{B1_u}$

Non-coplanar SSGs with parent space group $Pma2$ (No. 28) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N28.9.314 T2 ⊕ Z1 ⊕ Z2	√	1	1	×	-	-
N28.9.315 T2 ⊕ Z1 ⊕ Z3	√	1	1	√	mmm	$\mathrm{B2_u}$
N28.9.316 T2 ⊕ Z1 ⊕ Z4	√	1	1	×	-	-
N28.9.317 T2 ⊕ Z2 ⊕ Z2	√	1	1	√	mmm	$\mathrm{B1_u}$
N28.9.318 T2 ⊕ Z2 ⊕ Z3	√	1	1	×	-	-
N28.9.319 T2 ⊕ Z2 ⊕ Z4	√	1	1	√	mmm	$\mathrm{B2_u}$
N28.9.320 T2 ⊕ Z3 ⊕ Z3	√	1	1	√	mmm	$\mathrm{B1_u}$
N28.9.321 T2 ⊕ Z3 ⊕ Z4	√	1	1	×	-	-
N28.9.322 T2 ⊕ Z4 ⊕ Z4	√	1	1	√	mmm	$\mathrm{B1_u}$
N28.9.323 Y1 ⊕ Y1 ⊕ Y1	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N28.9.324 Y1 ⊕ Y1 ⊕ Y3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N28.9.325 Y1 ⊕ Y1 ⊕ Y2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N28.9.326 Y1 ⊕ Y1 ⊕ Y4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N28.9.327 Y1 ⊕ Y3 ⊕ Y2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N28.9.328 Y1 ⊕ Y1 ⊕ Z1	√	1	1	×	-	-
N28.9.329 Y1 ⊕ Y3 ⊕ Z1	√	1	1	√	mmm	$\mathrm{B2_u}$
N28.9.330 Y1 ⊕ Y1 ⊕ Z2	√	1	1	×	-	-
N28.9.331 Y1 ⊕ Y3 ⊕ Z2	√	1	1	√	mmm	$\mathrm{B2_u}$
N28.9.332 Y1 ⊕ Y1 ⊕ Z3	√	1	1	×	-	-
N28.9.333 Y1 ⊕ Y3 ⊕ Z3	√	1	1	√	mmm	$\mathrm{B2_u}$
N28.9.334 Y1 ⊕ Y1 ⊕ Z4	√	1	1	×	-	-
N28.9.335 Y1 ⊕ Y3 ⊕ Z4	√	1	1	√	mmm	$\mathrm{B2_u}$
N28.9.336 Y1 ⊕ Y2 ⊕ Y2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N28.9.337 Y1 ⊕ Y2 ⊕ Y4	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N28.9.338 Y1 ⊕ Y4 ⊕ Y4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N28.9.339 Y1 ⊕ Y2 ⊕ Z1	√	1	1	×	-	-
N28.9.340 Y1 ⊕ Y4 ⊕ Z1	√	1	1	×	-	-
N28.9.341 Y1 ⊕ Y2 ⊕ Z2	√	1	1	×	-	-
N28.9.342 Y1 ⊕ Y4 ⊕ Z2	√	1	1	×	-	-
N28.9.343 Y1 ⊕ Y2 ⊕ Z3	√	1	1	×	-	-
N28.9.344 Y1 ⊕ Y4 ⊕ Z3	√	1	1	×	-	-
N28.9.345 Y1 ⊕ Y2 ⊕ Z4	√	1	1	×	-	-
N28.9.346 Y1 ⊕ Y4 ⊕ Z4	√	1	1	×	-	-
N28.9.347 Y1 ⊕ Z1 ⊕ Z1	√	1	1	√	mmm	$\mathrm{B1_u}$
N28.9.348 Y1 ⊕ Z1 ⊕ Z2	√	1	1	×	-	-
N28.9.349 Y1 ⊕ Z1 ⊕ Z3	√	1	1	×	-	-
N28.9.350 Y1 ⊕ Z1 ⊕ Z4	√	1	1	×	-	-
N28.9.351 Y1 ⊕ Z2 ⊕ Z2	√	1	1	√	mmm	$\mathrm{B1_u}$
N28.9.352 Y1 ⊕ Z2 ⊕ Z3	√	1	1	×	-	-
N28.9.353 Y1 ⊕ Z2 ⊕ Z4	√	1	1	×	-	-
N28.9.354 Y1 ⊕ Z3 ⊕ Z3	√	1	1	√	mmm	$\mathrm{B1_u}$
N28.9.355 Y1 ⊕ Z3 ⊕ Z4	√	1	1	×	-	-
N28.9.356 Y1 ⊕ Z4 ⊕ Z4	√	1	1	√	mmm	$\mathrm{B1_u}$
N28.9.357 Y2 ⊕ Y2 ⊕ Y2	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N28.9.358 Y2 ⊕ Y2 ⊕ Y4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N28.9.359 Y2 ⊕ Y2 ⊕ Z1	√	1	1	×	-	-

Non-coplanar SSGs with parent space group $Pma2$ (No. 28) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N28.9.360 Y2 ⊕ Y4 ⊕ Z1	√	1	1	√	mmm	$\mathrm{B2_u}$
N28.9.361 Y2 ⊕ Y2 ⊕ Z2	√	1	1	×	-	-
N28.9.362 Y2 ⊕ Y4 ⊕ Z2	√	1	1	√	mmm	$\mathrm{B2_u}$
N28.9.363 Y2 ⊕ Y2 ⊕ Z3	√	1	1	×	-	-
N28.9.364 Y2 ⊕ Y4 ⊕ Z3	√	1	1	√	mmm	$\mathrm{B2_u}$
N28.9.365 Y2 ⊕ Y2 ⊕ Z4	√	1	1	×	-	-
N28.9.366 Y2 ⊕ Y4 ⊕ Z4	√	1	1	√	mmm	$\mathrm{B2_u}$
N28.9.367 Y2 ⊕ Z1 ⊕ Z1	√	1	1	√	mmm	$\mathrm{B1_u}$
N28.9.368 Y2 ⊕ Z1 ⊕ Z2	√	1	1	×	-	-
N28.9.369 Y2 ⊕ Z1 ⊕ Z3	√	1	1	×	-	-
N28.9.370 Y2 ⊕ Z1 ⊕ Z4	√	1	1	×	-	-
N28.9.371 Y2 ⊕ Z2 ⊕ Z2	√	1	1	√	mmm	$\mathrm{B1_u}$
N28.9.372 Y2 ⊕ Z2 ⊕ Z3	√	1	1	×	-	-
N28.9.373 Y2 ⊕ Z2 ⊕ Z4	√	1	1	×	-	-
N28.9.374 Y2 ⊕ Z3 ⊕ Z3	√	1	1	√	mmm	$\mathrm{B1_u}$
N28.9.375 Y2 ⊕ Z3 ⊕ Z4	√	1	1	×	-	-
N28.9.376 Y2 ⊕ Z4 ⊕ Z4	√	1	1	√	mmm	$\mathrm{B1_u}$
N28.9.377 Z1 ⊕ Z1 ⊕ Z1	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N28.9.378 Z1 ⊕ Z1 ⊕ Z2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N28.9.379 Z1 ⊕ Z1 ⊕ Z3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N28.9.380 Z1 ⊕ Z1 ⊕ Z4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N28.9.381 Z1 ⊕ Z2 ⊕ Z2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N28.9.382 Z1 ⊕ Z2 ⊕ Z3	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N28.9.383 Z1 ⊕ Z2 ⊕ Z4	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N28.9.384 Z1 ⊕ Z3 ⊕ Z3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N28.9.385 Z1 ⊕ Z3 ⊕ Z4	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N28.9.386 Z1 ⊕ Z4 ⊕ Z4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N28.9.387 Z2 ⊕ Z2 ⊕ Z2	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N28.9.388 Z2 ⊕ Z2 ⊕ Z3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N28.9.389 Z2 ⊕ Z2 ⊕ Z4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N28.9.390 Z2 ⊕ Z3 ⊕ Z3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N28.9.391 Z2 ⊕ Z3 ⊕ Z4	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N28.9.392 Z2 ⊕ Z4 ⊕ Z4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N28.9.393 Z3 ⊕ Z3 ⊕ Z3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N28.9.394 Z3 ⊕ Z3 ⊕ Z4	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N28.9.395 Z3 ⊕ Z4 ⊕ Z4	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N28.9.396 Z4 ⊕ Z4 ⊕ Z4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N28.11.1 GM2 ⊕ LD1LE1	√	1	1	√	222	B1
N28.11.2 GM2 ⊕ LD2LE2	√	1	1	√	222	B1
N28.11.3 GM2 ⊕ LD3LE3	√	1	1	√	222	B1
N28.11.4 GM2 ⊕ LD4LE4	√	1	1	√	222	B1
N28.11.5 GM2 ⊕ H1HA1	√	1	1	×	-	-
N28.11.6 GM2 ⊕ H2HA2	√	1	1	×	-	-
N28.11.7 GM3 ⊕ LD1LE1	√	1	1	√	$mm2$	B2
N28.11.8 GM3 ⊕ LD2LE2	√	1	1	√	$mm2$	B2
N28.11.9 GM3 ⊕ LD3LE3	√	1	1	√	$mm2$	B2

Non-coplanar SSGs with parent space group $Pma2$ (No. 28) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N28.11.10 GM3 $\oplus$ LD4LE4	$\surd$	1	1	$\surd$	$mm2$	B2
N28.11.11 GM3 $\oplus$ H1HA1	$\surd$	1	1	$\times$	-	-
N28.11.12 GM3 $\oplus$ H2HA2	$\surd$	1	1	$\times$	-	-
N28.11.13 GM4 $\oplus$ LD1LE1	$\surd$	1	1	$\surd$	$mm2$	B1
N28.11.14 GM4 $\oplus$ LD2LE2	$\surd$	1	1	$\surd$	$mm2$	B1
N28.11.15 GM4 $\oplus$ LD3LE3	$\surd$	1	1	$\surd$	$mm2$	B1
N28.11.16 GM4 $\oplus$ LD4LE4	$\surd$	1	1	$\surd$	$mm2$	B1
N28.11.17 GM4 $\oplus$ H1HA1	$\surd$	1	1	$\times$	-	-
N28.11.18 GM4 $\oplus$ H2HA2	$\surd$	1	1	$\times$	-	-
N28.11.19 T1 $\oplus$ LD1LE1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N28.11.20 T1 $\oplus$ LD2LE2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N28.11.21 T1 $\oplus$ LD3LE3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N28.11.22 T1 $\oplus$ LD4LE4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N28.11.23 T1 $\oplus$ H1HA1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N28.11.24 T1 $\oplus$ H3HA3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N28.11.25 T1 $\oplus$ H2HA2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N28.11.26 T1 $\oplus$ H4HA4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N28.11.27 T2 $\oplus$ LD1LE1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N28.11.28 T2 $\oplus$ LD2LE2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N28.11.29 T2 $\oplus$ LD3LE3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N28.11.30 T2 $\oplus$ LD4LE4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N28.11.31 T2 $\oplus$ H1HA1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N28.11.32 T2 $\oplus$ H3HA3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N28.11.33 T2 $\oplus$ H2HA2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N28.11.34 T2 $\oplus$ H4HA4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N28.11.35 Y1 $\oplus$ LD1LE1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N28.11.36 Y1 $\oplus$ LD2LE2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N28.11.37 Y1 $\oplus$ LD3LE3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N28.11.38 Y1 $\oplus$ LD4LE4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N28.11.39 Y1 $\oplus$ H1HA1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N28.11.40 Y1 $\oplus$ H3HA3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N28.11.41 Y1 $\oplus$ H2HA2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N28.11.42 Y1 $\oplus$ H4HA4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N28.11.43 Y2 $\oplus$ LD1LE1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N28.11.44 Y2 $\oplus$ LD2LE2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N28.11.45 Y2 $\oplus$ LD3LE3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N28.11.46 Y2 $\oplus$ LD4LE4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N28.11.47 Y2 $\oplus$ H1HA1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N28.11.48 Y2 $\oplus$ H3HA3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N28.11.49 Y2 $\oplus$ H2HA2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N28.11.50 Y2 $\oplus$ H4HA4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N28.11.51 Z1 $\oplus$ LD1LE1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N28.11.52 Z1 $\oplus$ LD2LE2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N28.11.53 Z1 $\oplus$ LD3LE3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N28.11.54 Z1 $\oplus$ LD4LE4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N28.11.55 Z1 $\oplus$ H1HA1	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $Pma2$ (No. 28) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N28.11.56 Z1 ⊕ H2HA2	√	1	1	×	-	-
N28.11.57 Z2 ⊕ LD1LE1	√	1	1	√	mmm	$\mathrm{B1_u}$
N28.11.58 Z2 ⊕ LD2LE2	√	1	1	√	mmm	$\mathrm{B1_u}$
N28.11.59 Z2 ⊕ LD3LE3	√	1	1	√	mmm	$\mathrm{B1_u}$
N28.11.60 Z2 ⊕ LD4LE4	√	1	1	√	mmm	$\mathrm{B1_u}$
N28.11.61 Z2 ⊕ H1HA1	√	1	1	×	-	-
N28.11.62 Z2 ⊕ H2HA2	√	1	1	×	-	-
N28.11.63 Z3 ⊕ LD1LE1	√	1	1	√	mmm	$\mathrm{B1_u}$
N28.11.64 Z3 ⊕ LD2LE2	√	1	1	√	mmm	$\mathrm{B1_u}$
N28.11.65 Z3 ⊕ LD3LE3	√	1	1	√	mmm	$\mathrm{B1_u}$
N28.11.66 Z3 ⊕ LD4LE4	√	1	1	√	mmm	$\mathrm{B1_u}$
N28.11.67 Z3 ⊕ H1HA1	√	1	1	×	-	-
N28.11.68 Z3 ⊕ H2HA2	√	1	1	×	-	-
N28.11.69 Z4 ⊕ LD1LE1	√	1	1	√	mmm	$\mathrm{B1_u}$
N28.11.70 Z4 ⊕ LD2LE2	√	1	1	√	mmm	$\mathrm{B1_u}$
N28.11.71 Z4 ⊕ LD3LE3	√	1	1	√	mmm	$\mathrm{B1_u}$
N28.11.72 Z4 ⊕ LD4LE4	√	1	1	√	mmm	$\mathrm{B1_u}$
N28.11.73 Z4 ⊕ H1HA1	√	1	1	×	-	-
N28.11.74 Z4 ⊕ H2HA2	√	1	1	×	-	-
N28.12.1 GM2 ⊕ R1	√	1	1	×	-	-
N28.12.2 GM2 ⊕ S1	√	1	1	×	-	-
N28.12.3 GM2 ⊕ U1	√	1	1	×	-	-
N28.12.4 GM2 ⊕ X1	√	1	1	√	$mm2$	B1
N28.12.5 GM3 ⊕ R1	√	1	1	×	-	-
N28.12.6 GM3 ⊕ S1	√	1	1	×	-	-
N28.12.7 GM3 ⊕ U1	√	1	1	×	-	-
N28.12.8 GM3 ⊕ X1	√	1	1	√	222	B3
N28.12.9 GM4 ⊕ R1	√	1	1	×	-	-
N28.12.10 GM4 ⊕ S1	√	1	1	×	-	-
N28.12.11 GM4 ⊕ U1	√	1	1	×	-	-
N28.12.12 GM4 ⊕ X1	√	1	1	√	$mm2$	B1
N28.12.13 T1 ⊕ R1	√	1	1	√	mmm	$\mathrm{B3_u}$
N28.12.14 T1 ⊕ S1	√	1	1	×	-	-
N28.12.15 T1 ⊕ U1	√	1	1	×	-	-
N28.12.16 T1 ⊕ X1	√	1	1	√	mmm	$\mathrm{B3_u}$
N28.12.17 T2 ⊕ R1	√	1	1	√	mmm	$\mathrm{B3_u}$
N28.12.18 T2 ⊕ S1	√	1	1	×	-	-
N28.12.19 T2 ⊕ U1	√	1	1	×	-	-
N28.12.20 T2 ⊕ X1	√	1	1	√	mmm	$\mathrm{B3_u}$
N28.12.21 Y1 ⊕ R1	√	1	1	×	-	-
N28.12.22 Y1 ⊕ S1	√	1	1	√	mmm	$\mathrm{B3_u}$
N28.12.23 Y1 ⊕ U1	√	1	1	×	-	-
N28.12.24 Y1 ⊕ X1	√	1	1	√	mmm	$\mathrm{B3_u}$
N28.12.25 Y2 ⊕ R1	√	1	1	×	-	-
N28.12.26 Y2 ⊕ S1	√	1	1	√	mmm	$\mathrm{B3_u}$
N28.12.27 Y2 ⊕ U1	√	1	1	×	-	-

Non-coplanar SSGs with parent space group $Pma2$ (No. 28) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N28.12.28 Y2 ⊕ X1	√	1	1	√	mmm	$\mathrm{B3_u}$
N28.12.29 Z1 ⊕ R1	√	1	1	×	-	-
N28.12.30 Z1 ⊕ S1	√	1	1	×	-	-
N28.12.31 Z1 ⊕ U1	√	1	1	√	mmm	$\mathrm{B3_u}$
N28.12.32 Z1 ⊕ X1	√	1	1	√	mmm	$\mathrm{B3_u}$
N28.12.33 Z2 ⊕ R1	√	1	1	×	-	-
N28.12.34 Z2 ⊕ S1	√	1	1	×	-	-
N28.12.35 Z2 ⊕ U1	√	1	1	√	mmm	$\mathrm{B3_u}$
N28.12.36 Z2 ⊕ X1	√	1	1	√	mmm	$\mathrm{B3_u}$
N28.12.37 Z3 ⊕ R1	√	1	1	×	-	-
N28.12.38 Z3 ⊕ S1	√	1	1	×	-	-
N28.12.39 Z3 ⊕ U1	√	1	1	√	mmm	$\mathrm{B3_u}$
N28.12.40 Z3 ⊕ X1	√	1	1	√	mmm	$\mathrm{B3_u}$
N28.12.41 Z4 ⊕ R1	√	1	1	×	-	-
N28.12.42 Z4 ⊕ S1	√	1	1	×	-	-
N28.12.43 Z4 ⊕ U1	√	1	1	√	mmm	$\mathrm{B3_u}$
N28.12.44 Z4 ⊕ X1	√	1	1	√	mmm	$\mathrm{B3_u}$
N28.14.1 GM2 ⊕ SM1	√	1	1	√	$mm2$	B1
N28.14.2 GM2 ⊕ A1	√	1	1	×	-	-
N28.14.3 GM2 ⊕ C1	√	1	1	×	-	-
N28.14.4 GM2 ⊕ E1	√	1	1	×	-	-
N28.14.5 GM2 ⊕ DT1	√	1	1	√	$mm2$	B2
N28.14.6 GM2 ⊕ DT2	√	1	1	√	$mm2$	B2
N28.14.7 GM2 ⊕ B1	√	1	1	×	-	-
N28.14.8 GM2 ⊕ B2	√	1	1	×	-	-
N28.14.9 GM3 ⊕ SM1	√	1	1	√	222	B3
N28.14.10 GM3 ⊕ A1	√	1	1	×	-	-
N28.14.11 GM3 ⊕ C1	√	1	1	×	-	-
N28.14.12 GM3 ⊕ E1	√	1	1	×	-	-
N28.14.13 GM3 ⊕ DT1	√	1	1	√	$mm2$	B2
N28.14.14 GM3 ⊕ DT2	√	1	1	√	$mm2$	B2
N28.14.15 GM3 ⊕ B1	√	1	1	×	-	-
N28.14.16 GM3 ⊕ B2	√	1	1	×	-	-
N28.14.17 GM4 ⊕ SM1	√	1	1	√	$mm2$	B1
N28.14.18 GM4 ⊕ A1	√	1	1	×	-	-
N28.14.19 GM4 ⊕ C1	√	1	1	×	-	-
N28.14.20 GM4 ⊕ E1	√	1	1	×	-	-
N28.14.21 GM4 ⊕ DT1	√	1	1	√	222	B2
N28.14.22 GM4 ⊕ DT2	√	1	1	√	222	B2
N28.14.23 GM4 ⊕ B1	√	1	1	×	-	-
N28.14.24 GM4 ⊕ B2	√	1	1	×	-	-
N28.14.25 T1 ⊕ SM1	√	1	1	√	mmm	$\mathrm{B3_u}$
N28.14.26 T1 ⊕ A1	√	1	1	×	-	-
N28.14.27 T1 ⊕ C1	√	1	1	×	-	-
N28.14.28 T1 ⊕ E1	√	1	1	√	mmm	$\mathrm{B3_u}$
N28.14.29 T1 ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$

Non-coplanar SSGs with parent space group $Pma2$ (No. 28) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N28.14.30 T1 ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
N28.14.31 T1 ⊕ B1	√	1	1	√	mmm	$\mathrm{B2_u}$
N28.14.32 T1 ⊕ B2	√	1	1	√	mmm	$\mathrm{B2_u}$
N28.14.33 T2 ⊕ SM1	√	1	1	√	mmm	$\mathrm{B3_u}$
N28.14.34 T2 ⊕ A1	√	1	1	×	-	-
N28.14.35 T2 ⊕ C1	√	1	1	×	-	-
N28.14.36 T2 ⊕ E1	√	1	1	√	mmm	$\mathrm{B3_u}$
N28.14.37 T2 ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N28.14.38 T2 ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
N28.14.39 T2 ⊕ B1	√	1	1	√	mmm	$\mathrm{B2_u}$
N28.14.40 T2 ⊕ B2	√	1	1	√	mmm	$\mathrm{B2_u}$
N28.14.41 Y1 ⊕ SM1	√	1	1	√	mmm	$\mathrm{B3_u}$
N28.14.42 Y1 ⊕ A1	√	1	1	×	-	-
N28.14.43 Y1 ⊕ C1	√	1	1	√	mmm	$\mathrm{B3_u}$
N28.14.44 Y1 ⊕ E1	√	1	1	×	-	-
N28.14.45 Y1 ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N28.14.46 Y1 ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
N28.14.47 Y1 ⊕ B1	√	1	1	×	-	-
N28.14.48 Y1 ⊕ B2	√	1	1	×	-	-
N28.14.49 Y2 ⊕ SM1	√	1	1	√	mmm	$\mathrm{B3_u}$
N28.14.50 Y2 ⊕ A1	√	1	1	×	-	-
N28.14.51 Y2 ⊕ C1	√	1	1	√	mmm	$\mathrm{B3_u}$
N28.14.52 Y2 ⊕ E1	√	1	1	×	-	-
N28.14.53 Y2 ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N28.14.54 Y2 ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
N28.14.55 Y2 ⊕ B1	√	1	1	×	-	-
N28.14.56 Y2 ⊕ B2	√	1	1	×	-	-
N28.14.57 Z1 ⊕ SM1	√	1	1	√	mmm	$\mathrm{B3_u}$
N28.14.58 Z1 ⊕ A1	√	1	1	√	mmm	$\mathrm{B3_u}$
N28.14.59 Z1 ⊕ C1	√	1	1	×	-	-
N28.14.60 Z1 ⊕ E1	√	1	1	×	-	-
N28.14.61 Z1 ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N28.14.62 Z1 ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
N28.14.63 Z1 ⊕ B1	√	1	1	√	mmm	$\mathrm{B2_u}$
N28.14.64 Z1 ⊕ B2	√	1	1	√	mmm	$\mathrm{B2_u}$
N28.14.65 Z2 ⊕ SM1	√	1	1	√	mmm	$\mathrm{B3_u}$
N28.14.66 Z2 ⊕ A1	√	1	1	√	mmm	$\mathrm{B3_u}$
N28.14.67 Z2 ⊕ C1	√	1	1	×	-	-
N28.14.68 Z2 ⊕ E1	√	1	1	×	-	-
N28.14.69 Z2 ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N28.14.70 Z2 ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
N28.14.71 Z2 ⊕ B1	√	1	1	√	mmm	$\mathrm{B2_u}$
N28.14.72 Z2 ⊕ B2	√	1	1	√	mmm	$\mathrm{B2_u}$
N28.14.73 Z3 ⊕ SM1	√	1	1	√	mmm	$\mathrm{B3_u}$
N28.14.74 Z3 ⊕ A1	√	1	1	√	mmm	$\mathrm{B3_u}$
N28.14.75 Z3 ⊕ C1	√	1	1	×	-	-

Non-coplanar SSGs with parent space group $Pma2$ (No. 28) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N28.14.76 Z3 $\oplus$ E1	$\surd$	1	1	$\times$	-	-
N28.14.77 Z3 $\oplus$ DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N28.14.78 Z3 $\oplus$ DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N28.14.79 Z3 $\oplus$ B1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N28.14.80 Z3 $\oplus$ B2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N28.14.81 Z4 $\oplus$ SM1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N28.14.82 Z4 $\oplus$ A1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N28.14.83 Z4 $\oplus$ C1	$\surd$	1	1	$\times$	-	-
N28.14.84 Z4 $\oplus$ E1	$\surd$	1	1	$\times$	-	-
N28.14.85 Z4 $\oplus$ DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N28.14.86 Z4 $\oplus$ DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N28.14.87 Z4 $\oplus$ B1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N28.14.88 Z4 $\oplus$ B2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$

TABLE S85: Collinear SSGs with parent space group $Pca2_1$ (No. 29).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L29.1.1 GM1	1	mmm	$\mathrm{A_g}$
L29.2.1 GM2	1	mmm	$\mathrm{B1_g}$
L29.2.2 GM3	1	mmm	$\mathrm{B3_g}$
L29.2.3 GM4	1	mmm	$\mathrm{B2_g}$
L29.2.4 Y1	0	-	-
L29.2.5 Y2	0	-	-

TABLE S86: Coplanar SSGs with parent space group $Pca2_1$ (No. 29).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P29.1.1 GM1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B1_u}$
P29.2.1 GM2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$
P29.2.2 GM3	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
P29.2.3 GM4	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u} \oplus \mathrm{B2_g}$
P29.2.4 Y1	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P29.2.5 Y2	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P29.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
P29.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
P29.3.3 GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
P29.3.4 GM2 $\oplus$ Y1	$\surd$	1	1	$\times$	-	-
P29.3.5 GM2 $\oplus$ Y2	$\surd$	1	1	$\times$	-	-
P29.3.6 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
P29.3.7 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
P29.3.8 GM3 $\oplus$ Y1	$\surd$	1	1	$\times$	-	-
P29.3.9 GM3 $\oplus$ Y2	$\surd$	1	1	$\times$	-	-
P29.3.10 GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
P29.3.11 GM4 $\oplus$ Y1	$\surd$	1	1	$\times$	-	-
P29.3.12 GM4 $\oplus$ Y2	$\surd$	1	1	$\times$	-	-

Coplanar SSGs with parent space group $Pca2_1$ (No. 29) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P29.3.13 Y1 $\oplus$ Y1	$\surd$	1	1	$\times$	-	-
P29.3.14 Y1 $\oplus$ Y3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P29.3.15 Y1 $\oplus$ Y2	$\surd$	1	1	$\times$	-	-
P29.3.16 Y1 $\oplus$ Y4	$\surd$	1	1	$\times$	-	-
P29.3.17 Y2 $\oplus$ Y2	$\surd$	1	1	$\times$	-	-
P29.3.18 Y2 $\oplus$ Y4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P29.4.1 Z1Z4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P29.4.2 Z2Z3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P29.4.3 T1T4	$\surd$	1	1	$\times$	-	-
P29.5.1 LD1LE1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P29.5.2 LD2LE2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P29.5.3 H1HA1	$\surd$	1	1	$\times$	-	-
P29.6.1 S1	$\surd$	1	1	$\times$	-	-
P29.6.2 X1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P29.8.1 SM1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P29.8.2 C1	$\surd$	1	1	$\times$	-	-
P29.8.3 DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P29.8.4 DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$

TABLE S87: Non-coplanar SSGs with parent space group $Pca2_1$ (No. 29).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N29.1.1 GM1	$\surd$	3	3	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{A1}$
N29.2.1 GM2	$\surd$	3	3	$\surd$	222	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{B1}$
N29.2.2 GM3	$\surd$	3	3	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{B2}$
N29.2.3 GM4	$\surd$	3	3	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{B1}$
N29.2.4 Y1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B1_u}$
N29.2.5 Y2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B1_u}$
N29.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{A2} \oplus \mathrm{A2}$
N29.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{A2} \oplus \mathrm{B2}$
N29.3.3 GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{A2} \oplus \mathrm{B1}$
N29.3.4 GM2 $\oplus$ Y1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$
N29.3.5 GM2 $\oplus$ Y2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$
N29.3.6 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{B2} \oplus \mathrm{B2}$
N29.3.7 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	222	$\mathrm{A1} \oplus \mathrm{B3} \oplus \mathrm{B2}$
N29.3.8 GM3 $\oplus$ Y1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N29.3.9 GM3 $\oplus$ Y2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N29.3.10 GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{B1} \oplus \mathrm{B1}$
N29.3.11 GM4 $\oplus$ Y1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u} \oplus \mathrm{B2_g}$
N29.3.12 GM4 $\oplus$ Y2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u} \oplus \mathrm{B2_g}$
N29.3.13 Y1 $\oplus$ Y1	$\surd$	1	1	$\surd$	$mm2$	A1
N29.3.14 Y1 $\oplus$ Y3	$\surd$	1	1	$\surd$	$mm2$	A1
N29.3.15 Y1 $\oplus$ Y2	$\surd$	1	1	$\surd$	222	A1
N29.3.16 Y1 $\oplus$ Y4	$\surd$	1	1	$\surd$	$mm2$	A1
N29.3.17 Y2 $\oplus$ Y2	$\surd$	1	1	$\surd$	$mm2$	A1
N29.3.18 Y2 $\oplus$ Y4	$\surd$	1	1	$\surd$	$mm2$	A1

Non-coplanar SSGs with parent space group $Pca2_1$ (No. 29) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N29.4.1 Z1Z4	√	1	1	√	$mm2$	A1
N29.4.2 Z2Z3	√	1	1	√	$mm2$	A1
N29.4.3 T1T4	√	1	1	√	$mm2$	A1
N29.5.1 LD1LE1	√	1	1	√	$mm2$	A1
N29.5.2 LD2LE2	√	1	1	√	$mm2$	A1
N29.5.3 H1HA1	√	1	1	√	$mm2$	A1
N29.6.1 S1	√	1	1	√	$mm2$	A1
N29.6.2 X1	√	1	1	√	$mm2$	A1
N29.8.1 SM1	√	1	1	√	$mm2$	A1
N29.8.2 C1	√	1	1	√	$mm2$	A1
N29.8.3 DT1	√	1	1	√	$mm2$	A1
N29.8.4 DT2	√	1	1	√	$mm2$	A1
N29.9.1 GM2 ⊕ GM2 ⊕ GM2	√	3	3	√	222	B1 ⊕ B1 ⊕ B1
N29.9.2 GM2 ⊕ GM2 ⊕ GM3	√	3	3	√	$mm2$	B2 ⊕ B1 ⊕ B1
N29.9.3 GM2 ⊕ GM2 ⊕ GM4	√	3	3	√	$mm2$	B2 ⊕ B2 ⊕ B1
N29.9.4 GM2 ⊕ GM2 ⊕ Y1	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N29.9.5 GM2 ⊕ GM2 ⊕ Y2	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N29.9.6 GM2 ⊕ GM3 ⊕ GM3	√	3	3	√	222	B1 ⊕ B3 ⊕ B3
N29.9.7 GM2 ⊕ GM3 ⊕ GM4	√	3	3	√	$mm2$	A2 ⊕ B2 ⊕ B1
N29.9.8 GM2 ⊕ GM3 ⊕ Y1	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N29.9.9 GM2 ⊕ GM3 ⊕ Y2	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N29.9.10 GM2 ⊕ GM4 ⊕ GM4	√	3	3	√	222	B1 ⊕ B2 ⊕ B2
N29.9.11 GM2 ⊕ GM4 ⊕ Y1	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N29.9.12 GM2 ⊕ GM4 ⊕ Y2	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N29.9.13 GM2 ⊕ Y1 ⊕ Y1	√	1	1	×	-	-
N29.9.14 GM2 ⊕ Y1 ⊕ Y3	√	1	1	√	$mm2$	B2
N29.9.15 GM2 ⊕ Y1 ⊕ Y2	√	1	1	×	-	-
N29.9.16 GM2 ⊕ Y1 ⊕ Y4	√	1	1	×	-	-
N29.9.17 GM2 ⊕ Y2 ⊕ Y2	√	1	1	×	-	-
N29.9.18 GM2 ⊕ Y2 ⊕ Y4	√	1	1	√	$mm2$	B2
N29.9.19 GM3 ⊕ GM3 ⊕ GM3	√	3	3	√	$mm2$	B2 ⊕ B2 ⊕ B2
N29.9.20 GM3 ⊕ GM3 ⊕ GM4	√	3	3	√	$mm2$	A2 ⊕ A2 ⊕ B1
N29.9.21 GM3 ⊕ GM3 ⊕ Y1	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N29.9.22 GM3 ⊕ GM3 ⊕ Y2	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N29.9.23 GM3 ⊕ GM4 ⊕ GM4	√	3	3	√	$mm2$	A2 ⊕ A2 ⊕ B2
N29.9.24 GM3 ⊕ GM4 ⊕ Y1	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N29.9.25 GM3 ⊕ GM4 ⊕ Y2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N29.9.26 GM3 ⊕ Y1 ⊕ Y1	√	1	1	×	-	-
N29.9.27 GM3 ⊕ Y1 ⊕ Y3	√	1	1	√	$mm2$	B2
N29.9.28 GM3 ⊕ Y1 ⊕ Y2	√	1	1	×	-	-
N29.9.29 GM3 ⊕ Y1 ⊕ Y4	√	1	1	×	-	-
N29.9.30 GM3 ⊕ Y2 ⊕ Y2	√	1	1	×	-	-
N29.9.31 GM3 ⊕ Y2 ⊕ Y4	√	1	1	√	$mm2$	B2
N29.9.32 GM4 ⊕ GM4 ⊕ GM4	√	3	3	√	$mm2$	B1 ⊕ B1 ⊕ B1
N29.9.33 GM4 ⊕ GM4 ⊕ Y1	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N29.9.34 GM4 ⊕ GM4 ⊕ Y2	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$

Non-coplanar SSGs with parent space group $Pca2_1$ (No. 29) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N29.9.35 GM4 ⊕ Y1 ⊕ Y1	√	1	1	×	-	-
N29.9.36 GM4 ⊕ Y1 ⊕ Y3	√	1	1	√	222	B2
N29.9.37 GM4 ⊕ Y1 ⊕ Y2	√	1	1	×	-	-
N29.9.38 GM4 ⊕ Y1 ⊕ Y4	√	1	1	×	-	-
N29.9.39 GM4 ⊕ Y2 ⊕ Y2	√	1	1	×	-	-
N29.9.40 GM4 ⊕ Y2 ⊕ Y4	√	1	1	√	222	B2
N29.9.41 Y1 ⊕ Y1 ⊕ Y1	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N29.9.42 Y1 ⊕ Y1 ⊕ Y3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N29.9.43 Y1 ⊕ Y1 ⊕ Y2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N29.9.44 Y1 ⊕ Y1 ⊕ Y4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N29.9.45 Y1 ⊕ Y3 ⊕ Y2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N29.9.46 Y1 ⊕ Y2 ⊕ Y2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N29.9.47 Y1 ⊕ Y2 ⊕ Y4	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N29.9.48 Y1 ⊕ Y4 ⊕ Y4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N29.9.49 Y2 ⊕ Y2 ⊕ Y2	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N29.9.50 Y2 ⊕ Y2 ⊕ Y4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N29.10.1 GM2 ⊕ Z1Z4	√	1	1	√	222	B1
N29.10.2 GM2 ⊕ Z2Z3	√	1	1	√	222	B1
N29.10.3 GM2 ⊕ T1T4	√	1	1	×	-	-
N29.10.4 GM3 ⊕ Z1Z4	√	1	1	√	$mm2$	B2
N29.10.5 GM3 ⊕ Z2Z3	√	1	1	√	$mm2$	B2
N29.10.6 GM3 ⊕ T1T4	√	1	1	×	-	-
N29.10.7 GM4 ⊕ Z1Z4	√	1	1	√	$mm2$	B1
N29.10.8 GM4 ⊕ Z2Z3	√	1	1	√	$mm2$	B1
N29.10.9 GM4 ⊕ T1T4	√	1	1	×	-	-
N29.10.10 Y1 ⊕ Z1Z4	√	1	1	√	mmm	$\mathrm{B1_u}$
N29.10.11 Y1 ⊕ Z2Z3	√	1	1	√	mmm	$\mathrm{B1_u}$
N29.10.12 Y1 ⊕ T1T4	√	1	1	√	mmm	$\mathrm{B1_u}$
N29.10.13 Y1 ⊕ T2T3	√	1	1	√	mmm	$\mathrm{B1_u}$
N29.10.14 Y2 ⊕ Z1Z4	√	1	1	√	mmm	$\mathrm{B1_u}$
N29.10.15 Y2 ⊕ Z2Z3	√	1	1	√	mmm	$\mathrm{B1_u}$
N29.10.16 Y2 ⊕ T1T4	√	1	1	√	mmm	$\mathrm{B1_u}$
N29.10.17 Y2 ⊕ T2T3	√	1	1	√	mmm	$\mathrm{B1_u}$
N29.11.1 GM2 ⊕ LD1LE1	√	1	1	√	222	B1
N29.11.2 GM2 ⊕ LD2LE2	√	1	1	√	222	B1
N29.11.3 GM2 ⊕ H1HA1	√	1	1	×	-	-
N29.11.4 GM3 ⊕ LD1LE1	√	1	1	√	$mm2$	B2
N29.11.5 GM3 ⊕ LD2LE2	√	1	1	√	$mm2$	B2
N29.11.6 GM3 ⊕ H1HA1	√	1	1	×	-	-
N29.11.7 GM4 ⊕ LD1LE1	√	1	1	√	$mm2$	B1
N29.11.8 GM4 ⊕ LD2LE2	√	1	1	√	$mm2$	B1
N29.11.9 GM4 ⊕ H1HA1	√	1	1	×	-	-
N29.11.10 Y1 ⊕ LD1LE1	√	1	1	√	mmm	$\mathrm{B1_u}$
N29.11.11 Y1 ⊕ LD2LE2	√	1	1	√	mmm	$\mathrm{B1_u}$
N29.11.12 Y1 ⊕ H1HA1	√	1	1	√	mmm	$\mathrm{B1_u}$
N29.11.13 Y1 ⊕ H2HA2	√	1	1	√	mmm	$\mathrm{B1_u}$

Non-coplanar SSGs with parent space group $Pca2_1$ (No. 29) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N29.11.14 Y2 $\oplus$ LD1LE1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N29.11.15 Y2 $\oplus$ LD2LE2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N29.11.16 Y2 $\oplus$ H1HA1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N29.11.17 Y2 $\oplus$ H2HA2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N29.12.1 GM2 $\oplus$ S1	$\surd$	1	1	$\times$	-	-
N29.12.2 GM2 $\oplus$ X1	$\surd$	1	1	$\surd$	$mm2$	B1
N29.12.3 GM3 $\oplus$ S1	$\surd$	1	1	$\times$	-	-
N29.12.4 GM3 $\oplus$ X1	$\surd$	1	1	$\surd$	222	B3
N29.12.5 GM4 $\oplus$ S1	$\surd$	1	1	$\times$	-	-
N29.12.6 GM4 $\oplus$ X1	$\surd$	1	1	$\surd$	$mm2$	B1
N29.12.7 Y1 $\oplus$ S1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N29.12.8 Y1 $\oplus$ X1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N29.12.9 Y2 $\oplus$ S1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N29.12.10 Y2 $\oplus$ X1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N29.14.1 GM2 $\oplus$ SM1	$\surd$	1	1	$\surd$	$mm2$	B1
N29.14.2 GM2 $\oplus$ C1	$\surd$	1	1	$\times$	-	-
N29.14.3 GM2 $\oplus$ DT1	$\surd$	1	1	$\surd$	$mm2$	B2
N29.14.4 GM2 $\oplus$ DT2	$\surd$	1	1	$\surd$	$mm2$	B2
N29.14.5 GM3 $\oplus$ SM1	$\surd$	1	1	$\surd$	222	B3
N29.14.6 GM3 $\oplus$ C1	$\surd$	1	1	$\times$	-	-
N29.14.7 GM3 $\oplus$ DT1	$\surd$	1	1	$\surd$	$mm2$	B2
N29.14.8 GM3 $\oplus$ DT2	$\surd$	1	1	$\surd$	$mm2$	B2
N29.14.9 GM4 $\oplus$ SM1	$\surd$	1	1	$\surd$	$mm2$	B1
N29.14.10 GM4 $\oplus$ C1	$\surd$	1	1	$\times$	-	-
N29.14.11 GM4 $\oplus$ DT1	$\surd$	1	1	$\surd$	222	B2
N29.14.12 GM4 $\oplus$ DT2	$\surd$	1	1	$\surd$	222	B2
N29.14.13 Y1 $\oplus$ SM1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N29.14.14 Y1 $\oplus$ C1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N29.14.15 Y1 $\oplus$ DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N29.14.16 Y1 $\oplus$ DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N29.14.17 Y2 $\oplus$ SM1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N29.14.18 Y2 $\oplus$ C1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N29.14.19 Y2 $\oplus$ DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N29.14.20 Y2 $\oplus$ DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$

TABLE S88: Collinear SSGs with parent space group $Pnc2$ (No. 30).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L30.1.1 GM1	1	mmm	$\mathrm{A_g}$
L30.2.1 GM2	1	mmm	$\mathrm{B1_g}$
L30.2.2 GM3	1	mmm	$\mathrm{B3_g}$
L30.2.3 GM4	1	mmm	$\mathrm{B2_g}$
L30.2.4 X1	0	-	-
L30.2.5 X2	0	-	-

TABLE S89: Coplanar SSGs with parent space group $Pnc2$ (No. 30).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P30.1.1 GM1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{B1_u}$
P30.2.1 GM2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_u}\oplus\mathrm{B1_g}$
P30.2.2 GM3	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}\oplus\mathrm{B2_u}$
P30.2.3 GM4	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}\oplus\mathrm{B2_g}$
P30.2.4 X1	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P30.2.5 X2	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P30.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B1_u}$
P30.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B3_g}\oplus\mathrm{B3_u}$
P30.3.3 GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B2_g}\oplus\mathrm{B2_u}$
P30.3.4 GM2 $\oplus$ X1	$\surd$	1	1	$\times$	-	-
P30.3.5 GM2 $\oplus$ X2	$\surd$	1	1	$\times$	-	-
P30.3.6 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B3_g}\oplus\mathrm{B3_g}$
P30.3.7 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B3_g}\oplus\mathrm{B2_g}$
P30.3.8 GM3 $\oplus$ X1	$\surd$	1	1	$\times$	-	-
P30.3.9 GM3 $\oplus$ X2	$\surd$	1	1	$\times$	-	-
P30.3.10 GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B2_g}\oplus\mathrm{B2_g}$
P30.3.11 GM4 $\oplus$ X1	$\surd$	1	1	$\times$	-	-
P30.3.12 GM4 $\oplus$ X2	$\surd$	1	1	$\times$	-	-
P30.3.13 X1 $\oplus$ X1	$\surd$	1	1	$\times$	-	-
P30.3.14 X1 $\oplus$ X4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P30.3.15 X1 $\oplus$ X2	$\surd$	1	1	$\times$	-	-
P30.3.16 X1 $\oplus$ X3	$\surd$	1	1	$\times$	-	-
P30.3.17 X2 $\oplus$ X2	$\surd$	1	1	$\times$	-	-
P30.3.18 X2 $\oplus$ X3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P30.4.1 Z1Z2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P30.4.2 Z3Z4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P30.4.3 U1U2	$\surd$	1	1	$\times$	-	-
P30.5.1 LD1LE1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P30.5.2 LD3LE3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P30.5.3 G1GA1	$\surd$	1	1	$\times$	-	-
P30.6.1 R1	$\surd$	1	1	$\times$	-	-
P30.6.2 S1	$\surd$	1	1	$\times$	-	-
P30.6.3 T1	$\surd$	1	1	$\times$	-	-
P30.6.4 Y1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P30.8.1 SM1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P30.8.2 SM2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P30.8.3 E1	$\surd$	1	1	$\times$	-	-
P30.8.4 DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P30.8.5 D1	$\surd$	1	1	$\times$	-	-

TABLE S90: Non-coplanar SSGs with parent space group $Pnc2$ (No. 30).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N30.1.1 GM1	$\surd$	3	3	$\surd$	$mm2$	A1 $\oplus$ A1 $\oplus$ A1
N30.2.1 GM2	$\surd$	3	3	$\surd$	222	A1 $\oplus$ A1 $\oplus$ B1
N30.2.2 GM3	$\surd$	3	3	$\surd$	$mm2$	A1 $\oplus$ A1 $\oplus$ B2

Non-coplanar SSGs with parent space group $Pnc2$ (No. 30) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N30.2.3 GM4	√	3	3	√	$mm2$	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{B1}$
N30.2.4 X1	√	3	3	√	mmm	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{B1_u}$
N30.2.5 X2	√	3	3	√	mmm	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{B1_u}$
N30.3.1 GM2 ⊕ GM2	√	3	3	√	$mm2$	$\mathrm{A1}\oplus\mathrm{A2}\oplus\mathrm{A2}$
N30.3.2 GM2 ⊕ GM3	√	3	3	√	$mm2$	$\mathrm{A1}\oplus\mathrm{A2}\oplus\mathrm{B2}$
N30.3.3 GM2 ⊕ GM4	√	3	3	√	$mm2$	$\mathrm{A1}\oplus\mathrm{A2}\oplus\mathrm{B1}$
N30.3.4 GM2 ⊕ X1	√	3	3	√	mmm	$\mathrm{A_g}\oplus\mathrm{A_u}\oplus\mathrm{B1_g}$
N30.3.5 GM2 ⊕ X2	√	3	3	√	mmm	$\mathrm{A_g}\oplus\mathrm{A_u}\oplus\mathrm{B1_g}$
N30.3.6 GM3 ⊕ GM3	√	3	3	√	$mm2$	$\mathrm{A1}\oplus\mathrm{B2}\oplus\mathrm{B2}$
N30.3.7 GM3 ⊕ GM4	√	3	3	√	222	$\mathrm{A1}\oplus\mathrm{B3}\oplus\mathrm{B2}$
N30.3.8 GM3 ⊕ X1	√	3	3	√	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}\oplus\mathrm{B2_u}$
N30.3.9 GM3 ⊕ X2	√	3	3	√	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}\oplus\mathrm{B2_u}$
N30.3.10 GM4 ⊕ GM4	√	3	3	√	$mm2$	$\mathrm{A1}\oplus\mathrm{B1}\oplus\mathrm{B1}$
N30.3.11 GM4 ⊕ X1	√	3	3	√	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}\oplus\mathrm{B2_g}$
N30.3.12 GM4 ⊕ X2	√	3	3	√	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}\oplus\mathrm{B2_g}$
N30.3.13 X1 ⊕ X1	√	1	1	√	$mm2$	A1
N30.3.14 X1 ⊕ X4	√	1	1	√	$mm2$	A1
N30.3.15 X1 ⊕ X2	√	1	1	√	222	A1
N30.3.16 X1 ⊕ X3	√	1	1	√	$mm2$	A1
N30.3.17 X2 ⊕ X2	√	1	1	√	$mm2$	A1
N30.3.18 X2 ⊕ X3	√	1	1	√	$mm2$	A1
N30.4.1 Z1Z2	√	1	1	√	$mm2$	A1
N30.4.2 Z3Z4	√	1	1	√	$mm2$	A1
N30.4.3 U1U2	√	1	1	√	$mm2$	A1
N30.5.1 LD1LE1	√	1	1	√	$mm2$	A1
N30.5.2 LD3LE3	√	1	1	√	$mm2$	A1
N30.5.3 G1GA1	√	1	1	√	$mm2$	A1
N30.6.1 R1	√	1	1	√	$mm2$	A1
N30.6.2 S1	√	1	1	√	$mm2$	A1
N30.6.3 T1	√	1	1	√	$mm2$	A1
N30.6.4 Y1	√	1	1	√	$mm2$	A1
N30.8.1 SM1	√	1	1	√	$mm2$	A1
N30.8.2 SM2	√	1	1	√	$mm2$	A1
N30.8.3 E1	√	1	1	√	$mm2$	A1
N30.8.4 DT1	√	1	1	√	$mm2$	A1
N30.8.5 D1	√	1	1	√	$mm2$	A1
N30.9.1 GM2 ⊕ GM2 ⊕ GM2	√	3	3	√	222	$\mathrm{B1}\oplus\mathrm{B1}\oplus\mathrm{B1}$
N30.9.2 GM2 ⊕ GM2 ⊕ GM3	√	3	3	√	$mm2$	$\mathrm{B2}\oplus\mathrm{B1}\oplus\mathrm{B1}$
N30.9.3 GM2 ⊕ GM2 ⊕ GM4	√	3	3	√	$mm2$	$\mathrm{B2}\oplus\mathrm{B2}\oplus\mathrm{B1}$
N30.9.4 GM2 ⊕ GM2 ⊕ X1	√	3	3	√	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B1_u}$
N30.9.5 GM2 ⊕ GM2 ⊕ X2	√	3	3	√	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B1_u}$
N30.9.6 GM2 ⊕ GM3 ⊕ GM3	√	3	3	√	222	$\mathrm{B1}\oplus\mathrm{B3}\oplus\mathrm{B3}$
N30.9.7 GM2 ⊕ GM3 ⊕ GM4	√	3	3	√	$mm2$	$\mathrm{A2}\oplus\mathrm{B2}\oplus\mathrm{B1}$
N30.9.8 GM2 ⊕ GM3 ⊕ X1	√	3	3	√	mmm	$\mathrm{B1_g}\oplus\mathrm{B3_g}\oplus\mathrm{B3_u}$
N30.9.9 GM2 ⊕ GM3 ⊕ X2	√	3	3	√	mmm	$\mathrm{B1_g}\oplus\mathrm{B3_g}\oplus\mathrm{B3_u}$
N30.9.10 GM2 ⊕ GM4 ⊕ GM4	√	3	3	√	222	$\mathrm{B1}\oplus\mathrm{B2}\oplus\mathrm{B2}$

Non-coplanar SSGs with parent space group $Pnc2$ (No. 30) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N30.9.11 GM2 ⊕ GM4 ⊕ X1	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N30.9.12 GM2 ⊕ GM4 ⊕ X2	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N30.9.13 GM2 ⊕ X1 ⊕ X1	√	1	1	×	-	-
N30.9.14 GM2 ⊕ X1 ⊕ X4	√	1	1	√	$mm2$	B1
N30.9.15 GM2 ⊕ X1 ⊕ X2	√	1	1	×	-	-
N30.9.16 GM2 ⊕ X1 ⊕ X3	√	1	1	×	-	-
N30.9.17 GM2 ⊕ X2 ⊕ X2	√	1	1	×	-	-
N30.9.18 GM2 ⊕ X2 ⊕ X3	√	1	1	√	$mm2$	B1
N30.9.19 GM3 ⊕ GM3 ⊕ GM3	√	3	3	√	$mm2$	B2 ⊕ B2 ⊕ B2
N30.9.20 GM3 ⊕ GM3 ⊕ GM4	√	3	3	√	$mm2$	A2 ⊕ A2 ⊕ B1
N30.9.21 GM3 ⊕ GM3 ⊕ X1	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N30.9.22 GM3 ⊕ GM3 ⊕ X2	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N30.9.23 GM3 ⊕ GM4 ⊕ GM4	√	3	3	√	$mm2$	A2 ⊕ A2 ⊕ B2
N30.9.24 GM3 ⊕ GM4 ⊕ X1	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N30.9.25 GM3 ⊕ GM4 ⊕ X2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N30.9.26 GM3 ⊕ X1 ⊕ X1	√	1	1	×	-	-
N30.9.27 GM3 ⊕ X1 ⊕ X4	√	1	1	√	222	B3
N30.9.28 GM3 ⊕ X1 ⊕ X2	√	1	1	×	-	-
N30.9.29 GM3 ⊕ X1 ⊕ X3	√	1	1	×	-	-
N30.9.30 GM3 ⊕ X2 ⊕ X2	√	1	1	×	-	-
N30.9.31 GM3 ⊕ X2 ⊕ X3	√	1	1	√	222	B3
N30.9.32 GM4 ⊕ GM4 ⊕ GM4	√	3	3	√	$mm2$	B1 ⊕ B1 ⊕ B1
N30.9.33 GM4 ⊕ GM4 ⊕ X1	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N30.9.34 GM4 ⊕ GM4 ⊕ X2	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N30.9.35 GM4 ⊕ X1 ⊕ X1	√	1	1	×	-	-
N30.9.36 GM4 ⊕ X1 ⊕ X4	√	1	1	√	$mm2$	B1
N30.9.37 GM4 ⊕ X1 ⊕ X2	√	1	1	×	-	-
N30.9.38 GM4 ⊕ X1 ⊕ X3	√	1	1	×	-	-
N30.9.39 GM4 ⊕ X2 ⊕ X2	√	1	1	×	-	-
N30.9.40 GM4 ⊕ X2 ⊕ X3	√	1	1	√	$mm2$	B1
N30.9.41 X1 ⊕ X1 ⊕ X1	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N30.9.42 X1 ⊕ X1 ⊕ X4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N30.9.43 X1 ⊕ X1 ⊕ X2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N30.9.44 X1 ⊕ X1 ⊕ X3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N30.9.45 X1 ⊕ X4 ⊕ X2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N30.9.46 X1 ⊕ X2 ⊕ X2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N30.9.47 X1 ⊕ X2 ⊕ X3	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N30.9.48 X1 ⊕ X3 ⊕ X3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N30.9.49 X2 ⊕ X2 ⊕ X2	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N30.9.50 X2 ⊕ X2 ⊕ X3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N30.10.1 GM2 ⊕ Z1Z2	√	1	1	√	222	B1
N30.10.2 GM2 ⊕ Z3Z4	√	1	1	√	222	B1
N30.10.3 GM2 ⊕ U1U2	√	1	1	×	-	-
N30.10.4 GM3 ⊕ Z1Z2	√	1	1	√	$mm2$	B2
N30.10.5 GM3 ⊕ Z3Z4	√	1	1	√	$mm2$	B2
N30.10.6 GM3 ⊕ U1U2	√	1	1	×	-	-

Non-coplanar SSGs with parent space group $Pnc2$ (No. 30) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N30.10.7 GM4 ⊕ Z1Z2	√	1	1	√	$mm2$	B1
N30.10.8 GM4 ⊕ Z3Z4	√	1	1	√	$mm2$	B1
N30.10.9 GM4 ⊕ U1U2	√	1	1	×	-	-
N30.10.10 X1 ⊕ Z1Z2	√	1	1	√	mmm	$\mathrm{B1_u}$
N30.10.11 X1 ⊕ Z3Z4	√	1	1	√	mmm	$\mathrm{B1_u}$
N30.10.12 X1 ⊕ U1U2	√	1	1	√	mmm	$\mathrm{B1_u}$
N30.10.13 X1 ⊕ U3U4	√	1	1	√	mmm	$\mathrm{B1_u}$
N30.10.14 X2 ⊕ Z1Z2	√	1	1	√	mmm	$\mathrm{B1_u}$
N30.10.15 X2 ⊕ Z3Z4	√	1	1	√	mmm	$\mathrm{B1_u}$
N30.10.16 X2 ⊕ U1U2	√	1	1	√	mmm	$\mathrm{B1_u}$
N30.10.17 X2 ⊕ U3U4	√	1	1	√	mmm	$\mathrm{B1_u}$
N30.11.1 GM2 ⊕ LD1LE1	√	1	1	√	222	B1
N30.11.2 GM2 ⊕ LD3LE3	√	1	1	√	222	B1
N30.11.3 GM2 ⊕ G1GA1	√	1	1	×	-	-
N30.11.4 GM3 ⊕ LD1LE1	√	1	1	√	$mm2$	B2
N30.11.5 GM3 ⊕ LD3LE3	√	1	1	√	$mm2$	B2
N30.11.6 GM3 ⊕ G1GA1	√	1	1	×	-	-
N30.11.7 GM4 ⊕ LD1LE1	√	1	1	√	$mm2$	B1
N30.11.8 GM4 ⊕ LD3LE3	√	1	1	√	$mm2$	B1
N30.11.9 GM4 ⊕ G1GA1	√	1	1	×	-	-
N30.11.10 X1 ⊕ LD1LE1	√	1	1	√	mmm	$\mathrm{B1_u}$
N30.11.11 X1 ⊕ LD3LE3	√	1	1	√	mmm	$\mathrm{B1_u}$
N30.11.12 X1 ⊕ G1GA1	√	1	1	√	mmm	$\mathrm{B1_u}$
N30.11.13 X1 ⊕ G3GA3	√	1	1	√	mmm	$\mathrm{B1_u}$
N30.11.14 X2 ⊕ LD1LE1	√	1	1	√	mmm	$\mathrm{B1_u}$
N30.11.15 X2 ⊕ LD3LE3	√	1	1	√	mmm	$\mathrm{B1_u}$
N30.11.16 X2 ⊕ G1GA1	√	1	1	√	mmm	$\mathrm{B1_u}$
N30.11.17 X2 ⊕ G3GA3	√	1	1	√	mmm	$\mathrm{B1_u}$
N30.12.1 GM2 ⊕ R1	√	1	1	×	-	-
N30.12.2 GM2 ⊕ S1	√	1	1	×	-	-
N30.12.3 GM2 ⊕ T1	√	1	1	×	-	-
N30.12.4 GM2 ⊕ Y1	√	1	1	√	$mm2$	B2
N30.12.5 GM3 ⊕ R1	√	1	1	×	-	-
N30.12.6 GM3 ⊕ S1	√	1	1	×	-	-
N30.12.7 GM3 ⊕ T1	√	1	1	×	-	-
N30.12.8 GM3 ⊕ Y1	√	1	1	√	$mm2$	B2
N30.12.9 GM4 ⊕ R1	√	1	1	×	-	-
N30.12.10 GM4 ⊕ S1	√	1	1	×	-	-
N30.12.11 GM4 ⊕ T1	√	1	1	×	-	-
N30.12.12 GM4 ⊕ Y1	√	1	1	√	222	B2
N30.12.13 X1 ⊕ R1	√	1	1	×	-	-
N30.12.14 X1 ⊕ S1	√	1	1	√	mmm	$\mathrm{B2_u}$
N30.12.15 X1 ⊕ T1	√	1	1	×	-	-
N30.12.16 X1 ⊕ Y1	√	1	1	√	mmm	$\mathrm{B2_u}$
N30.12.17 X2 ⊕ R1	√	1	1	×	-	-
N30.12.18 X2 ⊕ S1	√	1	1	√	mmm	$\mathrm{B2_u}$

Non-coplanar SSGs with parent space group $Pnc2$ (No. 30) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N30.12.19 X2 $\oplus$ T1	$\surd$	1	1	$\times$	-	-
N30.12.20 X2 $\oplus$ Y1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N30.14.1 GM2 $\oplus$ SM1	$\surd$	1	1	$\surd$	$mm2$	B1
N30.14.2 GM2 $\oplus$ SM2	$\surd$	1	1	$\surd$	$mm2$	B1
N30.14.3 GM2 $\oplus$ E1	$\surd$	1	1	$\times$	-	-
N30.14.4 GM2 $\oplus$ DT1	$\surd$	1	1	$\surd$	$mm2$	B2
N30.14.5 GM2 $\oplus$ D1	$\surd$	1	1	$\times$	-	-
N30.14.6 GM3 $\oplus$ SM1	$\surd$	1	1	$\surd$	222	B3
N30.14.7 GM3 $\oplus$ SM2	$\surd$	1	1	$\surd$	222	B3
N30.14.8 GM3 $\oplus$ E1	$\surd$	1	1	$\times$	-	-
N30.14.9 GM3 $\oplus$ DT1	$\surd$	1	1	$\surd$	$mm2$	B2
N30.14.10 GM3 $\oplus$ D1	$\surd$	1	1	$\times$	-	-
N30.14.11 GM4 $\oplus$ SM1	$\surd$	1	1	$\surd$	$mm2$	B1
N30.14.12 GM4 $\oplus$ SM2	$\surd$	1	1	$\surd$	$mm2$	B1
N30.14.13 GM4 $\oplus$ E1	$\surd$	1	1	$\times$	-	-
N30.14.14 GM4 $\oplus$ DT1	$\surd$	1	1	$\surd$	222	B2
N30.14.15 GM4 $\oplus$ D1	$\surd$	1	1	$\times$	-	-
N30.14.16 X1 $\oplus$ SM1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N30.14.17 X1 $\oplus$ SM2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N30.14.18 X1 $\oplus$ E1	$\surd$	1	1	$\times$	-	-
N30.14.19 X1 $\oplus$ DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N30.14.20 X1 $\oplus$ D1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N30.14.21 X2 $\oplus$ SM1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N30.14.22 X2 $\oplus$ SM2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N30.14.23 X2 $\oplus$ E1	$\surd$	1	1	$\times$	-	-
N30.14.24 X2 $\oplus$ DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N30.14.25 X2 $\oplus$ D1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$

TABLE S91: Collinear SSGs with parent space group $Pmn2_1$ (No. 31).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L31.1.1 GM1	1	mmm	$\mathrm{A_g}$
L31.2.1 GM2	1	mmm	$\mathrm{B1_g}$
L31.2.2 GM3	1	mmm	$\mathrm{B3_g}$
L31.2.3 GM4	1	mmm	$\mathrm{B2_g}$
L31.2.4 Y1	0	-	-
L31.2.5 Y2	0	-	-

TABLE S92: Coplanar SSGs with parent space group $Pmn2_1$ (No. 31).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P31.1.1 GM1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B1_u}$
P31.2.1 GM2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$
P31.2.2 GM3	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
P31.2.3 GM4	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u} \oplus \mathrm{B2_g}$

Coplanar SSGs with parent space group $Pmn2_1$ (No. 31) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P31.2.4 Y1	√	1	1	√	mmm	$\mathrm{A_g}$
P31.2.5 Y2	√	1	1	√	mmm	$\mathrm{A_g}$
P31.3.1 GM2 ⊕ GM2	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
P31.3.2 GM2 ⊕ GM3	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
P31.3.3 GM2 ⊕ GM4	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
P31.3.4 GM2 ⊕ Y1	√	1	1	×	-	-
P31.3.5 GM2 ⊕ Y2	√	1	1	×	-	-
P31.3.6 GM3 ⊕ GM3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
P31.3.7 GM3 ⊕ GM4	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
P31.3.8 GM3 ⊕ Y1	√	1	1	×	-	-
P31.3.9 GM3 ⊕ Y2	√	1	1	×	-	-
P31.3.10 GM4 ⊕ GM4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
P31.3.11 GM4 ⊕ Y1	√	1	1	×	-	-
P31.3.12 GM4 ⊕ Y2	√	1	1	×	-	-
P31.3.13 Y1 ⊕ Y1	√	1	1	×	-	-
P31.3.14 Y1 ⊕ Y3	√	1	1	√	mmm	$\mathrm{B2_u}$
P31.3.15 Y1 ⊕ Y2	√	1	1	×	-	-
P31.3.16 Y1 ⊕ Y4	√	1	1	×	-	-
P31.3.17 Y2 ⊕ Y2	√	1	1	×	-	-
P31.3.18 Y2 ⊕ Y4	√	1	1	√	mmm	$\mathrm{B2_u}$
P31.4.1 Z1Z3	√	1	1	√	mmm	$\mathrm{B1_u}$
P31.4.2 Z2Z4	√	1	1	√	mmm	$\mathrm{B1_u}$
P31.4.3 T1T3	√	1	1	×	-	-
P31.4.4 T2T4	√	1	1	×	-	-
P31.5.1 LD1LE1	√	1	1	√	mmm	$\mathrm{B1_u}$
P31.5.2 LD2LE2	√	1	1	√	mmm	$\mathrm{B1_u}$
P31.5.3 H1HA1	√	1	1	×	-	-
P31.5.4 H2HA2	√	1	1	×	-	-
P31.6.1 R1	√	1	1	×	-	-
P31.6.2 S1	√	1	1	×	-	-
P31.6.3 U1	√	1	1	×	-	-
P31.6.4 X1	√	1	1	√	mmm	$\mathrm{B3_u}$
P31.8.1 SM1	√	1	1	√	mmm	$\mathrm{B3_u}$
P31.8.2 C1	√	1	1	×	-	-
P31.8.3 DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
P31.8.4 DT2	√	1	1	√	mmm	$\mathrm{B2_u}$

TABLE S93: Non-coplanar SSGs with parent space group $Pmn2_1$ (No. 31).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N31.1.1 GM1	√	3	3	√	$mm2$	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{A1}$
N31.2.1 GM2	√	3	3	√	222	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{B1}$
N31.2.2 GM3	√	3	3	√	$mm2$	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{B2}$
N31.2.3 GM4	√	3	3	√	$mm2$	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{B1}$
N31.2.4 Y1	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B1_u}$
N31.2.5 Y2	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B1_u}$

Non-coplanar SSGs with parent space group $Pmn2_1$ (No. 31) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N31.3.1 GM2 ⊕ GM2	√	3	3	√	$mm2$	A1 ⊕ A2 ⊕ A2
N31.3.2 GM2 ⊕ GM3	√	3	3	√	$mm2$	A1 ⊕ A2 ⊕ B2
N31.3.3 GM2 ⊕ GM4	√	3	3	√	$mm2$	A1 ⊕ A2 ⊕ B1
N31.3.4 GM2 ⊕ Y1	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$
N31.3.5 GM2 ⊕ Y2	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$
N31.3.6 GM3 ⊕ GM3	√	3	3	√	$mm2$	A1 ⊕ B2 ⊕ B2
N31.3.7 GM3 ⊕ GM4	√	3	3	√	222	A1 ⊕ B3 ⊕ B2
N31.3.8 GM3 ⊕ Y1	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N31.3.9 GM3 ⊕ Y2	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N31.3.10 GM4 ⊕ GM4	√	3	3	√	$mm2$	A1 ⊕ B1 ⊕ B1
N31.3.11 GM4 ⊕ Y1	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u} \oplus \mathrm{B2_g}$
N31.3.12 GM4 ⊕ Y2	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u} \oplus \mathrm{B2_g}$
N31.3.13 Y1 ⊕ Y1	√	1	1	√	$mm2$	A1
N31.3.14 Y1 ⊕ Y3	√	1	1	√	$mm2$	A1
N31.3.15 Y1 ⊕ Y2	√	1	1	√	222	A1
N31.3.16 Y1 ⊕ Y4	√	1	1	√	$mm2$	A1
N31.3.17 Y2 ⊕ Y2	√	1	1	√	$mm2$	A1
N31.3.18 Y2 ⊕ Y4	√	1	1	√	$mm2$	A1
N31.4.1 Z1Z3	√	1	1	√	$mm2$	A1
N31.4.2 Z2Z4	√	1	1	√	$mm2$	A1
N31.4.3 T1T3	√	1	1	√	$mm2$	A1
N31.4.4 T2T4	√	1	1	√	$mm2$	A1
N31.5.1 LD1LE1	√	1	1	√	$mm2$	A1
N31.5.2 LD2LE2	√	1	1	√	$mm2$	A1
N31.5.3 H1HA1	√	1	1	√	$mm2$	A1
N31.5.4 H2HA2	√	1	1	√	$mm2$	A1
N31.6.1 R1	√	1	1	√	222	A1
N31.6.2 S1	√	1	1	√	$mm2$	A1
N31.6.3 U1	√	1	1	√	222	A1
N31.6.4 X1	√	1	1	√	$mm2$	A1
N31.8.1 SM1	√	1	1	√	$mm2$	A1
N31.8.2 C1	√	1	1	√	$mm2$	A1
N31.8.3 DT1	√	1	1	√	$mm2$	A1
N31.8.4 DT2	√	1	1	√	$mm2$	A1
N31.9.1 GM2 ⊕ GM2 ⊕ GM2	√	3	3	√	222	B1 ⊕ B1 ⊕ B1
N31.9.2 GM2 ⊕ GM2 ⊕ GM3	√	3	3	√	$mm2$	B2 ⊕ B1 ⊕ B1
N31.9.3 GM2 ⊕ GM2 ⊕ GM4	√	3	3	√	$mm2$	B2 ⊕ B2 ⊕ B1
N31.9.4 GM2 ⊕ GM2 ⊕ Y1	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N31.9.5 GM2 ⊕ GM2 ⊕ Y2	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N31.9.6 GM2 ⊕ GM3 ⊕ GM3	√	3	3	√	222	B1 ⊕ B3 ⊕ B3
N31.9.7 GM2 ⊕ GM3 ⊕ GM4	√	3	3	√	$mm2$	A2 ⊕ B2 ⊕ B1
N31.9.8 GM2 ⊕ GM3 ⊕ Y1	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N31.9.9 GM2 ⊕ GM3 ⊕ Y2	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N31.9.10 GM2 ⊕ GM4 ⊕ GM4	√	3	3	√	222	B1 ⊕ B2 ⊕ B2
N31.9.11 GM2 ⊕ GM4 ⊕ Y1	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N31.9.12 GM2 ⊕ GM4 ⊕ Y2	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$

Non-coplanar SSGs with parent space group $Pmn2_1$ (No. 31) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N31.9.13 GM2 ⊕ Y1 ⊕ Y1	√	1	1	×	-	-
N31.9.14 GM2 ⊕ Y1 ⊕ Y3	√	1	1	√	$mm2$	B2
N31.9.15 GM2 ⊕ Y1 ⊕ Y2	√	1	1	×	-	-
N31.9.16 GM2 ⊕ Y1 ⊕ Y4	√	1	1	×	-	-
N31.9.17 GM2 ⊕ Y2 ⊕ Y2	√	1	1	×	-	-
N31.9.18 GM2 ⊕ Y2 ⊕ Y4	√	1	1	√	$mm2$	B2
N31.9.19 GM3 ⊕ GM3 ⊕ GM3	√	3	3	√	$mm2$	B2 ⊕ B2 ⊕ B2
N31.9.20 GM3 ⊕ GM3 ⊕ GM4	√	3	3	√	$mm2$	A2 ⊕ A2 ⊕ B1
N31.9.21 GM3 ⊕ GM3 ⊕ Y1	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N31.9.22 GM3 ⊕ GM3 ⊕ Y2	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N31.9.23 GM3 ⊕ GM4 ⊕ GM4	√	3	3	√	$mm2$	A2 ⊕ A2 ⊕ B2
N31.9.24 GM3 ⊕ GM4 ⊕ Y1	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N31.9.25 GM3 ⊕ GM4 ⊕ Y2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N31.9.26 GM3 ⊕ Y1 ⊕ Y1	√	1	1	×	-	-
N31.9.27 GM3 ⊕ Y1 ⊕ Y3	√	1	1	√	$mm2$	B2
N31.9.28 GM3 ⊕ Y1 ⊕ Y2	√	1	1	×	-	-
N31.9.29 GM3 ⊕ Y1 ⊕ Y4	√	1	1	×	-	-
N31.9.30 GM3 ⊕ Y2 ⊕ Y2	√	1	1	×	-	-
N31.9.31 GM3 ⊕ Y2 ⊕ Y4	√	1	1	√	$mm2$	B2
N31.9.32 GM4 ⊕ GM4 ⊕ GM4	√	3	3	√	$mm2$	B1 ⊕ B1 ⊕ B1
N31.9.33 GM4 ⊕ GM4 ⊕ Y1	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N31.9.34 GM4 ⊕ GM4 ⊕ Y2	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N31.9.35 GM4 ⊕ Y1 ⊕ Y1	√	1	1	×	-	-
N31.9.36 GM4 ⊕ Y1 ⊕ Y3	√	1	1	√	222	B2
N31.9.37 GM4 ⊕ Y1 ⊕ Y2	√	1	1	×	-	-
N31.9.38 GM4 ⊕ Y1 ⊕ Y4	√	1	1	×	-	-
N31.9.39 GM4 ⊕ Y2 ⊕ Y2	√	1	1	×	-	-
N31.9.40 GM4 ⊕ Y2 ⊕ Y4	√	1	1	√	222	B2
N31.9.41 Y1 ⊕ Y1 ⊕ Y1	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N31.9.42 Y1 ⊕ Y1 ⊕ Y3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N31.9.43 Y1 ⊕ Y1 ⊕ Y2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N31.9.44 Y1 ⊕ Y1 ⊕ Y4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N31.9.45 Y1 ⊕ Y3 ⊕ Y2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N31.9.46 Y1 ⊕ Y2 ⊕ Y2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N31.9.47 Y1 ⊕ Y2 ⊕ Y4	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N31.9.48 Y1 ⊕ Y4 ⊕ Y4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N31.9.49 Y2 ⊕ Y2 ⊕ Y2	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N31.9.50 Y2 ⊕ Y2 ⊕ Y4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N31.10.1 GM2 ⊕ Z1Z3	√	1	1	√	222	B1
N31.10.2 GM2 ⊕ Z2Z4	√	1	1	√	222	B1
N31.10.3 GM2 ⊕ T1T3	√	1	1	×	-	-
N31.10.4 GM2 ⊕ T2T4	√	1	1	×	-	-
N31.10.5 GM3 ⊕ Z1Z3	√	1	1	√	$mm2$	B2
N31.10.6 GM3 ⊕ Z2Z4	√	1	1	√	$mm2$	B2
N31.10.7 GM3 ⊕ T1T3	√	1	1	×	-	-
N31.10.8 GM3 ⊕ T2T4	√	1	1	×	-	-

Non-coplanar SSGs with parent space group $Pmn2_1$ (No. 31) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N31.10.9 GM4 ⊕ Z1Z3	√	1	1	√	$mm2$	B1
N31.10.10 GM4 ⊕ Z2Z4	√	1	1	√	$mm2$	B1
N31.10.11 GM4 ⊕ T1T3	√	1	1	×	-	-
N31.10.12 GM4 ⊕ T2T4	√	1	1	×	-	-
N31.10.13 Y1 ⊕ Z1Z3	√	1	1	√	mmm	$\mathrm{B1_u}$
N31.10.14 Y1 ⊕ Z2Z4	√	1	1	√	mmm	$\mathrm{B1_u}$
N31.10.15 Y1 ⊕ T1T3	√	1	1	√	mmm	$\mathrm{B1_u}$
N31.10.16 Y1 ⊕ T2T4	√	1	1	√	mmm	$\mathrm{B1_u}$
N31.10.17 Y2 ⊕ Z1Z3	√	1	1	√	mmm	$\mathrm{B1_u}$
N31.10.18 Y2 ⊕ Z2Z4	√	1	1	√	mmm	$\mathrm{B1_u}$
N31.10.19 Y2 ⊕ T1T3	√	1	1	√	mmm	$\mathrm{B1_u}$
N31.10.20 Y2 ⊕ T2T4	√	1	1	√	mmm	$\mathrm{B1_u}$
N31.11.1 GM2 ⊕ LD1LE1	√	1	1	√	222	B1
N31.11.2 GM2 ⊕ LD2LE2	√	1	1	√	222	B1
N31.11.3 GM2 ⊕ H1HA1	√	1	1	×	-	-
N31.11.4 GM2 ⊕ H2HA2	√	1	1	×	-	-
N31.11.5 GM3 ⊕ LD1LE1	√	1	1	√	$mm2$	B2
N31.11.6 GM3 ⊕ LD2LE2	√	1	1	√	$mm2$	B2
N31.11.7 GM3 ⊕ H1HA1	√	1	1	×	-	-
N31.11.8 GM3 ⊕ H2HA2	√	1	1	×	-	-
N31.11.9 GM4 ⊕ LD1LE1	√	1	1	√	$mm2$	B1
N31.11.10 GM4 ⊕ LD2LE2	√	1	1	√	$mm2$	B1
N31.11.11 GM4 ⊕ H1HA1	√	1	1	×	-	-
N31.11.12 GM4 ⊕ H2HA2	√	1	1	×	-	-
N31.11.13 Y1 ⊕ LD1LE1	√	1	1	√	mmm	$\mathrm{B1_u}$
N31.11.14 Y1 ⊕ LD2LE2	√	1	1	√	mmm	$\mathrm{B1_u}$
N31.11.15 Y1 ⊕ H1HA1	√	1	1	√	mmm	$\mathrm{B1_u}$
N31.11.16 Y1 ⊕ H2HA2	√	1	1	√	mmm	$\mathrm{B1_u}$
N31.11.17 Y2 ⊕ LD1LE1	√	1	1	√	mmm	$\mathrm{B1_u}$
N31.11.18 Y2 ⊕ LD2LE2	√	1	1	√	mmm	$\mathrm{B1_u}$
N31.11.19 Y2 ⊕ H1HA1	√	1	1	√	mmm	$\mathrm{B1_u}$
N31.11.20 Y2 ⊕ H2HA2	√	1	1	√	mmm	$\mathrm{B1_u}$
N31.12.1 GM2 ⊕ R1	√	1	1	×	-	-
N31.12.2 GM2 ⊕ S1	√	1	1	×	-	-
N31.12.3 GM2 ⊕ U1	√	1	1	×	-	-
N31.12.4 GM2 ⊕ X1	√	1	1	√	$mm2$	B1
N31.12.5 GM3 ⊕ R1	√	1	1	×	-	-
N31.12.6 GM3 ⊕ S1	√	1	1	×	-	-
N31.12.7 GM3 ⊕ U1	√	1	1	×	-	-
N31.12.8 GM3 ⊕ X1	√	1	1	√	222	B3
N31.12.9 GM4 ⊕ R1	√	1	1	×	-	-
N31.12.10 GM4 ⊕ S1	√	1	1	×	-	-
N31.12.11 GM4 ⊕ U1	√	1	1	×	-	-
N31.12.12 GM4 ⊕ X1	√	1	1	√	$mm2$	B1
N31.12.13 Y1 ⊕ R1	√	1	1	×	-	-
N31.12.14 Y1 ⊕ S1	√	1	1	√	mmm	$\mathrm{B3_u}$

Non-coplanar SSGs with parent space group $Pmn2_1$ (No. 31) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N31.12.15 Y1 $\oplus$ U1	$\surd$	1	1	$\times$	-	-
N31.12.16 Y1 $\oplus$ X1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N31.12.17 Y2 $\oplus$ R1	$\surd$	1	1	$\times$	-	-
N31.12.18 Y2 $\oplus$ S1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N31.12.19 Y2 $\oplus$ U1	$\surd$	1	1	$\times$	-	-
N31.12.20 Y2 $\oplus$ X1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N31.14.1 GM2 $\oplus$ SM1	$\surd$	1	1	$\surd$	$mm2$	B1
N31.14.2 GM2 $\oplus$ C1	$\surd$	1	1	$\times$	-	-
N31.14.3 GM2 $\oplus$ DT1	$\surd$	1	1	$\surd$	$mm2$	B2
N31.14.4 GM2 $\oplus$ DT2	$\surd$	1	1	$\surd$	$mm2$	B2
N31.14.5 GM3 $\oplus$ SM1	$\surd$	1	1	$\surd$	222	B3
N31.14.6 GM3 $\oplus$ C1	$\surd$	1	1	$\times$	-	-
N31.14.7 GM3 $\oplus$ DT1	$\surd$	1	1	$\surd$	$mm2$	B2
N31.14.8 GM3 $\oplus$ DT2	$\surd$	1	1	$\surd$	$mm2$	B2
N31.14.9 GM4 $\oplus$ SM1	$\surd$	1	1	$\surd$	$mm2$	B1
N31.14.10 GM4 $\oplus$ C1	$\surd$	1	1	$\times$	-	-
N31.14.11 GM4 $\oplus$ DT1	$\surd$	1	1	$\surd$	222	B2
N31.14.12 GM4 $\oplus$ DT2	$\surd$	1	1	$\surd$	222	B2
N31.14.13 Y1 $\oplus$ SM1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N31.14.14 Y1 $\oplus$ C1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N31.14.15 Y1 $\oplus$ DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N31.14.16 Y1 $\oplus$ DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N31.14.17 Y2 $\oplus$ SM1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N31.14.18 Y2 $\oplus$ C1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N31.14.19 Y2 $\oplus$ DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N31.14.20 Y2 $\oplus$ DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$

TABLE S94: Collinear SSGs with parent space group $Pba2$ (No. 32).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L32.1.1 GM1	1	mmm	$\mathrm{A_g}$
L32.2.1 GM2	1	mmm	$\mathrm{B1_g}$
L32.2.2 GM3	1	mmm	$\mathrm{B3_g}$
L32.2.3 Z1	0	-	-
L32.2.4 Z2	0	-	-
L32.2.5 Z3	0	-	-

TABLE S95: Coplanar SSGs with parent space group $Pba2$ (No. 32).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P32.1.1 GM1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B1_u}$
P32.2.1 GM2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$
P32.2.2 GM3	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
P32.2.3 Z1	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P32.2.4 Z2	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P32.2.5 Z3	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$

Coplanar SSGs with parent space group $Pba2$ (No. 32) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P32.3.1 GM2 ⊕ GM2	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
P32.3.2 GM2 ⊕ GM3	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
P32.3.3 GM2 ⊕ Z1	√	1	1	×	-	-
P32.3.4 GM2 ⊕ Z2	√	1	1	×	-	-
P32.3.5 GM2 ⊕ Z3	√	1	1	×	-	-
P32.3.6 GM3 ⊕ GM3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
P32.3.7 GM3 ⊕ GM4	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
P32.3.8 GM3 ⊕ Z1	√	1	1	×	-	-
P32.3.9 GM3 ⊕ Z2	√	1	1	×	-	-
P32.3.10 GM3 ⊕ Z3	√	1	1	×	-	-
P32.3.11 GM3 ⊕ Z4	√	1	1	×	-	-
P32.3.12 Z1 ⊕ Z1	√	1	1	√	mmm	$\mathrm{B1_u}$
P32.3.13 Z1 ⊕ Z2	√	1	1	×	-	-
P32.3.14 Z1 ⊕ Z3	√	1	1	×	-	-
P32.3.15 Z2 ⊕ Z2	√	1	1	√	mmm	$\mathrm{B1_u}$
P32.3.16 Z2 ⊕ Z3	√	1	1	×	-	-
P32.3.17 Z3 ⊕ Z3	√	1	1	√	mmm	$\mathrm{B1_u}$
P32.3.18 Z3 ⊕ Z4	√	1	1	×	-	-
P32.4.1 S1S2	√	1	1	×	-	-
P32.4.2 R1R2	√	1	1	×	-	-
P32.5.1 LD1LE1	√	1	1	√	mmm	$\mathrm{B1_u}$
P32.5.2 LD2LE2	√	1	1	√	mmm	$\mathrm{B1_u}$
P32.5.3 LD3LE3	√	1	1	√	mmm	$\mathrm{B1_u}$
P32.5.4 Q1QA1	√	1	1	×	-	-
P32.6.1 T1	√	1	1	×	-	-
P32.6.2 X1	√	1	1	√	mmm	$\mathrm{B3_u}$
P32.8.1 DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
P32.8.2 A1	√	1	1	×	-	-

TABLE S96: Non-coplanar SSGs with parent space group $Pba2$ (No. 32).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N32.1.1 GM1	√	3	3	√	$mm2$	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{A1}$
N32.2.1 GM2	√	3	3	√	222	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{B1}$
N32.2.2 GM3	√	3	3	√	$mm2$	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{B2}$
N32.2.3 Z1	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B1_u}$
N32.2.4 Z2	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B1_u}$
N32.2.5 Z3	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B1_u}$
N32.3.1 GM2 ⊕ GM2	√	3	3	√	$mm2$	$\mathrm{A1} \oplus \mathrm{A2} \oplus \mathrm{A2}$
N32.3.2 GM2 ⊕ GM3	√	3	3	√	$mm2$	$\mathrm{A1} \oplus \mathrm{A2} \oplus \mathrm{B2}$
N32.3.3 GM2 ⊕ Z1	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$
N32.3.4 GM2 ⊕ Z2	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$
N32.3.5 GM2 ⊕ Z3	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$
N32.3.6 GM3 ⊕ GM3	√	3	3	√	$mm2$	$\mathrm{A1} \oplus \mathrm{B2} \oplus \mathrm{B2}$
N32.3.7 GM3 ⊕ GM4	√	3	3	√	222	$\mathrm{A1} \oplus \mathrm{B3} \oplus \mathrm{B2}$
N32.3.8 GM3 ⊕ Z1	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$

Non-coplanar SSGs with parent space group $Pba2$ (No. 32) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N32.3.9 GM3 ⊕ Z2	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N32.3.10 GM3 ⊕ Z3	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N32.3.11 GM3 ⊕ Z4	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N32.3.12 Z1 ⊕ Z1	√	1	1	√	$mm2$	A1
N32.3.13 Z1 ⊕ Z2	√	1	1	√	222	A1
N32.3.14 Z1 ⊕ Z3	√	1	1	√	$mm2$	A1
N32.3.15 Z2 ⊕ Z2	√	1	1	√	$mm2$	A1
N32.3.16 Z2 ⊕ Z3	√	1	1	√	$mm2$	A1
N32.3.17 Z3 ⊕ Z3	√	1	1	√	$mm2$	A1
N32.3.18 Z3 ⊕ Z4	√	1	1	√	222	A1
N32.4.1 S1S2	√	1	1	√	$mm2$	A1
N32.4.2 R1R2	√	1	1	√	$mm2$	A1
N32.5.1 LD1LE1	√	1	1	√	$mm2$	A1
N32.5.2 LD2LE2	√	1	1	√	$mm2$	A1
N32.5.3 LD3LE3	√	1	1	√	$mm2$	A1
N32.5.4 Q1QA1	√	1	1	√	$mm2$	A1
N32.6.1 T1	√	1	1	√	$mm2$	A1
N32.6.2 X1	√	1	1	√	$mm2$	A1
N32.8.1 DT1	√	1	1	√	$mm2$	A1
N32.8.2 A1	√	1	1	√	$mm2$	A1
N32.9.1 GM2 ⊕ GM2 ⊕ GM2	√	3	3	√	222	B1 ⊕ B1 ⊕ B1
N32.9.2 GM2 ⊕ GM2 ⊕ GM3	√	3	3	√	$mm2$	B2 ⊕ B1 ⊕ B1
N32.9.3 GM2 ⊕ GM2 ⊕ Z1	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N32.9.4 GM2 ⊕ GM2 ⊕ Z2	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N32.9.5 GM2 ⊕ GM2 ⊕ Z3	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N32.9.6 GM2 ⊕ GM3 ⊕ GM3	√	3	3	√	222	B1 ⊕ B3 ⊕ B3
N32.9.7 GM2 ⊕ GM3 ⊕ GM4	√	3	3	√	$mm2$	A2 ⊕ B2 ⊕ B1
N32.9.8 GM2 ⊕ GM3 ⊕ Z1	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N32.9.9 GM2 ⊕ GM3 ⊕ Z2	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N32.9.10 GM2 ⊕ GM3 ⊕ Z3	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N32.9.11 GM2 ⊕ GM3 ⊕ Z4	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N32.9.12 GM2 ⊕ Z1 ⊕ Z1	√	1	1	√	222	B1
N32.9.13 GM2 ⊕ Z1 ⊕ Z2	√	1	1	×	-	-
N32.9.14 GM2 ⊕ Z1 ⊕ Z3	√	1	1	×	-	-
N32.9.15 GM2 ⊕ Z2 ⊕ Z2	√	1	1	√	222	B1
N32.9.16 GM2 ⊕ Z2 ⊕ Z3	√	1	1	×	-	-
N32.9.17 GM2 ⊕ Z3 ⊕ Z3	√	1	1	√	222	B1
N32.9.18 GM2 ⊕ Z3 ⊕ Z4	√	1	1	×	-	-
N32.9.19 GM3 ⊕ GM3 ⊕ GM3	√	3	3	√	$mm2$	B2 ⊕ B2 ⊕ B2
N32.9.20 GM3 ⊕ GM3 ⊕ GM4	√	3	3	√	$mm2$	A2 ⊕ A2 ⊕ B1
N32.9.21 GM3 ⊕ GM3 ⊕ Z1	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N32.9.22 GM3 ⊕ GM4 ⊕ Z1	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N32.9.23 GM3 ⊕ GM3 ⊕ Z2	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N32.9.24 GM3 ⊕ GM4 ⊕ Z2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N32.9.25 GM3 ⊕ GM3 ⊕ Z3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N32.9.26 GM3 ⊕ GM3 ⊕ Z4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$

Non-coplanar SSGs with parent space group $Pba2$ (No. 32) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N32.9.27 GM3 ⊕ GM4 ⊕ Z3	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N32.9.28 GM3 ⊕ Z1 ⊕ Z1	√	1	1	√	$mm2$	B2
N32.9.29 GM3 ⊕ Z1 ⊕ Z2	√	1	1	×	-	-
N32.9.30 GM3 ⊕ Z1 ⊕ Z3	√	1	1	×	-	-
N32.9.31 GM3 ⊕ Z1 ⊕ Z4	√	1	1	×	-	-
N32.9.32 GM3 ⊕ Z2 ⊕ Z2	√	1	1	√	$mm2$	B2
N32.9.33 GM3 ⊕ Z2 ⊕ Z3	√	1	1	×	-	-
N32.9.34 GM3 ⊕ Z2 ⊕ Z4	√	1	1	×	-	-
N32.9.35 GM3 ⊕ Z3 ⊕ Z3	√	1	1	√	$mm2$	B2
N32.9.36 GM3 ⊕ Z3 ⊕ Z4	√	1	1	×	-	-
N32.9.37 GM3 ⊕ Z4 ⊕ Z4	√	1	1	√	$mm2$	B2
N32.9.38 Z1 ⊕ Z1 ⊕ Z1	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N32.9.39 Z1 ⊕ Z1 ⊕ Z2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N32.9.40 Z1 ⊕ Z1 ⊕ Z3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N32.9.41 Z1 ⊕ Z2 ⊕ Z2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N32.9.42 Z1 ⊕ Z2 ⊕ Z3	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N32.9.43 Z1 ⊕ Z3 ⊕ Z3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N32.9.44 Z1 ⊕ Z3 ⊕ Z4	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N32.9.45 Z2 ⊕ Z2 ⊕ Z2	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N32.9.46 Z2 ⊕ Z2 ⊕ Z3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N32.9.47 Z2 ⊕ Z3 ⊕ Z3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N32.9.48 Z2 ⊕ Z3 ⊕ Z4	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N32.9.49 Z3 ⊕ Z3 ⊕ Z3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N32.9.50 Z3 ⊕ Z3 ⊕ Z4	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N32.10.1 GM2 ⊕ S1S2	√	1	1	×	-	-
N32.10.2 GM2 ⊕ R1R2	√	1	1	×	-	-
N32.10.3 GM3 ⊕ S1S2	√	1	1	×	-	-
N32.10.4 GM3 ⊕ R1R2	√	1	1	×	-	-
N32.10.5 Z1 ⊕ S1S2	√	1	1	×	-	-
N32.10.6 Z1 ⊕ R1R2	√	1	1	×	-	-
N32.10.7 Z2 ⊕ S1S2	√	1	1	×	-	-
N32.10.8 Z2 ⊕ R1R2	√	1	1	×	-	-
N32.10.9 Z3 ⊕ S1S2	√	1	1	×	-	-
N32.10.10 Z3 ⊕ R1R2	√	1	1	×	-	-
N32.11.1 GM2 ⊕ LD1LE1	√	1	1	√	222	B1
N32.11.2 GM2 ⊕ LD2LE2	√	1	1	√	222	B1
N32.11.3 GM2 ⊕ LD3LE3	√	1	1	√	222	B1
N32.11.4 GM2 ⊕ Q1QA1	√	1	1	×	-	-
N32.11.5 GM3 ⊕ LD1LE1	√	1	1	√	$mm2$	B2
N32.11.6 GM3 ⊕ LD2LE2	√	1	1	√	$mm2$	B2
N32.11.7 GM3 ⊕ LD3LE3	√	1	1	√	$mm2$	B2
N32.11.8 GM3 ⊕ LD4LE4	√	1	1	√	$mm2$	B2
N32.11.9 GM3 ⊕ Q1QA1	√	1	1	×	-	-
N32.11.10 Z1 ⊕ LD1LE1	√	1	1	√	mmm	$\mathrm{B1_u}$
N32.11.11 Z1 ⊕ LD2LE2	√	1	1	√	mmm	$\mathrm{B1_u}$
N32.11.12 Z1 ⊕ LD3LE3	√	1	1	√	mmm	$\mathrm{B1_u}$

Non-coplanar SSGs with parent space group $Pba2$ (No. 32) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N32.11.13 Z1 ⊕ Q1QA1	√	1	1	×	-	-
N32.11.14 Z2 ⊕ LD1LE1	√	1	1	√	mmm	$\mathrm{B1_u}$
N32.11.15 Z2 ⊕ LD2LE2	√	1	1	√	mmm	$\mathrm{B1_u}$
N32.11.16 Z2 ⊕ LD3LE3	√	1	1	√	mmm	$\mathrm{B1_u}$
N32.11.17 Z2 ⊕ Q1QA1	√	1	1	×	-	-
N32.11.18 Z3 ⊕ LD1LE1	√	1	1	√	mmm	$\mathrm{B1_u}$
N32.11.19 Z3 ⊕ LD2LE2	√	1	1	√	mmm	$\mathrm{B1_u}$
N32.11.20 Z3 ⊕ LD3LE3	√	1	1	√	mmm	$\mathrm{B1_u}$
N32.11.21 Z3 ⊕ LD4LE4	√	1	1	√	mmm	$\mathrm{B1_u}$
N32.11.22 Z3 ⊕ Q1QA1	√	1	1	×	-	-
N32.12.1 GM2 ⊕ T1	√	1	1	×	-	-
N32.12.2 GM2 ⊕ X1	√	1	1	√	$mm2$	B1
N32.12.3 GM3 ⊕ T1	√	1	1	×	-	-
N32.12.4 GM3 ⊕ U1	√	1	1	×	-	-
N32.12.5 GM3 ⊕ X1	√	1	1	√	222	B3
N32.12.6 GM3 ⊕ Y1	√	1	1	√	$mm2$	B2
N32.12.7 Z1 ⊕ T1	√	1	1	√	mmm	$\mathrm{B2_u}$
N32.12.8 Z1 ⊕ X1	√	1	1	√	mmm	$\mathrm{B3_u}$
N32.12.9 Z2 ⊕ T1	√	1	1	√	mmm	$\mathrm{B2_u}$
N32.12.10 Z2 ⊕ X1	√	1	1	√	mmm	$\mathrm{B3_u}$
N32.12.11 Z3 ⊕ T1	√	1	1	√	mmm	$\mathrm{B2_u}$
N32.12.12 Z3 ⊕ U1	√	1	1	√	mmm	$\mathrm{B3_u}$
N32.12.13 Z3 ⊕ X1	√	1	1	√	mmm	$\mathrm{B3_u}$
N32.12.14 Z3 ⊕ Y1	√	1	1	√	mmm	$\mathrm{B2_u}$
N32.14.1 GM2 ⊕ DT1	√	1	1	√	$mm2$	B2
N32.14.2 GM2 ⊕ A1	√	1	1	×	-	-
N32.14.3 GM3 ⊕ SM1	√	1	1	√	222	B3
N32.14.4 GM3 ⊕ DT1	√	1	1	√	$mm2$	B2
N32.14.5 GM3 ⊕ A1	√	1	1	×	-	-
N32.14.6 GM3 ⊕ B1	√	1	1	×	-	-
N32.14.7 Z1 ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N32.14.8 Z1 ⊕ A1	√	1	1	√	mmm	$\mathrm{B3_u}$
N32.14.9 Z2 ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N32.14.10 Z2 ⊕ A1	√	1	1	√	mmm	$\mathrm{B3_u}$
N32.14.11 Z3 ⊕ SM1	√	1	1	√	mmm	$\mathrm{B3_u}$
N32.14.12 Z3 ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N32.14.13 Z3 ⊕ A1	√	1	1	√	mmm	$\mathrm{B3_u}$
N32.14.14 Z3 ⊕ B1	√	1	1	√	mmm	$\mathrm{B2_u}$

TABLE S97: Collinear SSGs with parent space group $Pna2_1$ (No. 33).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L33.1.1 GM1	1	mmm	$\mathrm{A_g}$
L33.2.1 GM2	1	mmm	$\mathrm{B1_g}$
L33.2.2 GM3	1	mmm	$\mathrm{B3_g}$
L33.2.3 GM4	1	mmm	$\mathrm{B2_g}$

Coplanar SSGs with parent space group $Pna2_1$ (No. 33) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation

TABLE S98: Coplanar SSGs with parent space group $Pna2_1$ (No. 33).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P33.1.1 GM1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{B1_u}$
P33.2.1 GM2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_u}\oplus\mathrm{B1_g}$
P33.2.2 GM3	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}\oplus\mathrm{B2_u}$
P33.2.3 GM4	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}\oplus\mathrm{B2_g}$
P33.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B1_u}$
P33.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B3_g}\oplus\mathrm{B3_u}$
P33.3.3 GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B2_g}\oplus\mathrm{B2_u}$
P33.3.4 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B3_g}\oplus\mathrm{B3_g}$
P33.3.5 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B3_g}\oplus\mathrm{B2_g}$
P33.3.6 GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B2_g}\oplus\mathrm{B2_g}$
P33.4.1 Z1Z4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P33.4.2 Z2Z3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P33.4.3 S1S2	$\surd$	1	1	$\times$	-	-
P33.4.4 R1R3	$\surd$	1	1	$\times$	-	-
P33.5.1 LD1LE1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P33.5.2 LD2LE2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P33.5.3 Q1QA1	$\surd$	1	1	$\times$	-	-
P33.6.1 T1	$\surd$	1	1	$\times$	-	-
P33.6.2 X1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P33.6.3 Y1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P33.8.1 SM1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P33.8.2 DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$

TABLE S99: Non-coplanar SSGs with parent space group $Pna2_1$ (No. 33).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N33.1.1 GM1	$\surd$	3	3	$\surd$	$mm2$	A1 $\oplus$ A1 $\oplus$ A1
N33.2.1 GM2	$\surd$	3	3	$\surd$	222	A1 $\oplus$ A1 $\oplus$ B1
N33.2.2 GM3	$\surd$	3	3	$\surd$	$mm2$	A1 $\oplus$ A1 $\oplus$ B2
N33.2.3 GM4	$\surd$	3	3	$\surd$	$mm2$	A1 $\oplus$ A1 $\oplus$ B1
N33.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$mm2$	A1 $\oplus$ A2 $\oplus$ A2
N33.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$mm2$	A1 $\oplus$ A2 $\oplus$ B2
N33.3.3 GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	$mm2$	A1 $\oplus$ A2 $\oplus$ B1
N33.3.4 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	$mm2$	A1 $\oplus$ B2 $\oplus$ B2
N33.3.5 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	222	A1 $\oplus$ B3 $\oplus$ B2
N33.3.6 GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	$mm2$	A1 $\oplus$ B1 $\oplus$ B1
N33.4.1 Z1Z4	$\surd$	1	1	$\surd$	$mm2$	A1
N33.4.2 Z2Z3	$\surd$	1	1	$\surd$	$mm2$	A1
N33.4.3 S1S2	$\surd$	1	1	$\surd$	$mm2$	A1
N33.4.4 R1R3	$\surd$	1	1	$\surd$	$mm2$	A1

Non-coplanar SSGs with parent space group $Pna2_1$ (No. 33) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N33.5.1 LD1LE1	√	1	1	√	$mm2$	A1
N33.5.2 LD2LE2	√	1	1	√	$mm2$	A1
N33.5.3 Q1QA1	√	1	1	√	$mm2$	A1
N33.6.1 T1	√	1	1	√	222	A1
N33.6.2 X1	√	1	1	√	$mm2$	A1
N33.6.3 Y1	√	1	1	√	$mm2$	A1
N33.8.1 SM1	√	1	1	√	$mm2$	A1
N33.8.2 DT1	√	1	1	√	$mm2$	A1
N33.9.1 GM2 ⊕ GM2 ⊕ GM2	√	3	3	√	222	B1 ⊕ B1 ⊕ B1
N33.9.2 GM2 ⊕ GM2 ⊕ GM3	√	3	3	√	$mm2$	B2 ⊕ B1 ⊕ B1
N33.9.3 GM2 ⊕ GM2 ⊕ GM4	√	3	3	√	$mm2$	B2 ⊕ B2 ⊕ B1
N33.9.4 GM2 ⊕ GM3 ⊕ GM3	√	3	3	√	222	B1 ⊕ B3 ⊕ B3
N33.9.5 GM2 ⊕ GM3 ⊕ GM4	√	3	3	√	$mm2$	A2 ⊕ B2 ⊕ B1
N33.9.6 GM2 ⊕ GM4 ⊕ GM4	√	3	3	√	222	B1 ⊕ B2 ⊕ B2
N33.9.7 GM3 ⊕ GM3 ⊕ GM3	√	3	3	√	$mm2$	B2 ⊕ B2 ⊕ B2
N33.9.8 GM3 ⊕ GM3 ⊕ GM4	√	3	3	√	$mm2$	A2 ⊕ A2 ⊕ B1
N33.9.9 GM3 ⊕ GM4 ⊕ GM4	√	3	3	√	$mm2$	A2 ⊕ A2 ⊕ B2
N33.9.10 GM4 ⊕ GM4 ⊕ GM4	√	3	3	√	$mm2$	B1 ⊕ B1 ⊕ B1
N33.10.1 GM2 ⊕ Z1Z4	√	1	1	√	222	B1
N33.10.2 GM2 ⊕ Z2Z3	√	1	1	√	222	B1
N33.10.3 GM2 ⊕ S1S2	√	1	1	×	-	-
N33.10.4 GM2 ⊕ R1R3	√	1	1	×	-	-
N33.10.5 GM3 ⊕ Z1Z4	√	1	1	√	$mm2$	B2
N33.10.6 GM3 ⊕ Z2Z3	√	1	1	√	$mm2$	B2
N33.10.7 GM3 ⊕ S1S2	√	1	1	×	-	-
N33.10.8 GM3 ⊕ R1R3	√	1	1	×	-	-
N33.10.9 GM4 ⊕ Z1Z4	√	1	1	√	$mm2$	B1
N33.10.10 GM4 ⊕ Z2Z3	√	1	1	√	$mm2$	B1
N33.10.11 GM4 ⊕ S1S2	√	1	1	×	-	-
N33.10.12 GM4 ⊕ R1R3	√	1	1	×	-	-
N33.11.1 GM2 ⊕ LD1LE1	√	1	1	√	222	B1
N33.11.2 GM2 ⊕ LD2LE2	√	1	1	√	222	B1
N33.11.3 GM2 ⊕ Q1QA1	√	1	1	×	-	-
N33.11.4 GM3 ⊕ LD1LE1	√	1	1	√	$mm2$	B2
N33.11.5 GM3 ⊕ LD2LE2	√	1	1	√	$mm2$	B2
N33.11.6 GM3 ⊕ Q1QA1	√	1	1	×	-	-
N33.11.7 GM4 ⊕ LD1LE1	√	1	1	√	$mm2$	B1
N33.11.8 GM4 ⊕ LD2LE2	√	1	1	√	$mm2$	B1
N33.11.9 GM4 ⊕ Q1QA1	√	1	1	×	-	-
N33.12.1 GM2 ⊕ T1	√	1	1	×	-	-
N33.12.2 GM2 ⊕ X1	√	1	1	√	$mm2$	B1
N33.12.3 GM2 ⊕ Y1	√	1	1	√	$mm2$	B2
N33.12.4 GM3 ⊕ T1	√	1	1	×	-	-
N33.12.5 GM3 ⊕ X1	√	1	1	√	222	B3
N33.12.6 GM3 ⊕ Y1	√	1	1	√	$mm2$	B2
N33.12.7 GM4 ⊕ T1	√	1	1	×	-	-

Non-coplanar SSGs with parent space group $Pna2_1$ (No. 33) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N33.12.8 GM4 $\oplus$ X1	$\surd$	1	1	$\surd$	$mm2$	B1
N33.12.9 GM4 $\oplus$ Y1	$\surd$	1	1	$\surd$	222	B2
N33.14.1 GM2 $\oplus$ SM1	$\surd$	1	1	$\surd$	$mm2$	B1
N33.14.2 GM2 $\oplus$ DT1	$\surd$	1	1	$\surd$	$mm2$	B2
N33.14.3 GM3 $\oplus$ SM1	$\surd$	1	1	$\surd$	222	B3
N33.14.4 GM3 $\oplus$ DT1	$\surd$	1	1	$\surd$	$mm2$	B2
N33.14.5 GM4 $\oplus$ SM1	$\surd$	1	1	$\surd$	$mm2$	B1
N33.14.6 GM4 $\oplus$ DT1	$\surd$	1	1	$\surd$	222	B2

TABLE S100: Collinear SSGs with parent space group $Pnn2$ (No. 34).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L34.1.1 GM1	1	mmm	$\mathrm{A_g}$
L34.2.1 GM2	1	mmm	$\mathrm{B1_g}$
L34.2.2 GM3	1	mmm	$\mathrm{B3_g}$
L34.2.3 R1	0	-	-

TABLE S101: Coplanar SSGs with parent space group $Pnn2$ (No. 34).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P34.1.1 GM1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B1_u}$
P34.2.1 GM2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$
P34.2.2 GM3	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
P34.2.3 R1	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P34.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
P34.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
P34.3.3 GM2 $\oplus$ R1	$\surd$	1	1	$\times$	-	-
P34.3.4 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
P34.3.5 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
P34.3.6 GM3 $\oplus$ R1	$\surd$	1	1	$\times$	-	-
P34.3.7 R1 $\oplus$ R1	$\surd$	1	1	$\times$	-	-
P34.3.8 R1 $\oplus$ R2	$\surd$	1	1	$\times$	-	-
P34.3.9 R1 $\oplus$ R3	$\surd$	1	1	$\times$	-	-
P34.4.1 Z1Z2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P34.4.2 Z3Z4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P34.4.3 S1S2	$\surd$	1	1	$\times$	-	-
P34.5.1 LD1LE1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P34.5.2 LD3LE3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P34.5.3 Q1QA1	$\surd$	1	1	$\times$	-	-
P34.6.1 T1	$\surd$	1	1	$\times$	-	-
P34.6.2 X1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P34.8.1 DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P34.8.2 E1	$\surd$	1	1	$\times$	-	-

TABLE S102: Non-coplanar SSGs with parent space group $Pnn2$ (No. 34).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N34.1.1 GM1	√	3	3	√	$mm2$	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{A1}$
N34.2.1 GM2	√	3	3	√	222	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{B1}$
N34.2.2 GM3	√	3	3	√	$mm2$	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{B2}$
N34.2.3 R1	√	3	3	√	mmm	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{B1_u}$
N34.3.1 GM2 ⊕ GM2	√	3	3	√	$mm2$	$\mathrm{A1}\oplus\mathrm{A2}\oplus\mathrm{A2}$
N34.3.2 GM2 ⊕ GM3	√	3	3	√	$mm2$	$\mathrm{A1}\oplus\mathrm{A2}\oplus\mathrm{B2}$
N34.3.3 GM2 ⊕ R1	√	3	3	√	mmm	$\mathrm{A_g}\oplus\mathrm{A_u}\oplus\mathrm{B1_g}$
N34.3.4 GM3 ⊕ GM3	√	3	3	√	$mm2$	$\mathrm{A1}\oplus\mathrm{B2}\oplus\mathrm{B2}$
N34.3.5 GM3 ⊕ GM4	√	3	3	√	222	$\mathrm{A1}\oplus\mathrm{B3}\oplus\mathrm{B2}$
N34.3.6 GM3 ⊕ R1	√	3	3	√	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}\oplus\mathrm{B2_u}$
N34.3.7 R1 ⊕ R1	√	1	1	√	$mm2$	A1
N34.3.8 R1 ⊕ R2	√	1	1	√	222	A1
N34.3.9 R1 ⊕ R3	√	1	1	√	$mm2$	A1
N34.4.1 Z1Z2	√	1	1	√	$mm2$	A1
N34.4.2 Z3Z4	√	1	1	√	$mm2$	A1
N34.4.3 S1S2	√	1	1	√	$mm2$	A1
N34.5.1 LD1LE1	√	1	1	√	$mm2$	A1
N34.5.2 LD3LE3	√	1	1	√	$mm2$	A1
N34.5.3 Q1QA1	√	1	1	√	$mm2$	A1
N34.6.1 T1	√	1	1	√	$mm2$	A1
N34.6.2 X1	√	1	1	√	$mm2$	A1
N34.8.1 DT1	√	1	1	√	$mm2$	A1
N34.8.2 E1	√	1	1	√	$mm2$	A1
N34.9.1 GM2 ⊕ GM2 ⊕ GM2	√	3	3	√	222	$\mathrm{B1}\oplus\mathrm{B1}\oplus\mathrm{B1}$
N34.9.2 GM2 ⊕ GM2 ⊕ GM3	√	3	3	√	$mm2$	$\mathrm{B2}\oplus\mathrm{B1}\oplus\mathrm{B1}$
N34.9.3 GM2 ⊕ GM2 ⊕ R1	√	3	3	√	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B1_u}$
N34.9.4 GM2 ⊕ GM3 ⊕ GM3	√	3	3	√	222	$\mathrm{B1}\oplus\mathrm{B3}\oplus\mathrm{B3}$
N34.9.5 GM2 ⊕ GM3 ⊕ GM4	√	3	3	√	$mm2$	$\mathrm{A2}\oplus\mathrm{B2}\oplus\mathrm{B1}$
N34.9.6 GM2 ⊕ GM3 ⊕ R1	√	3	3	√	mmm	$\mathrm{B1_g}\oplus\mathrm{B3_g}\oplus\mathrm{B3_u}$
N34.9.7 GM2 ⊕ R1 ⊕ R1	√	1	1	×	-	-
N34.9.8 GM2 ⊕ R1 ⊕ R2	√	1	1	×	-	-
N34.9.9 GM2 ⊕ R1 ⊕ R3	√	1	1	×	-	-
N34.9.10 GM3 ⊕ GM3 ⊕ GM3	√	3	3	√	$mm2$	$\mathrm{B2}\oplus\mathrm{B2}\oplus\mathrm{B2}$
N34.9.11 GM3 ⊕ GM3 ⊕ GM4	√	3	3	√	$mm2$	$\mathrm{A2}\oplus\mathrm{A2}\oplus\mathrm{B1}$
N34.9.12 GM3 ⊕ GM3 ⊕ R1	√	3	3	√	mmm	$\mathrm{B1_u}\oplus\mathrm{B3_g}\oplus\mathrm{B3_g}$
N34.9.13 GM3 ⊕ GM4 ⊕ R1	√	3	3	√	mmm	$\mathrm{A_u}\oplus\mathrm{B3_g}\oplus\mathrm{B2_g}$
N34.9.14 GM3 ⊕ R1 ⊕ R1	√	1	1	×	-	-
N34.9.15 GM3 ⊕ R1 ⊕ R2	√	1	1	×	-	-
N34.9.16 GM3 ⊕ R1 ⊕ R3	√	1	1	×	-	-
N34.9.17 GM3 ⊕ R1 ⊕ R4	√	1	1	×	-	-
N34.9.18 R1 ⊕ R1 ⊕ R1	√	3	3	√	mmm	$\mathrm{B1_u}\oplus\mathrm{B1_u}\oplus\mathrm{B1_u}$
N34.9.19 R1 ⊕ R1 ⊕ R2	√	3	3	√	mmm	$\mathrm{A_u}\oplus\mathrm{A_u}\oplus\mathrm{B1_u}$
N34.9.20 R1 ⊕ R1 ⊕ R3	√	3	3	√	mmm	$\mathrm{B1_u}\oplus\mathrm{B2_u}\oplus\mathrm{B2_u}$
N34.9.21 R1 ⊕ R2 ⊕ R3	√	3	3	√	mmm	$\mathrm{A_u}\oplus\mathrm{B3_u}\oplus\mathrm{B2_u}$
N34.10.1 GM2 ⊕ Z1Z2	√	1	1	√	222	B1
N34.10.2 GM2 ⊕ Z3Z4	√	1	1	√	222	B1

Non-coplanar SSGs with parent space group $Pnn2$ (No. 34) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N34.10.3 GM2 ⊕ S1S2	√	1	1	×	-	-
N34.10.4 GM3 ⊕ Z1Z2	√	1	1	√	$mm2$	B2
N34.10.5 GM3 ⊕ Z3Z4	√	1	1	√	$mm2$	B2
N34.10.6 GM3 ⊕ S1S2	√	1	1	×	-	-
N34.10.7 R1 ⊕ Z1Z2	√	1	1	√	mmm	$\mathrm{B1_u}$
N34.10.8 R1 ⊕ Z3Z4	√	1	1	√	mmm	$\mathrm{B1_u}$
N34.10.9 R1 ⊕ S1S2	√	1	1	√	mmm	$\mathrm{B1_u}$
N34.10.10 R1 ⊕ S3S4	√	1	1	√	mmm	$\mathrm{B1_u}$
N34.11.1 GM2 ⊕ LD1LE1	√	1	1	√	222	B1
N34.11.2 GM2 ⊕ LD3LE3	√	1	1	√	222	B1
N34.11.3 GM2 ⊕ Q1QA1	√	1	1	×	-	-
N34.11.4 GM3 ⊕ LD1LE1	√	1	1	√	$mm2$	B2
N34.11.5 GM3 ⊕ LD3LE3	√	1	1	√	$mm2$	B2
N34.11.6 GM3 ⊕ Q1QA1	√	1	1	×	-	-
N34.11.7 R1 ⊕ LD1LE1	√	1	1	√	mmm	$\mathrm{B1_u}$
N34.11.8 R1 ⊕ LD3LE3	√	1	1	√	mmm	$\mathrm{B1_u}$
N34.11.9 R1 ⊕ Q1QA1	√	1	1	√	mmm	$\mathrm{B1_u}$
N34.11.10 R1 ⊕ Q3QA3	√	1	1	√	mmm	$\mathrm{B1_u}$
N34.12.1 GM2 ⊕ T1	√	1	1	×	-	-
N34.12.2 GM2 ⊕ X1	√	1	1	√	$mm2$	B1
N34.12.3 GM3 ⊕ T1	√	1	1	×	-	-
N34.12.4 GM3 ⊕ U1	√	1	1	×	-	-
N34.12.5 GM3 ⊕ X1	√	1	1	√	222	B3
N34.12.6 GM3 ⊕ Y1	√	1	1	√	$mm2$	B2
N34.12.7 R1 ⊕ T1	√	1	1	√	mmm	$\mathrm{B3_u}$
N34.12.8 R1 ⊕ X1	√	1	1	√	mmm	$\mathrm{B3_u}$
N34.14.1 GM2 ⊕ DT1	√	1	1	√	$mm2$	B2
N34.14.2 GM2 ⊕ E1	√	1	1	×	-	-
N34.14.3 GM3 ⊕ SM1	√	1	1	√	222	B3
N34.14.4 GM3 ⊕ DT1	√	1	1	√	$mm2$	B2
N34.14.5 GM3 ⊕ E1	√	1	1	×	-	-
N34.14.6 GM3 ⊕ P1	√	1	1	×	-	-
N34.14.7 R1 ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N34.14.8 R1 ⊕ E1	√	1	1	√	mmm	$\mathrm{B3_u}$

TABLE S103: Collinear SSGs with parent space group $Cmm2$ (No. 35).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L35.1.1 GM1	1	mmm	$\mathrm{A_g}$
L35.2.1 GM2	1	mmm	$\mathrm{B1_g}$
L35.2.2 GM3	1	mmm	$\mathrm{B3_g}$
L35.2.3 T1	0	-	-
L35.2.4 T2	0	-	-
L35.2.5 T3	0	-	-
L35.2.6 Y1	0	-	-
L35.2.7 Y2	0	-	-

Collinear SSGs with parent space group $Cmm2$ (No. 35)(continued)

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L35.2.8 Y3	0	-	-
L35.2.9 Z1	0	-	-
L35.2.10 Z2	0	-	-
L35.2.11 Z3	0	-	-

TABLE S104: Coplanar SSGs with parent space group $Cmm2$ (No. 35).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P35.1.1 GM1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{B1_u}$
P35.2.1 GM2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_u}\oplus\mathrm{B1_g}$
P35.2.2 GM3	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}\oplus\mathrm{B2_u}$
P35.2.3 T1	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P35.2.4 T2	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P35.2.5 T3	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P35.2.6 Y1	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P35.2.7 Y2	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P35.2.8 Y3	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P35.2.9 Z1	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P35.2.10 Z2	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P35.2.11 Z3	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P35.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B1_u}$
P35.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B3_g}\oplus\mathrm{B3_u}$
P35.3.3 GM2 $\oplus$ T1	$\surd$	1	1	$\times$	-	-
P35.3.4 GM2 $\oplus$ T2	$\surd$	1	1	$\times$	-	-
P35.3.5 GM2 $\oplus$ T3	$\surd$	1	1	$\times$	-	-
P35.3.6 GM2 $\oplus$ Y1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
P35.3.7 GM2 $\oplus$ Y2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
P35.3.8 GM2 $\oplus$ Y3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
P35.3.9 GM2 $\oplus$ Z1	$\surd$	1	1	$\times$	-	-
P35.3.10 GM2 $\oplus$ Z2	$\surd$	1	1	$\times$	-	-
P35.3.11 GM2 $\oplus$ Z3	$\surd$	1	1	$\times$	-	-
P35.3.12 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B3_g}\oplus\mathrm{B3_g}$
P35.3.13 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B3_g}\oplus\mathrm{B2_g}$
P35.3.14 GM3 $\oplus$ T1	$\surd$	1	1	$\times$	-	-
P35.3.15 GM3 $\oplus$ T2	$\surd$	1	1	$\times$	-	-
P35.3.16 GM3 $\oplus$ T3	$\surd$	1	1	$\times$	-	-
P35.3.17 GM3 $\oplus$ T4	$\surd$	1	1	$\times$	-	-
P35.3.18 GM3 $\oplus$ Y1	$\surd$	1	1	$\times$	-	-
P35.3.19 GM3 $\oplus$ Y2	$\surd$	1	1	$\times$	-	-
P35.3.20 GM3 $\oplus$ Y3	$\surd$	1	1	$\times$	-	-
P35.3.21 GM3 $\oplus$ Y4	$\surd$	1	1	$\times$	-	-
P35.3.22 GM3 $\oplus$ Z1	$\surd$	1	1	$\times$	-	-
P35.3.23 GM3 $\oplus$ Z2	$\surd$	1	1	$\times$	-	-
P35.3.24 GM3 $\oplus$ Z3	$\surd$	1	1	$\times$	-	-
P35.3.25 GM3 $\oplus$ Z4	$\surd$	1	1	$\times$	-	-
P35.3.26 T1 $\oplus$ T1	$\surd$	1	1	$\times$	-	-

Coplanar SSGs with parent space group $Cmm2$ (No. 35) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P35.3.27 T1 $\oplus$ T2	$\surd$	1	1	$\times$	-	-
P35.3.28 T1 $\oplus$ T3	$\surd$	1	1	$\times$	-	-
P35.3.29 T1 $\oplus$ Y1	$\times$	-	-	-	-	-
P35.3.30 T1 $\oplus$ Y2	$\times$	-	-	-	-	-
P35.3.31 T1 $\oplus$ Y3	$\times$	-	-	-	-	-
P35.3.32 T1 $\oplus$ Z1	$\times$	-	-	-	-	-
P35.3.33 T1 $\oplus$ Z2	$\times$	-	-	-	-	-
P35.3.34 T1 $\oplus$ Z3	$\times$	-	-	-	-	-
P35.3.35 T2 $\oplus$ T2	$\surd$	1	1	$\times$	-	-
P35.3.36 T2 $\oplus$ T3	$\surd$	1	1	$\times$	-	-
P35.3.37 T2 $\oplus$ Y1	$\times$	-	-	-	-	-
P35.3.38 T2 $\oplus$ Y2	$\times$	-	-	-	-	-
P35.3.39 T2 $\oplus$ Y3	$\times$	-	-	-	-	-
P35.3.40 T2 $\oplus$ Z1	$\times$	-	-	-	-	-
P35.3.41 T2 $\oplus$ Z2	$\times$	-	-	-	-	-
P35.3.42 T2 $\oplus$ Z3	$\times$	-	-	-	-	-
P35.3.43 T3 $\oplus$ T3	$\surd$	1	1	$\times$	-	-
P35.3.44 T3 $\oplus$ T4	$\surd$	1	1	$\times$	-	-
P35.3.45 T3 $\oplus$ Y1	$\times$	-	-	-	-	-
P35.3.46 T3 $\oplus$ Y2	$\times$	-	-	-	-	-
P35.3.47 T3 $\oplus$ Y3	$\times$	-	-	-	-	-
P35.3.48 T3 $\oplus$ Y4	$\times$	-	-	-	-	-
P35.3.49 T3 $\oplus$ Z1	$\times$	-	-	-	-	-
P35.3.50 T3 $\oplus$ Z2	$\times$	-	-	-	-	-
P35.3.51 T3 $\oplus$ Z3	$\times$	-	-	-	-	-
P35.3.52 T3 $\oplus$ Z4	$\times$	-	-	-	-	-
P35.3.53 Y1 $\oplus$ Y1	$\surd$	1	1	$\times$	-	-
P35.3.54 Y1 $\oplus$ Y2	$\surd$	1	1	$\times$	-	-
P35.3.55 Y1 $\oplus$ Y3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P35.3.56 Y1 $\oplus$ Z1	$\times$	-	-	-	-	-
P35.3.57 Y1 $\oplus$ Z2	$\times$	-	-	-	-	-
P35.3.58 Y1 $\oplus$ Z3	$\times$	-	-	-	-	-
P35.3.59 Y2 $\oplus$ Y2	$\surd$	1	1	$\times$	-	-
P35.3.60 Y2 $\oplus$ Y3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P35.3.61 Y2 $\oplus$ Z1	$\times$	-	-	-	-	-
P35.3.62 Y2 $\oplus$ Z2	$\times$	-	-	-	-	-
P35.3.63 Y2 $\oplus$ Z3	$\times$	-	-	-	-	-
P35.3.64 Y3 $\oplus$ Y3	$\surd$	1	1	$\times$	-	-
P35.3.65 Y3 $\oplus$ Y4	$\surd$	1	1	$\times$	-	-
P35.3.66 Y3 $\oplus$ Z1	$\times$	-	-	-	-	-
P35.3.67 Y3 $\oplus$ Z2	$\times$	-	-	-	-	-
P35.3.68 Y3 $\oplus$ Z3	$\times$	-	-	-	-	-
P35.3.69 Y3 $\oplus$ Z4	$\times$	-	-	-	-	-
P35.3.70 Z1 $\oplus$ Z1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P35.3.71 Z1 $\oplus$ Z2	$\surd$	1	1	$\times$	-	-
P35.3.72 Z1 $\oplus$ Z3	$\surd$	1	1	$\times$	-	-

Coplanar SSGs with parent space group $Cmm2$ (No. 35) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P35.3.73 Z2 $\oplus$ Z2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P35.3.74 Z2 $\oplus$ Z3	$\surd$	1	1	$\times$	-	-
P35.3.75 Z3 $\oplus$ Z3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P35.3.76 Z3 $\oplus$ Z4	$\surd$	1	1	$\times$	-	-
P35.5.1 LD1LE1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P35.5.2 LD2LE2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P35.5.3 LD3LE3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P35.5.4 H1HA1	$\surd$	1	1	$\times$	-	-
P35.5.5 H2HA2	$\surd$	1	1	$\times$	-	-
P35.5.6 H3HA3	$\surd$	1	1	$\times$	-	-
P35.7.1 S1	$\times$	-	-	-	-	-
P35.7.2 R1	$\times$	-	-	-	-	-
P35.8.1 DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P35.8.2 DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P35.8.3 A1	$\surd$	1	1	$\times$	-	-
P35.8.4 A2	$\surd$	1	1	$\times$	-	-

TABLE S105: Non-coplanar SSGs with parent space group $Cmm2$ (No. 35).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N35.1.1 GM1	$\surd$	3	3	$\surd$	$mm2$	A1 $\oplus$ A1 $\oplus$ A1
N35.2.1 GM2	$\surd$	3	3	$\surd$	222	A1 $\oplus$ A1 $\oplus$ B1
N35.2.2 GM3	$\surd$	3	3	$\surd$	$mm2$	A1 $\oplus$ A1 $\oplus$ B2
N35.2.3 T1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B1_u}$
N35.2.4 T2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B1_u}$
N35.2.5 T3	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B1_u}$
N35.2.6 Y1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B1_u}$
N35.2.7 Y2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B1_u}$
N35.2.8 Y3	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B1_u}$
N35.2.9 Z1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B1_u}$
N35.2.10 Z2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B1_u}$
N35.2.11 Z3	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B1_u}$
N35.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$mm2$	A1 $\oplus$ A2 $\oplus$ A2
N35.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$mm2$	A1 $\oplus$ A2 $\oplus$ B2
N35.3.3 GM2 $\oplus$ T1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$
N35.3.4 GM2 $\oplus$ T2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$
N35.3.5 GM2 $\oplus$ T3	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$
N35.3.6 GM2 $\oplus$ Y1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$
N35.3.7 GM2 $\oplus$ Y2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$
N35.3.8 GM2 $\oplus$ Y3	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$
N35.3.9 GM2 $\oplus$ Z1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$
N35.3.10 GM2 $\oplus$ Z2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$
N35.3.11 GM2 $\oplus$ Z3	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$
N35.3.12 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	$mm2$	A1 $\oplus$ B2 $\oplus$ B2
N35.3.13 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	222	A1 $\oplus$ B3 $\oplus$ B2
N35.3.14 GM3 $\oplus$ T1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$

Non-coplanar SSGs with parent space group $Cmm2$ (No. 35) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N35.3.15 GM3 ⊕ T2	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N35.3.16 GM3 ⊕ T3	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N35.3.17 GM3 ⊕ T4	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N35.3.18 GM3 ⊕ Y1	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N35.3.19 GM3 ⊕ Y2	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N35.3.20 GM3 ⊕ Y3	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N35.3.21 GM3 ⊕ Y4	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N35.3.22 GM3 ⊕ Z1	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N35.3.23 GM3 ⊕ Z2	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N35.3.24 GM3 ⊕ Z3	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N35.3.25 GM3 ⊕ Z4	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N35.3.26 T1 ⊕ T1	√	1	1	√	$mm2$	A1
N35.3.27 T1 ⊕ T2	√	1	1	√	222	A1
N35.3.28 T1 ⊕ T3	√	1	1	√	$mm2$	A1
N35.3.29 T1 ⊕ Y1	√	1	1	√	mmm	$\mathrm{A_g}$
N35.3.30 T1 ⊕ Y2	√	1	1	√	mmm	$\mathrm{A_g}$
N35.3.31 T1 ⊕ Y3	√	1	1	√	mmm	$\mathrm{A_g}$
N35.3.32 T1 ⊕ Z1	√	1	1	√	mmm	$\mathrm{A_g}$
N35.3.33 T1 ⊕ Z2	√	1	1	√	mmm	$\mathrm{A_g}$
N35.3.34 T1 ⊕ Z3	√	1	1	√	mmm	$\mathrm{A_g}$
N35.3.35 T2 ⊕ T2	√	1	1	√	$mm2$	A1
N35.3.36 T2 ⊕ T3	√	1	1	√	$mm2$	A1
N35.3.37 T2 ⊕ Y1	√	1	1	√	mmm	$\mathrm{A_g}$
N35.3.38 T2 ⊕ Y2	√	1	1	√	mmm	$\mathrm{A_g}$
N35.3.39 T2 ⊕ Y3	√	1	1	√	mmm	$\mathrm{A_g}$
N35.3.40 T2 ⊕ Z1	√	1	1	√	mmm	$\mathrm{A_g}$
N35.3.41 T2 ⊕ Z2	√	1	1	√	mmm	$\mathrm{A_g}$
N35.3.42 T2 ⊕ Z3	√	1	1	√	mmm	$\mathrm{A_g}$
N35.3.43 T3 ⊕ T3	√	1	1	√	$mm2$	A1
N35.3.44 T3 ⊕ T4	√	1	1	√	222	A1
N35.3.45 T3 ⊕ Y1	√	1	1	√	mmm	$\mathrm{A_g}$
N35.3.46 T3 ⊕ Y2	√	1	1	√	mmm	$\mathrm{A_g}$
N35.3.47 T3 ⊕ Y3	√	1	1	√	mmm	$\mathrm{A_g}$
N35.3.48 T3 ⊕ Y4	√	1	1	√	mmm	$\mathrm{A_g}$
N35.3.49 T3 ⊕ Z1	√	1	1	√	mmm	$\mathrm{A_g}$
N35.3.50 T3 ⊕ Z2	√	1	1	√	mmm	$\mathrm{A_g}$
N35.3.51 T3 ⊕ Z3	√	1	1	√	mmm	$\mathrm{A_g}$
N35.3.52 T3 ⊕ Z4	√	1	1	√	mmm	$\mathrm{A_g}$
N35.3.53 Y1 ⊕ Y1	√	1	1	√	$mm2$	A1
N35.3.54 Y1 ⊕ Y2	√	1	1	√	222	A1
N35.3.55 Y1 ⊕ Y3	√	1	1	√	$mm2$	A1
N35.3.56 Y1 ⊕ Z1	√	1	1	√	mmm	$\mathrm{A_g}$
N35.3.57 Y1 ⊕ Z2	√	1	1	√	mmm	$\mathrm{A_g}$
N35.3.58 Y1 ⊕ Z3	√	1	1	√	mmm	$\mathrm{A_g}$
N35.3.59 Y2 ⊕ Y2	√	1	1	√	$mm2$	A1
N35.3.60 Y2 ⊕ Y3	√	1	1	√	$mm2$	A1

Non-coplanar SSGs with parent space group $Cmm2$ (No. 35) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N35.3.61 Y2 ⊕ Z1	√	1	1	√	mmm	$\mathrm{A_g}$
N35.3.62 Y2 ⊕ Z2	√	1	1	√	mmm	$\mathrm{A_g}$
N35.3.63 Y2 ⊕ Z3	√	1	1	√	mmm	$\mathrm{A_g}$
N35.3.64 Y3 ⊕ Y3	√	1	1	√	$mm2$	A1
N35.3.65 Y3 ⊕ Y4	√	1	1	√	222	A1
N35.3.66 Y3 ⊕ Z1	√	1	1	√	mmm	$\mathrm{A_g}$
N35.3.67 Y3 ⊕ Z2	√	1	1	√	mmm	$\mathrm{A_g}$
N35.3.68 Y3 ⊕ Z3	√	1	1	√	mmm	$\mathrm{A_g}$
N35.3.69 Y3 ⊕ Z4	√	1	1	√	mmm	$\mathrm{A_g}$
N35.3.70 Z1 ⊕ Z1	√	1	1	√	$mm2$	A1
N35.3.71 Z1 ⊕ Z2	√	1	1	√	222	A1
N35.3.72 Z1 ⊕ Z3	√	1	1	√	$mm2$	A1
N35.3.73 Z2 ⊕ Z2	√	1	1	√	$mm2$	A1
N35.3.74 Z2 ⊕ Z3	√	1	1	√	$mm2$	A1
N35.3.75 Z3 ⊕ Z3	√	1	1	√	$mm2$	A1
N35.3.76 Z3 ⊕ Z4	√	1	1	√	222	A1
N35.5.1 LD1LE1	√	1	1	√	$mm2$	A1
N35.5.2 LD2LE2	√	1	1	√	$mm2$	A1
N35.5.3 LD3LE3	√	1	1	√	$mm2$	A1
N35.5.4 H1HA1	√	1	1	√	$mm2$	A1
N35.5.5 H2HA2	√	1	1	√	$mm2$	A1
N35.5.6 H3HA3	√	1	1	√	$mm2$	A1
N35.7.1 S1	√	1	1	√	mmm	$\mathrm{A_g}$
N35.7.2 R1	√	1	1	√	mmm	$\mathrm{A_g}$
N35.8.1 DT1	√	1	1	√	$mm2$	A1
N35.8.2 DT2	√	1	1	√	$mm2$	A1
N35.8.3 A1	√	1	1	√	$mm2$	A1
N35.8.4 A2	√	1	1	√	$mm2$	A1
N35.9.1 GM2 ⊕ GM2 ⊕ GM2	√	3	3	√	222	B1 ⊕ B1 ⊕ B1
N35.9.2 GM2 ⊕ GM2 ⊕ GM3	√	3	3	√	$mm2$	B2 ⊕ B1 ⊕ B1
N35.9.3 GM2 ⊕ GM2 ⊕ T1	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N35.9.4 GM2 ⊕ GM2 ⊕ T2	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N35.9.5 GM2 ⊕ GM2 ⊕ T3	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N35.9.6 GM2 ⊕ GM2 ⊕ Y1	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N35.9.7 GM2 ⊕ GM2 ⊕ Y2	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N35.9.8 GM2 ⊕ GM2 ⊕ Y3	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N35.9.9 GM2 ⊕ GM2 ⊕ Z1	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N35.9.10 GM2 ⊕ GM2 ⊕ Z2	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N35.9.11 GM2 ⊕ GM2 ⊕ Z3	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N35.9.12 GM2 ⊕ GM3 ⊕ GM3	√	3	3	√	222	B1 ⊕ B3 ⊕ B3
N35.9.13 GM2 ⊕ GM3 ⊕ GM4	√	3	3	√	$mm2$	A2 ⊕ B2 ⊕ B1
N35.9.14 GM2 ⊕ GM3 ⊕ T1	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N35.9.15 GM2 ⊕ GM3 ⊕ T2	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N35.9.16 GM2 ⊕ GM3 ⊕ T3	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N35.9.17 GM2 ⊕ GM3 ⊕ T4	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N35.9.18 GM2 ⊕ GM3 ⊕ Y1	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$

Non-coplanar SSGs with parent space group $Cmm2$ (No. 35) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N35.9.19 GM2 ⊕ GM3 ⊕ Y2	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N35.9.20 GM2 ⊕ GM3 ⊕ Y3	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N35.9.21 GM2 ⊕ GM3 ⊕ Y4	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N35.9.22 GM2 ⊕ GM3 ⊕ Z1	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N35.9.23 GM2 ⊕ GM3 ⊕ Z2	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N35.9.24 GM2 ⊕ GM3 ⊕ Z3	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N35.9.25 GM2 ⊕ GM3 ⊕ Z4	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N35.9.26 GM2 ⊕ T1 ⊕ T1	√	1	1	√	222	B1
N35.9.27 GM2 ⊕ T1 ⊕ T2	√	1	1	×	-	-
N35.9.28 GM2 ⊕ T1 ⊕ T3	√	1	1	×	-	-
N35.9.29 GM2 ⊕ T1 ⊕ Y1	√	1	1	√	mmm	$\mathrm{B1_g}$
N35.9.30 GM2 ⊕ T1 ⊕ Y2	√	1	1	√	mmm	$\mathrm{B1_g}$
N35.9.31 GM2 ⊕ T1 ⊕ Y3	√	1	1	√	mmm	$\mathrm{B1_g}$
N35.9.32 GM2 ⊕ T1 ⊕ Z1	√	1	1	×	-	-
N35.9.33 GM2 ⊕ T1 ⊕ Z2	√	1	1	×	-	-
N35.9.34 GM2 ⊕ T1 ⊕ Z3	√	1	1	×	-	-
N35.9.35 GM2 ⊕ T2 ⊕ T2	√	1	1	√	222	B1
N35.9.36 GM2 ⊕ T2 ⊕ T3	√	1	1	×	-	-
N35.9.37 GM2 ⊕ T2 ⊕ Y1	√	1	1	√	mmm	$\mathrm{B1_g}$
N35.9.38 GM2 ⊕ T2 ⊕ Y2	√	1	1	√	mmm	$\mathrm{B1_g}$
N35.9.39 GM2 ⊕ T2 ⊕ Y3	√	1	1	√	mmm	$\mathrm{B1_g}$
N35.9.40 GM2 ⊕ T2 ⊕ Z1	√	1	1	×	-	-
N35.9.41 GM2 ⊕ T2 ⊕ Z2	√	1	1	×	-	-
N35.9.42 GM2 ⊕ T2 ⊕ Z3	√	1	1	×	-	-
N35.9.43 GM2 ⊕ T3 ⊕ T3	√	1	1	√	222	B1
N35.9.44 GM2 ⊕ T3 ⊕ T4	√	1	1	×	-	-
N35.9.45 GM2 ⊕ T3 ⊕ Y1	√	1	1	√	mmm	$\mathrm{B1_g}$
N35.9.46 GM2 ⊕ T3 ⊕ Y2	√	1	1	√	mmm	$\mathrm{B1_g}$
N35.9.47 GM2 ⊕ T3 ⊕ Y3	√	1	1	√	mmm	$\mathrm{B1_g}$
N35.9.48 GM2 ⊕ T3 ⊕ Y4	√	1	1	√	mmm	$\mathrm{B1_g}$
N35.9.49 GM2 ⊕ T3 ⊕ Z1	√	1	1	×	-	-
N35.9.50 GM2 ⊕ T3 ⊕ Z2	√	1	1	×	-	-
N35.9.51 GM2 ⊕ T3 ⊕ Z3	√	1	1	×	-	-
N35.9.52 GM2 ⊕ T3 ⊕ Z4	√	1	1	×	-	-
N35.9.53 GM2 ⊕ Y1 ⊕ Y1	√	1	1	√	222	B1
N35.9.54 GM2 ⊕ Y1 ⊕ Y2	√	1	1	√	$mm2$	A2
N35.9.55 GM2 ⊕ Y1 ⊕ Y3	√	1	1	√	$mm2$	B2
N35.9.56 GM2 ⊕ Y1 ⊕ Z1	√	1	1	√	mmm	$\mathrm{B1_g}$
N35.9.57 GM2 ⊕ Y1 ⊕ Z2	√	1	1	√	mmm	$\mathrm{B1_g}$
N35.9.58 GM2 ⊕ Y1 ⊕ Z3	√	1	1	√	mmm	$\mathrm{B1_g}$
N35.9.59 GM2 ⊕ Y2 ⊕ Y2	√	1	1	√	222	B1
N35.9.60 GM2 ⊕ Y2 ⊕ Y3	√	1	1	√	$mm2$	B1
N35.9.61 GM2 ⊕ Y2 ⊕ Z1	√	1	1	√	mmm	$\mathrm{B1_g}$
N35.9.62 GM2 ⊕ Y2 ⊕ Z2	√	1	1	√	mmm	$\mathrm{B1_g}$
N35.9.63 GM2 ⊕ Y2 ⊕ Z3	√	1	1	√	mmm	$\mathrm{B1_g}$
N35.9.64 GM2 ⊕ Y3 ⊕ Y3	√	1	1	√	222	B1

Non-coplanar SSGs with parent space group $Cmm2$ (No. 35) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N35.9.65 GM2 ⊕ Y3 ⊕ Y4	√	1	1	√	$mm2$	A2
N35.9.66 GM2 ⊕ Y3 ⊕ Z1	√	1	1	√	mmm	$\mathrm{B1_g}$
N35.9.67 GM2 ⊕ Y3 ⊕ Z2	√	1	1	√	mmm	$\mathrm{B1_g}$
N35.9.68 GM2 ⊕ Y3 ⊕ Z3	√	1	1	√	mmm	$\mathrm{B1_g}$
N35.9.69 GM2 ⊕ Y3 ⊕ Z4	√	1	1	√	mmm	$\mathrm{B1_g}$
N35.9.70 GM2 ⊕ Z1 ⊕ Z1	√	1	1	√	222	B1
N35.9.71 GM2 ⊕ Z1 ⊕ Z2	√	1	1	×	-	-
N35.9.72 GM2 ⊕ Z1 ⊕ Z3	√	1	1	×	-	-
N35.9.73 GM2 ⊕ Z2 ⊕ Z2	√	1	1	√	222	B1
N35.9.74 GM2 ⊕ Z2 ⊕ Z3	√	1	1	×	-	-
N35.9.75 GM2 ⊕ Z3 ⊕ Z3	√	1	1	√	222	B1
N35.9.76 GM2 ⊕ Z3 ⊕ Z4	√	1	1	×	-	-
N35.9.77 GM3 ⊕ GM3 ⊕ GM3	√	3	3	√	$mm2$	B2 ⊕ B2 ⊕ B2
N35.9.78 GM3 ⊕ GM3 ⊕ GM4	√	3	3	√	$mm2$	A2 ⊕ A2 ⊕ B1
N35.9.79 GM3 ⊕ GM3 ⊕ T1	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N35.9.80 GM3 ⊕ GM4 ⊕ T1	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N35.9.81 GM3 ⊕ GM3 ⊕ T2	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N35.9.82 GM3 ⊕ GM4 ⊕ T2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N35.9.83 GM3 ⊕ GM3 ⊕ T3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N35.9.84 GM3 ⊕ GM3 ⊕ T4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N35.9.85 GM3 ⊕ GM4 ⊕ T3	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N35.9.86 GM3 ⊕ GM3 ⊕ Y1	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N35.9.87 GM3 ⊕ GM4 ⊕ Y1	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N35.9.88 GM3 ⊕ GM3 ⊕ Y2	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N35.9.89 GM3 ⊕ GM4 ⊕ Y2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N35.9.90 GM3 ⊕ GM3 ⊕ Y3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N35.9.91 GM3 ⊕ GM3 ⊕ Y4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N35.9.92 GM3 ⊕ GM4 ⊕ Y3	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N35.9.93 GM3 ⊕ GM3 ⊕ Z1	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N35.9.94 GM3 ⊕ GM4 ⊕ Z1	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N35.9.95 GM3 ⊕ GM3 ⊕ Z2	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N35.9.96 GM3 ⊕ GM4 ⊕ Z2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N35.9.97 GM3 ⊕ GM3 ⊕ Z3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N35.9.98 GM3 ⊕ GM3 ⊕ Z4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N35.9.99 GM3 ⊕ GM4 ⊕ Z3	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N35.9.100 GM3 ⊕ T1 ⊕ T1	√	1	1	×	-	-
N35.9.101 GM3 ⊕ T1 ⊕ T2	√	1	1	×	-	-
N35.9.102 GM3 ⊕ T1 ⊕ T3	√	1	1	×	-	-
N35.9.103 GM3 ⊕ T1 ⊕ T4	√	1	1	×	-	-
N35.9.104 GM3 ⊕ T1 ⊕ Y1	√	1	1	×	-	-
N35.9.105 GM3 ⊕ T1 ⊕ Y2	√	1	1	×	-	-
N35.9.106 GM3 ⊕ T1 ⊕ Y3	√	1	1	×	-	-
N35.9.107 GM3 ⊕ T1 ⊕ Y4	√	1	1	×	-	-
N35.9.108 GM3 ⊕ T1 ⊕ Z1	√	1	1	×	-	-
N35.9.109 GM3 ⊕ T1 ⊕ Z2	√	1	1	×	-	-
N35.9.110 GM3 ⊕ T1 ⊕ Z3	√	1	1	×	-	-

Non-coplanar SSGs with parent space group $Cmm2$ (No. 35) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N35.9.111 GM3 $\oplus$ T1 $\oplus$ Z4	$\surd$	1	1	$\times$	-	-
N35.9.112 GM3 $\oplus$ T2 $\oplus$ T2	$\surd$	1	1	$\times$	-	-
N35.9.113 GM3 $\oplus$ T2 $\oplus$ T3	$\surd$	1	1	$\times$	-	-
N35.9.114 GM3 $\oplus$ T2 $\oplus$ T4	$\surd$	1	1	$\times$	-	-
N35.9.115 GM3 $\oplus$ T2 $\oplus$ Y1	$\surd$	1	1	$\times$	-	-
N35.9.116 GM3 $\oplus$ T2 $\oplus$ Y2	$\surd$	1	1	$\times$	-	-
N35.9.117 GM3 $\oplus$ T2 $\oplus$ Y3	$\surd$	1	1	$\times$	-	-
N35.9.118 GM3 $\oplus$ T2 $\oplus$ Y4	$\surd$	1	1	$\times$	-	-
N35.9.119 GM3 $\oplus$ T2 $\oplus$ Z1	$\surd$	1	1	$\times$	-	-
N35.9.120 GM3 $\oplus$ T2 $\oplus$ Z2	$\surd$	1	1	$\times$	-	-
N35.9.121 GM3 $\oplus$ T2 $\oplus$ Z3	$\surd$	1	1	$\times$	-	-
N35.9.122 GM3 $\oplus$ T2 $\oplus$ Z4	$\surd$	1	1	$\times$	-	-
N35.9.123 GM3 $\oplus$ T3 $\oplus$ T3	$\surd$	1	1	$\times$	-	-
N35.9.124 GM3 $\oplus$ T3 $\oplus$ T4	$\surd$	1	1	$\times$	-	-
N35.9.125 GM3 $\oplus$ T4 $\oplus$ T4	$\surd$	1	1	$\times$	-	-
N35.9.126 GM3 $\oplus$ T3 $\oplus$ Y1	$\surd$	1	1	$\times$	-	-
N35.9.127 GM3 $\oplus$ T4 $\oplus$ Y1	$\surd$	1	1	$\times$	-	-
N35.9.128 GM3 $\oplus$ T3 $\oplus$ Y2	$\surd$	1	1	$\times$	-	-
N35.9.129 GM3 $\oplus$ T4 $\oplus$ Y2	$\surd$	1	1	$\times$	-	-
N35.9.130 GM3 $\oplus$ T3 $\oplus$ Y3	$\surd$	1	1	$\times$	-	-
N35.9.131 GM3 $\oplus$ T3 $\oplus$ Y4	$\surd$	1	1	$\times$	-	-
N35.9.132 GM3 $\oplus$ T4 $\oplus$ Y3	$\surd$	1	1	$\times$	-	-
N35.9.133 GM3 $\oplus$ T4 $\oplus$ Y4	$\surd$	1	1	$\times$	-	-
N35.9.134 GM3 $\oplus$ T3 $\oplus$ Z1	$\surd$	1	1	$\times$	-	-
N35.9.135 GM3 $\oplus$ T4 $\oplus$ Z1	$\surd$	1	1	$\times$	-	-
N35.9.136 GM3 $\oplus$ T3 $\oplus$ Z2	$\surd$	1	1	$\times$	-	-
N35.9.137 GM3 $\oplus$ T4 $\oplus$ Z2	$\surd$	1	1	$\times$	-	-
N35.9.138 GM3 $\oplus$ T3 $\oplus$ Z3	$\surd$	1	1	$\times$	-	-
N35.9.139 GM3 $\oplus$ T3 $\oplus$ Z4	$\surd$	1	1	$\times$	-	-
N35.9.140 GM3 $\oplus$ T4 $\oplus$ Z3	$\surd$	1	1	$\times$	-	-
N35.9.141 GM3 $\oplus$ T4 $\oplus$ Z4	$\surd$	1	1	$\times$	-	-
N35.9.142 GM3 $\oplus$ Y1 $\oplus$ Y1	$\surd$	1	1	$\times$	-	-
N35.9.143 GM3 $\oplus$ Y1 $\oplus$ Y2	$\surd$	1	1	$\times$	-	-
N35.9.144 GM3 $\oplus$ Y1 $\oplus$ Y3	$\surd$	1	1	$\surd$	$mm2$	B2
N35.9.145 GM3 $\oplus$ Y1 $\oplus$ Y4	$\surd$	1	1	$\surd$	222	B3
N35.9.146 GM3 $\oplus$ Y1 $\oplus$ Z1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N35.9.147 GM3 $\oplus$ Y1 $\oplus$ Z2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N35.9.148 GM3 $\oplus$ Y1 $\oplus$ Z3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N35.9.149 GM3 $\oplus$ Y1 $\oplus$ Z4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N35.9.150 GM3 $\oplus$ Y2 $\oplus$ Y2	$\surd$	1	1	$\times$	-	-
N35.9.151 GM3 $\oplus$ Y2 $\oplus$ Y3	$\surd$	1	1	$\surd$	222	B3
N35.9.152 GM3 $\oplus$ Y2 $\oplus$ Y4	$\surd$	1	1	$\surd$	$mm2$	B2
N35.9.153 GM3 $\oplus$ Y2 $\oplus$ Z1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N35.9.154 GM3 $\oplus$ Y2 $\oplus$ Z2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N35.9.155 GM3 $\oplus$ Y2 $\oplus$ Z3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N35.9.156 GM3 $\oplus$ Y2 $\oplus$ Z4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$

Non-coplanar SSGs with parent space group $Cmm2$ (No. 35) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N35.9.157 GM3 $\oplus$ Y3 $\oplus$ Y3	$\surd$	1	1	$\times$	-	-
N35.9.158 GM3 $\oplus$ Y3 $\oplus$ Y4	$\surd$	1	1	$\times$	-	-
N35.9.159 GM3 $\oplus$ Y4 $\oplus$ Y4	$\surd$	1	1	$\times$	-	-
N35.9.160 GM3 $\oplus$ Y3 $\oplus$ Z1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N35.9.161 GM3 $\oplus$ Y4 $\oplus$ Z1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N35.9.162 GM3 $\oplus$ Y3 $\oplus$ Z2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N35.9.163 GM3 $\oplus$ Y4 $\oplus$ Z2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N35.9.164 GM3 $\oplus$ Y3 $\oplus$ Z3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N35.9.165 GM3 $\oplus$ Y3 $\oplus$ Z4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N35.9.166 GM3 $\oplus$ Y4 $\oplus$ Z3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N35.9.167 GM3 $\oplus$ Y4 $\oplus$ Z4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N35.9.168 GM3 $\oplus$ Z1 $\oplus$ Z1	$\surd$	1	1	$\surd$	$mm2$	B2
N35.9.169 GM3 $\oplus$ Z1 $\oplus$ Z2	$\surd$	1	1	$\times$	-	-
N35.9.170 GM3 $\oplus$ Z1 $\oplus$ Z3	$\surd$	1	1	$\times$	-	-
N35.9.171 GM3 $\oplus$ Z1 $\oplus$ Z4	$\surd$	1	1	$\times$	-	-
N35.9.172 GM3 $\oplus$ Z2 $\oplus$ Z2	$\surd$	1	1	$\surd$	$mm2$	B2
N35.9.173 GM3 $\oplus$ Z2 $\oplus$ Z3	$\surd$	1	1	$\times$	-	-
N35.9.174 GM3 $\oplus$ Z2 $\oplus$ Z4	$\surd$	1	1	$\times$	-	-
N35.9.175 GM3 $\oplus$ Z3 $\oplus$ Z3	$\surd$	1	1	$\surd$	$mm2$	B2
N35.9.176 GM3 $\oplus$ Z3 $\oplus$ Z4	$\surd$	1	1	$\times$	-	-
N35.9.177 GM3 $\oplus$ Z4 $\oplus$ Z4	$\surd$	1	1	$\surd$	$mm2$	B2
N35.9.178 T1 $\oplus$ T1 $\oplus$ T1	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N35.9.179 T1 $\oplus$ T1 $\oplus$ T2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N35.9.180 T1 $\oplus$ T1 $\oplus$ T3	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N35.9.181 T1 $\oplus$ T1 $\oplus$ Y1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N35.9.182 T1 $\oplus$ T1 $\oplus$ Y2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N35.9.183 T1 $\oplus$ T1 $\oplus$ Y3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N35.9.184 T1 $\oplus$ T1 $\oplus$ Z1	$\surd$	1	1	$\times$	-	-
N35.9.185 T1 $\oplus$ T1 $\oplus$ Z2	$\surd$	1	1	$\times$	-	-
N35.9.186 T1 $\oplus$ T1 $\oplus$ Z3	$\surd$	1	1	$\times$	-	-
N35.9.187 T1 $\oplus$ T2 $\oplus$ T2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N35.9.188 T1 $\oplus$ T2 $\oplus$ T3	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N35.9.189 T1 $\oplus$ T2 $\oplus$ Y1	$\surd$	1	1	$\times$	-	-
N35.9.190 T1 $\oplus$ T2 $\oplus$ Y2	$\surd$	1	1	$\times$	-	-
N35.9.191 T1 $\oplus$ T2 $\oplus$ Y3	$\surd$	1	1	$\times$	-	-
N35.9.192 T1 $\oplus$ T2 $\oplus$ Z1	$\surd$	1	1	$\times$	-	-
N35.9.193 T1 $\oplus$ T2 $\oplus$ Z2	$\surd$	1	1	$\times$	-	-
N35.9.194 T1 $\oplus$ T2 $\oplus$ Z3	$\surd$	1	1	$\times$	-	-
N35.9.195 T1 $\oplus$ T3 $\oplus$ T3	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N35.9.196 T1 $\oplus$ T3 $\oplus$ T4	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N35.9.197 T1 $\oplus$ T3 $\oplus$ Y1	$\surd$	1	1	$\times$	-	-
N35.9.198 T1 $\oplus$ T3 $\oplus$ Y2	$\surd$	1	1	$\times$	-	-
N35.9.199 T1 $\oplus$ T3 $\oplus$ Y3	$\surd$	1	1	$\times$	-	-
N35.9.200 T1 $\oplus$ T3 $\oplus$ Y4	$\surd$	1	1	$\times$	-	-
N35.9.201 T1 $\oplus$ T3 $\oplus$ Z1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N35.9.202 T1 $\oplus$ T3 $\oplus$ Z2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$

Non-coplanar SSGs with parent space group $Cmm2$ (No. 35) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N35.9.203 T1 ⊕ T3 ⊕ Z3	√	1	1	√	mmm	$\mathrm{B2_u}$
N35.9.204 T1 ⊕ T3 ⊕ Z4	√	1	1	√	mmm	$\mathrm{B2_u}$
N35.9.205 T1 ⊕ Y1 ⊕ Y1	√	1	1	√	mmm	$\mathrm{B1_u}$
N35.9.206 T1 ⊕ Y1 ⊕ Y2	√	1	1	√	mmm	$\mathrm{A_u}$
N35.9.207 T1 ⊕ Y1 ⊕ Y3	√	1	1	√	mmm	$\mathrm{B2_u}$
N35.9.208 T1 ⊕ Y1 ⊕ Z1	×	-	-	-	-	-
N35.9.209 T1 ⊕ Y1 ⊕ Z2	×	-	-	-	-	-
N35.9.210 T1 ⊕ Y1 ⊕ Z3	×	-	-	-	-	-
N35.9.211 T1 ⊕ Y2 ⊕ Y2	√	1	1	√	mmm	$\mathrm{B1_u}$
N35.9.212 T1 ⊕ Y2 ⊕ Y3	√	1	1	√	mmm	$\mathrm{B3_u}$
N35.9.213 T1 ⊕ Y2 ⊕ Z1	×	-	-	-	-	-
N35.9.214 T1 ⊕ Y2 ⊕ Z2	×	-	-	-	-	-
N35.9.215 T1 ⊕ Y2 ⊕ Z3	×	-	-	-	-	-
N35.9.216 T1 ⊕ Y3 ⊕ Y3	√	1	1	√	mmm	$\mathrm{B1_u}$
N35.9.217 T1 ⊕ Y3 ⊕ Y4	√	1	1	√	mmm	$\mathrm{A_u}$
N35.9.218 T1 ⊕ Y3 ⊕ Z1	×	-	-	-	-	-
N35.9.219 T1 ⊕ Y3 ⊕ Z2	×	-	-	-	-	-
N35.9.220 T1 ⊕ Y3 ⊕ Z3	×	-	-	-	-	-
N35.9.221 T1 ⊕ Y3 ⊕ Z4	×	-	-	-	-	-
N35.9.222 T1 ⊕ Z1 ⊕ Z1	√	1	1	√	mmm	$\mathrm{B1_u}$
N35.9.223 T1 ⊕ Z1 ⊕ Z2	√	1	1	√	mmm	$\mathrm{A_u}$
N35.9.224 T1 ⊕ Z1 ⊕ Z3	√	1	1	√	mmm	$\mathrm{B2_u}$
N35.9.225 T1 ⊕ Z2 ⊕ Z2	√	1	1	√	mmm	$\mathrm{B1_u}$
N35.9.226 T1 ⊕ Z2 ⊕ Z3	√	1	1	√	mmm	$\mathrm{B3_u}$
N35.9.227 T1 ⊕ Z3 ⊕ Z3	√	1	1	√	mmm	$\mathrm{B1_u}$
N35.9.228 T1 ⊕ Z3 ⊕ Z4	√	1	1	√	mmm	$\mathrm{A_u}$
N35.9.229 T2 ⊕ T2 ⊕ T2	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N35.9.230 T2 ⊕ T2 ⊕ T3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N35.9.231 T2 ⊕ T2 ⊕ Y1	√	1	1	√	mmm	$\mathrm{B1_u}$
N35.9.232 T2 ⊕ T2 ⊕ Y2	√	1	1	√	mmm	$\mathrm{B1_u}$
N35.9.233 T2 ⊕ T2 ⊕ Y3	√	1	1	√	mmm	$\mathrm{B1_u}$
N35.9.234 T2 ⊕ T2 ⊕ Z1	√	1	1	×	-	-
N35.9.235 T2 ⊕ T2 ⊕ Z2	√	1	1	×	-	-
N35.9.236 T2 ⊕ T2 ⊕ Z3	√	1	1	×	-	-
N35.9.237 T2 ⊕ T3 ⊕ T3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N35.9.238 T2 ⊕ T3 ⊕ T4	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N35.9.239 T2 ⊕ T3 ⊕ Y1	√	1	1	×	-	-
N35.9.240 T2 ⊕ T3 ⊕ Y2	√	1	1	×	-	-
N35.9.241 T2 ⊕ T3 ⊕ Y3	√	1	1	×	-	-
N35.9.242 T2 ⊕ T3 ⊕ Y4	√	1	1	×	-	-
N35.9.243 T2 ⊕ T3 ⊕ Z1	√	1	1	√	mmm	$\mathrm{B3_u}$
N35.9.244 T2 ⊕ T3 ⊕ Z2	√	1	1	√	mmm	$\mathrm{B3_u}$
N35.9.245 T2 ⊕ T3 ⊕ Z3	√	1	1	√	mmm	$\mathrm{B3_u}$
N35.9.246 T2 ⊕ T3 ⊕ Z4	√	1	1	√	mmm	$\mathrm{B3_u}$
N35.9.247 T2 ⊕ Y1 ⊕ Y1	√	1	1	√	mmm	$\mathrm{B1_u}$
N35.9.248 T2 ⊕ Y1 ⊕ Y2	√	1	1	√	mmm	$\mathrm{A_u}$

Non-coplanar SSGs with parent space group $Cmm2$ (No. 35) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N35.9.249 T2 ⊕ Y1 ⊕ Y3	√	1	1	√	mmm	$\mathrm{B2_u}$
N35.9.250 T2 ⊕ Y1 ⊕ Z1	×	-	-	-	-	-
N35.9.251 T2 ⊕ Y1 ⊕ Z2	×	-	-	-	-	-
N35.9.252 T2 ⊕ Y1 ⊕ Z3	×	-	-	-	-	-
N35.9.253 T2 ⊕ Y2 ⊕ Y2	√	1	1	√	mmm	$\mathrm{B1_u}$
N35.9.254 T2 ⊕ Y2 ⊕ Y3	√	1	1	√	mmm	$\mathrm{B3_u}$
N35.9.255 T2 ⊕ Y2 ⊕ Z1	×	-	-	-	-	-
N35.9.256 T2 ⊕ Y2 ⊕ Z2	×	-	-	-	-	-
N35.9.257 T2 ⊕ Y2 ⊕ Z3	×	-	-	-	-	-
N35.9.258 T2 ⊕ Y3 ⊕ Y3	√	1	1	√	mmm	$\mathrm{B1_u}$
N35.9.259 T2 ⊕ Y3 ⊕ Y4	√	1	1	√	mmm	$\mathrm{A_u}$
N35.9.260 T2 ⊕ Y3 ⊕ Z1	×	-	-	-	-	-
N35.9.261 T2 ⊕ Y3 ⊕ Z2	×	-	-	-	-	-
N35.9.262 T2 ⊕ Y3 ⊕ Z3	×	-	-	-	-	-
N35.9.263 T2 ⊕ Y3 ⊕ Z4	×	-	-	-	-	-
N35.9.264 T2 ⊕ Z1 ⊕ Z1	√	1	1	√	mmm	$\mathrm{B1_u}$
N35.9.265 T2 ⊕ Z1 ⊕ Z2	√	1	1	√	mmm	$\mathrm{A_u}$
N35.9.266 T2 ⊕ Z1 ⊕ Z3	√	1	1	√	mmm	$\mathrm{B2_u}$
N35.9.267 T2 ⊕ Z2 ⊕ Z2	√	1	1	√	mmm	$\mathrm{B1_u}$
N35.9.268 T2 ⊕ Z2 ⊕ Z3	√	1	1	√	mmm	$\mathrm{B3_u}$
N35.9.269 T2 ⊕ Z3 ⊕ Z3	√	1	1	√	mmm	$\mathrm{B1_u}$
N35.9.270 T2 ⊕ Z3 ⊕ Z4	√	1	1	√	mmm	$\mathrm{A_u}$
N35.9.271 T3 ⊕ T3 ⊕ T3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N35.9.272 T3 ⊕ T3 ⊕ T4	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N35.9.273 T3 ⊕ T3 ⊕ Y1	√	1	1	√	mmm	$\mathrm{B1_u}$
N35.9.274 T3 ⊕ T4 ⊕ Y1	√	1	1	×	-	-
N35.9.275 T3 ⊕ T3 ⊕ Y2	√	1	1	√	mmm	$\mathrm{B1_u}$
N35.9.276 T3 ⊕ T4 ⊕ Y2	√	1	1	×	-	-
N35.9.277 T3 ⊕ T3 ⊕ Y3	√	1	1	√	mmm	$\mathrm{B1_u}$
N35.9.278 T3 ⊕ T3 ⊕ Y4	√	1	1	√	mmm	$\mathrm{B1_u}$
N35.9.279 T3 ⊕ T4 ⊕ Y3	√	1	1	×	-	-
N35.9.280 T3 ⊕ T3 ⊕ Z1	√	1	1	×	-	-
N35.9.281 T3 ⊕ T4 ⊕ Z1	√	1	1	×	-	-
N35.9.282 T3 ⊕ T3 ⊕ Z2	√	1	1	×	-	-
N35.9.283 T3 ⊕ T4 ⊕ Z2	√	1	1	×	-	-
N35.9.284 T3 ⊕ T3 ⊕ Z3	√	1	1	×	-	-
N35.9.285 T3 ⊕ T3 ⊕ Z4	√	1	1	×	-	-
N35.9.286 T3 ⊕ T4 ⊕ Z3	√	1	1	×	-	-
N35.9.287 T3 ⊕ Y1 ⊕ Y1	√	1	1	√	mmm	$\mathrm{B1_u}$
N35.9.288 T3 ⊕ Y1 ⊕ Y2	√	1	1	√	mmm	$\mathrm{A_u}$
N35.9.289 T3 ⊕ Y1 ⊕ Y3	√	1	1	√	mmm	$\mathrm{B2_u}$
N35.9.290 T3 ⊕ Y1 ⊕ Y4	√	1	1	√	mmm	$\mathrm{B3_u}$
N35.9.291 T3 ⊕ Y1 ⊕ Z1	×	-	-	-	-	-
N35.9.292 T3 ⊕ Y1 ⊕ Z2	×	-	-	-	-	-
N35.9.293 T3 ⊕ Y1 ⊕ Z3	×	-	-	-	-	-
N35.9.294 T3 ⊕ Y1 ⊕ Z4	×	-	-	-	-	-

Non-coplanar SSGs with parent space group $Cmm2$ (No. 35) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N35.9.295 T3 $\oplus$ Y2 $\oplus$ Y2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N35.9.296 T3 $\oplus$ Y2 $\oplus$ Y3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N35.9.297 T3 $\oplus$ Y2 $\oplus$ Y4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N35.9.298 T3 $\oplus$ Y2 $\oplus$ Z1	$\times$	-	-	-	-	-
N35.9.299 T3 $\oplus$ Y2 $\oplus$ Z2	$\times$	-	-	-	-	-
N35.9.300 T3 $\oplus$ Y2 $\oplus$ Z3	$\times$	-	-	-	-	-
N35.9.301 T3 $\oplus$ Y2 $\oplus$ Z4	$\times$	-	-	-	-	-
N35.9.302 T3 $\oplus$ Y3 $\oplus$ Y3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N35.9.303 T3 $\oplus$ Y3 $\oplus$ Y4	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_u}$
N35.9.304 T3 $\oplus$ Y4 $\oplus$ Y4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N35.9.305 T3 $\oplus$ Y3 $\oplus$ Z1	$\times$	-	-	-	-	-
N35.9.306 T3 $\oplus$ Y4 $\oplus$ Z1	$\times$	-	-	-	-	-
N35.9.307 T3 $\oplus$ Y3 $\oplus$ Z2	$\times$	-	-	-	-	-
N35.9.308 T3 $\oplus$ Y4 $\oplus$ Z2	$\times$	-	-	-	-	-
N35.9.309 T3 $\oplus$ Y3 $\oplus$ Z3	$\times$	-	-	-	-	-
N35.9.310 T3 $\oplus$ Y3 $\oplus$ Z4	$\times$	-	-	-	-	-
N35.9.311 T3 $\oplus$ Y4 $\oplus$ Z3	$\times$	-	-	-	-	-
N35.9.312 T3 $\oplus$ Y4 $\oplus$ Z4	$\times$	-	-	-	-	-
N35.9.313 T3 $\oplus$ Z1 $\oplus$ Z1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N35.9.314 T3 $\oplus$ Z1 $\oplus$ Z2	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_u}$
N35.9.315 T3 $\oplus$ Z1 $\oplus$ Z3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N35.9.316 T3 $\oplus$ Z1 $\oplus$ Z4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N35.9.317 T3 $\oplus$ Z2 $\oplus$ Z2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N35.9.318 T3 $\oplus$ Z2 $\oplus$ Z3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N35.9.319 T3 $\oplus$ Z2 $\oplus$ Z4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N35.9.320 T3 $\oplus$ Z3 $\oplus$ Z3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N35.9.321 T3 $\oplus$ Z3 $\oplus$ Z4	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_u}$
N35.9.322 T3 $\oplus$ Z4 $\oplus$ Z4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N35.9.323 Y1 $\oplus$ Y1 $\oplus$ Y1	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N35.9.324 Y1 $\oplus$ Y1 $\oplus$ Y2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N35.9.325 Y1 $\oplus$ Y1 $\oplus$ Y3	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N35.9.326 Y1 $\oplus$ Y1 $\oplus$ Z1	$\surd$	1	1	$\times$	-	-
N35.9.327 Y1 $\oplus$ Y1 $\oplus$ Z2	$\surd$	1	1	$\times$	-	-
N35.9.328 Y1 $\oplus$ Y1 $\oplus$ Z3	$\surd$	1	1	$\times$	-	-
N35.9.329 Y1 $\oplus$ Y2 $\oplus$ Y2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N35.9.330 Y1 $\oplus$ Y2 $\oplus$ Y3	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N35.9.331 Y1 $\oplus$ Y2 $\oplus$ Z1	$\surd$	1	1	$\times$	-	-
N35.9.332 Y1 $\oplus$ Y2 $\oplus$ Z2	$\surd$	1	1	$\times$	-	-
N35.9.333 Y1 $\oplus$ Y2 $\oplus$ Z3	$\surd$	1	1	$\times$	-	-
N35.9.334 Y1 $\oplus$ Y3 $\oplus$ Y3	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N35.9.335 Y1 $\oplus$ Y3 $\oplus$ Y4	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N35.9.336 Y1 $\oplus$ Y3 $\oplus$ Z1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N35.9.337 Y1 $\oplus$ Y3 $\oplus$ Z2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N35.9.338 Y1 $\oplus$ Y3 $\oplus$ Z3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N35.9.339 Y1 $\oplus$ Y3 $\oplus$ Z4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N35.9.340 Y1 $\oplus$ Z1 $\oplus$ Z1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$

Non-coplanar SSGs with parent space group $Cmm2$ (No. 35) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N35.9.341 Y1 ⊕ Z1 ⊕ Z2	√	1	1	×	-	-
N35.9.342 Y1 ⊕ Z1 ⊕ Z3	√	1	1	×	-	-
N35.9.343 Y1 ⊕ Z2 ⊕ Z2	√	1	1	√	mmm	$\mathrm{B1_u}$
N35.9.344 Y1 ⊕ Z2 ⊕ Z3	√	1	1	×	-	-
N35.9.345 Y1 ⊕ Z3 ⊕ Z3	√	1	1	√	mmm	$\mathrm{B1_u}$
N35.9.346 Y1 ⊕ Z3 ⊕ Z4	√	1	1	×	-	-
N35.9.347 Y2 ⊕ Y2 ⊕ Y2	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N35.9.348 Y2 ⊕ Y2 ⊕ Y3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N35.9.349 Y2 ⊕ Y2 ⊕ Z1	√	1	1	×	-	-
N35.9.350 Y2 ⊕ Y2 ⊕ Z2	√	1	1	×	-	-
N35.9.351 Y2 ⊕ Y2 ⊕ Z3	√	1	1	×	-	-
N35.9.352 Y2 ⊕ Y3 ⊕ Y3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N35.9.353 Y2 ⊕ Y3 ⊕ Y4	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N35.9.354 Y2 ⊕ Y3 ⊕ Z1	√	1	1	√	mmm	$\mathrm{B3_u}$
N35.9.355 Y2 ⊕ Y3 ⊕ Z2	√	1	1	√	mmm	$\mathrm{B3_u}$
N35.9.356 Y2 ⊕ Y3 ⊕ Z3	√	1	1	√	mmm	$\mathrm{B3_u}$
N35.9.357 Y2 ⊕ Y3 ⊕ Z4	√	1	1	√	mmm	$\mathrm{B3_u}$
N35.9.358 Y2 ⊕ Z1 ⊕ Z1	√	1	1	√	mmm	$\mathrm{B1_u}$
N35.9.359 Y2 ⊕ Z1 ⊕ Z2	√	1	1	×	-	-
N35.9.360 Y2 ⊕ Z1 ⊕ Z3	√	1	1	×	-	-
N35.9.361 Y2 ⊕ Z2 ⊕ Z2	√	1	1	√	mmm	$\mathrm{B1_u}$
N35.9.362 Y2 ⊕ Z2 ⊕ Z3	√	1	1	×	-	-
N35.9.363 Y2 ⊕ Z3 ⊕ Z3	√	1	1	√	mmm	$\mathrm{B1_u}$
N35.9.364 Y2 ⊕ Z3 ⊕ Z4	√	1	1	×	-	-
N35.9.365 Y3 ⊕ Y3 ⊕ Y3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N35.9.366 Y3 ⊕ Y3 ⊕ Y4	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N35.9.367 Y3 ⊕ Y3 ⊕ Z1	√	1	1	×	-	-
N35.9.368 Y3 ⊕ Y4 ⊕ Z1	√	1	1	×	-	-
N35.9.369 Y3 ⊕ Y3 ⊕ Z2	√	1	1	×	-	-
N35.9.370 Y3 ⊕ Y4 ⊕ Z2	√	1	1	×	-	-
N35.9.371 Y3 ⊕ Y3 ⊕ Z3	√	1	1	×	-	-
N35.9.372 Y3 ⊕ Y3 ⊕ Z4	√	1	1	×	-	-
N35.9.373 Y3 ⊕ Y4 ⊕ Z3	√	1	1	×	-	-
N35.9.374 Y3 ⊕ Z1 ⊕ Z1	√	1	1	√	mmm	$\mathrm{B1_u}$
N35.9.375 Y3 ⊕ Z1 ⊕ Z2	√	1	1	×	-	-
N35.9.376 Y3 ⊕ Z1 ⊕ Z3	√	1	1	×	-	-
N35.9.377 Y3 ⊕ Z1 ⊕ Z4	√	1	1	×	-	-
N35.9.378 Y3 ⊕ Z2 ⊕ Z2	√	1	1	√	mmm	$\mathrm{B1_u}$
N35.9.379 Y3 ⊕ Z2 ⊕ Z3	√	1	1	×	-	-
N35.9.380 Y3 ⊕ Z2 ⊕ Z4	√	1	1	×	-	-
N35.9.381 Y3 ⊕ Z3 ⊕ Z3	√	1	1	√	mmm	$\mathrm{B1_u}$
N35.9.382 Y3 ⊕ Z3 ⊕ Z4	√	1	1	×	-	-
N35.9.383 Y3 ⊕ Z4 ⊕ Z4	√	1	1	√	mmm	$\mathrm{B1_u}$
N35.9.384 Z1 ⊕ Z1 ⊕ Z1	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N35.9.385 Z1 ⊕ Z1 ⊕ Z2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N35.9.386 Z1 ⊕ Z1 ⊕ Z3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$

Non-coplanar SSGs with parent space group $Cmm2$ (No. 35) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N35.9.387 Z1 ⊕ Z2 ⊕ Z2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N35.9.388 Z1 ⊕ Z2 ⊕ Z3	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N35.9.389 Z1 ⊕ Z3 ⊕ Z3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N35.9.390 Z1 ⊕ Z3 ⊕ Z4	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N35.9.391 Z2 ⊕ Z2 ⊕ Z2	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N35.9.392 Z2 ⊕ Z2 ⊕ Z3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N35.9.393 Z2 ⊕ Z3 ⊕ Z3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N35.9.394 Z2 ⊕ Z3 ⊕ Z4	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N35.9.395 Z3 ⊕ Z3 ⊕ Z3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N35.9.396 Z3 ⊕ Z3 ⊕ Z4	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N35.11.1 GM2 ⊕ LD1LE1	√	1	1	√	222	B1
N35.11.2 GM2 ⊕ LD2LE2	√	1	1	√	222	B1
N35.11.3 GM2 ⊕ LD3LE3	√	1	1	√	222	B1
N35.11.4 GM2 ⊕ H1HA1	√	1	1	√	222	B1
N35.11.5 GM2 ⊕ H2HA2	√	1	1	√	222	B1
N35.11.6 GM2 ⊕ H3HA3	√	1	1	√	222	B1
N35.11.7 GM3 ⊕ LD1LE1	√	1	1	√	$mm2$	B2
N35.11.8 GM3 ⊕ LD2LE2	√	1	1	√	$mm2$	B2
N35.11.9 GM3 ⊕ LD3LE3	√	1	1	√	$mm2$	B2
N35.11.10 GM3 ⊕ LD4LE4	√	1	1	√	$mm2$	B2
N35.11.11 GM3 ⊕ H1HA1	√	1	1	×	-	-
N35.11.12 GM3 ⊕ H2HA2	√	1	1	×	-	-
N35.11.13 GM3 ⊕ H3HA3	√	1	1	×	-	-
N35.11.14 GM3 ⊕ H4HA4	√	1	1	×	-	-
N35.11.15 T1 ⊕ LD1LE1	√	1	1	√	mmm	$\mathrm{B1_u}$
N35.11.16 T1 ⊕ LD2LE2	√	1	1	√	mmm	$\mathrm{B1_u}$
N35.11.17 T1 ⊕ LD3LE3	√	1	1	√	mmm	$\mathrm{B1_u}$
N35.11.18 T1 ⊕ H1HA1	√	1	1	√	mmm	$\mathrm{B1_u}$
N35.11.19 T1 ⊕ H2HA2	√	1	1	√	mmm	$\mathrm{B1_u}$
N35.11.20 T1 ⊕ H3HA3	√	1	1	√	mmm	$\mathrm{B1_u}$
N35.11.21 T2 ⊕ LD1LE1	√	1	1	√	mmm	$\mathrm{B1_u}$
N35.11.22 T2 ⊕ LD2LE2	√	1	1	√	mmm	$\mathrm{B1_u}$
N35.11.23 T2 ⊕ LD3LE3	√	1	1	√	mmm	$\mathrm{B1_u}$
N35.11.24 T2 ⊕ H1HA1	√	1	1	√	mmm	$\mathrm{B1_u}$
N35.11.25 T2 ⊕ H2HA2	√	1	1	√	mmm	$\mathrm{B1_u}$
N35.11.26 T2 ⊕ H3HA3	√	1	1	√	mmm	$\mathrm{B1_u}$
N35.11.27 T3 ⊕ LD1LE1	√	1	1	√	mmm	$\mathrm{B1_u}$
N35.11.28 T3 ⊕ LD2LE2	√	1	1	√	mmm	$\mathrm{B1_u}$
N35.11.29 T3 ⊕ LD3LE3	√	1	1	√	mmm	$\mathrm{B1_u}$
N35.11.30 T3 ⊕ LD4LE4	√	1	1	√	mmm	$\mathrm{B1_u}$
N35.11.31 T3 ⊕ H1HA1	√	1	1	√	mmm	$\mathrm{B1_u}$
N35.11.32 T3 ⊕ H2HA2	√	1	1	√	mmm	$\mathrm{B1_u}$
N35.11.33 T3 ⊕ H3HA3	√	1	1	√	mmm	$\mathrm{B1_u}$
N35.11.34 T3 ⊕ H4HA4	√	1	1	√	mmm	$\mathrm{B1_u}$
N35.11.35 Y1 ⊕ LD1LE1	√	1	1	√	mmm	$\mathrm{B1_u}$
N35.11.36 Y1 ⊕ LD2LE2	√	1	1	√	mmm	$\mathrm{B1_u}$

Non-coplanar SSGs with parent space group $Cmm2$ (No. 35) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N35.11.37 Y1 ⊕ LD3LE3	√	1	1	√	mmm	$\mathrm{B1_u}$
N35.11.38 Y1 ⊕ H1HA1	√	1	1	√	mmm	$\mathrm{B1_u}$
N35.11.39 Y1 ⊕ H2HA2	√	1	1	√	mmm	$\mathrm{B1_u}$
N35.11.40 Y1 ⊕ H3HA3	√	1	1	√	mmm	$\mathrm{B1_u}$
N35.11.41 Y2 ⊕ LD1LE1	√	1	1	√	mmm	$\mathrm{B1_u}$
N35.11.42 Y2 ⊕ LD2LE2	√	1	1	√	mmm	$\mathrm{B1_u}$
N35.11.43 Y2 ⊕ LD3LE3	√	1	1	√	mmm	$\mathrm{B1_u}$
N35.11.44 Y2 ⊕ H1HA1	√	1	1	√	mmm	$\mathrm{B1_u}$
N35.11.45 Y2 ⊕ H2HA2	√	1	1	√	mmm	$\mathrm{B1_u}$
N35.11.46 Y2 ⊕ H3HA3	√	1	1	√	mmm	$\mathrm{B1_u}$
N35.11.47 Y3 ⊕ LD1LE1	√	1	1	√	mmm	$\mathrm{B1_u}$
N35.11.48 Y3 ⊕ LD2LE2	√	1	1	√	mmm	$\mathrm{B1_u}$
N35.11.49 Y3 ⊕ LD3LE3	√	1	1	√	mmm	$\mathrm{B1_u}$
N35.11.50 Y3 ⊕ LD4LE4	√	1	1	√	mmm	$\mathrm{B1_u}$
N35.11.51 Y3 ⊕ H1HA1	√	1	1	√	mmm	$\mathrm{B1_u}$
N35.11.52 Y3 ⊕ H2HA2	√	1	1	√	mmm	$\mathrm{B1_u}$
N35.11.53 Y3 ⊕ H3HA3	√	1	1	√	mmm	$\mathrm{B1_u}$
N35.11.54 Y3 ⊕ H4HA4	√	1	1	√	mmm	$\mathrm{B1_u}$
N35.11.55 Z1 ⊕ LD1LE1	√	1	1	√	mmm	$\mathrm{B1_u}$
N35.11.56 Z1 ⊕ LD2LE2	√	1	1	√	mmm	$\mathrm{B1_u}$
N35.11.57 Z1 ⊕ LD3LE3	√	1	1	√	mmm	$\mathrm{B1_u}$
N35.11.58 Z1 ⊕ H1HA1	√	1	1	×	-	-
N35.11.59 Z1 ⊕ H2HA2	√	1	1	×	-	-
N35.11.60 Z1 ⊕ H3HA3	√	1	1	×	-	-
N35.11.61 Z2 ⊕ LD1LE1	√	1	1	√	mmm	$\mathrm{B1_u}$
N35.11.62 Z2 ⊕ LD2LE2	√	1	1	√	mmm	$\mathrm{B1_u}$
N35.11.63 Z2 ⊕ LD3LE3	√	1	1	√	mmm	$\mathrm{B1_u}$
N35.11.64 Z2 ⊕ H1HA1	√	1	1	×	-	-
N35.11.65 Z2 ⊕ H2HA2	√	1	1	×	-	-
N35.11.66 Z2 ⊕ H3HA3	√	1	1	×	-	-
N35.11.67 Z3 ⊕ LD1LE1	√	1	1	√	mmm	$\mathrm{B1_u}$
N35.11.68 Z3 ⊕ LD2LE2	√	1	1	√	mmm	$\mathrm{B1_u}$
N35.11.69 Z3 ⊕ LD3LE3	√	1	1	√	mmm	$\mathrm{B1_u}$
N35.11.70 Z3 ⊕ LD4LE4	√	1	1	√	mmm	$\mathrm{B1_u}$
N35.11.71 Z3 ⊕ H1HA1	√	1	1	×	-	-
N35.11.72 Z3 ⊕ H2HA2	√	1	1	×	-	-
N35.11.73 Z3 ⊕ H3HA3	√	1	1	×	-	-
N35.11.74 Z3 ⊕ H4HA4	√	1	1	×	-	-
N35.13.1 GM2 ⊕ S1	√	1	1	×	-	-
N35.13.2 GM2 ⊕ R1	√	1	1	×	-	-
N35.13.3 GM3 ⊕ S1	√	1	1	×	-	-
N35.13.4 GM3 ⊕ R1	√	1	1	×	-	-
N35.13.5 T1 ⊕ S1	×	-	-	-	-	-
N35.13.6 T1 ⊕ R1	×	-	-	-	-	-
N35.13.7 T2 ⊕ S1	×	-	-	-	-	-
N35.13.8 T2 ⊕ R1	×	-	-	-	-	-

Non-coplanar SSGs with parent space group $Cmm2$ (No. 35) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N35.13.9 T3 $\oplus$ S1	$\times$	-	-	-	-	-
N35.13.10 T3 $\oplus$ R1	$\times$	-	-	-	-	-
N35.13.11 Y1 $\oplus$ S1	$\times$	-	-	-	-	-
N35.13.12 Y1 $\oplus$ R1	$\times$	-	-	-	-	-
N35.13.13 Y2 $\oplus$ S1	$\times$	-	-	-	-	-
N35.13.14 Y2 $\oplus$ R1	$\times$	-	-	-	-	-
N35.13.15 Y3 $\oplus$ S1	$\times$	-	-	-	-	-
N35.13.16 Y3 $\oplus$ R1	$\times$	-	-	-	-	-
N35.13.17 Z1 $\oplus$ S1	$\times$	-	-	-	-	-
N35.13.18 Z1 $\oplus$ R1	$\times$	-	-	-	-	-
N35.13.19 Z2 $\oplus$ S1	$\times$	-	-	-	-	-
N35.13.20 Z2 $\oplus$ R1	$\times$	-	-	-	-	-
N35.13.21 Z3 $\oplus$ S1	$\times$	-	-	-	-	-
N35.13.22 Z3 $\oplus$ R1	$\times$	-	-	-	-	-
N35.14.1 GM2 $\oplus$ DT1	$\surd$	1	1	$\surd$	$mm2$	B2
N35.14.2 GM2 $\oplus$ DT2	$\surd$	1	1	$\surd$	$mm2$	B2
N35.14.3 GM2 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
N35.14.4 GM2 $\oplus$ A2	$\surd$	1	1	$\times$	-	-
N35.14.5 GM3 $\oplus$ SM1	$\surd$	1	1	$\surd$	222	B3
N35.14.6 GM3 $\oplus$ DT1	$\surd$	1	1	$\surd$	$mm2$	B2
N35.14.7 GM3 $\oplus$ SM2	$\surd$	1	1	$\surd$	222	B3
N35.14.8 GM3 $\oplus$ DT2	$\surd$	1	1	$\surd$	$mm2$	B2
N35.14.9 GM3 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
N35.14.10 GM3 $\oplus$ B1	$\surd$	1	1	$\times$	-	-
N35.14.11 GM3 $\oplus$ A2	$\surd$	1	1	$\times$	-	-
N35.14.12 GM3 $\oplus$ B2	$\surd$	1	1	$\times$	-	-
N35.14.13 T1 $\oplus$ DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N35.14.14 T1 $\oplus$ DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N35.14.15 T1 $\oplus$ A1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N35.14.16 T1 $\oplus$ A2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N35.14.17 T2 $\oplus$ DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N35.14.18 T2 $\oplus$ DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N35.14.19 T2 $\oplus$ A1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N35.14.20 T2 $\oplus$ A2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N35.14.21 T3 $\oplus$ SM1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N35.14.22 T3 $\oplus$ DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N35.14.23 T3 $\oplus$ SM2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N35.14.24 T3 $\oplus$ DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N35.14.25 T3 $\oplus$ A1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N35.14.26 T3 $\oplus$ B1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N35.14.27 T3 $\oplus$ A2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N35.14.28 T3 $\oplus$ B2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N35.14.29 Y1 $\oplus$ DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N35.14.30 Y1 $\oplus$ DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N35.14.31 Y1 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
N35.14.32 Y1 $\oplus$ A2	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $Cmm2$ (No. 35) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N35.14.33 Y2 $\oplus$ DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N35.14.34 Y2 $\oplus$ DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N35.14.35 Y2 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
N35.14.36 Y2 $\oplus$ A2	$\surd$	1	1	$\times$	-	-
N35.14.37 Y3 $\oplus$ SM1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N35.14.38 Y3 $\oplus$ DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N35.14.39 Y3 $\oplus$ SM2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N35.14.40 Y3 $\oplus$ DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N35.14.41 Y3 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
N35.14.42 Y3 $\oplus$ B1	$\surd$	1	1	$\times$	-	-
N35.14.43 Y3 $\oplus$ A2	$\surd$	1	1	$\times$	-	-
N35.14.44 Y3 $\oplus$ B2	$\surd$	1	1	$\times$	-	-
N35.14.45 Z1 $\oplus$ DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N35.14.46 Z1 $\oplus$ DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N35.14.47 Z1 $\oplus$ A1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N35.14.48 Z1 $\oplus$ A2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N35.14.49 Z2 $\oplus$ DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N35.14.50 Z2 $\oplus$ DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N35.14.51 Z2 $\oplus$ A1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N35.14.52 Z2 $\oplus$ A2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N35.14.53 Z3 $\oplus$ SM1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N35.14.54 Z3 $\oplus$ DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N35.14.55 Z3 $\oplus$ SM2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N35.14.56 Z3 $\oplus$ DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N35.14.57 Z3 $\oplus$ A1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N35.14.58 Z3 $\oplus$ B1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N35.14.59 Z3 $\oplus$ A2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N35.14.60 Z3 $\oplus$ B2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$

TABLE S106: Collinear SSGs with parent space group $Cmc2_1$ (No. 36).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L36.1.1 GM1	1	mmm	$\mathrm{A_g}$
L36.2.1 GM2	1	mmm	$\mathrm{B1_g}$
L36.2.2 GM3	1	mmm	$\mathrm{B3_g}$
L36.2.3 GM4	1	mmm	$\mathrm{B2_g}$
L36.2.4 Y1	0	-	-
L36.2.5 Y2	0	-	-
L36.2.6 Y3	0	-	-
L36.2.7 Y4	0	-	-

TABLE S107: Coplanar SSGs with parent space group $Cmc2_1$ (No. 36).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P36.1.1 GM1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B1_u}$

Coplanar SSGs with parent space group $Cmc2_1$ (No. 36) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P36.2.1 GM2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$
P36.2.2 GM3	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
P36.2.3 GM4	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u} \oplus \mathrm{B2_g}$
P36.2.4 Y1	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P36.2.5 Y2	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P36.2.6 Y3	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P36.2.7 Y4	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P36.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
P36.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
P36.3.3 GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
P36.3.4 GM2 $\oplus$ Y1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
P36.3.5 GM2 $\oplus$ Y2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
P36.3.6 GM2 $\oplus$ Y3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
P36.3.7 GM2 $\oplus$ Y4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
P36.3.8 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
P36.3.9 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
P36.3.10 GM3 $\oplus$ Y1	$\surd$	1	1	$\times$	-	-
P36.3.11 GM3 $\oplus$ Y2	$\surd$	1	1	$\times$	-	-
P36.3.12 GM3 $\oplus$ Y3	$\surd$	1	1	$\times$	-	-
P36.3.13 GM3 $\oplus$ Y4	$\surd$	1	1	$\times$	-	-
P36.3.14 GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
P36.3.15 GM4 $\oplus$ Y1	$\surd$	1	1	$\times$	-	-
P36.3.16 GM4 $\oplus$ Y2	$\surd$	1	1	$\times$	-	-
P36.3.17 GM4 $\oplus$ Y3	$\surd$	1	1	$\times$	-	-
P36.3.18 GM4 $\oplus$ Y4	$\surd$	1	1	$\times$	-	-
P36.3.19 Y1 $\oplus$ Y1	$\surd$	1	1	$\times$	-	-
P36.3.20 Y1 $\oplus$ Y2	$\surd$	1	1	$\times$	-	-
P36.3.21 Y1 $\oplus$ Y3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P36.3.22 Y1 $\oplus$ Y4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P36.3.23 Y2 $\oplus$ Y2	$\surd$	1	1	$\times$	-	-
P36.3.24 Y2 $\oplus$ Y3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P36.3.25 Y2 $\oplus$ Y4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P36.3.26 Y3 $\oplus$ Y3	$\surd$	1	1	$\times$	-	-
P36.3.27 Y3 $\oplus$ Y4	$\surd$	1	1	$\times$	-	-
P36.3.28 Y4 $\oplus$ Y4	$\surd$	1	1	$\times$	-	-
P36.4.1 T1T3	$\surd$	1	1	$\times$	-	-
P36.4.2 T2T4	$\surd$	1	1	$\times$	-	-
P36.4.3 Z1Z3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P36.4.4 Z2Z4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P36.5.1 LD1LE1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P36.5.2 LD2LE2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P36.5.3 H1HA1	$\surd$	1	1	$\times$	-	-
P36.5.4 H2HA2	$\surd$	1	1	$\times$	-	-
P36.7.1 S1	$\times$	-	-	-	-	-
P36.8.1 SM1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P36.8.2 SM2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$

Coplanar SSGs with parent space group $Cmc2_1$ (No. 36) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P36.8.3 DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P36.8.4 DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$

TABLE S108: Non-coplanar SSGs with parent space group $Cmc2_1$ (No. 36).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N36.1.1 GM1	$\surd$	3	3	$\surd$	$mm2$	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{A1}$
N36.2.1 GM2	$\surd$	3	3	$\surd$	222	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{B1}$
N36.2.2 GM3	$\surd$	3	3	$\surd$	$mm2$	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{B2}$
N36.2.3 GM4	$\surd$	3	3	$\surd$	$mm2$	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{B1}$
N36.2.4 Y1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{B1_u}$
N36.2.5 Y2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{B1_u}$
N36.2.6 Y3	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{B1_u}$
N36.2.7 Y4	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{B1_u}$
N36.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$mm2$	$\mathrm{A1}\oplus\mathrm{A2}\oplus\mathrm{A2}$
N36.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$mm2$	$\mathrm{A1}\oplus\mathrm{A2}\oplus\mathrm{B2}$
N36.3.3 GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	$mm2$	$\mathrm{A1}\oplus\mathrm{A2}\oplus\mathrm{B1}$
N36.3.4 GM2 $\oplus$ Y1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_u}\oplus\mathrm{B1_g}$
N36.3.5 GM2 $\oplus$ Y2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_u}\oplus\mathrm{B1_g}$
N36.3.6 GM2 $\oplus$ Y3	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_u}\oplus\mathrm{B1_g}$
N36.3.7 GM2 $\oplus$ Y4	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_u}\oplus\mathrm{B1_g}$
N36.3.8 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	$mm2$	$\mathrm{A1}\oplus\mathrm{B2}\oplus\mathrm{B2}$
N36.3.9 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	222	$\mathrm{A1}\oplus\mathrm{B3}\oplus\mathrm{B2}$
N36.3.10 GM3 $\oplus$ Y1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}\oplus\mathrm{B2_u}$
N36.3.11 GM3 $\oplus$ Y2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}\oplus\mathrm{B2_u}$
N36.3.12 GM3 $\oplus$ Y3	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}\oplus\mathrm{B2_u}$
N36.3.13 GM3 $\oplus$ Y4	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}\oplus\mathrm{B2_u}$
N36.3.14 GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	$mm2$	$\mathrm{A1}\oplus\mathrm{B1}\oplus\mathrm{B1}$
N36.3.15 GM4 $\oplus$ Y1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}\oplus\mathrm{B2_g}$
N36.3.16 GM4 $\oplus$ Y2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}\oplus\mathrm{B2_g}$
N36.3.17 GM4 $\oplus$ Y3	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}\oplus\mathrm{B2_g}$
N36.3.18 GM4 $\oplus$ Y4	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}\oplus\mathrm{B2_g}$
N36.3.19 Y1 $\oplus$ Y1	$\surd$	1	1	$\surd$	$mm2$	A1
N36.3.20 Y1 $\oplus$ Y2	$\surd$	1	1	$\surd$	222	A1
N36.3.21 Y1 $\oplus$ Y3	$\surd$	1	1	$\surd$	$mm2$	A1
N36.3.22 Y1 $\oplus$ Y4	$\surd$	1	1	$\surd$	$mm2$	A1
N36.3.23 Y2 $\oplus$ Y2	$\surd$	1	1	$\surd$	$mm2$	A1
N36.3.24 Y2 $\oplus$ Y3	$\surd$	1	1	$\surd$	$mm2$	A1
N36.3.25 Y2 $\oplus$ Y4	$\surd$	1	1	$\surd$	$mm2$	A1
N36.3.26 Y3 $\oplus$ Y3	$\surd$	1	1	$\surd$	$mm2$	A1
N36.3.27 Y3 $\oplus$ Y4	$\surd$	1	1	$\surd$	222	A1
N36.3.28 Y4 $\oplus$ Y4	$\surd$	1	1	$\surd$	$mm2$	A1
N36.4.1 T1T3	$\surd$	1	1	$\surd$	$mm2$	A1
N36.4.2 T2T4	$\surd$	1	1	$\surd$	$mm2$	A1
N36.4.3 Z1Z3	$\surd$	1	1	$\surd$	$mm2$	A1
N36.4.4 Z2Z4	$\surd$	1	1	$\surd$	$mm2$	A1

Non-coplanar SSGs with parent space group $Cmc2_1$ (No. 36) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N36.5.1 LD1LE1	√	1	1	√	$mm2$	A1
N36.5.2 LD2LE2	√	1	1	√	$mm2$	A1
N36.5.3 H1HA1	√	1	1	√	$mm2$	A1
N36.5.4 H2HA2	√	1	1	√	$mm2$	A1
N36.7.1 S1	√	1	1	√	mmm	$\mathrm{A_g}$
N36.8.1 SM1	√	1	1	√	$mm2$	A1
N36.8.2 SM2	√	1	1	√	$mm2$	A1
N36.8.3 DT1	√	1	1	√	$mm2$	A1
N36.8.4 DT2	√	1	1	√	$mm2$	A1
N36.9.1 GM2 ⊕ GM2 ⊕ GM2	√	3	3	√	222	B1 ⊕ B1 ⊕ B1
N36.9.2 GM2 ⊕ GM2 ⊕ GM3	√	3	3	√	$mm2$	B2 ⊕ B1 ⊕ B1
N36.9.3 GM2 ⊕ GM2 ⊕ GM4	√	3	3	√	$mm2$	B2 ⊕ B2 ⊕ B1
N36.9.4 GM2 ⊕ GM2 ⊕ Y1	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N36.9.5 GM2 ⊕ GM2 ⊕ Y2	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N36.9.6 GM2 ⊕ GM2 ⊕ Y3	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N36.9.7 GM2 ⊕ GM2 ⊕ Y4	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N36.9.8 GM2 ⊕ GM3 ⊕ GM3	√	3	3	√	222	B1 ⊕ B3 ⊕ B3
N36.9.9 GM2 ⊕ GM3 ⊕ GM4	√	3	3	√	$mm2$	A2 ⊕ B2 ⊕ B1
N36.9.10 GM2 ⊕ GM3 ⊕ Y1	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N36.9.11 GM2 ⊕ GM3 ⊕ Y2	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N36.9.12 GM2 ⊕ GM3 ⊕ Y3	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N36.9.13 GM2 ⊕ GM3 ⊕ Y4	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N36.9.14 GM2 ⊕ GM4 ⊕ GM4	√	3	3	√	222	B1 ⊕ B2 ⊕ B2
N36.9.15 GM2 ⊕ GM4 ⊕ Y1	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N36.9.16 GM2 ⊕ GM4 ⊕ Y2	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N36.9.17 GM2 ⊕ GM4 ⊕ Y3	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N36.9.18 GM2 ⊕ GM4 ⊕ Y4	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N36.9.19 GM2 ⊕ Y1 ⊕ Y1	√	1	1	√	222	B1
N36.9.20 GM2 ⊕ Y1 ⊕ Y2	√	1	1	√	$mm2$	A2
N36.9.21 GM2 ⊕ Y1 ⊕ Y3	√	1	1	√	$mm2$	B2
N36.9.22 GM2 ⊕ Y1 ⊕ Y4	√	1	1	√	$mm2$	B1
N36.9.23 GM2 ⊕ Y2 ⊕ Y2	√	1	1	√	222	B1
N36.9.24 GM2 ⊕ Y2 ⊕ Y3	√	1	1	√	$mm2$	B1
N36.9.25 GM2 ⊕ Y2 ⊕ Y4	√	1	1	√	$mm2$	B2
N36.9.26 GM2 ⊕ Y3 ⊕ Y3	√	1	1	√	222	B1
N36.9.27 GM2 ⊕ Y3 ⊕ Y4	√	1	1	√	$mm2$	A2
N36.9.28 GM2 ⊕ Y4 ⊕ Y4	√	1	1	√	222	B1
N36.9.29 GM3 ⊕ GM3 ⊕ GM3	√	3	3	√	$mm2$	B2 ⊕ B2 ⊕ B2
N36.9.30 GM3 ⊕ GM3 ⊕ GM4	√	3	3	√	$mm2$	A2 ⊕ A2 ⊕ B1
N36.9.31 GM3 ⊕ GM3 ⊕ Y1	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N36.9.32 GM3 ⊕ GM3 ⊕ Y2	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N36.9.33 GM3 ⊕ GM3 ⊕ Y3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N36.9.34 GM3 ⊕ GM3 ⊕ Y4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N36.9.35 GM3 ⊕ GM4 ⊕ GM4	√	3	3	√	$mm2$	A2 ⊕ A2 ⊕ B2
N36.9.36 GM3 ⊕ GM4 ⊕ Y1	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N36.9.37 GM3 ⊕ GM4 ⊕ Y2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$

Non-coplanar SSGs with parent space group $Cmc2_1$ (No. 36) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N36.9.38 GM3 ⊕ GM4 ⊕ Y3	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N36.9.39 GM3 ⊕ GM4 ⊕ Y4	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N36.9.40 GM3 ⊕ Y1 ⊕ Y1	√	1	1	×	-	-
N36.9.41 GM3 ⊕ Y1 ⊕ Y2	√	1	1	×	-	-
N36.9.42 GM3 ⊕ Y1 ⊕ Y3	√	1	1	√	$mm2$	B2
N36.9.43 GM3 ⊕ Y1 ⊕ Y4	√	1	1	√	222	B3
N36.9.44 GM3 ⊕ Y2 ⊕ Y2	√	1	1	×	-	-
N36.9.45 GM3 ⊕ Y2 ⊕ Y3	√	1	1	√	222	B3
N36.9.46 GM3 ⊕ Y2 ⊕ Y4	√	1	1	√	$mm2$	B2
N36.9.47 GM3 ⊕ Y3 ⊕ Y3	√	1	1	×	-	-
N36.9.48 GM3 ⊕ Y3 ⊕ Y4	√	1	1	×	-	-
N36.9.49 GM3 ⊕ Y4 ⊕ Y4	√	1	1	×	-	-
N36.9.50 GM4 ⊕ GM4 ⊕ GM4	√	3	3	√	$mm2$	B1 ⊕ B1 ⊕ B1
N36.9.51 GM4 ⊕ GM4 ⊕ Y1	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N36.9.52 GM4 ⊕ GM4 ⊕ Y2	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N36.9.53 GM4 ⊕ GM4 ⊕ Y3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N36.9.54 GM4 ⊕ GM4 ⊕ Y4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N36.9.55 GM4 ⊕ Y1 ⊕ Y1	√	1	1	×	-	-
N36.9.56 GM4 ⊕ Y1 ⊕ Y2	√	1	1	×	-	-
N36.9.57 GM4 ⊕ Y1 ⊕ Y3	√	1	1	√	222	B2
N36.9.58 GM4 ⊕ Y1 ⊕ Y4	√	1	1	√	$mm2$	B1
N36.9.59 GM4 ⊕ Y2 ⊕ Y2	√	1	1	×	-	-
N36.9.60 GM4 ⊕ Y2 ⊕ Y3	√	1	1	√	$mm2$	B1
N36.9.61 GM4 ⊕ Y2 ⊕ Y4	√	1	1	√	222	B2
N36.9.62 GM4 ⊕ Y3 ⊕ Y3	√	1	1	×	-	-
N36.9.63 GM4 ⊕ Y3 ⊕ Y4	√	1	1	×	-	-
N36.9.64 GM4 ⊕ Y4 ⊕ Y4	√	1	1	×	-	-
N36.9.65 Y1 ⊕ Y1 ⊕ Y1	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N36.9.66 Y1 ⊕ Y1 ⊕ Y2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N36.9.67 Y1 ⊕ Y1 ⊕ Y3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N36.9.68 Y1 ⊕ Y1 ⊕ Y4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N36.9.69 Y1 ⊕ Y2 ⊕ Y2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N36.9.70 Y1 ⊕ Y2 ⊕ Y3	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N36.9.71 Y1 ⊕ Y2 ⊕ Y4	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N36.9.72 Y1 ⊕ Y3 ⊕ Y3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N36.9.73 Y1 ⊕ Y3 ⊕ Y4	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N36.9.74 Y1 ⊕ Y4 ⊕ Y4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N36.9.75 Y2 ⊕ Y2 ⊕ Y2	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N36.9.76 Y2 ⊕ Y2 ⊕ Y3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N36.9.77 Y2 ⊕ Y2 ⊕ Y4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N36.9.78 Y2 ⊕ Y3 ⊕ Y3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N36.9.79 Y2 ⊕ Y3 ⊕ Y4	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N36.9.80 Y2 ⊕ Y4 ⊕ Y4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N36.9.81 Y3 ⊕ Y3 ⊕ Y3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N36.9.82 Y3 ⊕ Y3 ⊕ Y4	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N36.9.83 Y3 ⊕ Y4 ⊕ Y4	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$

Non-coplanar SSGs with parent space group $Cmc2_1$ (No. 36) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N36.9.84 Y4 $\oplus$ Y4 $\oplus$ Y4	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N36.10.1 GM2 $\oplus$ T1T3	$\surd$	1	1	$\surd$	222	B1
N36.10.2 GM2 $\oplus$ T2T4	$\surd$	1	1	$\surd$	222	B1
N36.10.3 GM2 $\oplus$ Z1Z3	$\surd$	1	1	$\surd$	222	B1
N36.10.4 GM2 $\oplus$ Z2Z4	$\surd$	1	1	$\surd$	222	B1
N36.10.5 GM3 $\oplus$ T1T3	$\surd$	1	1	$\times$	-	-
N36.10.6 GM3 $\oplus$ T2T4	$\surd$	1	1	$\times$	-	-
N36.10.7 GM3 $\oplus$ Z1Z3	$\surd$	1	1	$\surd$	$mm2$	B2
N36.10.8 GM3 $\oplus$ Z2Z4	$\surd$	1	1	$\surd$	$mm2$	B2
N36.10.9 GM4 $\oplus$ T1T3	$\surd$	1	1	$\times$	-	-
N36.10.10 GM4 $\oplus$ T2T4	$\surd$	1	1	$\times$	-	-
N36.10.11 GM4 $\oplus$ Z1Z3	$\surd$	1	1	$\surd$	$mm2$	B1
N36.10.12 GM4 $\oplus$ Z2Z4	$\surd$	1	1	$\surd$	$mm2$	B1
N36.10.13 Y1 $\oplus$ T1T3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N36.10.14 Y1 $\oplus$ T2T4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N36.10.15 Y1 $\oplus$ Z1Z3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N36.10.16 Y1 $\oplus$ Z2Z4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N36.10.17 Y2 $\oplus$ T1T3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N36.10.18 Y2 $\oplus$ T2T4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N36.10.19 Y2 $\oplus$ Z1Z3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N36.10.20 Y2 $\oplus$ Z2Z4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N36.10.21 Y3 $\oplus$ T1T3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N36.10.22 Y3 $\oplus$ T2T4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N36.10.23 Y3 $\oplus$ Z1Z3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N36.10.24 Y3 $\oplus$ Z2Z4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N36.10.25 Y4 $\oplus$ T1T3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N36.10.26 Y4 $\oplus$ T2T4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N36.10.27 Y4 $\oplus$ Z1Z3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N36.10.28 Y4 $\oplus$ Z2Z4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N36.11.1 GM2 $\oplus$ LD1LE1	$\surd$	1	1	$\surd$	222	B1
N36.11.2 GM2 $\oplus$ LD2LE2	$\surd$	1	1	$\surd$	222	B1
N36.11.3 GM2 $\oplus$ H1HA1	$\surd$	1	1	$\surd$	222	B1
N36.11.4 GM2 $\oplus$ H2HA2	$\surd$	1	1	$\surd$	222	B1
N36.11.5 GM3 $\oplus$ LD1LE1	$\surd$	1	1	$\surd$	$mm2$	B2
N36.11.6 GM3 $\oplus$ LD2LE2	$\surd$	1	1	$\surd$	$mm2$	B2
N36.11.7 GM3 $\oplus$ H1HA1	$\surd$	1	1	$\times$	-	-
N36.11.8 GM3 $\oplus$ H2HA2	$\surd$	1	1	$\times$	-	-
N36.11.9 GM4 $\oplus$ LD1LE1	$\surd$	1	1	$\surd$	$mm2$	B1
N36.11.10 GM4 $\oplus$ LD2LE2	$\surd$	1	1	$\surd$	$mm2$	B1
N36.11.11 GM4 $\oplus$ H1HA1	$\surd$	1	1	$\times$	-	-
N36.11.12 GM4 $\oplus$ H2HA2	$\surd$	1	1	$\times$	-	-
N36.11.13 Y1 $\oplus$ LD1LE1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N36.11.14 Y1 $\oplus$ LD2LE2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N36.11.15 Y1 $\oplus$ H1HA1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N36.11.16 Y1 $\oplus$ H2HA2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N36.11.17 Y2 $\oplus$ LD1LE1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$

Non-coplanar SSGs with parent space group $Cmc2_1$ (No. 36) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N36.11.18 Y2 $\oplus$ LD2LE2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N36.11.19 Y2 $\oplus$ H1HA1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N36.11.20 Y2 $\oplus$ H2HA2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N36.11.21 Y3 $\oplus$ LD1LE1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N36.11.22 Y3 $\oplus$ LD2LE2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N36.11.23 Y3 $\oplus$ H1HA1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N36.11.24 Y3 $\oplus$ H2HA2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N36.11.25 Y4 $\oplus$ LD1LE1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N36.11.26 Y4 $\oplus$ LD2LE2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N36.11.27 Y4 $\oplus$ H1HA1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N36.11.28 Y4 $\oplus$ H2HA2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N36.13.1 GM2 $\oplus$ S1	$\surd$	1	1	$\times$	-	-
N36.13.2 GM3 $\oplus$ S1	$\surd$	1	1	$\times$	-	-
N36.13.3 GM4 $\oplus$ S1	$\surd$	1	1	$\times$	-	-
N36.13.4 Y1 $\oplus$ S1	$\times$	-	-	-	-	-
N36.13.5 Y2 $\oplus$ S1	$\times$	-	-	-	-	-
N36.13.6 Y3 $\oplus$ S1	$\times$	-	-	-	-	-
N36.13.7 Y4 $\oplus$ S1	$\times$	-	-	-	-	-
N36.14.1 GM2 $\oplus$ SM1	$\surd$	1	1	$\surd$	$mm2$	B1
N36.14.2 GM2 $\oplus$ SM2	$\surd$	1	1	$\surd$	$mm2$	B1
N36.14.3 GM2 $\oplus$ DT1	$\surd$	1	1	$\surd$	$mm2$	B2
N36.14.4 GM2 $\oplus$ DT2	$\surd$	1	1	$\surd$	$mm2$	B2
N36.14.5 GM3 $\oplus$ SM1	$\surd$	1	1	$\surd$	222	B3
N36.14.6 GM3 $\oplus$ SM2	$\surd$	1	1	$\surd$	222	B3
N36.14.7 GM3 $\oplus$ DT1	$\surd$	1	1	$\surd$	$mm2$	B2
N36.14.8 GM3 $\oplus$ DT2	$\surd$	1	1	$\surd$	$mm2$	B2
N36.14.9 GM4 $\oplus$ SM1	$\surd$	1	1	$\surd$	$mm2$	B1
N36.14.10 GM4 $\oplus$ SM2	$\surd$	1	1	$\surd$	$mm2$	B1
N36.14.11 GM4 $\oplus$ DT1	$\surd$	1	1	$\surd$	222	B2
N36.14.12 GM4 $\oplus$ DT2	$\surd$	1	1	$\surd$	222	B2
N36.14.13 Y1 $\oplus$ SM1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N36.14.14 Y1 $\oplus$ SM2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N36.14.15 Y1 $\oplus$ DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N36.14.16 Y1 $\oplus$ DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N36.14.17 Y2 $\oplus$ SM1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N36.14.18 Y2 $\oplus$ SM2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N36.14.19 Y2 $\oplus$ DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N36.14.20 Y2 $\oplus$ DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N36.14.21 Y3 $\oplus$ SM1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N36.14.22 Y3 $\oplus$ SM2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N36.14.23 Y3 $\oplus$ DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N36.14.24 Y3 $\oplus$ DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N36.14.25 Y4 $\oplus$ SM1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N36.14.26 Y4 $\oplus$ SM2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N36.14.27 Y4 $\oplus$ DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N36.14.28 Y4 $\oplus$ DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$

Collinear SSGs with parent space group $Ccc2$ (No. 37)(continued)

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation

TABLE S109: Collinear SSGs with parent space group $Ccc2$ (No. 37).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L37.1.1 GM1	1	mmm	$\mathrm{A_g}$
L37.2.1 GM2	1	mmm	$\mathrm{B1_g}$
L37.2.2 GM3	1	mmm	$\mathrm{B3_g}$
L37.2.3 Y1	0	-	-
L37.2.4 Y2	0	-	-
L37.2.5 Y3	0	-	-

TABLE S110: Coplanar SSGs with parent space group $Ccc2$ (No. 37).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P37.1.1 GM1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{B1_u}$
P37.2.1 GM2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_u}\oplus\mathrm{B1_g}$
P37.2.2 GM3	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}\oplus\mathrm{B2_u}$
P37.2.3 Y1	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P37.2.4 Y2	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P37.2.5 Y3	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P37.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B1_u}$
P37.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B3_g}\oplus\mathrm{B3_u}$
P37.3.3 GM2 $\oplus$ Y1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
P37.3.4 GM2 $\oplus$ Y2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
P37.3.5 GM2 $\oplus$ Y3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
P37.3.6 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B3_g}\oplus\mathrm{B3_g}$
P37.3.7 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B3_g}\oplus\mathrm{B2_g}$
P37.3.8 GM3 $\oplus$ Y1	$\surd$	1	1	$\times$	-	-
P37.3.9 GM3 $\oplus$ Y2	$\surd$	1	1	$\times$	-	-
P37.3.10 GM3 $\oplus$ Y3	$\surd$	1	1	$\times$	-	-
P37.3.11 GM3 $\oplus$ Y4	$\surd$	1	1	$\times$	-	-
P37.3.12 Y1 $\oplus$ Y1	$\surd$	1	1	$\times$	-	-
P37.3.13 Y1 $\oplus$ Y2	$\surd$	1	1	$\times$	-	-
P37.3.14 Y1 $\oplus$ Y3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P37.3.15 Y2 $\oplus$ Y2	$\surd$	1	1	$\times$	-	-
P37.3.16 Y2 $\oplus$ Y3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P37.3.17 Y3 $\oplus$ Y3	$\surd$	1	1	$\times$	-	-
P37.3.18 Y3 $\oplus$ Y4	$\surd$	1	1	$\times$	-	-
P37.4.1 T1T2	$\surd$	1	1	$\times$	-	-
P37.4.2 T3T4	$\surd$	1	1	$\times$	-	-
P37.4.3 Z1Z2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P37.4.4 Z3Z4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P37.5.1 LD1LE1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P37.5.2 LD3LE3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P37.5.3 H1HA1	$\surd$	1	1	$\times$	-	-
P37.5.4 H3HA3	$\surd$	1	1	$\times$	-	-

Coplanar SSGs with parent space group $Ccc2$ (No. 37) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P37.7.1 S1	×	-	-	-	-	-
P37.7.2 R1	×	-	-	-	-	-
P37.8.1 DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
P37.8.2 DT2	√	1	1	√	mmm	$\mathrm{B2_u}$

TABLE S111: Non-coplanar SSGs with parent space group $Ccc2$ (No. 37).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N37.1.1 GM1	√	3	3	√	$mm2$	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{A1}$
N37.2.1 GM2	√	3	3	√	222	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{B1}$
N37.2.2 GM3	√	3	3	√	$mm2$	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{B2}$
N37.2.3 Y1	√	3	3	√	mmm	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{B1_u}$
N37.2.4 Y2	√	3	3	√	mmm	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{B1_u}$
N37.2.5 Y3	√	3	3	√	mmm	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{B1_u}$
N37.3.1 GM2 ⊕ GM2	√	3	3	√	$mm2$	$\mathrm{A1}\oplus\mathrm{A2}\oplus\mathrm{A2}$
N37.3.2 GM2 ⊕ GM3	√	3	3	√	$mm2$	$\mathrm{A1}\oplus\mathrm{A2}\oplus\mathrm{B2}$
N37.3.3 GM2 ⊕ Y1	√	3	3	√	mmm	$\mathrm{A_g}\oplus\mathrm{A_u}\oplus\mathrm{B1_g}$
N37.3.4 GM2 ⊕ Y2	√	3	3	√	mmm	$\mathrm{A_g}\oplus\mathrm{A_u}\oplus\mathrm{B1_g}$
N37.3.5 GM2 ⊕ Y3	√	3	3	√	mmm	$\mathrm{A_g}\oplus\mathrm{A_u}\oplus\mathrm{B1_g}$
N37.3.6 GM3 ⊕ GM3	√	3	3	√	$mm2$	$\mathrm{A1}\oplus\mathrm{B2}\oplus\mathrm{B2}$
N37.3.7 GM3 ⊕ GM4	√	3	3	√	222	$\mathrm{A1}\oplus\mathrm{B3}\oplus\mathrm{B2}$
N37.3.8 GM3 ⊕ Y1	√	3	3	√	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}\oplus\mathrm{B2_u}$
N37.3.9 GM3 ⊕ Y2	√	3	3	√	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}\oplus\mathrm{B2_u}$
N37.3.10 GM3 ⊕ Y3	√	3	3	√	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}\oplus\mathrm{B2_u}$
N37.3.11 GM3 ⊕ Y4	√	3	3	√	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}\oplus\mathrm{B2_u}$
N37.3.12 Y1 ⊕ Y1	√	1	1	√	$mm2$	A1
N37.3.13 Y1 ⊕ Y2	√	1	1	√	222	A1
N37.3.14 Y1 ⊕ Y3	√	1	1	√	$mm2$	A1
N37.3.15 Y2 ⊕ Y2	√	1	1	√	$mm2$	A1
N37.3.16 Y2 ⊕ Y3	√	1	1	√	$mm2$	A1
N37.3.17 Y3 ⊕ Y3	√	1	1	√	$mm2$	A1
N37.3.18 Y3 ⊕ Y4	√	1	1	√	222	A1
N37.4.1 T1T2	√	1	1	√	$mm2$	A1
N37.4.2 T3T4	√	1	1	√	$mm2$	A1
N37.4.3 Z1Z2	√	1	1	√	$mm2$	A1
N37.4.4 Z3Z4	√	1	1	√	$mm2$	A1
N37.5.1 LD1LE1	√	1	1	√	$mm2$	A1
N37.5.2 LD3LE3	√	1	1	√	$mm2$	A1
N37.5.3 H1HA1	√	1	1	√	$mm2$	A1
N37.5.4 H3HA3	√	1	1	√	$mm2$	A1
N37.7.1 S1	√	1	1	√	mmm	$\mathrm{A_g}$
N37.7.2 R1	√	1	1	√	mmm	$\mathrm{A_g}$
N37.8.1 DT1	√	1	1	√	$mm2$	A1
N37.8.2 DT2	√	1	1	√	$mm2$	A1
N37.9.1 GM2 ⊕ GM2 ⊕ GM2	√	3	3	√	222	$\mathrm{B1}\oplus\mathrm{B1}\oplus\mathrm{B1}$
N37.9.2 GM2 ⊕ GM2 ⊕ GM3	√	3	3	√	$mm2$	$\mathrm{B2}\oplus\mathrm{B1}\oplus\mathrm{B1}$

Non-coplanar SSGs with parent space group $Ccc2$ (No. 37) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N37.9.3 GM2 ⊕ GM2 ⊕ Y1	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N37.9.4 GM2 ⊕ GM2 ⊕ Y2	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N37.9.5 GM2 ⊕ GM2 ⊕ Y3	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N37.9.6 GM2 ⊕ GM3 ⊕ GM3	√	3	3	√	222	$\mathrm{B1} \oplus \mathrm{B3} \oplus \mathrm{B3}$
N37.9.7 GM2 ⊕ GM3 ⊕ GM4	√	3	3	√	$mm2$	$\mathrm{A2} \oplus \mathrm{B2} \oplus \mathrm{B1}$
N37.9.8 GM2 ⊕ GM3 ⊕ Y1	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N37.9.9 GM2 ⊕ GM3 ⊕ Y2	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N37.9.10 GM2 ⊕ GM3 ⊕ Y3	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N37.9.11 GM2 ⊕ GM3 ⊕ Y4	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N37.9.12 GM2 ⊕ Y1 ⊕ Y1	√	1	1	√	222	B1
N37.9.13 GM2 ⊕ Y1 ⊕ Y2	√	1	1	√	$mm2$	A2
N37.9.14 GM2 ⊕ Y1 ⊕ Y3	√	1	1	√	$mm2$	B2
N37.9.15 GM2 ⊕ Y2 ⊕ Y2	√	1	1	√	222	B1
N37.9.16 GM2 ⊕ Y2 ⊕ Y3	√	1	1	√	$mm2$	B1
N37.9.17 GM2 ⊕ Y3 ⊕ Y3	√	1	1	√	222	B1
N37.9.18 GM2 ⊕ Y3 ⊕ Y4	√	1	1	√	$mm2$	A2
N37.9.19 GM3 ⊕ GM3 ⊕ GM3	√	3	3	√	$mm2$	$\mathrm{B2} \oplus \mathrm{B2} \oplus \mathrm{B2}$
N37.9.20 GM3 ⊕ GM3 ⊕ GM4	√	3	3	√	$mm2$	$\mathrm{A2} \oplus \mathrm{A2} \oplus \mathrm{B1}$
N37.9.21 GM3 ⊕ GM3 ⊕ Y1	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N37.9.22 GM3 ⊕ GM4 ⊕ Y1	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N37.9.23 GM3 ⊕ GM3 ⊕ Y2	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N37.9.24 GM3 ⊕ GM4 ⊕ Y2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N37.9.25 GM3 ⊕ GM3 ⊕ Y3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N37.9.26 GM3 ⊕ GM3 ⊕ Y4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N37.9.27 GM3 ⊕ GM4 ⊕ Y3	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N37.9.28 GM3 ⊕ Y1 ⊕ Y1	√	1	1	×	-	-
N37.9.29 GM3 ⊕ Y1 ⊕ Y2	√	1	1	×	-	-
N37.9.30 GM3 ⊕ Y1 ⊕ Y3	√	1	1	√	$mm2$	B2
N37.9.31 GM3 ⊕ Y1 ⊕ Y4	√	1	1	√	222	B3
N37.9.32 GM3 ⊕ Y2 ⊕ Y2	√	1	1	×	-	-
N37.9.33 GM3 ⊕ Y2 ⊕ Y3	√	1	1	√	222	B3
N37.9.34 GM3 ⊕ Y2 ⊕ Y4	√	1	1	√	$mm2$	B2
N37.9.35 GM3 ⊕ Y3 ⊕ Y3	√	1	1	×	-	-
N37.9.36 GM3 ⊕ Y3 ⊕ Y4	√	1	1	×	-	-
N37.9.37 GM3 ⊕ Y4 ⊕ Y4	√	1	1	×	-	-
N37.9.38 Y1 ⊕ Y1 ⊕ Y1	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N37.9.39 Y1 ⊕ Y1 ⊕ Y2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N37.9.40 Y1 ⊕ Y1 ⊕ Y3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N37.9.41 Y1 ⊕ Y2 ⊕ Y2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N37.9.42 Y1 ⊕ Y2 ⊕ Y3	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N37.9.43 Y1 ⊕ Y3 ⊕ Y3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N37.9.44 Y1 ⊕ Y3 ⊕ Y4	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N37.9.45 Y2 ⊕ Y2 ⊕ Y2	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N37.9.46 Y2 ⊕ Y2 ⊕ Y3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N37.9.47 Y2 ⊕ Y3 ⊕ Y3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N37.9.48 Y2 ⊕ Y3 ⊕ Y4	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$

Non-coplanar SSGs with parent space group $Ccc2$ (No. 37) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N37.9.49 Y3 $\oplus$ Y3 $\oplus$ Y3	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N37.9.50 Y3 $\oplus$ Y3 $\oplus$ Y4	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N37.10.1 GM2 $\oplus$ T1T2	$\surd$	1	1	$\surd$	222	B1
N37.10.2 GM2 $\oplus$ T3T4	$\surd$	1	1	$\surd$	222	B1
N37.10.3 GM2 $\oplus$ Z1Z2	$\surd$	1	1	$\surd$	222	B1
N37.10.4 GM2 $\oplus$ Z3Z4	$\surd$	1	1	$\surd$	222	B1
N37.10.5 GM3 $\oplus$ T1T2	$\surd$	1	1	$\times$	-	-
N37.10.6 GM3 $\oplus$ T3T4	$\surd$	1	1	$\times$	-	-
N37.10.7 GM3 $\oplus$ Z1Z2	$\surd$	1	1	$\surd$	$mm2$	B2
N37.10.8 GM3 $\oplus$ Z3Z4	$\surd$	1	1	$\surd$	$mm2$	B2
N37.10.9 Y1 $\oplus$ T1T2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N37.10.10 Y1 $\oplus$ T3T4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N37.10.11 Y1 $\oplus$ Z1Z2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N37.10.12 Y1 $\oplus$ Z3Z4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N37.10.13 Y2 $\oplus$ T1T2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N37.10.14 Y2 $\oplus$ T3T4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N37.10.15 Y2 $\oplus$ Z1Z2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N37.10.16 Y2 $\oplus$ Z3Z4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N37.10.17 Y3 $\oplus$ T1T2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N37.10.18 Y3 $\oplus$ T3T4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N37.10.19 Y3 $\oplus$ Z1Z2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N37.10.20 Y3 $\oplus$ Z3Z4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N37.11.1 GM2 $\oplus$ LD1LE1	$\surd$	1	1	$\surd$	222	B1
N37.11.2 GM2 $\oplus$ LD3LE3	$\surd$	1	1	$\surd$	222	B1
N37.11.3 GM2 $\oplus$ H1HA1	$\surd$	1	1	$\surd$	222	B1
N37.11.4 GM2 $\oplus$ H3HA3	$\surd$	1	1	$\surd$	222	B1
N37.11.5 GM3 $\oplus$ LD1LE1	$\surd$	1	1	$\surd$	$mm2$	B2
N37.11.6 GM3 $\oplus$ LD3LE3	$\surd$	1	1	$\surd$	$mm2$	B2
N37.11.7 GM3 $\oplus$ H1HA1	$\surd$	1	1	$\times$	-	-
N37.11.8 GM3 $\oplus$ H3HA3	$\surd$	1	1	$\times$	-	-
N37.11.9 Y1 $\oplus$ LD1LE1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N37.11.10 Y1 $\oplus$ LD3LE3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N37.11.11 Y1 $\oplus$ H1HA1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N37.11.12 Y1 $\oplus$ H3HA3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N37.11.13 Y2 $\oplus$ LD1LE1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N37.11.14 Y2 $\oplus$ LD3LE3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N37.11.15 Y2 $\oplus$ H1HA1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N37.11.16 Y2 $\oplus$ H3HA3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N37.11.17 Y3 $\oplus$ LD1LE1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N37.11.18 Y3 $\oplus$ LD3LE3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N37.11.19 Y3 $\oplus$ H1HA1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N37.11.20 Y3 $\oplus$ H3HA3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N37.13.1 GM2 $\oplus$ S1	$\surd$	1	1	$\times$	-	-
N37.13.2 GM2 $\oplus$ R1	$\surd$	1	1	$\times$	-	-
N37.13.3 GM3 $\oplus$ S1	$\surd$	1	1	$\times$	-	-
N37.13.4 GM3 $\oplus$ R1	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $Ccc2$ (No. 37) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N37.13.5 Y1 $\oplus$ S1	$\times$	-	-	-	-	-
N37.13.6 Y1 $\oplus$ R1	$\times$	-	-	-	-	-
N37.13.7 Y2 $\oplus$ S1	$\times$	-	-	-	-	-
N37.13.8 Y2 $\oplus$ R1	$\times$	-	-	-	-	-
N37.13.9 Y3 $\oplus$ S1	$\times$	-	-	-	-	-
N37.13.10 Y3 $\oplus$ R1	$\times$	-	-	-	-	-
N37.14.1 GM2 $\oplus$ DT1	$\surd$	1	1	$\surd$	$mm2$	B2
N37.14.2 GM2 $\oplus$ DT2	$\surd$	1	1	$\surd$	$mm2$	B2
N37.14.3 GM3 $\oplus$ SM1	$\surd$	1	1	$\surd$	222	B3
N37.14.4 GM3 $\oplus$ DT1	$\surd$	1	1	$\surd$	$mm2$	B2
N37.14.5 GM3 $\oplus$ SM2	$\surd$	1	1	$\surd$	222	B3
N37.14.6 GM3 $\oplus$ DT2	$\surd$	1	1	$\surd$	$mm2$	B2
N37.14.7 Y1 $\oplus$ DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N37.14.8 Y1 $\oplus$ DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N37.14.9 Y2 $\oplus$ DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N37.14.10 Y2 $\oplus$ DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N37.14.11 Y3 $\oplus$ SM1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N37.14.12 Y3 $\oplus$ DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N37.14.13 Y3 $\oplus$ SM2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N37.14.14 Y3 $\oplus$ DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$

TABLE S112: Collinear SSGs with parent space group $Amm2$ (No. 38).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L38.1.1 GM1	1	mmm	$\mathrm{A_g}$
L38.2.1 GM2	1	mmm	$\mathrm{B1_g}$
L38.2.2 GM3	1	mmm	$\mathrm{B2_g}$
L38.2.3 GM4	1	mmm	$\mathrm{B3_g}$
L38.2.4 T1	0	-	-
L38.2.5 T2	0	-	-
L38.2.6 Y1	0	-	-
L38.2.7 Y2	0	-	-
L38.2.8 Y3	0	-	-
L38.2.9 Y4	0	-	-
L38.2.10 Z1	0	-	-
L38.2.11 Z2	0	-	-

TABLE S113: Coplanar SSGs with parent space group $Amm2$ (No. 38).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P38.1.1 GM1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B1_u}$
P38.2.1 GM2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$
P38.2.2 GM3	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u} \oplus \mathrm{B2_g}$
P38.2.3 GM4	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
P38.2.4 T1	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$

Coplanar SSGs with parent space group $Amm2$ (No. 38) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P38.2.5 T2	√	1	1	√	mmm	$\mathrm{A_g}$
P38.2.6 Y1	√	1	1	√	mmm	$\mathrm{A_g}$
P38.2.7 Y2	√	1	1	√	mmm	$\mathrm{A_g}$
P38.2.8 Y3	√	1	1	√	mmm	$\mathrm{A_g}$
P38.2.9 Y4	√	1	1	√	mmm	$\mathrm{A_g}$
P38.2.10 Z1	√	1	1	√	mmm	$\mathrm{A_g}$
P38.2.11 Z2	√	1	1	√	mmm	$\mathrm{A_g}$
P38.3.1 GM2 ⊕ GM2	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
P38.3.2 GM2 ⊕ GM3	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
P38.3.3 GM2 ⊕ GM4	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
P38.3.4 GM2 ⊕ T1	√	1	1	×	-	-
P38.3.5 GM2 ⊕ T2	√	1	1	×	-	-
P38.3.6 GM2 ⊕ Y1	√	1	1	×	-	-
P38.3.7 GM2 ⊕ Y2	√	1	1	×	-	-
P38.3.8 GM2 ⊕ Y3	√	1	1	×	-	-
P38.3.9 GM2 ⊕ Y4	√	1	1	×	-	-
P38.3.10 GM2 ⊕ Z1	√	1	1	×	-	-
P38.3.11 GM2 ⊕ Z2	√	1	1	×	-	-
P38.3.12 GM3 ⊕ GM3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
P38.3.13 GM3 ⊕ GM4	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
P38.3.14 GM3 ⊕ T1	√	1	1	×	-	-
P38.3.15 GM3 ⊕ T2	√	1	1	×	-	-
P38.3.16 GM3 ⊕ Y1	√	1	1	×	-	-
P38.3.17 GM3 ⊕ Y2	√	1	1	×	-	-
P38.3.18 GM3 ⊕ Y3	√	1	1	×	-	-
P38.3.19 GM3 ⊕ Y4	√	1	1	×	-	-
P38.3.20 GM3 ⊕ Z1	√	1	1	×	-	-
P38.3.21 GM3 ⊕ Z2	√	1	1	×	-	-
P38.3.22 GM4 ⊕ GM4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
P38.3.23 GM4 ⊕ T1	√	1	1	×	-	-
P38.3.24 GM4 ⊕ T2	√	1	1	×	-	-
P38.3.25 GM4 ⊕ Y1	√	1	1	√	mmm	$\mathrm{B3_g}$
P38.3.26 GM4 ⊕ Y2	√	1	1	√	mmm	$\mathrm{B3_g}$
P38.3.27 GM4 ⊕ Y3	√	1	1	√	mmm	$\mathrm{B3_g}$
P38.3.28 GM4 ⊕ Y4	√	1	1	√	mmm	$\mathrm{B3_g}$
P38.3.29 GM4 ⊕ Z1	√	1	1	×	-	-
P38.3.30 GM4 ⊕ Z2	√	1	1	×	-	-
P38.3.31 T1 ⊕ T1	√	1	1	×	-	-
P38.3.32 T1 ⊕ T3	√	1	1	×	-	-
P38.3.33 T1 ⊕ T2	√	1	1	×	-	-
P38.3.34 T1 ⊕ T4	√	1	1	×	-	-
P38.3.35 T1 ⊕ Y1	×	-	-	-	-	-
P38.3.36 T1 ⊕ Y2	×	-	-	-	-	-
P38.3.37 T1 ⊕ Y3	×	-	-	-	-	-
P38.3.38 T1 ⊕ Y4	×	-	-	-	-	-
P38.3.39 T1 ⊕ Z1	×	-	-	-	-	-

Coplanar SSGs with parent space group $Amm2$ (No. 38) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P38.3.40 T1 ⊕ Z3	×	-	-	-	-	-
P38.3.41 T1 ⊕ Z2	×	-	-	-	-	-
P38.3.42 T1 ⊕ Z4	×	-	-	-	-	-
P38.3.43 T2 ⊕ T2	√	1	1	×	-	-
P38.3.44 T2 ⊕ T4	√	1	1	×	-	-
P38.3.45 T2 ⊕ Y1	×	-	-	-	-	-
P38.3.46 T2 ⊕ Y2	×	-	-	-	-	-
P38.3.47 T2 ⊕ Y3	×	-	-	-	-	-
P38.3.48 T2 ⊕ Y4	×	-	-	-	-	-
P38.3.49 T2 ⊕ Z1	×	-	-	-	-	-
P38.3.50 T2 ⊕ Z3	×	-	-	-	-	-
P38.3.51 T2 ⊕ Z2	×	-	-	-	-	-
P38.3.52 T2 ⊕ Z4	×	-	-	-	-	-
P38.3.53 Y1 ⊕ Y1	√	1	1	√	mmm	$\mathrm{B1_u}$
P38.3.54 Y1 ⊕ Y2	√	1	1	×	-	-
P38.3.55 Y1 ⊕ Y3	√	1	1	×	-	-
P38.3.56 Y1 ⊕ Y4	√	1	1	√	mmm	$\mathrm{B2_u}$
P38.3.57 Y1 ⊕ Z1	×	-	-	-	-	-
P38.3.58 Y1 ⊕ Z2	×	-	-	-	-	-
P38.3.59 Y2 ⊕ Y2	√	1	1	√	mmm	$\mathrm{B1_u}$
P38.3.60 Y2 ⊕ Y3	√	1	1	√	mmm	$\mathrm{B2_u}$
P38.3.61 Y2 ⊕ Y4	√	1	1	×	-	-
P38.3.62 Y2 ⊕ Z1	×	-	-	-	-	-
P38.3.63 Y2 ⊕ Z2	×	-	-	-	-	-
P38.3.64 Y3 ⊕ Y3	√	1	1	√	mmm	$\mathrm{B1_u}$
P38.3.65 Y3 ⊕ Y4	√	1	1	×	-	-
P38.3.66 Y3 ⊕ Z1	×	-	-	-	-	-
P38.3.67 Y3 ⊕ Z2	×	-	-	-	-	-
P38.3.68 Y4 ⊕ Y4	√	1	1	√	mmm	$\mathrm{B1_u}$
P38.3.69 Y4 ⊕ Z1	×	-	-	-	-	-
P38.3.70 Y4 ⊕ Z2	×	-	-	-	-	-
P38.3.71 Z1 ⊕ Z1	√	1	1	×	-	-
P38.3.72 Z1 ⊕ Z3	√	1	1	√	mmm	$\mathrm{B3_u}$
P38.3.73 Z1 ⊕ Z2	√	1	1	×	-	-
P38.3.74 Z1 ⊕ Z4	√	1	1	×	-	-
P38.3.75 Z2 ⊕ Z2	√	1	1	×	-	-
P38.3.76 Z2 ⊕ Z4	√	1	1	√	mmm	$\mathrm{B3_u}$
P38.5.1 SM1SN1	√	1	1	√	mmm	$\mathrm{B1_u}$
P38.5.2 SM2SN2	√	1	1	√	mmm	$\mathrm{B1_u}$
P38.5.3 SM4SN4	√	1	1	√	mmm	$\mathrm{B1_u}$
P38.5.4 SM3SN3	√	1	1	√	mmm	$\mathrm{B1_u}$
P38.5.5 A1AA1	√	1	1	×	-	-
P38.5.6 A2AA2	√	1	1	×	-	-
P38.7.1 S1	×	-	-	-	-	-
P38.7.2 S2	×	-	-	-	-	-
P38.7.3 R1	×	-	-	-	-	-

Coplanar SSGs with parent space group $Amm2$ (No. 38) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P38.8.1 DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P38.8.2 DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P38.8.3 B1	$\surd$	1	1	$\times$	-	-
P38.8.4 LD1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P38.8.5 LD2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P38.8.6 H1	$\surd$	1	1	$\times$	-	-
P38.8.7 H2	$\surd$	1	1	$\times$	-	-

TABLE S114: Non-coplanar SSGs with parent space group $Amm2$ (No. 38).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N38.1.1 GM1	$\surd$	3	3	$\surd$	$mm2$	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{A1}$
N38.2.1 GM2	$\surd$	3	3	$\surd$	222	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{B1}$
N38.2.2 GM3	$\surd$	3	3	$\surd$	$mm2$	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{B1}$
N38.2.3 GM4	$\surd$	3	3	$\surd$	$mm2$	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{B2}$
N38.2.4 T1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{B1_u}$
N38.2.5 T2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{B1_u}$
N38.2.6 Y1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{B1_u}$
N38.2.7 Y2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{B1_u}$
N38.2.8 Y3	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{B1_u}$
N38.2.9 Y4	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{B1_u}$
N38.2.10 Z1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{B1_u}$
N38.2.11 Z2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{B1_u}$
N38.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$mm2$	$\mathrm{A1}\oplus\mathrm{A2}\oplus\mathrm{A2}$
N38.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$mm2$	$\mathrm{A1}\oplus\mathrm{A2}\oplus\mathrm{B1}$
N38.3.3 GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	$mm2$	$\mathrm{A1}\oplus\mathrm{A2}\oplus\mathrm{B2}$
N38.3.4 GM2 $\oplus$ T1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_u}\oplus\mathrm{B1_g}$
N38.3.5 GM2 $\oplus$ T2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_u}\oplus\mathrm{B1_g}$
N38.3.6 GM2 $\oplus$ Y1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_u}\oplus\mathrm{B1_g}$
N38.3.7 GM2 $\oplus$ Y2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_u}\oplus\mathrm{B1_g}$
N38.3.8 GM2 $\oplus$ Y3	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_u}\oplus\mathrm{B1_g}$
N38.3.9 GM2 $\oplus$ Y4	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_u}\oplus\mathrm{B1_g}$
N38.3.10 GM2 $\oplus$ Z1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_u}\oplus\mathrm{B1_g}$
N38.3.11 GM2 $\oplus$ Z2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_u}\oplus\mathrm{B1_g}$
N38.3.12 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	$mm2$	$\mathrm{A1}\oplus\mathrm{B1}\oplus\mathrm{B1}$
N38.3.13 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	222	$\mathrm{A1}\oplus\mathrm{B3}\oplus\mathrm{B2}$
N38.3.14 GM3 $\oplus$ T1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}\oplus\mathrm{B2_g}$
N38.3.15 GM3 $\oplus$ T2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}\oplus\mathrm{B2_g}$
N38.3.16 GM3 $\oplus$ Y1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}\oplus\mathrm{B2_g}$
N38.3.17 GM3 $\oplus$ Y2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}\oplus\mathrm{B2_g}$
N38.3.18 GM3 $\oplus$ Y3	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}\oplus\mathrm{B2_g}$
N38.3.19 GM3 $\oplus$ Y4	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}\oplus\mathrm{B2_g}$
N38.3.20 GM3 $\oplus$ Z1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}\oplus\mathrm{B2_g}$
N38.3.21 GM3 $\oplus$ Z2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}\oplus\mathrm{B2_g}$
N38.3.22 GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	$mm2$	$\mathrm{A1}\oplus\mathrm{B2}\oplus\mathrm{B2}$
N38.3.23 GM4 $\oplus$ T1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}\oplus\mathrm{B2_u}$

Non-coplanar SSGs with parent space group $Amm2$ (No. 38) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N38.3.24 GM4 $\oplus$ T2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N38.3.25 GM4 $\oplus$ Y1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N38.3.26 GM4 $\oplus$ Y2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N38.3.27 GM4 $\oplus$ Y3	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N38.3.28 GM4 $\oplus$ Y4	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N38.3.29 GM4 $\oplus$ Z1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N38.3.30 GM4 $\oplus$ Z2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N38.3.31 T1 $\oplus$ T1	$\surd$	1	1	$\surd$	$mm2$	A1
N38.3.32 T1 $\oplus$ T3	$\surd$	1	1	$\surd$	$mm2$	A1
N38.3.33 T1 $\oplus$ T2	$\surd$	1	1	$\surd$	222	A1
N38.3.34 T1 $\oplus$ T4	$\surd$	1	1	$\surd$	$mm2$	A1
N38.3.35 T1 $\oplus$ Y1	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N38.3.36 T1 $\oplus$ Y2	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N38.3.37 T1 $\oplus$ Y3	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N38.3.38 T1 $\oplus$ Y4	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N38.3.39 T1 $\oplus$ Z1	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N38.3.40 T1 $\oplus$ Z3	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N38.3.41 T1 $\oplus$ Z2	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N38.3.42 T1 $\oplus$ Z4	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N38.3.43 T2 $\oplus$ T2	$\surd$	1	1	$\surd$	$mm2$	A1
N38.3.44 T2 $\oplus$ T4	$\surd$	1	1	$\surd$	$mm2$	A1
N38.3.45 T2 $\oplus$ Y1	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N38.3.46 T2 $\oplus$ Y2	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N38.3.47 T2 $\oplus$ Y3	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N38.3.48 T2 $\oplus$ Y4	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N38.3.49 T2 $\oplus$ Z1	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N38.3.50 T2 $\oplus$ Z3	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N38.3.51 T2 $\oplus$ Z2	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N38.3.52 T2 $\oplus$ Z4	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N38.3.53 Y1 $\oplus$ Y1	$\surd$	1	1	$\surd$	$mm2$	A1
N38.3.54 Y1 $\oplus$ Y2	$\surd$	1	1	$\surd$	222	A1
N38.3.55 Y1 $\oplus$ Y3	$\surd$	1	1	$\surd$	$mm2$	A1
N38.3.56 Y1 $\oplus$ Y4	$\surd$	1	1	$\surd$	$mm2$	A1
N38.3.57 Y1 $\oplus$ Z1	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N38.3.58 Y1 $\oplus$ Z2	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N38.3.59 Y2 $\oplus$ Y2	$\surd$	1	1	$\surd$	$mm2$	A1
N38.3.60 Y2 $\oplus$ Y3	$\surd$	1	1	$\surd$	$mm2$	A1
N38.3.61 Y2 $\oplus$ Y4	$\surd$	1	1	$\surd$	$mm2$	A1
N38.3.62 Y2 $\oplus$ Z1	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N38.3.63 Y2 $\oplus$ Z2	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N38.3.64 Y3 $\oplus$ Y3	$\surd$	1	1	$\surd$	$mm2$	A1
N38.3.65 Y3 $\oplus$ Y4	$\surd$	1	1	$\surd$	222	A1
N38.3.66 Y3 $\oplus$ Z1	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N38.3.67 Y3 $\oplus$ Z2	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N38.3.68 Y4 $\oplus$ Y4	$\surd$	1	1	$\surd$	$mm2$	A1
N38.3.69 Y4 $\oplus$ Z1	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$

Non-coplanar SSGs with parent space group $Amm2$ (No. 38) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N38.3.70 Y4 ⊕ Z2	√	1	1	√	mmm	$\mathrm{A_g}$
N38.3.71 Z1 ⊕ Z1	√	1	1	√	$mm2$	A1
N38.3.72 Z1 ⊕ Z3	√	1	1	√	$mm2$	A1
N38.3.73 Z1 ⊕ Z2	√	1	1	√	222	A1
N38.3.74 Z1 ⊕ Z4	√	1	1	√	$mm2$	A1
N38.3.75 Z2 ⊕ Z2	√	1	1	√	$mm2$	A1
N38.3.76 Z2 ⊕ Z4	√	1	1	√	$mm2$	A1
N38.5.1 SM1SN1	√	1	1	√	$mm2$	A1
N38.5.2 SM2SN2	√	1	1	√	$mm2$	A1
N38.5.3 SM4SN4	√	1	1	√	$mm2$	A1
N38.5.4 SM3SN3	√	1	1	√	$mm2$	A1
N38.5.5 A1AA1	√	1	1	√	$mm2$	A1
N38.5.6 A2AA2	√	1	1	√	$mm2$	A1
N38.7.1 S1	√	1	1	√	mmm	$\mathrm{A_g}$
N38.7.2 S2	√	1	1	√	mmm	$\mathrm{A_g}$
N38.7.3 R1	√	1	1	√	mmm	$\mathrm{A_g}$
N38.8.1 DT1	√	1	1	√	$mm2$	A1
N38.8.2 DT2	√	1	1	√	$mm2$	A1
N38.8.3 B1	√	1	1	√	$mm2$	A1
N38.8.4 LD1	√	1	1	√	$mm2$	A1
N38.8.5 LD2	√	1	1	√	$mm2$	A1
N38.8.6 H1	√	1	1	√	$mm2$	A1
N38.8.7 H2	√	1	1	√	$mm2$	A1
N38.9.1 GM2 ⊕ GM2 ⊕ GM2	√	3	3	√	222	B1 ⊕ B1 ⊕ B1
N38.9.2 GM2 ⊕ GM2 ⊕ GM3	√	3	3	√	$mm2$	B2 ⊕ B2 ⊕ B1
N38.9.3 GM2 ⊕ GM2 ⊕ GM4	√	3	3	√	$mm2$	B2 ⊕ B1 ⊕ B1
N38.9.4 GM2 ⊕ GM2 ⊕ T1	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N38.9.5 GM2 ⊕ GM2 ⊕ T2	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N38.9.6 GM2 ⊕ GM2 ⊕ Y1	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N38.9.7 GM2 ⊕ GM2 ⊕ Y2	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N38.9.8 GM2 ⊕ GM2 ⊕ Y3	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N38.9.9 GM2 ⊕ GM2 ⊕ Y4	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N38.9.10 GM2 ⊕ GM2 ⊕ Z1	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N38.9.11 GM2 ⊕ GM2 ⊕ Z2	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N38.9.12 GM2 ⊕ GM3 ⊕ GM3	√	3	3	√	222	B1 ⊕ B2 ⊕ B2
N38.9.13 GM2 ⊕ GM3 ⊕ GM4	√	3	3	√	$mm2$	A2 ⊕ B2 ⊕ B1
N38.9.14 GM2 ⊕ GM3 ⊕ T1	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N38.9.15 GM2 ⊕ GM3 ⊕ T2	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N38.9.16 GM2 ⊕ GM3 ⊕ Y1	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N38.9.17 GM2 ⊕ GM3 ⊕ Y2	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N38.9.18 GM2 ⊕ GM3 ⊕ Y3	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N38.9.19 GM2 ⊕ GM3 ⊕ Y4	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N38.9.20 GM2 ⊕ GM3 ⊕ Z1	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N38.9.21 GM2 ⊕ GM3 ⊕ Z2	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N38.9.22 GM2 ⊕ GM4 ⊕ GM4	√	3	3	√	222	B1 ⊕ B3 ⊕ B3
N38.9.23 GM2 ⊕ GM4 ⊕ T1	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$

Non-coplanar SSGs with parent space group $Amm2$ (No. 38) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N38.9.24 GM2 ⊕ GM4 ⊕ T2	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N38.9.25 GM2 ⊕ GM4 ⊕ Y1	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N38.9.26 GM2 ⊕ GM4 ⊕ Y2	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N38.9.27 GM2 ⊕ GM4 ⊕ Y3	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N38.9.28 GM2 ⊕ GM4 ⊕ Y4	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N38.9.29 GM2 ⊕ GM4 ⊕ Z1	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N38.9.30 GM2 ⊕ GM4 ⊕ Z2	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N38.9.31 GM2 ⊕ T1 ⊕ T1	√	1	1	×	-	-
N38.9.32 GM2 ⊕ T1 ⊕ T3	√	1	1	×	-	-
N38.9.33 GM2 ⊕ T1 ⊕ T2	√	1	1	×	-	-
N38.9.34 GM2 ⊕ T1 ⊕ T4	√	1	1	×	-	-
N38.9.35 GM2 ⊕ T1 ⊕ Y1	√	1	1	×	-	-
N38.9.36 GM2 ⊕ T1 ⊕ Y2	√	1	1	×	-	-
N38.9.37 GM2 ⊕ T1 ⊕ Y3	√	1	1	×	-	-
N38.9.38 GM2 ⊕ T1 ⊕ Y4	√	1	1	×	-	-
N38.9.39 GM2 ⊕ T1 ⊕ Z1	√	1	1	×	-	-
N38.9.40 GM2 ⊕ T1 ⊕ Z3	√	1	1	×	-	-
N38.9.41 GM2 ⊕ T1 ⊕ Z2	√	1	1	×	-	-
N38.9.42 GM2 ⊕ T1 ⊕ Z4	√	1	1	×	-	-
N38.9.43 GM2 ⊕ T2 ⊕ T2	√	1	1	×	-	-
N38.9.44 GM2 ⊕ T2 ⊕ T4	√	1	1	×	-	-
N38.9.45 GM2 ⊕ T2 ⊕ Y1	√	1	1	×	-	-
N38.9.46 GM2 ⊕ T2 ⊕ Y2	√	1	1	×	-	-
N38.9.47 GM2 ⊕ T2 ⊕ Y3	√	1	1	×	-	-
N38.9.48 GM2 ⊕ T2 ⊕ Y4	√	1	1	×	-	-
N38.9.49 GM2 ⊕ T2 ⊕ Z1	√	1	1	×	-	-
N38.9.50 GM2 ⊕ T2 ⊕ Z3	√	1	1	×	-	-
N38.9.51 GM2 ⊕ T2 ⊕ Z2	√	1	1	×	-	-
N38.9.52 GM2 ⊕ T2 ⊕ Z4	√	1	1	×	-	-
N38.9.53 GM2 ⊕ Y1 ⊕ Y1	√	1	1	√	222	B1
N38.9.54 GM2 ⊕ Y1 ⊕ Y2	√	1	1	×	-	-
N38.9.55 GM2 ⊕ Y1 ⊕ Y3	√	1	1	×	-	-
N38.9.56 GM2 ⊕ Y1 ⊕ Y4	√	1	1	√	$mm2$	B2
N38.9.57 GM2 ⊕ Y1 ⊕ Z1	√	1	1	√	mmm	$\mathrm{B1_g}$
N38.9.58 GM2 ⊕ Y1 ⊕ Z2	√	1	1	√	mmm	$\mathrm{B1_g}$
N38.9.59 GM2 ⊕ Y2 ⊕ Y2	√	1	1	√	222	B1
N38.9.60 GM2 ⊕ Y2 ⊕ Y3	√	1	1	√	$mm2$	B2
N38.9.61 GM2 ⊕ Y2 ⊕ Y4	√	1	1	×	-	-
N38.9.62 GM2 ⊕ Y2 ⊕ Z1	√	1	1	√	mmm	$\mathrm{B1_g}$
N38.9.63 GM2 ⊕ Y2 ⊕ Z2	√	1	1	√	mmm	$\mathrm{B1_g}$
N38.9.64 GM2 ⊕ Y3 ⊕ Y3	√	1	1	√	222	B1
N38.9.65 GM2 ⊕ Y3 ⊕ Y4	√	1	1	×	-	-
N38.9.66 GM2 ⊕ Y3 ⊕ Z1	√	1	1	√	mmm	$\mathrm{B1_g}$
N38.9.67 GM2 ⊕ Y3 ⊕ Z2	√	1	1	√	mmm	$\mathrm{B1_g}$
N38.9.68 GM2 ⊕ Y4 ⊕ Y4	√	1	1	√	222	B1
N38.9.69 GM2 ⊕ Y4 ⊕ Z1	√	1	1	√	mmm	$\mathrm{B1_g}$

Non-coplanar SSGs with parent space group $Amm2$ (No. 38) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N38.9.70 GM2 $\oplus$ Y4 $\oplus$ Z2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N38.9.71 GM2 $\oplus$ Z1 $\oplus$ Z1	$\surd$	1	1	$\times$	-	-
N38.9.72 GM2 $\oplus$ Z1 $\oplus$ Z3	$\surd$	1	1	$\surd$	$mm2$	B1
N38.9.73 GM2 $\oplus$ Z1 $\oplus$ Z2	$\surd$	1	1	$\times$	-	-
N38.9.74 GM2 $\oplus$ Z1 $\oplus$ Z4	$\surd$	1	1	$\times$	-	-
N38.9.75 GM2 $\oplus$ Z2 $\oplus$ Z2	$\surd$	1	1	$\times$	-	-
N38.9.76 GM2 $\oplus$ Z2 $\oplus$ Z4	$\surd$	1	1	$\surd$	$mm2$	B1
N38.9.77 GM3 $\oplus$ GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	$mm2$	B1 $\oplus$ B1 $\oplus$ B1
N38.9.78 GM3 $\oplus$ GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	$mm2$	A2 $\oplus$ A2 $\oplus$ B2
N38.9.79 GM3 $\oplus$ GM3 $\oplus$ T1	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N38.9.80 GM3 $\oplus$ GM3 $\oplus$ T2	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N38.9.81 GM3 $\oplus$ GM3 $\oplus$ Y1	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N38.9.82 GM3 $\oplus$ GM3 $\oplus$ Y2	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N38.9.83 GM3 $\oplus$ GM3 $\oplus$ Y3	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N38.9.84 GM3 $\oplus$ GM3 $\oplus$ Y4	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N38.9.85 GM3 $\oplus$ GM3 $\oplus$ Z1	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N38.9.86 GM3 $\oplus$ GM3 $\oplus$ Z2	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N38.9.87 GM3 $\oplus$ GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	$mm2$	A2 $\oplus$ A2 $\oplus$ B1
N38.9.88 GM3 $\oplus$ GM4 $\oplus$ T1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N38.9.89 GM3 $\oplus$ GM4 $\oplus$ T2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N38.9.90 GM3 $\oplus$ GM4 $\oplus$ Y1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N38.9.91 GM3 $\oplus$ GM4 $\oplus$ Y2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N38.9.92 GM3 $\oplus$ GM4 $\oplus$ Y3	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N38.9.93 GM3 $\oplus$ GM4 $\oplus$ Y4	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N38.9.94 GM3 $\oplus$ GM4 $\oplus$ Z1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N38.9.95 GM3 $\oplus$ GM4 $\oplus$ Z2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N38.9.96 GM3 $\oplus$ T1 $\oplus$ T1	$\surd$	1	1	$\times$	-	-
N38.9.97 GM3 $\oplus$ T1 $\oplus$ T3	$\surd$	1	1	$\times$	-	-
N38.9.98 GM3 $\oplus$ T1 $\oplus$ T2	$\surd$	1	1	$\times$	-	-
N38.9.99 GM3 $\oplus$ T1 $\oplus$ T4	$\surd$	1	1	$\times$	-	-
N38.9.100 GM3 $\oplus$ T1 $\oplus$ Y1	$\surd$	1	1	$\times$	-	-
N38.9.101 GM3 $\oplus$ T1 $\oplus$ Y2	$\surd$	1	1	$\times$	-	-
N38.9.102 GM3 $\oplus$ T1 $\oplus$ Y3	$\surd$	1	1	$\times$	-	-
N38.9.103 GM3 $\oplus$ T1 $\oplus$ Y4	$\surd$	1	1	$\times$	-	-
N38.9.104 GM3 $\oplus$ T1 $\oplus$ Z1	$\surd$	1	1	$\times$	-	-
N38.9.105 GM3 $\oplus$ T1 $\oplus$ Z3	$\surd$	1	1	$\times$	-	-
N38.9.106 GM3 $\oplus$ T1 $\oplus$ Z2	$\surd$	1	1	$\times$	-	-
N38.9.107 GM3 $\oplus$ T1 $\oplus$ Z4	$\surd$	1	1	$\times$	-	-
N38.9.108 GM3 $\oplus$ T2 $\oplus$ T2	$\surd$	1	1	$\times$	-	-
N38.9.109 GM3 $\oplus$ T2 $\oplus$ T4	$\surd$	1	1	$\times$	-	-
N38.9.110 GM3 $\oplus$ T2 $\oplus$ Y1	$\surd$	1	1	$\times$	-	-
N38.9.111 GM3 $\oplus$ T2 $\oplus$ Y2	$\surd$	1	1	$\times$	-	-
N38.9.112 GM3 $\oplus$ T2 $\oplus$ Y3	$\surd$	1	1	$\times$	-	-
N38.9.113 GM3 $\oplus$ T2 $\oplus$ Y4	$\surd$	1	1	$\times$	-	-
N38.9.114 GM3 $\oplus$ T2 $\oplus$ Z1	$\surd$	1	1	$\times$	-	-
N38.9.115 GM3 $\oplus$ T2 $\oplus$ Z3	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $Amm2$ (No. 38) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N38.9.116 GM3 ⊕ T2 ⊕ Z2	√	1	1	×	-	-
N38.9.117 GM3 ⊕ T2 ⊕ Z4	√	1	1	×	-	-
N38.9.118 GM3 ⊕ Y1 ⊕ Y1	√	1	1	√	$mm2$	B1
N38.9.119 GM3 ⊕ Y1 ⊕ Y2	√	1	1	×	-	-
N38.9.120 GM3 ⊕ Y1 ⊕ Y3	√	1	1	×	-	-
N38.9.121 GM3 ⊕ Y1 ⊕ Y4	√	1	1	√	222	B2
N38.9.122 GM3 ⊕ Y1 ⊕ Z1	√	1	1	√	mmm	$\mathrm{B2_g}$
N38.9.123 GM3 ⊕ Y1 ⊕ Z2	√	1	1	√	mmm	$\mathrm{B2_g}$
N38.9.124 GM3 ⊕ Y2 ⊕ Y2	√	1	1	√	$mm2$	B1
N38.9.125 GM3 ⊕ Y2 ⊕ Y3	√	1	1	√	222	B2
N38.9.126 GM3 ⊕ Y2 ⊕ Y4	√	1	1	×	-	-
N38.9.127 GM3 ⊕ Y2 ⊕ Z1	√	1	1	√	mmm	$\mathrm{B2_g}$
N38.9.128 GM3 ⊕ Y2 ⊕ Z2	√	1	1	√	mmm	$\mathrm{B2_g}$
N38.9.129 GM3 ⊕ Y3 ⊕ Y3	√	1	1	√	$mm2$	B1
N38.9.130 GM3 ⊕ Y3 ⊕ Y4	√	1	1	×	-	-
N38.9.131 GM3 ⊕ Y3 ⊕ Z1	√	1	1	√	mmm	$\mathrm{B2_g}$
N38.9.132 GM3 ⊕ Y3 ⊕ Z2	√	1	1	√	mmm	$\mathrm{B2_g}$
N38.9.133 GM3 ⊕ Y4 ⊕ Y4	√	1	1	√	$mm2$	B1
N38.9.134 GM3 ⊕ Y4 ⊕ Z1	√	1	1	√	mmm	$\mathrm{B2_g}$
N38.9.135 GM3 ⊕ Y4 ⊕ Z2	√	1	1	√	mmm	$\mathrm{B2_g}$
N38.9.136 GM3 ⊕ Z1 ⊕ Z1	√	1	1	×	-	-
N38.9.137 GM3 ⊕ Z1 ⊕ Z3	√	1	1	√	$mm2$	B1
N38.9.138 GM3 ⊕ Z1 ⊕ Z2	√	1	1	×	-	-
N38.9.139 GM3 ⊕ Z1 ⊕ Z4	√	1	1	×	-	-
N38.9.140 GM3 ⊕ Z2 ⊕ Z2	√	1	1	×	-	-
N38.9.141 GM3 ⊕ Z2 ⊕ Z4	√	1	1	√	$mm2$	B1
N38.9.142 GM4 ⊕ GM4 ⊕ GM4	√	3	3	√	$mm2$	B2 ⊕ B2 ⊕ B2
N38.9.143 GM4 ⊕ GM4 ⊕ T1	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N38.9.144 GM4 ⊕ GM4 ⊕ T2	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N38.9.145 GM4 ⊕ GM4 ⊕ Y1	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N38.9.146 GM4 ⊕ GM4 ⊕ Y2	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N38.9.147 GM4 ⊕ GM4 ⊕ Y3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N38.9.148 GM4 ⊕ GM4 ⊕ Y4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N38.9.149 GM4 ⊕ GM4 ⊕ Z1	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N38.9.150 GM4 ⊕ GM4 ⊕ Z2	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N38.9.151 GM4 ⊕ T1 ⊕ T1	√	1	1	×	-	-
N38.9.152 GM4 ⊕ T1 ⊕ T3	√	1	1	√	222	B3
N38.9.153 GM4 ⊕ T1 ⊕ T2	√	1	1	×	-	-
N38.9.154 GM4 ⊕ T1 ⊕ T4	√	1	1	×	-	-
N38.9.155 GM4 ⊕ T1 ⊕ Y1	√	1	1	√	mmm	$\mathrm{B3_g}$
N38.9.156 GM4 ⊕ T1 ⊕ Y2	√	1	1	√	mmm	$\mathrm{B3_g}$
N38.9.157 GM4 ⊕ T1 ⊕ Y3	√	1	1	√	mmm	$\mathrm{B3_g}$
N38.9.158 GM4 ⊕ T1 ⊕ Y4	√	1	1	√	mmm	$\mathrm{B3_g}$
N38.9.159 GM4 ⊕ T1 ⊕ Z1	√	1	1	×	-	-
N38.9.160 GM4 ⊕ T1 ⊕ Z3	√	1	1	×	-	-
N38.9.161 GM4 ⊕ T1 ⊕ Z2	√	1	1	×	-	-

Non-coplanar SSGs with parent space group $Amm2$ (No. 38) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N38.9.162 GM4 ⊕ T1 ⊕ Z4	√	1	1	×	-	-
N38.9.163 GM4 ⊕ T2 ⊕ T2	√	1	1	×	-	-
N38.9.164 GM4 ⊕ T2 ⊕ T4	√	1	1	√	222	B3
N38.9.165 GM4 ⊕ T2 ⊕ Y1	√	1	1	√	mmm	$\mathrm{B3_g}$
N38.9.166 GM4 ⊕ T2 ⊕ Y2	√	1	1	√	mmm	$\mathrm{B3_g}$
N38.9.167 GM4 ⊕ T2 ⊕ Y3	√	1	1	√	mmm	$\mathrm{B3_g}$
N38.9.168 GM4 ⊕ T2 ⊕ Y4	√	1	1	√	mmm	$\mathrm{B3_g}$
N38.9.169 GM4 ⊕ T2 ⊕ Z1	√	1	1	×	-	-
N38.9.170 GM4 ⊕ T2 ⊕ Z3	√	1	1	×	-	-
N38.9.171 GM4 ⊕ T2 ⊕ Z2	√	1	1	×	-	-
N38.9.172 GM4 ⊕ T2 ⊕ Z4	√	1	1	×	-	-
N38.9.173 GM4 ⊕ Y1 ⊕ Y1	√	1	1	√	$mm2$	B2
N38.9.174 GM4 ⊕ Y1 ⊕ Y2	√	1	1	√	$mm2$	A2
N38.9.175 GM4 ⊕ Y1 ⊕ Y3	√	1	1	√	222	B3
N38.9.176 GM4 ⊕ Y1 ⊕ Y4	√	1	1	√	$mm2$	B2
N38.9.177 GM4 ⊕ Y1 ⊕ Z1	√	1	1	√	mmm	$\mathrm{B3_g}$
N38.9.178 GM4 ⊕ Y1 ⊕ Z2	√	1	1	√	mmm	$\mathrm{B3_g}$
N38.9.179 GM4 ⊕ Y2 ⊕ Y2	√	1	1	√	$mm2$	B2
N38.9.180 GM4 ⊕ Y2 ⊕ Y3	√	1	1	√	$mm2$	B2
N38.9.181 GM4 ⊕ Y2 ⊕ Y4	√	1	1	√	222	B3
N38.9.182 GM4 ⊕ Y2 ⊕ Z1	√	1	1	√	mmm	$\mathrm{B3_g}$
N38.9.183 GM4 ⊕ Y2 ⊕ Z2	√	1	1	√	mmm	$\mathrm{B3_g}$
N38.9.184 GM4 ⊕ Y3 ⊕ Y3	√	1	1	√	$mm2$	B2
N38.9.185 GM4 ⊕ Y3 ⊕ Y4	√	1	1	√	$mm2$	A2
N38.9.186 GM4 ⊕ Y3 ⊕ Z1	√	1	1	√	mmm	$\mathrm{B3_g}$
N38.9.187 GM4 ⊕ Y3 ⊕ Z2	√	1	1	√	mmm	$\mathrm{B3_g}$
N38.9.188 GM4 ⊕ Y4 ⊕ Y4	√	1	1	√	$mm2$	B2
N38.9.189 GM4 ⊕ Y4 ⊕ Z1	√	1	1	√	mmm	$\mathrm{B3_g}$
N38.9.190 GM4 ⊕ Y4 ⊕ Z2	√	1	1	√	mmm	$\mathrm{B3_g}$
N38.9.191 GM4 ⊕ Z1 ⊕ Z1	√	1	1	×	-	-
N38.9.192 GM4 ⊕ Z1 ⊕ Z3	√	1	1	√	222	B3
N38.9.193 GM4 ⊕ Z1 ⊕ Z2	√	1	1	×	-	-
N38.9.194 GM4 ⊕ Z1 ⊕ Z4	√	1	1	×	-	-
N38.9.195 GM4 ⊕ Z2 ⊕ Z2	√	1	1	×	-	-
N38.9.196 GM4 ⊕ Z2 ⊕ Z4	√	1	1	√	222	B3
N38.9.197 T1 ⊕ T1 ⊕ T1	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N38.9.198 T1 ⊕ T1 ⊕ T3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N38.9.199 T1 ⊕ T1 ⊕ T2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N38.9.200 T1 ⊕ T1 ⊕ T4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N38.9.201 T1 ⊕ T3 ⊕ T2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N38.9.202 T1 ⊕ T1 ⊕ Y1	√	1	1	×	-	-
N38.9.203 T1 ⊕ T3 ⊕ Y1	√	1	1	√	mmm	$\mathrm{B3_u}$
N38.9.204 T1 ⊕ T1 ⊕ Y2	√	1	1	×	-	-
N38.9.205 T1 ⊕ T3 ⊕ Y2	√	1	1	√	mmm	$\mathrm{B3_u}$
N38.9.206 T1 ⊕ T1 ⊕ Y3	√	1	1	×	-	-
N38.9.207 T1 ⊕ T3 ⊕ Y3	√	1	1	√	mmm	$\mathrm{B3_u}$

Non-coplanar SSGs with parent space group $Amm2$ (No. 38) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N38.9.208 $\mathrm{T1}\oplus\mathrm{T1}\oplus\mathrm{Y4}$	$\surd$	1	1	$\times$	-	-
N38.9.209 $\mathrm{T1}\oplus\mathrm{T3}\oplus\mathrm{Y4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N38.9.210 $\mathrm{T1}\oplus\mathrm{T1}\oplus\mathrm{Z1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N38.9.211 $\mathrm{T1}\oplus\mathrm{T1}\oplus\mathrm{Z3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N38.9.212 $\mathrm{T1}\oplus\mathrm{T3}\oplus\mathrm{Z1}$	$\surd$	1	1	$\times$	-	-
N38.9.213 $\mathrm{T1}\oplus\mathrm{T1}\oplus\mathrm{Z2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N38.9.214 $\mathrm{T1}\oplus\mathrm{T1}\oplus\mathrm{Z4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N38.9.215 $\mathrm{T1}\oplus\mathrm{T3}\oplus\mathrm{Z2}$	$\surd$	1	1	$\times$	-	-
N38.9.216 $\mathrm{T1}\oplus\mathrm{T2}\oplus\mathrm{T2}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{A_u}\oplus\mathrm{B1_u}$
N38.9.217 $\mathrm{T1}\oplus\mathrm{T2}\oplus\mathrm{T4}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B3_u}\oplus\mathrm{B2_u}$
N38.9.218 $\mathrm{T1}\oplus\mathrm{T4}\oplus\mathrm{T4}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B2_u}\oplus\mathrm{B2_u}$
N38.9.219 $\mathrm{T1}\oplus\mathrm{T2}\oplus\mathrm{Y1}$	$\surd$	1	1	$\times$	-	-
N38.9.220 $\mathrm{T1}\oplus\mathrm{T4}\oplus\mathrm{Y1}$	$\surd$	1	1	$\times$	-	-
N38.9.221 $\mathrm{T1}\oplus\mathrm{T2}\oplus\mathrm{Y2}$	$\surd$	1	1	$\times$	-	-
N38.9.222 $\mathrm{T1}\oplus\mathrm{T4}\oplus\mathrm{Y2}$	$\surd$	1	1	$\times$	-	-
N38.9.223 $\mathrm{T1}\oplus\mathrm{T2}\oplus\mathrm{Y3}$	$\surd$	1	1	$\times$	-	-
N38.9.224 $\mathrm{T1}\oplus\mathrm{T4}\oplus\mathrm{Y3}$	$\surd$	1	1	$\times$	-	-
N38.9.225 $\mathrm{T1}\oplus\mathrm{T2}\oplus\mathrm{Y4}$	$\surd$	1	1	$\times$	-	-
N38.9.226 $\mathrm{T1}\oplus\mathrm{T4}\oplus\mathrm{Y4}$	$\surd$	1	1	$\times$	-	-
N38.9.227 $\mathrm{T1}\oplus\mathrm{T2}\oplus\mathrm{Z1}$	$\surd$	1	1	$\times$	-	-
N38.9.228 $\mathrm{T1}\oplus\mathrm{T2}\oplus\mathrm{Z3}$	$\surd$	1	1	$\times$	-	-
N38.9.229 $\mathrm{T1}\oplus\mathrm{T4}\oplus\mathrm{Z1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N38.9.230 $\mathrm{T1}\oplus\mathrm{T4}\oplus\mathrm{Z3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N38.9.231 $\mathrm{T1}\oplus\mathrm{T2}\oplus\mathrm{Z2}$	$\surd$	1	1	$\times$	-	-
N38.9.232 $\mathrm{T1}\oplus\mathrm{T2}\oplus\mathrm{Z4}$	$\surd$	1	1	$\times$	-	-
N38.9.233 $\mathrm{T1}\oplus\mathrm{T4}\oplus\mathrm{Z2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N38.9.234 $\mathrm{T1}\oplus\mathrm{T4}\oplus\mathrm{Z4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N38.9.235 $\mathrm{T1}\oplus\mathrm{Y1}\oplus\mathrm{Y1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N38.9.236 $\mathrm{T1}\oplus\mathrm{Y1}\oplus\mathrm{Y2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_u}$
N38.9.237 $\mathrm{T1}\oplus\mathrm{Y1}\oplus\mathrm{Y3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N38.9.238 $\mathrm{T1}\oplus\mathrm{Y1}\oplus\mathrm{Y4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N38.9.239 $\mathrm{T1}\oplus\mathrm{Y1}\oplus\mathrm{Z1}$	$\times$	-	-	-	-	-
N38.9.240 $\mathrm{T1}\oplus\mathrm{Y1}\oplus\mathrm{Z3}$	$\times$	-	-	-	-	-
N38.9.241 $\mathrm{T1}\oplus\mathrm{Y1}\oplus\mathrm{Z2}$	$\times$	-	-	-	-	-
N38.9.242 $\mathrm{T1}\oplus\mathrm{Y1}\oplus\mathrm{Z4}$	$\times$	-	-	-	-	-
N38.9.243 $\mathrm{T1}\oplus\mathrm{Y2}\oplus\mathrm{Y2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N38.9.244 $\mathrm{T1}\oplus\mathrm{Y2}\oplus\mathrm{Y3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N38.9.245 $\mathrm{T1}\oplus\mathrm{Y2}\oplus\mathrm{Y4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N38.9.246 $\mathrm{T1}\oplus\mathrm{Y2}\oplus\mathrm{Z1}$	$\times$	-	-	-	-	-
N38.9.247 $\mathrm{T1}\oplus\mathrm{Y2}\oplus\mathrm{Z3}$	$\times$	-	-	-	-	-
N38.9.248 $\mathrm{T1}\oplus\mathrm{Y2}\oplus\mathrm{Z2}$	$\times$	-	-	-	-	-
N38.9.249 $\mathrm{T1}\oplus\mathrm{Y2}\oplus\mathrm{Z4}$	$\times$	-	-	-	-	-
N38.9.250 $\mathrm{T1}\oplus\mathrm{Y3}\oplus\mathrm{Y3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N38.9.251 $\mathrm{T1}\oplus\mathrm{Y3}\oplus\mathrm{Y4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_u}$
N38.9.252 $\mathrm{T1}\oplus\mathrm{Y3}\oplus\mathrm{Z1}$	$\times$	-	-	-	-	-
N38.9.253 $\mathrm{T1}\oplus\mathrm{Y3}\oplus\mathrm{Z3}$	$\times$	-	-	-	-	-

Non-coplanar SSGs with parent space group $Amm2$ (No. 38) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N38.9.254 T1 ⊕ Y3 ⊕ Z2	×	-	-	-	-	-
N38.9.255 T1 ⊕ Y3 ⊕ Z4	×	-	-	-	-	-
N38.9.256 T1 ⊕ Y4 ⊕ Y4	√	1	1	√	mmm	$\mathrm{B1_u}$
N38.9.257 T1 ⊕ Y4 ⊕ Z1	×	-	-	-	-	-
N38.9.258 T1 ⊕ Y4 ⊕ Z3	×	-	-	-	-	-
N38.9.259 T1 ⊕ Y4 ⊕ Z2	×	-	-	-	-	-
N38.9.260 T1 ⊕ Y4 ⊕ Z4	×	-	-	-	-	-
N38.9.261 T1 ⊕ Z1 ⊕ Z1	√	1	1	√	mmm	$\mathrm{B1_u}$
N38.9.262 T1 ⊕ Z1 ⊕ Z3	√	1	1	√	mmm	$\mathrm{B3_u}$
N38.9.263 T1 ⊕ Z3 ⊕ Z3	√	1	1	√	mmm	$\mathrm{B1_u}$
N38.9.264 T1 ⊕ Z1 ⊕ Z2	√	1	1	√	mmm	$\mathrm{A_u}$
N38.9.265 T1 ⊕ Z1 ⊕ Z4	√	1	1	√	mmm	$\mathrm{B2_u}$
N38.9.266 T1 ⊕ Z3 ⊕ Z2	√	1	1	√	mmm	$\mathrm{B2_u}$
N38.9.267 T1 ⊕ Z3 ⊕ Z4	√	1	1	√	mmm	$\mathrm{A_u}$
N38.9.268 T1 ⊕ Z2 ⊕ Z2	√	1	1	√	mmm	$\mathrm{B1_u}$
N38.9.269 T1 ⊕ Z2 ⊕ Z4	√	1	1	√	mmm	$\mathrm{B3_u}$
N38.9.270 T1 ⊕ Z4 ⊕ Z4	√	1	1	√	mmm	$\mathrm{B1_u}$
N38.9.271 T2 ⊕ T2 ⊕ T2	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N38.9.272 T2 ⊕ T2 ⊕ T4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N38.9.273 T2 ⊕ T2 ⊕ Y1	√	1	1	×	-	-
N38.9.274 T2 ⊕ T4 ⊕ Y1	√	1	1	√	mmm	$\mathrm{B3_u}$
N38.9.275 T2 ⊕ T2 ⊕ Y2	√	1	1	×	-	-
N38.9.276 T2 ⊕ T4 ⊕ Y2	√	1	1	√	mmm	$\mathrm{B3_u}$
N38.9.277 T2 ⊕ T2 ⊕ Y3	√	1	1	×	-	-
N38.9.278 T2 ⊕ T4 ⊕ Y3	√	1	1	√	mmm	$\mathrm{B3_u}$
N38.9.279 T2 ⊕ T2 ⊕ Y4	√	1	1	×	-	-
N38.9.280 T2 ⊕ T4 ⊕ Y4	√	1	1	√	mmm	$\mathrm{B3_u}$
N38.9.281 T2 ⊕ T2 ⊕ Z1	√	1	1	√	mmm	$\mathrm{B1_u}$
N38.9.282 T2 ⊕ T2 ⊕ Z3	√	1	1	√	mmm	$\mathrm{B1_u}$
N38.9.283 T2 ⊕ T4 ⊕ Z1	√	1	1	×	-	-
N38.9.284 T2 ⊕ T2 ⊕ Z2	√	1	1	√	mmm	$\mathrm{B1_u}$
N38.9.285 T2 ⊕ T2 ⊕ Z4	√	1	1	√	mmm	$\mathrm{B1_u}$
N38.9.286 T2 ⊕ T4 ⊕ Z2	√	1	1	×	-	-
N38.9.287 T2 ⊕ Y1 ⊕ Y1	√	1	1	√	mmm	$\mathrm{B1_u}$
N38.9.288 T2 ⊕ Y1 ⊕ Y2	√	1	1	√	mmm	$\mathrm{A_u}$
N38.9.289 T2 ⊕ Y1 ⊕ Y3	√	1	1	√	mmm	$\mathrm{B3_u}$
N38.9.290 T2 ⊕ Y1 ⊕ Y4	√	1	1	√	mmm	$\mathrm{B2_u}$
N38.9.291 T2 ⊕ Y1 ⊕ Z1	×	-	-	-	-	-
N38.9.292 T2 ⊕ Y1 ⊕ Z3	×	-	-	-	-	-
N38.9.293 T2 ⊕ Y1 ⊕ Z2	×	-	-	-	-	-
N38.9.294 T2 ⊕ Y1 ⊕ Z4	×	-	-	-	-	-
N38.9.295 T2 ⊕ Y2 ⊕ Y2	√	1	1	√	mmm	$\mathrm{B1_u}$
N38.9.296 T2 ⊕ Y2 ⊕ Y3	√	1	1	√	mmm	$\mathrm{B2_u}$
N38.9.297 T2 ⊕ Y2 ⊕ Y4	√	1	1	√	mmm	$\mathrm{B3_u}$
N38.9.298 T2 ⊕ Y2 ⊕ Z1	×	-	-	-	-	-
N38.9.299 T2 ⊕ Y2 ⊕ Z3	×	-	-	-	-	-

Non-coplanar SSGs with parent space group $Amm2$ (No. 38) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N38.9.300 T2 ⊕ Y2 ⊕ Z2	×	-	-	-	-	-
N38.9.301 T2 ⊕ Y2 ⊕ Z4	×	-	-	-	-	-
N38.9.302 T2 ⊕ Y3 ⊕ Y3	√	1	1	√	mmm	$\mathrm{B1_u}$
N38.9.303 T2 ⊕ Y3 ⊕ Y4	√	1	1	√	mmm	$\mathrm{A_u}$
N38.9.304 T2 ⊕ Y3 ⊕ Z1	×	-	-	-	-	-
N38.9.305 T2 ⊕ Y3 ⊕ Z3	×	-	-	-	-	-
N38.9.306 T2 ⊕ Y3 ⊕ Z2	×	-	-	-	-	-
N38.9.307 T2 ⊕ Y3 ⊕ Z4	×	-	-	-	-	-
N38.9.308 T2 ⊕ Y4 ⊕ Y4	√	1	1	√	mmm	$\mathrm{B1_u}$
N38.9.309 T2 ⊕ Y4 ⊕ Z1	×	-	-	-	-	-
N38.9.310 T2 ⊕ Y4 ⊕ Z3	×	-	-	-	-	-
N38.9.311 T2 ⊕ Y4 ⊕ Z2	×	-	-	-	-	-
N38.9.312 T2 ⊕ Y4 ⊕ Z4	×	-	-	-	-	-
N38.9.313 T2 ⊕ Z1 ⊕ Z1	√	1	1	√	mmm	$\mathrm{B1_u}$
N38.9.314 T2 ⊕ Z1 ⊕ Z3	√	1	1	√	mmm	$\mathrm{B3_u}$
N38.9.315 T2 ⊕ Z3 ⊕ Z3	√	1	1	√	mmm	$\mathrm{B1_u}$
N38.9.316 T2 ⊕ Z1 ⊕ Z2	√	1	1	√	mmm	$\mathrm{A_u}$
N38.9.317 T2 ⊕ Z1 ⊕ Z4	√	1	1	√	mmm	$\mathrm{B2_u}$
N38.9.318 T2 ⊕ Z3 ⊕ Z2	√	1	1	√	mmm	$\mathrm{B2_u}$
N38.9.319 T2 ⊕ Z3 ⊕ Z4	√	1	1	√	mmm	$\mathrm{A_u}$
N38.9.320 T2 ⊕ Z2 ⊕ Z2	√	1	1	√	mmm	$\mathrm{B1_u}$
N38.9.321 T2 ⊕ Z2 ⊕ Z4	√	1	1	√	mmm	$\mathrm{B3_u}$
N38.9.322 T2 ⊕ Z4 ⊕ Z4	√	1	1	√	mmm	$\mathrm{B1_u}$
N38.9.323 Y1 ⊕ Y1 ⊕ Y1	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N38.9.324 Y1 ⊕ Y1 ⊕ Y2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N38.9.325 Y1 ⊕ Y1 ⊕ Y3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N38.9.326 Y1 ⊕ Y1 ⊕ Y4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N38.9.327 Y1 ⊕ Y1 ⊕ Z1	√	1	1	√	mmm	$\mathrm{B1_u}$
N38.9.328 Y1 ⊕ Y1 ⊕ Z2	√	1	1	√	mmm	$\mathrm{B1_u}$
N38.9.329 Y1 ⊕ Y2 ⊕ Y2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N38.9.330 Y1 ⊕ Y2 ⊕ Y3	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N38.9.331 Y1 ⊕ Y2 ⊕ Y4	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N38.9.332 Y1 ⊕ Y2 ⊕ Z1	√	1	1	×	-	-
N38.9.333 Y1 ⊕ Y2 ⊕ Z2	√	1	1	×	-	-
N38.9.334 Y1 ⊕ Y3 ⊕ Y3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N38.9.335 Y1 ⊕ Y3 ⊕ Y4	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N38.9.336 Y1 ⊕ Y3 ⊕ Z1	√	1	1	×	-	-
N38.9.337 Y1 ⊕ Y3 ⊕ Z2	√	1	1	×	-	-
N38.9.338 Y1 ⊕ Y4 ⊕ Y4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N38.9.339 Y1 ⊕ Y4 ⊕ Z1	√	1	1	√	mmm	$\mathrm{B2_u}$
N38.9.340 Y1 ⊕ Y4 ⊕ Z2	√	1	1	√	mmm	$\mathrm{B2_u}$
N38.9.341 Y1 ⊕ Z1 ⊕ Z1	√	1	1	×	-	-
N38.9.342 Y1 ⊕ Z1 ⊕ Z3	√	1	1	√	mmm	$\mathrm{B3_u}$
N38.9.343 Y1 ⊕ Z1 ⊕ Z2	√	1	1	×	-	-
N38.9.344 Y1 ⊕ Z1 ⊕ Z4	√	1	1	×	-	-
N38.9.345 Y1 ⊕ Z2 ⊕ Z2	√	1	1	×	-	-

Non-coplanar SSGs with parent space group $Amm2$ (No. 38) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N38.9.346 Y1 ⊕ Z2 ⊕ Z4	√	1	1	√	mmm	$\mathrm{B3_u}$
N38.9.347 Y2 ⊕ Y2 ⊕ Y2	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N38.9.348 Y2 ⊕ Y2 ⊕ Y3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N38.9.349 Y2 ⊕ Y2 ⊕ Y4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N38.9.350 Y2 ⊕ Y2 ⊕ Z1	√	1	1	√	mmm	$\mathrm{B1_u}$
N38.9.351 Y2 ⊕ Y2 ⊕ Z2	√	1	1	√	mmm	$\mathrm{B1_u}$
N38.9.352 Y2 ⊕ Y3 ⊕ Y3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N38.9.353 Y2 ⊕ Y3 ⊕ Y4	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N38.9.354 Y2 ⊕ Y3 ⊕ Z1	√	1	1	√	mmm	$\mathrm{B2_u}$
N38.9.355 Y2 ⊕ Y3 ⊕ Z2	√	1	1	√	mmm	$\mathrm{B2_u}$
N38.9.356 Y2 ⊕ Y4 ⊕ Y4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N38.9.357 Y2 ⊕ Y4 ⊕ Z1	√	1	1	×	-	-
N38.9.358 Y2 ⊕ Y4 ⊕ Z2	√	1	1	×	-	-
N38.9.359 Y2 ⊕ Z1 ⊕ Z1	√	1	1	×	-	-
N38.9.360 Y2 ⊕ Z1 ⊕ Z3	√	1	1	√	mmm	$\mathrm{B3_u}$
N38.9.361 Y2 ⊕ Z1 ⊕ Z2	√	1	1	×	-	-
N38.9.362 Y2 ⊕ Z1 ⊕ Z4	√	1	1	×	-	-
N38.9.363 Y2 ⊕ Z2 ⊕ Z2	√	1	1	×	-	-
N38.9.364 Y2 ⊕ Z2 ⊕ Z4	√	1	1	√	mmm	$\mathrm{B3_u}$
N38.9.365 Y3 ⊕ Y3 ⊕ Y3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N38.9.366 Y3 ⊕ Y3 ⊕ Y4	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N38.9.367 Y3 ⊕ Y3 ⊕ Z1	√	1	1	√	mmm	$\mathrm{B1_u}$
N38.9.368 Y3 ⊕ Y3 ⊕ Z2	√	1	1	√	mmm	$\mathrm{B1_u}$
N38.9.369 Y3 ⊕ Y4 ⊕ Y4	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N38.9.370 Y3 ⊕ Y4 ⊕ Z1	√	1	1	×	-	-
N38.9.371 Y3 ⊕ Y4 ⊕ Z2	√	1	1	×	-	-
N38.9.372 Y3 ⊕ Z1 ⊕ Z1	√	1	1	×	-	-
N38.9.373 Y3 ⊕ Z1 ⊕ Z3	√	1	1	√	mmm	$\mathrm{B3_u}$
N38.9.374 Y3 ⊕ Z1 ⊕ Z2	√	1	1	×	-	-
N38.9.375 Y3 ⊕ Z1 ⊕ Z4	√	1	1	×	-	-
N38.9.376 Y3 ⊕ Z2 ⊕ Z2	√	1	1	×	-	-
N38.9.377 Y3 ⊕ Z2 ⊕ Z4	√	1	1	√	mmm	$\mathrm{B3_u}$
N38.9.378 Y4 ⊕ Y4 ⊕ Y4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N38.9.379 Y4 ⊕ Y4 ⊕ Z1	√	1	1	√	mmm	$\mathrm{B1_u}$
N38.9.380 Y4 ⊕ Y4 ⊕ Z2	√	1	1	√	mmm	$\mathrm{B1_u}$
N38.9.381 Y4 ⊕ Z1 ⊕ Z1	√	1	1	×	-	-
N38.9.382 Y4 ⊕ Z1 ⊕ Z3	√	1	1	√	mmm	$\mathrm{B3_u}$
N38.9.383 Y4 ⊕ Z1 ⊕ Z2	√	1	1	×	-	-
N38.9.384 Y4 ⊕ Z1 ⊕ Z4	√	1	1	×	-	-
N38.9.385 Y4 ⊕ Z2 ⊕ Z2	√	1	1	×	-	-
N38.9.386 Y4 ⊕ Z2 ⊕ Z4	√	1	1	√	mmm	$\mathrm{B3_u}$
N38.9.387 Z1 ⊕ Z1 ⊕ Z1	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N38.9.388 Z1 ⊕ Z1 ⊕ Z3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N38.9.389 Z1 ⊕ Z1 ⊕ Z2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N38.9.390 Z1 ⊕ Z1 ⊕ Z4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N38.9.391 Z1 ⊕ Z3 ⊕ Z2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$

Non-coplanar SSGs with parent space group $Amm2$ (No. 38) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N38.9.392 Z1 $\oplus$ Z2 $\oplus$ Z2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N38.9.393 Z1 $\oplus$ Z2 $\oplus$ Z4	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N38.9.394 Z1 $\oplus$ Z4 $\oplus$ Z4	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N38.9.395 Z2 $\oplus$ Z2 $\oplus$ Z2	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N38.9.396 Z2 $\oplus$ Z2 $\oplus$ Z4	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N38.11.1 GM2 $\oplus$ SM1SN1	$\surd$	1	1	$\surd$	222	B1
N38.11.2 GM2 $\oplus$ SM2SN2	$\surd$	1	1	$\surd$	222	B1
N38.11.3 GM2 $\oplus$ SM4SN4	$\surd$	1	1	$\surd$	222	B1
N38.11.4 GM2 $\oplus$ SM3SN3	$\surd$	1	1	$\surd$	222	B1
N38.11.5 GM2 $\oplus$ A1AA1	$\surd$	1	1	$\times$	-	-
N38.11.6 GM2 $\oplus$ A2AA2	$\surd$	1	1	$\times$	-	-
N38.11.7 GM3 $\oplus$ SM1SN1	$\surd$	1	1	$\surd$	$mm2$	B1
N38.11.8 GM3 $\oplus$ SM2SN2	$\surd$	1	1	$\surd$	$mm2$	B1
N38.11.9 GM3 $\oplus$ SM4SN4	$\surd$	1	1	$\surd$	$mm2$	B1
N38.11.10 GM3 $\oplus$ SM3SN3	$\surd$	1	1	$\surd$	$mm2$	B1
N38.11.11 GM3 $\oplus$ A1AA1	$\surd$	1	1	$\times$	-	-
N38.11.12 GM3 $\oplus$ A2AA2	$\surd$	1	1	$\times$	-	-
N38.11.13 GM4 $\oplus$ SM1SN1	$\surd$	1	1	$\surd$	$mm2$	B2
N38.11.14 GM4 $\oplus$ SM2SN2	$\surd$	1	1	$\surd$	$mm2$	B2
N38.11.15 GM4 $\oplus$ SM4SN4	$\surd$	1	1	$\surd$	$mm2$	B2
N38.11.16 GM4 $\oplus$ SM3SN3	$\surd$	1	1	$\surd$	$mm2$	B2
N38.11.17 GM4 $\oplus$ A1AA1	$\surd$	1	1	$\times$	-	-
N38.11.18 GM4 $\oplus$ A2AA2	$\surd$	1	1	$\times$	-	-
N38.11.19 T1 $\oplus$ SM1SN1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N38.11.20 T1 $\oplus$ SM2SN2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N38.11.21 T1 $\oplus$ SM4SN4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N38.11.22 T1 $\oplus$ SM3SN3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N38.11.23 T1 $\oplus$ A1AA1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N38.11.24 T1 $\oplus$ A3AA3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N38.11.25 T1 $\oplus$ A2AA2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N38.11.26 T1 $\oplus$ A4AA4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N38.11.27 T2 $\oplus$ SM1SN1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N38.11.28 T2 $\oplus$ SM2SN2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N38.11.29 T2 $\oplus$ SM4SN4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N38.11.30 T2 $\oplus$ SM3SN3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N38.11.31 T2 $\oplus$ A1AA1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N38.11.32 T2 $\oplus$ A3AA3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N38.11.33 T2 $\oplus$ A2AA2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N38.11.34 T2 $\oplus$ A4AA4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N38.11.35 Y1 $\oplus$ SM1SN1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N38.11.36 Y1 $\oplus$ SM2SN2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N38.11.37 Y1 $\oplus$ SM4SN4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N38.11.38 Y1 $\oplus$ SM3SN3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N38.11.39 Y1 $\oplus$ A1AA1	$\surd$	1	1	$\times$	-	-
N38.11.40 Y1 $\oplus$ A2AA2	$\surd$	1	1	$\times$	-	-
N38.11.41 Y2 $\oplus$ SM1SN1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$

Non-coplanar SSGs with parent space group $Amm2$ (No. 38) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N38.11.42 Y2 ⊕ SM2SN2	√	1	1	√	mmm	$\mathrm{B1_u}$
N38.11.43 Y2 ⊕ SM4SN4	√	1	1	√	mmm	$\mathrm{B1_u}$
N38.11.44 Y2 ⊕ SM3SN3	√	1	1	√	mmm	$\mathrm{B1_u}$
N38.11.45 Y2 ⊕ A1AA1	√	1	1	×	-	-
N38.11.46 Y2 ⊕ A2AA2	√	1	1	×	-	-
N38.11.47 Y3 ⊕ SM1SN1	√	1	1	√	mmm	$\mathrm{B1_u}$
N38.11.48 Y3 ⊕ SM2SN2	√	1	1	√	mmm	$\mathrm{B1_u}$
N38.11.49 Y3 ⊕ SM4SN4	√	1	1	√	mmm	$\mathrm{B1_u}$
N38.11.50 Y3 ⊕ SM3SN3	√	1	1	√	mmm	$\mathrm{B1_u}$
N38.11.51 Y3 ⊕ A1AA1	√	1	1	×	-	-
N38.11.52 Y3 ⊕ A2AA2	√	1	1	×	-	-
N38.11.53 Y4 ⊕ SM1SN1	√	1	1	√	mmm	$\mathrm{B1_u}$
N38.11.54 Y4 ⊕ SM2SN2	√	1	1	√	mmm	$\mathrm{B1_u}$
N38.11.55 Y4 ⊕ SM4SN4	√	1	1	√	mmm	$\mathrm{B1_u}$
N38.11.56 Y4 ⊕ SM3SN3	√	1	1	√	mmm	$\mathrm{B1_u}$
N38.11.57 Y4 ⊕ A1AA1	√	1	1	×	-	-
N38.11.58 Y4 ⊕ A2AA2	√	1	1	×	-	-
N38.11.59 Z1 ⊕ SM1SN1	√	1	1	√	mmm	$\mathrm{B1_u}$
N38.11.60 Z1 ⊕ SM2SN2	√	1	1	√	mmm	$\mathrm{B1_u}$
N38.11.61 Z1 ⊕ SM4SN4	√	1	1	√	mmm	$\mathrm{B1_u}$
N38.11.62 Z1 ⊕ SM3SN3	√	1	1	√	mmm	$\mathrm{B1_u}$
N38.11.63 Z1 ⊕ A1AA1	√	1	1	√	mmm	$\mathrm{B1_u}$
N38.11.64 Z1 ⊕ A3AA3	√	1	1	√	mmm	$\mathrm{B1_u}$
N38.11.65 Z1 ⊕ A2AA2	√	1	1	√	mmm	$\mathrm{B1_u}$
N38.11.66 Z1 ⊕ A4AA4	√	1	1	√	mmm	$\mathrm{B1_u}$
N38.11.67 Z2 ⊕ SM1SN1	√	1	1	√	mmm	$\mathrm{B1_u}$
N38.11.68 Z2 ⊕ SM2SN2	√	1	1	√	mmm	$\mathrm{B1_u}$
N38.11.69 Z2 ⊕ SM4SN4	√	1	1	√	mmm	$\mathrm{B1_u}$
N38.11.70 Z2 ⊕ SM3SN3	√	1	1	√	mmm	$\mathrm{B1_u}$
N38.11.71 Z2 ⊕ A1AA1	√	1	1	√	mmm	$\mathrm{B1_u}$
N38.11.72 Z2 ⊕ A3AA3	√	1	1	√	mmm	$\mathrm{B1_u}$
N38.11.73 Z2 ⊕ A2AA2	√	1	1	√	mmm	$\mathrm{B1_u}$
N38.11.74 Z2 ⊕ A4AA4	√	1	1	√	mmm	$\mathrm{B1_u}$
N38.13.1 GM2 ⊕ S1	√	1	1	×	-	-
N38.13.2 GM2 ⊕ S2	√	1	1	×	-	-
N38.13.3 GM2 ⊕ R1	√	1	1	×	-	-
N38.13.4 GM3 ⊕ S1	√	1	1	×	-	-
N38.13.5 GM3 ⊕ S2	√	1	1	×	-	-
N38.13.6 GM3 ⊕ R1	√	1	1	×	-	-
N38.13.7 GM4 ⊕ S1	√	1	1	×	-	-
N38.13.8 GM4 ⊕ S2	√	1	1	×	-	-
N38.13.9 GM4 ⊕ R1	√	1	1	×	-	-
N38.13.10 T1 ⊕ S1	×	-	-	-	-	-
N38.13.11 T1 ⊕ S2	×	-	-	-	-	-
N38.13.12 T1 ⊕ R1	×	-	-	-	-	-
N38.13.13 T1 ⊕ R2	×	-	-	-	-	-

Non-coplanar SSGs with parent space group $Amm2$ (No. 38) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N38.13.14 T2 $\oplus$ S1	$\times$	-	-	-	-	-
N38.13.15 T2 $\oplus$ S2	$\times$	-	-	-	-	-
N38.13.16 T2 $\oplus$ R1	$\times$	-	-	-	-	-
N38.13.17 T2 $\oplus$ R2	$\times$	-	-	-	-	-
N38.13.18 Y1 $\oplus$ S1	$\times$	-	-	-	-	-
N38.13.19 Y1 $\oplus$ S2	$\times$	-	-	-	-	-
N38.13.20 Y1 $\oplus$ R1	$\times$	-	-	-	-	-
N38.13.21 Y2 $\oplus$ S1	$\times$	-	-	-	-	-
N38.13.22 Y2 $\oplus$ S2	$\times$	-	-	-	-	-
N38.13.23 Y2 $\oplus$ R1	$\times$	-	-	-	-	-
N38.13.24 Y3 $\oplus$ S1	$\times$	-	-	-	-	-
N38.13.25 Y3 $\oplus$ S2	$\times$	-	-	-	-	-
N38.13.26 Y3 $\oplus$ R1	$\times$	-	-	-	-	-
N38.13.27 Y4 $\oplus$ S1	$\times$	-	-	-	-	-
N38.13.28 Y4 $\oplus$ S2	$\times$	-	-	-	-	-
N38.13.29 Y4 $\oplus$ R1	$\times$	-	-	-	-	-
N38.13.30 Z1 $\oplus$ S1	$\times$	-	-	-	-	-
N38.13.31 Z1 $\oplus$ S2	$\times$	-	-	-	-	-
N38.13.32 Z1 $\oplus$ R1	$\times$	-	-	-	-	-
N38.13.33 Z1 $\oplus$ R2	$\times$	-	-	-	-	-
N38.13.34 Z2 $\oplus$ S1	$\times$	-	-	-	-	-
N38.13.35 Z2 $\oplus$ S2	$\times$	-	-	-	-	-
N38.13.36 Z2 $\oplus$ R1	$\times$	-	-	-	-	-
N38.13.37 Z2 $\oplus$ R2	$\times$	-	-	-	-	-
N38.14.1 GM2 $\oplus$ DT1	$\surd$	1	1	$\surd$	$mm2$	B2
N38.14.2 GM2 $\oplus$ DT2	$\surd$	1	1	$\surd$	$mm2$	B2
N38.14.3 GM2 $\oplus$ B1	$\surd$	1	1	$\times$	-	-
N38.14.4 GM2 $\oplus$ LD1	$\surd$	1	1	$\surd$	$mm2$	B1
N38.14.5 GM2 $\oplus$ LD2	$\surd$	1	1	$\surd$	$mm2$	B1
N38.14.6 GM2 $\oplus$ H1	$\surd$	1	1	$\times$	-	-
N38.14.7 GM2 $\oplus$ H2	$\surd$	1	1	$\times$	-	-
N38.14.8 GM3 $\oplus$ DT1	$\surd$	1	1	$\surd$	222	B2
N38.14.9 GM3 $\oplus$ DT2	$\surd$	1	1	$\surd$	222	B2
N38.14.10 GM3 $\oplus$ B1	$\surd$	1	1	$\times$	-	-
N38.14.11 GM3 $\oplus$ LD1	$\surd$	1	1	$\surd$	$mm2$	B1
N38.14.12 GM3 $\oplus$ LD2	$\surd$	1	1	$\surd$	$mm2$	B1
N38.14.13 GM3 $\oplus$ H1	$\surd$	1	1	$\times$	-	-
N38.14.14 GM3 $\oplus$ H2	$\surd$	1	1	$\times$	-	-
N38.14.15 GM4 $\oplus$ DT1	$\surd$	1	1	$\surd$	$mm2$	B2
N38.14.16 GM4 $\oplus$ DT2	$\surd$	1	1	$\surd$	$mm2$	B2
N38.14.17 GM4 $\oplus$ B1	$\surd$	1	1	$\times$	-	-
N38.14.18 GM4 $\oplus$ LD1	$\surd$	1	1	$\surd$	222	B3
N38.14.19 GM4 $\oplus$ LD2	$\surd$	1	1	$\surd$	222	B3
N38.14.20 GM4 $\oplus$ H1	$\surd$	1	1	$\surd$	222	B3
N38.14.21 GM4 $\oplus$ H2	$\surd$	1	1	$\surd$	222	B3
N38.14.22 T1 $\oplus$ DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$

Non-coplanar SSGs with parent space group $Amm2$ (No. 38) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N38.14.23 T1 ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
N38.14.24 T1 ⊕ B1	√	1	1	√	mmm	$\mathrm{B2_u}$
N38.14.25 T1 ⊕ B2	√	1	1	√	mmm	$\mathrm{B2_u}$
N38.14.26 T1 ⊕ LD1	√	1	1	√	mmm	$\mathrm{B3_u}$
N38.14.27 T1 ⊕ LD2	√	1	1	√	mmm	$\mathrm{B3_u}$
N38.14.28 T1 ⊕ H1	√	1	1	√	mmm	$\mathrm{B3_u}$
N38.14.29 T1 ⊕ H2	√	1	1	√	mmm	$\mathrm{B3_u}$
N38.14.30 T2 ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N38.14.31 T2 ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
N38.14.32 T2 ⊕ B1	√	1	1	√	mmm	$\mathrm{B2_u}$
N38.14.33 T2 ⊕ B2	√	1	1	√	mmm	$\mathrm{B2_u}$
N38.14.34 T2 ⊕ LD1	√	1	1	√	mmm	$\mathrm{B3_u}$
N38.14.35 T2 ⊕ LD2	√	1	1	√	mmm	$\mathrm{B3_u}$
N38.14.36 T2 ⊕ H1	√	1	1	√	mmm	$\mathrm{B3_u}$
N38.14.37 T2 ⊕ H2	√	1	1	√	mmm	$\mathrm{B3_u}$
N38.14.38 Y1 ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N38.14.39 Y1 ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
N38.14.40 Y1 ⊕ B1	√	1	1	×	-	-
N38.14.41 Y1 ⊕ LD1	√	1	1	√	mmm	$\mathrm{B3_u}$
N38.14.42 Y1 ⊕ LD2	√	1	1	√	mmm	$\mathrm{B3_u}$
N38.14.43 Y1 ⊕ H1	√	1	1	√	mmm	$\mathrm{B3_u}$
N38.14.44 Y1 ⊕ H2	√	1	1	√	mmm	$\mathrm{B3_u}$
N38.14.45 Y2 ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N38.14.46 Y2 ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
N38.14.47 Y2 ⊕ B1	√	1	1	×	-	-
N38.14.48 Y2 ⊕ LD1	√	1	1	√	mmm	$\mathrm{B3_u}$
N38.14.49 Y2 ⊕ LD2	√	1	1	√	mmm	$\mathrm{B3_u}$
N38.14.50 Y2 ⊕ H1	√	1	1	√	mmm	$\mathrm{B3_u}$
N38.14.51 Y2 ⊕ H2	√	1	1	√	mmm	$\mathrm{B3_u}$
N38.14.52 Y3 ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N38.14.53 Y3 ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
N38.14.54 Y3 ⊕ B1	√	1	1	×	-	-
N38.14.55 Y3 ⊕ LD1	√	1	1	√	mmm	$\mathrm{B3_u}$
N38.14.56 Y3 ⊕ LD2	√	1	1	√	mmm	$\mathrm{B3_u}$
N38.14.57 Y3 ⊕ H1	√	1	1	√	mmm	$\mathrm{B3_u}$
N38.14.58 Y3 ⊕ H2	√	1	1	√	mmm	$\mathrm{B3_u}$
N38.14.59 Y4 ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N38.14.60 Y4 ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
N38.14.61 Y4 ⊕ B1	√	1	1	×	-	-
N38.14.62 Y4 ⊕ LD1	√	1	1	√	mmm	$\mathrm{B3_u}$
N38.14.63 Y4 ⊕ LD2	√	1	1	√	mmm	$\mathrm{B3_u}$
N38.14.64 Y4 ⊕ H1	√	1	1	√	mmm	$\mathrm{B3_u}$
N38.14.65 Y4 ⊕ H2	√	1	1	√	mmm	$\mathrm{B3_u}$
N38.14.66 Z1 ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N38.14.67 Z1 ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
N38.14.68 Z1 ⊕ B1	√	1	1	√	mmm	$\mathrm{B2_u}$

Non-coplanar SSGs with parent space group $Amm2$ (No. 38) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N38.14.69 Z1 $\oplus$ B2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N38.14.70 Z1 $\oplus$ LD1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N38.14.71 Z1 $\oplus$ LD2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N38.14.72 Z1 $\oplus$ H1	$\surd$	1	1	$\times$	-	-
N38.14.73 Z1 $\oplus$ H2	$\surd$	1	1	$\times$	-	-
N38.14.74 Z2 $\oplus$ DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N38.14.75 Z2 $\oplus$ DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N38.14.76 Z2 $\oplus$ B1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N38.14.77 Z2 $\oplus$ B2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N38.14.78 Z2 $\oplus$ LD1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N38.14.79 Z2 $\oplus$ LD2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N38.14.80 Z2 $\oplus$ H1	$\surd$	1	1	$\times$	-	-
N38.14.81 Z2 $\oplus$ H2	$\surd$	1	1	$\times$	-	-

TABLE S115: Collinear SSGs with parent space group $Aem2$ (No. 39).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L39.1.1 GM1	1	mmm	$\mathrm{A_g}$
L39.2.1 GM2	1	mmm	$\mathrm{B1_g}$
L39.2.2 GM3	1	mmm	$\mathrm{B2_g}$
L39.2.3 GM4	1	mmm	$\mathrm{B3_g}$
L39.2.4 T1	0	-	-
L39.2.5 T2	0	-	-
L39.2.6 Y1	0	-	-
L39.2.7 Y2	0	-	-
L39.2.8 Y3	0	-	-
L39.2.9 Y4	0	-	-
L39.2.10 Z1	0	-	-
L39.2.11 Z2	0	-	-

TABLE S116: Coplanar SSGs with parent space group $Aem2$ (No. 39).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P39.1.1 GM1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B1_u}$
P39.2.1 GM2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$
P39.2.2 GM3	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u} \oplus \mathrm{B2_g}$
P39.2.3 GM4	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
P39.2.4 T1	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P39.2.5 T2	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P39.2.6 Y1	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P39.2.7 Y2	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P39.2.8 Y3	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P39.2.9 Y4	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P39.2.10 Z1	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P39.2.11 Z2	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$

Coplanar SSGs with parent space group $Aem2$ (No. 39) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P39.3.1 GM2 ⊕ GM2	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
P39.3.2 GM2 ⊕ GM3	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
P39.3.3 GM2 ⊕ GM4	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
P39.3.4 GM2 ⊕ T1	√	1	1	×	-	-
P39.3.5 GM2 ⊕ T2	√	1	1	×	-	-
P39.3.6 GM2 ⊕ Y1	√	1	1	×	-	-
P39.3.7 GM2 ⊕ Y2	√	1	1	×	-	-
P39.3.8 GM2 ⊕ Y3	√	1	1	×	-	-
P39.3.9 GM2 ⊕ Y4	√	1	1	×	-	-
P39.3.10 GM2 ⊕ Z1	√	1	1	×	-	-
P39.3.11 GM2 ⊕ Z2	√	1	1	×	-	-
P39.3.12 GM3 ⊕ GM3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
P39.3.13 GM3 ⊕ GM4	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
P39.3.14 GM3 ⊕ T1	√	1	1	×	-	-
P39.3.15 GM3 ⊕ T2	√	1	1	×	-	-
P39.3.16 GM3 ⊕ Y1	√	1	1	×	-	-
P39.3.17 GM3 ⊕ Y2	√	1	1	×	-	-
P39.3.18 GM3 ⊕ Y3	√	1	1	×	-	-
P39.3.19 GM3 ⊕ Y4	√	1	1	×	-	-
P39.3.20 GM3 ⊕ Z1	√	1	1	×	-	-
P39.3.21 GM3 ⊕ Z2	√	1	1	×	-	-
P39.3.22 GM4 ⊕ GM4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
P39.3.23 GM4 ⊕ T1	√	1	1	×	-	-
P39.3.24 GM4 ⊕ T2	√	1	1	×	-	-
P39.3.25 GM4 ⊕ Y1	√	1	1	√	mmm	$\mathrm{B3_g}$
P39.3.26 GM4 ⊕ Y2	√	1	1	√	mmm	$\mathrm{B3_g}$
P39.3.27 GM4 ⊕ Y3	√	1	1	√	mmm	$\mathrm{B3_g}$
P39.3.28 GM4 ⊕ Y4	√	1	1	√	mmm	$\mathrm{B3_g}$
P39.3.29 GM4 ⊕ Z1	√	1	1	×	-	-
P39.3.30 GM4 ⊕ Z2	√	1	1	×	-	-
P39.3.31 T1 ⊕ T1	√	1	1	×	-	-
P39.3.32 T1 ⊕ T3	√	1	1	×	-	-
P39.3.33 T1 ⊕ T2	√	1	1	×	-	-
P39.3.34 T1 ⊕ T4	√	1	1	×	-	-
P39.3.35 T1 ⊕ Y1	×	-	-	-	-	-
P39.3.36 T1 ⊕ Y2	×	-	-	-	-	-
P39.3.37 T1 ⊕ Y3	×	-	-	-	-	-
P39.3.38 T1 ⊕ Y4	×	-	-	-	-	-
P39.3.39 T1 ⊕ Z1	×	-	-	-	-	-
P39.3.40 T1 ⊕ Z3	×	-	-	-	-	-
P39.3.41 T1 ⊕ Z2	×	-	-	-	-	-
P39.3.42 T1 ⊕ Z4	×	-	-	-	-	-
P39.3.43 T2 ⊕ T2	√	1	1	×	-	-
P39.3.44 T2 ⊕ T4	√	1	1	×	-	-
P39.3.45 T2 ⊕ Y1	×	-	-	-	-	-
P39.3.46 T2 ⊕ Y2	×	-	-	-	-	-

Coplanar SSGs with parent space group $Aem2$ (No. 39) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P39.3.47 T2 ⊕ Y3	×	-	-	-	-	-
P39.3.48 T2 ⊕ Y4	×	-	-	-	-	-
P39.3.49 T2 ⊕ Z1	×	-	-	-	-	-
P39.3.50 T2 ⊕ Z3	×	-	-	-	-	-
P39.3.51 T2 ⊕ Z2	×	-	-	-	-	-
P39.3.52 T2 ⊕ Z4	×	-	-	-	-	-
P39.3.53 Y1 ⊕ Y1	√	1	1	√	mmm	$\mathrm{B1_u}$
P39.3.54 Y1 ⊕ Y2	√	1	1	×	-	-
P39.3.55 Y1 ⊕ Y3	√	1	1	×	-	-
P39.3.56 Y1 ⊕ Y4	√	1	1	√	mmm	$\mathrm{B2_u}$
P39.3.57 Y1 ⊕ Z1	×	-	-	-	-	-
P39.3.58 Y1 ⊕ Z2	×	-	-	-	-	-
P39.3.59 Y2 ⊕ Y2	√	1	1	√	mmm	$\mathrm{B1_u}$
P39.3.60 Y2 ⊕ Y3	√	1	1	√	mmm	$\mathrm{B2_u}$
P39.3.61 Y2 ⊕ Y4	√	1	1	×	-	-
P39.3.62 Y2 ⊕ Z1	×	-	-	-	-	-
P39.3.63 Y2 ⊕ Z2	×	-	-	-	-	-
P39.3.64 Y3 ⊕ Y3	√	1	1	√	mmm	$\mathrm{B1_u}$
P39.3.65 Y3 ⊕ Y4	√	1	1	×	-	-
P39.3.66 Y3 ⊕ Z1	×	-	-	-	-	-
P39.3.67 Y3 ⊕ Z2	×	-	-	-	-	-
P39.3.68 Y4 ⊕ Y4	√	1	1	√	mmm	$\mathrm{B1_u}$
P39.3.69 Y4 ⊕ Z1	×	-	-	-	-	-
P39.3.70 Y4 ⊕ Z2	×	-	-	-	-	-
P39.3.71 Z1 ⊕ Z1	√	1	1	×	-	-
P39.3.72 Z1 ⊕ Z3	√	1	1	√	mmm	$\mathrm{B3_u}$
P39.3.73 Z1 ⊕ Z2	√	1	1	×	-	-
P39.3.74 Z1 ⊕ Z4	√	1	1	×	-	-
P39.3.75 Z2 ⊕ Z2	√	1	1	×	-	-
P39.3.76 Z2 ⊕ Z4	√	1	1	√	mmm	$\mathrm{B3_u}$
P39.5.1 SM1SN1	√	1	1	√	mmm	$\mathrm{B1_u}$
P39.5.2 SM2SN2	√	1	1	√	mmm	$\mathrm{B1_u}$
P39.5.3 SM4SN4	√	1	1	√	mmm	$\mathrm{B1_u}$
P39.5.4 SM3SN3	√	1	1	√	mmm	$\mathrm{B1_u}$
P39.5.5 A1AA1	√	1	1	×	-	-
P39.5.6 A2AA2	√	1	1	×	-	-
P39.8.1 DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
P39.8.2 DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
P39.8.3 B1	√	1	1	×	-	-
P39.8.4 LD1	√	1	1	√	mmm	$\mathrm{B3_u}$
P39.8.5 LD2	√	1	1	√	mmm	$\mathrm{B3_u}$
P39.8.6 H2	√	1	1	×	-	-
P39.8.7 H1	√	1	1	×	-	-

TABLE S117: Non-coplanar SSGs with parent space group $Aem2$ (No. 39).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N39.1.1 GM1	$\surd$	3	3	$\surd$	$mm2$	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{A1}$
N39.2.1 GM2	$\surd$	3	3	$\surd$	222	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{B1}$
N39.2.2 GM3	$\surd$	3	3	$\surd$	$mm2$	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{B1}$
N39.2.3 GM4	$\surd$	3	3	$\surd$	$mm2$	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{B2}$
N39.2.4 T1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{B1_u}$
N39.2.5 T2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{B1_u}$
N39.2.6 Y1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{B1_u}$
N39.2.7 Y2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{B1_u}$
N39.2.8 Y3	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{B1_u}$
N39.2.9 Y4	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{B1_u}$
N39.2.10 Z1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{B1_u}$
N39.2.11 Z2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{B1_u}$
N39.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$mm2$	$\mathrm{A1}\oplus\mathrm{A2}\oplus\mathrm{A2}$
N39.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$mm2$	$\mathrm{A1}\oplus\mathrm{A2}\oplus\mathrm{B1}$
N39.3.3 GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	$mm2$	$\mathrm{A1}\oplus\mathrm{A2}\oplus\mathrm{B2}$
N39.3.4 GM2 $\oplus$ T1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_u}\oplus\mathrm{B1_g}$
N39.3.5 GM2 $\oplus$ T2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_u}\oplus\mathrm{B1_g}$
N39.3.6 GM2 $\oplus$ Y1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_u}\oplus\mathrm{B1_g}$
N39.3.7 GM2 $\oplus$ Y2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_u}\oplus\mathrm{B1_g}$
N39.3.8 GM2 $\oplus$ Y3	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_u}\oplus\mathrm{B1_g}$
N39.3.9 GM2 $\oplus$ Y4	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_u}\oplus\mathrm{B1_g}$
N39.3.10 GM2 $\oplus$ Z1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_u}\oplus\mathrm{B1_g}$
N39.3.11 GM2 $\oplus$ Z2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_u}\oplus\mathrm{B1_g}$
N39.3.12 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	$mm2$	$\mathrm{A1}\oplus\mathrm{B1}\oplus\mathrm{B1}$
N39.3.13 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	222	$\mathrm{A1}\oplus\mathrm{B3}\oplus\mathrm{B2}$
N39.3.14 GM3 $\oplus$ T1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}\oplus\mathrm{B2_g}$
N39.3.15 GM3 $\oplus$ T2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}\oplus\mathrm{B2_g}$
N39.3.16 GM3 $\oplus$ Y1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}\oplus\mathrm{B2_g}$
N39.3.17 GM3 $\oplus$ Y2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}\oplus\mathrm{B2_g}$
N39.3.18 GM3 $\oplus$ Y3	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}\oplus\mathrm{B2_g}$
N39.3.19 GM3 $\oplus$ Y4	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}\oplus\mathrm{B2_g}$
N39.3.20 GM3 $\oplus$ Z1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}\oplus\mathrm{B2_g}$
N39.3.21 GM3 $\oplus$ Z2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}\oplus\mathrm{B2_g}$
N39.3.22 GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	$mm2$	$\mathrm{A1}\oplus\mathrm{B2}\oplus\mathrm{B2}$
N39.3.23 GM4 $\oplus$ T1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}\oplus\mathrm{B2_u}$
N39.3.24 GM4 $\oplus$ T2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}\oplus\mathrm{B2_u}$
N39.3.25 GM4 $\oplus$ Y1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}\oplus\mathrm{B2_u}$
N39.3.26 GM4 $\oplus$ Y2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}\oplus\mathrm{B2_u}$
N39.3.27 GM4 $\oplus$ Y3	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}\oplus\mathrm{B2_u}$
N39.3.28 GM4 $\oplus$ Y4	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}\oplus\mathrm{B2_u}$
N39.3.29 GM4 $\oplus$ Z1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}\oplus\mathrm{B2_u}$
N39.3.30 GM4 $\oplus$ Z2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}\oplus\mathrm{B2_u}$
N39.3.31 T1 $\oplus$ T1	$\surd$	1	1	$\surd$	$mm2$	A1
N39.3.32 T1 $\oplus$ T3	$\surd$	1	1	$\surd$	$mm2$	A1
N39.3.33 T1 $\oplus$ T2	$\surd$	1	1	$\surd$	222	A1
N39.3.34 T1 $\oplus$ T4	$\surd$	1	1	$\surd$	$mm2$	A1

Non-coplanar SSGs with parent space group $Aem2$ (No. 39) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N39.3.35 T1 ⊕ Y1	√	1	1	√	mmm	$\mathrm{A_g}$
N39.3.36 T1 ⊕ Y2	√	1	1	√	mmm	$\mathrm{A_g}$
N39.3.37 T1 ⊕ Y3	√	1	1	√	mmm	$\mathrm{A_g}$
N39.3.38 T1 ⊕ Y4	√	1	1	√	mmm	$\mathrm{A_g}$
N39.3.39 T1 ⊕ Z1	√	1	1	√	mmm	$\mathrm{A_g}$
N39.3.40 T1 ⊕ Z3	√	1	1	√	mmm	$\mathrm{A_g}$
N39.3.41 T1 ⊕ Z2	√	1	1	√	mmm	$\mathrm{A_g}$
N39.3.42 T1 ⊕ Z4	√	1	1	√	mmm	$\mathrm{A_g}$
N39.3.43 T2 ⊕ T2	√	1	1	√	$mm2$	A1
N39.3.44 T2 ⊕ T4	√	1	1	√	$mm2$	A1
N39.3.45 T2 ⊕ Y1	√	1	1	√	mmm	$\mathrm{A_g}$
N39.3.46 T2 ⊕ Y2	√	1	1	√	mmm	$\mathrm{A_g}$
N39.3.47 T2 ⊕ Y3	√	1	1	√	mmm	$\mathrm{A_g}$
N39.3.48 T2 ⊕ Y4	√	1	1	√	mmm	$\mathrm{A_g}$
N39.3.49 T2 ⊕ Z1	√	1	1	√	mmm	$\mathrm{A_g}$
N39.3.50 T2 ⊕ Z3	√	1	1	√	mmm	$\mathrm{A_g}$
N39.3.51 T2 ⊕ Z2	√	1	1	√	mmm	$\mathrm{A_g}$
N39.3.52 T2 ⊕ Z4	√	1	1	√	mmm	$\mathrm{A_g}$
N39.3.53 Y1 ⊕ Y1	√	1	1	√	$mm2$	A1
N39.3.54 Y1 ⊕ Y2	√	1	1	√	222	A1
N39.3.55 Y1 ⊕ Y3	√	1	1	√	$mm2$	A1
N39.3.56 Y1 ⊕ Y4	√	1	1	√	$mm2$	A1
N39.3.57 Y1 ⊕ Z1	√	1	1	√	mmm	$\mathrm{A_g}$
N39.3.58 Y1 ⊕ Z2	√	1	1	√	mmm	$\mathrm{A_g}$
N39.3.59 Y2 ⊕ Y2	√	1	1	√	$mm2$	A1
N39.3.60 Y2 ⊕ Y3	√	1	1	√	$mm2$	A1
N39.3.61 Y2 ⊕ Y4	√	1	1	√	$mm2$	A1
N39.3.62 Y2 ⊕ Z1	√	1	1	√	mmm	$\mathrm{A_g}$
N39.3.63 Y2 ⊕ Z2	√	1	1	√	mmm	$\mathrm{A_g}$
N39.3.64 Y3 ⊕ Y3	√	1	1	√	$mm2$	A1
N39.3.65 Y3 ⊕ Y4	√	1	1	√	222	A1
N39.3.66 Y3 ⊕ Z1	√	1	1	√	mmm	$\mathrm{A_g}$
N39.3.67 Y3 ⊕ Z2	√	1	1	√	mmm	$\mathrm{A_g}$
N39.3.68 Y4 ⊕ Y4	√	1	1	√	$mm2$	A1
N39.3.69 Y4 ⊕ Z1	√	1	1	√	mmm	$\mathrm{A_g}$
N39.3.70 Y4 ⊕ Z2	√	1	1	√	mmm	$\mathrm{A_g}$
N39.3.71 Z1 ⊕ Z1	√	1	1	√	$mm2$	A1
N39.3.72 Z1 ⊕ Z3	√	1	1	√	$mm2$	A1
N39.3.73 Z1 ⊕ Z2	√	1	1	√	222	A1
N39.3.74 Z1 ⊕ Z4	√	1	1	√	$mm2$	A1
N39.3.75 Z2 ⊕ Z2	√	1	1	√	$mm2$	A1
N39.3.76 Z2 ⊕ Z4	√	1	1	√	$mm2$	A1
N39.5.1 SM1SN1	√	1	1	√	$mm2$	A1
N39.5.2 SM2SN2	√	1	1	√	$mm2$	A1
N39.5.3 SM4SN4	√	1	1	√	$mm2$	A1
N39.5.4 SM3SN3	√	1	1	√	$mm2$	A1

Non-coplanar SSGs with parent space group $Aem2$ (No. 39) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N39.5.5 A1AA1	$\surd$	1	1	$\surd$	$mm2$	A1
N39.5.6 A2AA2	$\surd$	1	1	$\surd$	$mm2$	A1
N39.8.1 DT1	$\surd$	1	1	$\surd$	$mm2$	A1
N39.8.2 DT2	$\surd$	1	1	$\surd$	$mm2$	A1
N39.8.3 B1	$\surd$	1	1	$\surd$	$mm2$	A1
N39.8.4 LD1	$\surd$	1	1	$\surd$	$mm2$	A1
N39.8.5 LD2	$\surd$	1	1	$\surd$	$mm2$	A1
N39.8.6 H2	$\surd$	1	1	$\surd$	$mm2$	A1
N39.8.7 H1	$\surd$	1	1	$\surd$	$mm2$	A1
N39.9.1 GM2 $\oplus$ GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	222	B1 $\oplus$ B1 $\oplus$ B1
N39.9.2 GM2 $\oplus$ GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$mm2$	B2 $\oplus$ B2 $\oplus$ B1
N39.9.3 GM2 $\oplus$ GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	$mm2$	B2 $\oplus$ B1 $\oplus$ B1
N39.9.4 GM2 $\oplus$ GM2 $\oplus$ T1	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N39.9.5 GM2 $\oplus$ GM2 $\oplus$ T2	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N39.9.6 GM2 $\oplus$ GM2 $\oplus$ Y1	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N39.9.7 GM2 $\oplus$ GM2 $\oplus$ Y2	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N39.9.8 GM2 $\oplus$ GM2 $\oplus$ Y3	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N39.9.9 GM2 $\oplus$ GM2 $\oplus$ Y4	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N39.9.10 GM2 $\oplus$ GM2 $\oplus$ Z1	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N39.9.11 GM2 $\oplus$ GM2 $\oplus$ Z2	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N39.9.12 GM2 $\oplus$ GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	222	B1 $\oplus$ B2 $\oplus$ B2
N39.9.13 GM2 $\oplus$ GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	$mm2$	A2 $\oplus$ B2 $\oplus$ B1
N39.9.14 GM2 $\oplus$ GM3 $\oplus$ T1	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N39.9.15 GM2 $\oplus$ GM3 $\oplus$ T2	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N39.9.16 GM2 $\oplus$ GM3 $\oplus$ Y1	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N39.9.17 GM2 $\oplus$ GM3 $\oplus$ Y2	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N39.9.18 GM2 $\oplus$ GM3 $\oplus$ Y3	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N39.9.19 GM2 $\oplus$ GM3 $\oplus$ Y4	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N39.9.20 GM2 $\oplus$ GM3 $\oplus$ Z1	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N39.9.21 GM2 $\oplus$ GM3 $\oplus$ Z2	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N39.9.22 GM2 $\oplus$ GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	222	B1 $\oplus$ B3 $\oplus$ B3
N39.9.23 GM2 $\oplus$ GM4 $\oplus$ T1	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N39.9.24 GM2 $\oplus$ GM4 $\oplus$ T2	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N39.9.25 GM2 $\oplus$ GM4 $\oplus$ Y1	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N39.9.26 GM2 $\oplus$ GM4 $\oplus$ Y2	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N39.9.27 GM2 $\oplus$ GM4 $\oplus$ Y3	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N39.9.28 GM2 $\oplus$ GM4 $\oplus$ Y4	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N39.9.29 GM2 $\oplus$ GM4 $\oplus$ Z1	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N39.9.30 GM2 $\oplus$ GM4 $\oplus$ Z2	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N39.9.31 GM2 $\oplus$ T1 $\oplus$ T1	$\surd$	1	1	$\times$	-	-
N39.9.32 GM2 $\oplus$ T1 $\oplus$ T3	$\surd$	1	1	$\times$	-	-
N39.9.33 GM2 $\oplus$ T1 $\oplus$ T2	$\surd$	1	1	$\times$	-	-
N39.9.34 GM2 $\oplus$ T1 $\oplus$ T4	$\surd$	1	1	$\times$	-	-
N39.9.35 GM2 $\oplus$ T1 $\oplus$ Y1	$\surd$	1	1	$\times$	-	-
N39.9.36 GM2 $\oplus$ T1 $\oplus$ Y2	$\surd$	1	1	$\times$	-	-
N39.9.37 GM2 $\oplus$ T1 $\oplus$ Y3	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $Aem2$ (No. 39) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N39.9.38 GM2 $\oplus$ T1 $\oplus$ Y4	$\surd$	1	1	$\times$	-	-
N39.9.39 GM2 $\oplus$ T1 $\oplus$ Z1	$\surd$	1	1	$\times$	-	-
N39.9.40 GM2 $\oplus$ T1 $\oplus$ Z3	$\surd$	1	1	$\times$	-	-
N39.9.41 GM2 $\oplus$ T1 $\oplus$ Z2	$\surd$	1	1	$\times$	-	-
N39.9.42 GM2 $\oplus$ T1 $\oplus$ Z4	$\surd$	1	1	$\times$	-	-
N39.9.43 GM2 $\oplus$ T2 $\oplus$ T2	$\surd$	1	1	$\times$	-	-
N39.9.44 GM2 $\oplus$ T2 $\oplus$ T4	$\surd$	1	1	$\times$	-	-
N39.9.45 GM2 $\oplus$ T2 $\oplus$ Y1	$\surd$	1	1	$\times$	-	-
N39.9.46 GM2 $\oplus$ T2 $\oplus$ Y2	$\surd$	1	1	$\times$	-	-
N39.9.47 GM2 $\oplus$ T2 $\oplus$ Y3	$\surd$	1	1	$\times$	-	-
N39.9.48 GM2 $\oplus$ T2 $\oplus$ Y4	$\surd$	1	1	$\times$	-	-
N39.9.49 GM2 $\oplus$ T2 $\oplus$ Z1	$\surd$	1	1	$\times$	-	-
N39.9.50 GM2 $\oplus$ T2 $\oplus$ Z3	$\surd$	1	1	$\times$	-	-
N39.9.51 GM2 $\oplus$ T2 $\oplus$ Z2	$\surd$	1	1	$\times$	-	-
N39.9.52 GM2 $\oplus$ T2 $\oplus$ Z4	$\surd$	1	1	$\times$	-	-
N39.9.53 GM2 $\oplus$ Y1 $\oplus$ Y1	$\surd$	1	1	$\surd$	222	B1
N39.9.54 GM2 $\oplus$ Y1 $\oplus$ Y2	$\surd$	1	1	$\times$	-	-
N39.9.55 GM2 $\oplus$ Y1 $\oplus$ Y3	$\surd$	1	1	$\times$	-	-
N39.9.56 GM2 $\oplus$ Y1 $\oplus$ Y4	$\surd$	1	1	$\surd$	$mm2$	B2
N39.9.57 GM2 $\oplus$ Y1 $\oplus$ Z1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N39.9.58 GM2 $\oplus$ Y1 $\oplus$ Z2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N39.9.59 GM2 $\oplus$ Y2 $\oplus$ Y2	$\surd$	1	1	$\surd$	222	B1
N39.9.60 GM2 $\oplus$ Y2 $\oplus$ Y3	$\surd$	1	1	$\surd$	$mm2$	B2
N39.9.61 GM2 $\oplus$ Y2 $\oplus$ Y4	$\surd$	1	1	$\times$	-	-
N39.9.62 GM2 $\oplus$ Y2 $\oplus$ Z1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N39.9.63 GM2 $\oplus$ Y2 $\oplus$ Z2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N39.9.64 GM2 $\oplus$ Y3 $\oplus$ Y3	$\surd$	1	1	$\surd$	222	B1
N39.9.65 GM2 $\oplus$ Y3 $\oplus$ Y4	$\surd$	1	1	$\times$	-	-
N39.9.66 GM2 $\oplus$ Y3 $\oplus$ Z1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N39.9.67 GM2 $\oplus$ Y3 $\oplus$ Z2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N39.9.68 GM2 $\oplus$ Y4 $\oplus$ Y4	$\surd$	1	1	$\surd$	222	B1
N39.9.69 GM2 $\oplus$ Y4 $\oplus$ Z1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N39.9.70 GM2 $\oplus$ Y4 $\oplus$ Z2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N39.9.71 GM2 $\oplus$ Z1 $\oplus$ Z1	$\surd$	1	1	$\times$	-	-
N39.9.72 GM2 $\oplus$ Z1 $\oplus$ Z3	$\surd$	1	1	$\surd$	$mm2$	B1
N39.9.73 GM2 $\oplus$ Z1 $\oplus$ Z2	$\surd$	1	1	$\times$	-	-
N39.9.74 GM2 $\oplus$ Z1 $\oplus$ Z4	$\surd$	1	1	$\times$	-	-
N39.9.75 GM2 $\oplus$ Z2 $\oplus$ Z2	$\surd$	1	1	$\times$	-	-
N39.9.76 GM2 $\oplus$ Z2 $\oplus$ Z4	$\surd$	1	1	$\surd$	$mm2$	B1
N39.9.77 GM3 $\oplus$ GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	$mm2$	B1 $\oplus$ B1 $\oplus$ B1
N39.9.78 GM3 $\oplus$ GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	$mm2$	A2 $\oplus$ A2 $\oplus$ B2
N39.9.79 GM3 $\oplus$ GM3 $\oplus$ T1	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N39.9.80 GM3 $\oplus$ GM3 $\oplus$ T2	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N39.9.81 GM3 $\oplus$ GM3 $\oplus$ Y1	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N39.9.82 GM3 $\oplus$ GM3 $\oplus$ Y2	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N39.9.83 GM3 $\oplus$ GM3 $\oplus$ Y3	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$

Non-coplanar SSGs with parent space group $Aem2$ (No. 39) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N39.9.84 GM3 ⊕ GM3 ⊕ Y4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N39.9.85 GM3 ⊕ GM3 ⊕ Z1	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N39.9.86 GM3 ⊕ GM3 ⊕ Z2	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N39.9.87 GM3 ⊕ GM4 ⊕ GM4	√	3	3	√	$mm2$	A2 ⊕ A2 ⊕ B1
N39.9.88 GM3 ⊕ GM4 ⊕ T1	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N39.9.89 GM3 ⊕ GM4 ⊕ T2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N39.9.90 GM3 ⊕ GM4 ⊕ Y1	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N39.9.91 GM3 ⊕ GM4 ⊕ Y2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N39.9.92 GM3 ⊕ GM4 ⊕ Y3	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N39.9.93 GM3 ⊕ GM4 ⊕ Y4	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N39.9.94 GM3 ⊕ GM4 ⊕ Z1	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N39.9.95 GM3 ⊕ GM4 ⊕ Z2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N39.9.96 GM3 ⊕ T1 ⊕ T1	√	1	1	×	-	-
N39.9.97 GM3 ⊕ T1 ⊕ T3	√	1	1	×	-	-
N39.9.98 GM3 ⊕ T1 ⊕ T2	√	1	1	×	-	-
N39.9.99 GM3 ⊕ T1 ⊕ T4	√	1	1	×	-	-
N39.9.100 GM3 ⊕ T1 ⊕ Y1	√	1	1	×	-	-
N39.9.101 GM3 ⊕ T1 ⊕ Y2	√	1	1	×	-	-
N39.9.102 GM3 ⊕ T1 ⊕ Y3	√	1	1	×	-	-
N39.9.103 GM3 ⊕ T1 ⊕ Y4	√	1	1	×	-	-
N39.9.104 GM3 ⊕ T1 ⊕ Z1	√	1	1	×	-	-
N39.9.105 GM3 ⊕ T1 ⊕ Z3	√	1	1	×	-	-
N39.9.106 GM3 ⊕ T1 ⊕ Z2	√	1	1	×	-	-
N39.9.107 GM3 ⊕ T1 ⊕ Z4	√	1	1	×	-	-
N39.9.108 GM3 ⊕ T2 ⊕ T2	√	1	1	×	-	-
N39.9.109 GM3 ⊕ T2 ⊕ T4	√	1	1	×	-	-
N39.9.110 GM3 ⊕ T2 ⊕ Y1	√	1	1	×	-	-
N39.9.111 GM3 ⊕ T2 ⊕ Y2	√	1	1	×	-	-
N39.9.112 GM3 ⊕ T2 ⊕ Y3	√	1	1	×	-	-
N39.9.113 GM3 ⊕ T2 ⊕ Y4	√	1	1	×	-	-
N39.9.114 GM3 ⊕ T2 ⊕ Z1	√	1	1	×	-	-
N39.9.115 GM3 ⊕ T2 ⊕ Z3	√	1	1	×	-	-
N39.9.116 GM3 ⊕ T2 ⊕ Z2	√	1	1	×	-	-
N39.9.117 GM3 ⊕ T2 ⊕ Z4	√	1	1	×	-	-
N39.9.118 GM3 ⊕ Y1 ⊕ Y1	√	1	1	√	$mm2$	B1
N39.9.119 GM3 ⊕ Y1 ⊕ Y2	√	1	1	×	-	-
N39.9.120 GM3 ⊕ Y1 ⊕ Y3	√	1	1	×	-	-
N39.9.121 GM3 ⊕ Y1 ⊕ Y4	√	1	1	√	222	B2
N39.9.122 GM3 ⊕ Y1 ⊕ Z1	√	1	1	√	mmm	$\mathrm{B2_g}$
N39.9.123 GM3 ⊕ Y1 ⊕ Z2	√	1	1	√	mmm	$\mathrm{B2_g}$
N39.9.124 GM3 ⊕ Y2 ⊕ Y2	√	1	1	√	$mm2$	B1
N39.9.125 GM3 ⊕ Y2 ⊕ Y3	√	1	1	√	222	B2
N39.9.126 GM3 ⊕ Y2 ⊕ Y4	√	1	1	×	-	-
N39.9.127 GM3 ⊕ Y2 ⊕ Z1	√	1	1	√	mmm	$\mathrm{B2_g}$
N39.9.128 GM3 ⊕ Y2 ⊕ Z2	√	1	1	√	mmm	$\mathrm{B2_g}$
N39.9.129 GM3 ⊕ Y3 ⊕ Y3	√	1	1	√	$mm2$	B1

Non-coplanar SSGs with parent space group $Aem2$ (No. 39) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N39.9.130 GM3 ⊕ Y3 ⊕ Y4	√	1	1	×	-	-
N39.9.131 GM3 ⊕ Y3 ⊕ Z1	√	1	1	√	mmm	$\mathrm{B2_g}$
N39.9.132 GM3 ⊕ Y3 ⊕ Z2	√	1	1	√	mmm	$\mathrm{B2_g}$
N39.9.133 GM3 ⊕ Y4 ⊕ Y4	√	1	1	√	$mm2$	B1
N39.9.134 GM3 ⊕ Y4 ⊕ Z1	√	1	1	√	mmm	$\mathrm{B2_g}$
N39.9.135 GM3 ⊕ Y4 ⊕ Z2	√	1	1	√	mmm	$\mathrm{B2_g}$
N39.9.136 GM3 ⊕ Z1 ⊕ Z1	√	1	1	×	-	-
N39.9.137 GM3 ⊕ Z1 ⊕ Z3	√	1	1	√	$mm2$	B1
N39.9.138 GM3 ⊕ Z1 ⊕ Z2	√	1	1	×	-	-
N39.9.139 GM3 ⊕ Z1 ⊕ Z4	√	1	1	×	-	-
N39.9.140 GM3 ⊕ Z2 ⊕ Z2	√	1	1	×	-	-
N39.9.141 GM3 ⊕ Z2 ⊕ Z4	√	1	1	√	$mm2$	B1
N39.9.142 GM4 ⊕ GM4 ⊕ GM4	√	3	3	√	$mm2$	B2 ⊕ B2 ⊕ B2
N39.9.143 GM4 ⊕ GM4 ⊕ T1	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N39.9.144 GM4 ⊕ GM4 ⊕ T2	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N39.9.145 GM4 ⊕ GM4 ⊕ Y1	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N39.9.146 GM4 ⊕ GM4 ⊕ Y2	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N39.9.147 GM4 ⊕ GM4 ⊕ Y3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N39.9.148 GM4 ⊕ GM4 ⊕ Y4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N39.9.149 GM4 ⊕ GM4 ⊕ Z1	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N39.9.150 GM4 ⊕ GM4 ⊕ Z2	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N39.9.151 GM4 ⊕ T1 ⊕ T1	√	1	1	×	-	-
N39.9.152 GM4 ⊕ T1 ⊕ T3	√	1	1	√	222	B3
N39.9.153 GM4 ⊕ T1 ⊕ T2	√	1	1	×	-	-
N39.9.154 GM4 ⊕ T1 ⊕ T4	√	1	1	×	-	-
N39.9.155 GM4 ⊕ T1 ⊕ Y1	√	1	1	√	mmm	$\mathrm{B3_g}$
N39.9.156 GM4 ⊕ T1 ⊕ Y2	√	1	1	√	mmm	$\mathrm{B3_g}$
N39.9.157 GM4 ⊕ T1 ⊕ Y3	√	1	1	√	mmm	$\mathrm{B3_g}$
N39.9.158 GM4 ⊕ T1 ⊕ Y4	√	1	1	√	mmm	$\mathrm{B3_g}$
N39.9.159 GM4 ⊕ T1 ⊕ Z1	√	1	1	×	-	-
N39.9.160 GM4 ⊕ T1 ⊕ Z3	√	1	1	×	-	-
N39.9.161 GM4 ⊕ T1 ⊕ Z2	√	1	1	×	-	-
N39.9.162 GM4 ⊕ T1 ⊕ Z4	√	1	1	×	-	-
N39.9.163 GM4 ⊕ T2 ⊕ T2	√	1	1	×	-	-
N39.9.164 GM4 ⊕ T2 ⊕ T4	√	1	1	√	222	B3
N39.9.165 GM4 ⊕ T2 ⊕ Y1	√	1	1	√	mmm	$\mathrm{B3_g}$
N39.9.166 GM4 ⊕ T2 ⊕ Y2	√	1	1	√	mmm	$\mathrm{B3_g}$
N39.9.167 GM4 ⊕ T2 ⊕ Y3	√	1	1	√	mmm	$\mathrm{B3_g}$
N39.9.168 GM4 ⊕ T2 ⊕ Y4	√	1	1	√	mmm	$\mathrm{B3_g}$
N39.9.169 GM4 ⊕ T2 ⊕ Z1	√	1	1	×	-	-
N39.9.170 GM4 ⊕ T2 ⊕ Z3	√	1	1	×	-	-
N39.9.171 GM4 ⊕ T2 ⊕ Z2	√	1	1	×	-	-
N39.9.172 GM4 ⊕ T2 ⊕ Z4	√	1	1	×	-	-
N39.9.173 GM4 ⊕ Y1 ⊕ Y1	√	1	1	√	$mm2$	B2
N39.9.174 GM4 ⊕ Y1 ⊕ Y2	√	1	1	√	$mm2$	A2
N39.9.175 GM4 ⊕ Y1 ⊕ Y3	√	1	1	√	222	B3

Non-coplanar SSGs with parent space group $Aem2$ (No. 39) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N39.9.176 GM4 ⊕ Y1 ⊕ Y4	√	1	1	√	$mm2$	B2
N39.9.177 GM4 ⊕ Y1 ⊕ Z1	√	1	1	√	mmm	$\mathrm{B3_g}$
N39.9.178 GM4 ⊕ Y1 ⊕ Z2	√	1	1	√	mmm	$\mathrm{B3_g}$
N39.9.179 GM4 ⊕ Y2 ⊕ Y2	√	1	1	√	$mm2$	B2
N39.9.180 GM4 ⊕ Y2 ⊕ Y3	√	1	1	√	$mm2$	B2
N39.9.181 GM4 ⊕ Y2 ⊕ Y4	√	1	1	√	222	B3
N39.9.182 GM4 ⊕ Y2 ⊕ Z1	√	1	1	√	mmm	$\mathrm{B3_g}$
N39.9.183 GM4 ⊕ Y2 ⊕ Z2	√	1	1	√	mmm	$\mathrm{B3_g}$
N39.9.184 GM4 ⊕ Y3 ⊕ Y3	√	1	1	√	$mm2$	B2
N39.9.185 GM4 ⊕ Y3 ⊕ Y4	√	1	1	√	$mm2$	A2
N39.9.186 GM4 ⊕ Y3 ⊕ Z1	√	1	1	√	mmm	$\mathrm{B3_g}$
N39.9.187 GM4 ⊕ Y3 ⊕ Z2	√	1	1	√	mmm	$\mathrm{B3_g}$
N39.9.188 GM4 ⊕ Y4 ⊕ Y4	√	1	1	√	$mm2$	B2
N39.9.189 GM4 ⊕ Y4 ⊕ Z1	√	1	1	√	mmm	$\mathrm{B3_g}$
N39.9.190 GM4 ⊕ Y4 ⊕ Z2	√	1	1	√	mmm	$\mathrm{B3_g}$
N39.9.191 GM4 ⊕ Z1 ⊕ Z1	√	1	1	×	-	-
N39.9.192 GM4 ⊕ Z1 ⊕ Z3	√	1	1	√	222	B3
N39.9.193 GM4 ⊕ Z1 ⊕ Z2	√	1	1	×	-	-
N39.9.194 GM4 ⊕ Z1 ⊕ Z4	√	1	1	×	-	-
N39.9.195 GM4 ⊕ Z2 ⊕ Z2	√	1	1	×	-	-
N39.9.196 GM4 ⊕ Z2 ⊕ Z4	√	1	1	√	222	B3
N39.9.197 T1 ⊕ T1 ⊕ T1	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N39.9.198 T1 ⊕ T1 ⊕ T3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N39.9.199 T1 ⊕ T1 ⊕ T2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N39.9.200 T1 ⊕ T1 ⊕ T4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N39.9.201 T1 ⊕ T3 ⊕ T2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N39.9.202 T1 ⊕ T1 ⊕ Y1	√	1	1	×	-	-
N39.9.203 T1 ⊕ T3 ⊕ Y1	√	1	1	√	mmm	$\mathrm{B3_u}$
N39.9.204 T1 ⊕ T1 ⊕ Y2	√	1	1	×	-	-
N39.9.205 T1 ⊕ T3 ⊕ Y2	√	1	1	√	mmm	$\mathrm{B3_u}$
N39.9.206 T1 ⊕ T1 ⊕ Y3	√	1	1	×	-	-
N39.9.207 T1 ⊕ T3 ⊕ Y3	√	1	1	√	mmm	$\mathrm{B3_u}$
N39.9.208 T1 ⊕ T1 ⊕ Y4	√	1	1	×	-	-
N39.9.209 T1 ⊕ T3 ⊕ Y4	√	1	1	√	mmm	$\mathrm{B3_u}$
N39.9.210 T1 ⊕ T1 ⊕ Z1	√	1	1	√	mmm	$\mathrm{B1_u}$
N39.9.211 T1 ⊕ T1 ⊕ Z3	√	1	1	√	mmm	$\mathrm{B1_u}$
N39.9.212 T1 ⊕ T3 ⊕ Z1	√	1	1	×	-	-
N39.9.213 T1 ⊕ T1 ⊕ Z2	√	1	1	√	mmm	$\mathrm{B1_u}$
N39.9.214 T1 ⊕ T1 ⊕ Z4	√	1	1	√	mmm	$\mathrm{B1_u}$
N39.9.215 T1 ⊕ T3 ⊕ Z2	√	1	1	×	-	-
N39.9.216 T1 ⊕ T2 ⊕ T2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N39.9.217 T1 ⊕ T2 ⊕ T4	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N39.9.218 T1 ⊕ T4 ⊕ T4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N39.9.219 T1 ⊕ T2 ⊕ Y1	√	1	1	×	-	-
N39.9.220 T1 ⊕ T4 ⊕ Y1	√	1	1	×	-	-
N39.9.221 T1 ⊕ T2 ⊕ Y2	√	1	1	×	-	-

Non-coplanar SSGs with parent space group $Aem2$ (No. 39) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N39.9.222 T1 ⊕ T4 ⊕ Y2	√	1	1	×	-	-
N39.9.223 T1 ⊕ T2 ⊕ Y3	√	1	1	×	-	-
N39.9.224 T1 ⊕ T4 ⊕ Y3	√	1	1	×	-	-
N39.9.225 T1 ⊕ T2 ⊕ Y4	√	1	1	×	-	-
N39.9.226 T1 ⊕ T4 ⊕ Y4	√	1	1	×	-	-
N39.9.227 T1 ⊕ T2 ⊕ Z1	√	1	1	×	-	-
N39.9.228 T1 ⊕ T2 ⊕ Z3	√	1	1	×	-	-
N39.9.229 T1 ⊕ T4 ⊕ Z1	√	1	1	√	mmm	$\mathrm{B2_u}$
N39.9.230 T1 ⊕ T4 ⊕ Z3	√	1	1	√	mmm	$\mathrm{B2_u}$
N39.9.231 T1 ⊕ T2 ⊕ Z2	√	1	1	×	-	-
N39.9.232 T1 ⊕ T2 ⊕ Z4	√	1	1	×	-	-
N39.9.233 T1 ⊕ T4 ⊕ Z2	√	1	1	√	mmm	$\mathrm{B2_u}$
N39.9.234 T1 ⊕ T4 ⊕ Z4	√	1	1	√	mmm	$\mathrm{B2_u}$
N39.9.235 T1 ⊕ Y1 ⊕ Y1	√	1	1	√	mmm	$\mathrm{B1_u}$
N39.9.236 T1 ⊕ Y1 ⊕ Y2	√	1	1	√	mmm	$\mathrm{A_u}$
N39.9.237 T1 ⊕ Y1 ⊕ Y3	√	1	1	√	mmm	$\mathrm{B3_u}$
N39.9.238 T1 ⊕ Y1 ⊕ Y4	√	1	1	√	mmm	$\mathrm{B2_u}$
N39.9.239 T1 ⊕ Y1 ⊕ Z1	×	-	-	-	-	-
N39.9.240 T1 ⊕ Y1 ⊕ Z3	×	-	-	-	-	-
N39.9.241 T1 ⊕ Y1 ⊕ Z2	×	-	-	-	-	-
N39.9.242 T1 ⊕ Y1 ⊕ Z4	×	-	-	-	-	-
N39.9.243 T1 ⊕ Y2 ⊕ Y2	√	1	1	√	mmm	$\mathrm{B1_u}$
N39.9.244 T1 ⊕ Y2 ⊕ Y3	√	1	1	√	mmm	$\mathrm{B2_u}$
N39.9.245 T1 ⊕ Y2 ⊕ Y4	√	1	1	√	mmm	$\mathrm{B3_u}$
N39.9.246 T1 ⊕ Y2 ⊕ Z1	×	-	-	-	-	-
N39.9.247 T1 ⊕ Y2 ⊕ Z3	×	-	-	-	-	-
N39.9.248 T1 ⊕ Y2 ⊕ Z2	×	-	-	-	-	-
N39.9.249 T1 ⊕ Y2 ⊕ Z4	×	-	-	-	-	-
N39.9.250 T1 ⊕ Y3 ⊕ Y3	√	1	1	√	mmm	$\mathrm{B1_u}$
N39.9.251 T1 ⊕ Y3 ⊕ Y4	√	1	1	√	mmm	$\mathrm{A_u}$
N39.9.252 T1 ⊕ Y3 ⊕ Z1	×	-	-	-	-	-
N39.9.253 T1 ⊕ Y3 ⊕ Z3	×	-	-	-	-	-
N39.9.254 T1 ⊕ Y3 ⊕ Z2	×	-	-	-	-	-
N39.9.255 T1 ⊕ Y3 ⊕ Z4	×	-	-	-	-	-
N39.9.256 T1 ⊕ Y4 ⊕ Y4	√	1	1	√	mmm	$\mathrm{B1_u}$
N39.9.257 T1 ⊕ Y4 ⊕ Z1	×	-	-	-	-	-
N39.9.258 T1 ⊕ Y4 ⊕ Z3	×	-	-	-	-	-
N39.9.259 T1 ⊕ Y4 ⊕ Z2	×	-	-	-	-	-
N39.9.260 T1 ⊕ Y4 ⊕ Z4	×	-	-	-	-	-
N39.9.261 T1 ⊕ Z1 ⊕ Z1	√	1	1	√	mmm	$\mathrm{B1_u}$
N39.9.262 T1 ⊕ Z1 ⊕ Z3	√	1	1	√	mmm	$\mathrm{B3_u}$
N39.9.263 T1 ⊕ Z3 ⊕ Z3	√	1	1	√	mmm	$\mathrm{B1_u}$
N39.9.264 T1 ⊕ Z1 ⊕ Z2	√	1	1	√	mmm	$\mathrm{A_u}$
N39.9.265 T1 ⊕ Z1 ⊕ Z4	√	1	1	√	mmm	$\mathrm{B2_u}$
N39.9.266 T1 ⊕ Z3 ⊕ Z2	√	1	1	√	mmm	$\mathrm{B2_u}$
N39.9.267 T1 ⊕ Z3 ⊕ Z4	√	1	1	√	mmm	$\mathrm{A_u}$

Non-coplanar SSGs with parent space group $Aem2$ (No. 39) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N39.9.268 T1 ⊕ Z2 ⊕ Z2	√	1	1	√	mmm	$\mathrm{B1_u}$
N39.9.269 T1 ⊕ Z2 ⊕ Z4	√	1	1	√	mmm	$\mathrm{B3_u}$
N39.9.270 T1 ⊕ Z4 ⊕ Z4	√	1	1	√	mmm	$\mathrm{B1_u}$
N39.9.271 T2 ⊕ T2 ⊕ T2	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N39.9.272 T2 ⊕ T2 ⊕ T4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N39.9.273 T2 ⊕ T2 ⊕ Y1	√	1	1	×	-	-
N39.9.274 T2 ⊕ T4 ⊕ Y1	√	1	1	√	mmm	$\mathrm{B3_u}$
N39.9.275 T2 ⊕ T2 ⊕ Y2	√	1	1	×	-	-
N39.9.276 T2 ⊕ T4 ⊕ Y2	√	1	1	√	mmm	$\mathrm{B3_u}$
N39.9.277 T2 ⊕ T2 ⊕ Y3	√	1	1	×	-	-
N39.9.278 T2 ⊕ T4 ⊕ Y3	√	1	1	√	mmm	$\mathrm{B3_u}$
N39.9.279 T2 ⊕ T2 ⊕ Y4	√	1	1	×	-	-
N39.9.280 T2 ⊕ T4 ⊕ Y4	√	1	1	√	mmm	$\mathrm{B3_u}$
N39.9.281 T2 ⊕ T2 ⊕ Z1	√	1	1	√	mmm	$\mathrm{B1_u}$
N39.9.282 T2 ⊕ T2 ⊕ Z3	√	1	1	√	mmm	$\mathrm{B1_u}$
N39.9.283 T2 ⊕ T4 ⊕ Z1	√	1	1	×	-	-
N39.9.284 T2 ⊕ T2 ⊕ Z2	√	1	1	√	mmm	$\mathrm{B1_u}$
N39.9.285 T2 ⊕ T2 ⊕ Z4	√	1	1	√	mmm	$\mathrm{B1_u}$
N39.9.286 T2 ⊕ T4 ⊕ Z2	√	1	1	×	-	-
N39.9.287 T2 ⊕ Y1 ⊕ Y1	√	1	1	√	mmm	$\mathrm{B1_u}$
N39.9.288 T2 ⊕ Y1 ⊕ Y2	√	1	1	√	mmm	$\mathrm{A_u}$
N39.9.289 T2 ⊕ Y1 ⊕ Y3	√	1	1	√	mmm	$\mathrm{B3_u}$
N39.9.290 T2 ⊕ Y1 ⊕ Y4	√	1	1	√	mmm	$\mathrm{B2_u}$
N39.9.291 T2 ⊕ Y1 ⊕ Z1	×	-	-	-	-	-
N39.9.292 T2 ⊕ Y1 ⊕ Z3	×	-	-	-	-	-
N39.9.293 T2 ⊕ Y1 ⊕ Z2	×	-	-	-	-	-
N39.9.294 T2 ⊕ Y1 ⊕ Z4	×	-	-	-	-	-
N39.9.295 T2 ⊕ Y2 ⊕ Y2	√	1	1	√	mmm	$\mathrm{B1_u}$
N39.9.296 T2 ⊕ Y2 ⊕ Y3	√	1	1	√	mmm	$\mathrm{B2_u}$
N39.9.297 T2 ⊕ Y2 ⊕ Y4	√	1	1	√	mmm	$\mathrm{B3_u}$
N39.9.298 T2 ⊕ Y2 ⊕ Z1	×	-	-	-	-	-
N39.9.299 T2 ⊕ Y2 ⊕ Z3	×	-	-	-	-	-
N39.9.300 T2 ⊕ Y2 ⊕ Z2	×	-	-	-	-	-
N39.9.301 T2 ⊕ Y2 ⊕ Z4	×	-	-	-	-	-
N39.9.302 T2 ⊕ Y3 ⊕ Y3	√	1	1	√	mmm	$\mathrm{B1_u}$
N39.9.303 T2 ⊕ Y3 ⊕ Y4	√	1	1	√	mmm	$\mathrm{A_u}$
N39.9.304 T2 ⊕ Y3 ⊕ Z1	×	-	-	-	-	-
N39.9.305 T2 ⊕ Y3 ⊕ Z3	×	-	-	-	-	-
N39.9.306 T2 ⊕ Y3 ⊕ Z2	×	-	-	-	-	-
N39.9.307 T2 ⊕ Y3 ⊕ Z4	×	-	-	-	-	-
N39.9.308 T2 ⊕ Y4 ⊕ Y4	√	1	1	√	mmm	$\mathrm{B1_u}$
N39.9.309 T2 ⊕ Y4 ⊕ Z1	×	-	-	-	-	-
N39.9.310 T2 ⊕ Y4 ⊕ Z3	×	-	-	-	-	-
N39.9.311 T2 ⊕ Y4 ⊕ Z2	×	-	-	-	-	-
N39.9.312 T2 ⊕ Y4 ⊕ Z4	×	-	-	-	-	-
N39.9.313 T2 ⊕ Z1 ⊕ Z1	√	1	1	√	mmm	$\mathrm{B1_u}$

Non-coplanar SSGs with parent space group $Aem2$ (No. 39) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N39.9.314 T2 ⊕ Z1 ⊕ Z3	√	1	1	√	mmm	$\mathrm{B3_u}$
N39.9.315 T2 ⊕ Z3 ⊕ Z3	√	1	1	√	mmm	$\mathrm{B1_u}$
N39.9.316 T2 ⊕ Z1 ⊕ Z2	√	1	1	√	mmm	$\mathrm{A_u}$
N39.9.317 T2 ⊕ Z1 ⊕ Z4	√	1	1	√	mmm	$\mathrm{B2_u}$
N39.9.318 T2 ⊕ Z3 ⊕ Z2	√	1	1	√	mmm	$\mathrm{B2_u}$
N39.9.319 T2 ⊕ Z3 ⊕ Z4	√	1	1	√	mmm	$\mathrm{A_u}$
N39.9.320 T2 ⊕ Z2 ⊕ Z2	√	1	1	√	mmm	$\mathrm{B1_u}$
N39.9.321 T2 ⊕ Z2 ⊕ Z4	√	1	1	√	mmm	$\mathrm{B3_u}$
N39.9.322 T2 ⊕ Z4 ⊕ Z4	√	1	1	√	mmm	$\mathrm{B1_u}$
N39.9.323 Y1 ⊕ Y1 ⊕ Y1	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N39.9.324 Y1 ⊕ Y1 ⊕ Y2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N39.9.325 Y1 ⊕ Y1 ⊕ Y3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N39.9.326 Y1 ⊕ Y1 ⊕ Y4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N39.9.327 Y1 ⊕ Y1 ⊕ Z1	√	1	1	√	mmm	$\mathrm{B1_u}$
N39.9.328 Y1 ⊕ Y1 ⊕ Z2	√	1	1	√	mmm	$\mathrm{B1_u}$
N39.9.329 Y1 ⊕ Y2 ⊕ Y2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N39.9.330 Y1 ⊕ Y2 ⊕ Y3	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N39.9.331 Y1 ⊕ Y2 ⊕ Y4	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N39.9.332 Y1 ⊕ Y2 ⊕ Z1	√	1	1	×	-	-
N39.9.333 Y1 ⊕ Y2 ⊕ Z2	√	1	1	×	-	-
N39.9.334 Y1 ⊕ Y3 ⊕ Y3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N39.9.335 Y1 ⊕ Y3 ⊕ Y4	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N39.9.336 Y1 ⊕ Y3 ⊕ Z1	√	1	1	×	-	-
N39.9.337 Y1 ⊕ Y3 ⊕ Z2	√	1	1	×	-	-
N39.9.338 Y1 ⊕ Y4 ⊕ Y4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N39.9.339 Y1 ⊕ Y4 ⊕ Z1	√	1	1	√	mmm	$\mathrm{B2_u}$
N39.9.340 Y1 ⊕ Y4 ⊕ Z2	√	1	1	√	mmm	$\mathrm{B2_u}$
N39.9.341 Y1 ⊕ Z1 ⊕ Z1	√	1	1	×	-	-
N39.9.342 Y1 ⊕ Z1 ⊕ Z3	√	1	1	√	mmm	$\mathrm{B3_u}$
N39.9.343 Y1 ⊕ Z1 ⊕ Z2	√	1	1	×	-	-
N39.9.344 Y1 ⊕ Z1 ⊕ Z4	√	1	1	×	-	-
N39.9.345 Y1 ⊕ Z2 ⊕ Z2	√	1	1	×	-	-
N39.9.346 Y1 ⊕ Z2 ⊕ Z4	√	1	1	√	mmm	$\mathrm{B3_u}$
N39.9.347 Y2 ⊕ Y2 ⊕ Y2	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N39.9.348 Y2 ⊕ Y2 ⊕ Y3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N39.9.349 Y2 ⊕ Y2 ⊕ Y4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N39.9.350 Y2 ⊕ Y2 ⊕ Z1	√	1	1	√	mmm	$\mathrm{B1_u}$
N39.9.351 Y2 ⊕ Y2 ⊕ Z2	√	1	1	√	mmm	$\mathrm{B1_u}$
N39.9.352 Y2 ⊕ Y3 ⊕ Y3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N39.9.353 Y2 ⊕ Y3 ⊕ Y4	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N39.9.354 Y2 ⊕ Y3 ⊕ Z1	√	1	1	√	mmm	$\mathrm{B2_u}$
N39.9.355 Y2 ⊕ Y3 ⊕ Z2	√	1	1	√	mmm	$\mathrm{B2_u}$
N39.9.356 Y2 ⊕ Y4 ⊕ Y4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N39.9.357 Y2 ⊕ Y4 ⊕ Z1	√	1	1	×	-	-
N39.9.358 Y2 ⊕ Y4 ⊕ Z2	√	1	1	×	-	-
N39.9.359 Y2 ⊕ Z1 ⊕ Z1	√	1	1	×	-	-

Non-coplanar SSGs with parent space group $Aem2$ (No. 39) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N39.9.360 Y2 ⊕ Z1 ⊕ Z3	√	1	1	√	mmm	$\mathrm{B3_u}$
N39.9.361 Y2 ⊕ Z1 ⊕ Z2	√	1	1	×	-	-
N39.9.362 Y2 ⊕ Z1 ⊕ Z4	√	1	1	×	-	-
N39.9.363 Y2 ⊕ Z2 ⊕ Z2	√	1	1	×	-	-
N39.9.364 Y2 ⊕ Z2 ⊕ Z4	√	1	1	√	mmm	$\mathrm{B3_u}$
N39.9.365 Y3 ⊕ Y3 ⊕ Y3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N39.9.366 Y3 ⊕ Y3 ⊕ Y4	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N39.9.367 Y3 ⊕ Y3 ⊕ Z1	√	1	1	√	mmm	$\mathrm{B1_u}$
N39.9.368 Y3 ⊕ Y3 ⊕ Z2	√	1	1	√	mmm	$\mathrm{B1_u}$
N39.9.369 Y3 ⊕ Y4 ⊕ Y4	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N39.9.370 Y3 ⊕ Y4 ⊕ Z1	√	1	1	×	-	-
N39.9.371 Y3 ⊕ Y4 ⊕ Z2	√	1	1	×	-	-
N39.9.372 Y3 ⊕ Z1 ⊕ Z1	√	1	1	×	-	-
N39.9.373 Y3 ⊕ Z1 ⊕ Z3	√	1	1	√	mmm	$\mathrm{B3_u}$
N39.9.374 Y3 ⊕ Z1 ⊕ Z2	√	1	1	×	-	-
N39.9.375 Y3 ⊕ Z1 ⊕ Z4	√	1	1	×	-	-
N39.9.376 Y3 ⊕ Z2 ⊕ Z2	√	1	1	×	-	-
N39.9.377 Y3 ⊕ Z2 ⊕ Z4	√	1	1	√	mmm	$\mathrm{B3_u}$
N39.9.378 Y4 ⊕ Y4 ⊕ Y4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N39.9.379 Y4 ⊕ Y4 ⊕ Z1	√	1	1	√	mmm	$\mathrm{B1_u}$
N39.9.380 Y4 ⊕ Y4 ⊕ Z2	√	1	1	√	mmm	$\mathrm{B1_u}$
N39.9.381 Y4 ⊕ Z1 ⊕ Z1	√	1	1	×	-	-
N39.9.382 Y4 ⊕ Z1 ⊕ Z3	√	1	1	√	mmm	$\mathrm{B3_u}$
N39.9.383 Y4 ⊕ Z1 ⊕ Z2	√	1	1	×	-	-
N39.9.384 Y4 ⊕ Z1 ⊕ Z4	√	1	1	×	-	-
N39.9.385 Y4 ⊕ Z2 ⊕ Z2	√	1	1	×	-	-
N39.9.386 Y4 ⊕ Z2 ⊕ Z4	√	1	1	√	mmm	$\mathrm{B3_u}$
N39.9.387 Z1 ⊕ Z1 ⊕ Z1	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N39.9.388 Z1 ⊕ Z1 ⊕ Z3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N39.9.389 Z1 ⊕ Z1 ⊕ Z2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N39.9.390 Z1 ⊕ Z1 ⊕ Z4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N39.9.391 Z1 ⊕ Z3 ⊕ Z2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N39.9.392 Z1 ⊕ Z2 ⊕ Z2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N39.9.393 Z1 ⊕ Z2 ⊕ Z4	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N39.9.394 Z1 ⊕ Z4 ⊕ Z4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N39.9.395 Z2 ⊕ Z2 ⊕ Z2	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N39.9.396 Z2 ⊕ Z2 ⊕ Z4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N39.11.1 GM2 ⊕ SM1SN1	√	1	1	√	222	B1
N39.11.2 GM2 ⊕ SM2SN2	√	1	1	√	222	B1
N39.11.3 GM2 ⊕ SM4SN4	√	1	1	√	222	B1
N39.11.4 GM2 ⊕ SM3SN3	√	1	1	√	222	B1
N39.11.5 GM2 ⊕ A1AA1	√	1	1	×	-	-
N39.11.6 GM2 ⊕ A2AA2	√	1	1	×	-	-
N39.11.7 GM3 ⊕ SM1SN1	√	1	1	√	$mm2$	B1
N39.11.8 GM3 ⊕ SM2SN2	√	1	1	√	$mm2$	B1
N39.11.9 GM3 ⊕ SM4SN4	√	1	1	√	$mm2$	B1

Non-coplanar SSGs with parent space group $Aem2$ (No. 39) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N39.11.10 GM3 $\oplus$ SM3SN3	$\surd$	1	1	$\surd$	$mm2$	B1
N39.11.11 GM3 $\oplus$ A1AA1	$\surd$	1	1	$\times$	-	-
N39.11.12 GM3 $\oplus$ A2AA2	$\surd$	1	1	$\times$	-	-
N39.11.13 GM4 $\oplus$ SM1SN1	$\surd$	1	1	$\surd$	$mm2$	B2
N39.11.14 GM4 $\oplus$ SM2SN2	$\surd$	1	1	$\surd$	$mm2$	B2
N39.11.15 GM4 $\oplus$ SM4SN4	$\surd$	1	1	$\surd$	$mm2$	B2
N39.11.16 GM4 $\oplus$ SM3SN3	$\surd$	1	1	$\surd$	$mm2$	B2
N39.11.17 GM4 $\oplus$ A1AA1	$\surd$	1	1	$\times$	-	-
N39.11.18 GM4 $\oplus$ A2AA2	$\surd$	1	1	$\times$	-	-
N39.11.19 T1 $\oplus$ SM1SN1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N39.11.20 T1 $\oplus$ SM2SN2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N39.11.21 T1 $\oplus$ SM4SN4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N39.11.22 T1 $\oplus$ SM3SN3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N39.11.23 T1 $\oplus$ A1AA1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N39.11.24 T1 $\oplus$ A3AA3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N39.11.25 T1 $\oplus$ A2AA2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N39.11.26 T1 $\oplus$ A4AA4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N39.11.27 T2 $\oplus$ SM1SN1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N39.11.28 T2 $\oplus$ SM2SN2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N39.11.29 T2 $\oplus$ SM4SN4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N39.11.30 T2 $\oplus$ SM3SN3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N39.11.31 T2 $\oplus$ A1AA1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N39.11.32 T2 $\oplus$ A3AA3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N39.11.33 T2 $\oplus$ A2AA2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N39.11.34 T2 $\oplus$ A4AA4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N39.11.35 Y1 $\oplus$ SM1SN1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N39.11.36 Y1 $\oplus$ SM2SN2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N39.11.37 Y1 $\oplus$ SM4SN4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N39.11.38 Y1 $\oplus$ SM3SN3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N39.11.39 Y1 $\oplus$ A1AA1	$\surd$	1	1	$\times$	-	-
N39.11.40 Y1 $\oplus$ A2AA2	$\surd$	1	1	$\times$	-	-
N39.11.41 Y2 $\oplus$ SM1SN1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N39.11.42 Y2 $\oplus$ SM2SN2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N39.11.43 Y2 $\oplus$ SM4SN4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N39.11.44 Y2 $\oplus$ SM3SN3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N39.11.45 Y2 $\oplus$ A1AA1	$\surd$	1	1	$\times$	-	-
N39.11.46 Y2 $\oplus$ A2AA2	$\surd$	1	1	$\times$	-	-
N39.11.47 Y3 $\oplus$ SM1SN1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N39.11.48 Y3 $\oplus$ SM2SN2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N39.11.49 Y3 $\oplus$ SM4SN4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N39.11.50 Y3 $\oplus$ SM3SN3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N39.11.51 Y3 $\oplus$ A1AA1	$\surd$	1	1	$\times$	-	-
N39.11.52 Y3 $\oplus$ A2AA2	$\surd$	1	1	$\times$	-	-
N39.11.53 Y4 $\oplus$ SM1SN1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N39.11.54 Y4 $\oplus$ SM2SN2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N39.11.55 Y4 $\oplus$ SM4SN4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$

Non-coplanar SSGs with parent space group $Aem2$ (No. 39) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N39.11.56 Y4 ⊕ SM3SN3	√	1	1	√	mmm	$\mathrm{B1_u}$
N39.11.57 Y4 ⊕ A1AA1	√	1	1	×	-	-
N39.11.58 Y4 ⊕ A2AA2	√	1	1	×	-	-
N39.11.59 Z1 ⊕ SM1SN1	√	1	1	√	mmm	$\mathrm{B1_u}$
N39.11.60 Z1 ⊕ SM2SN2	√	1	1	√	mmm	$\mathrm{B1_u}$
N39.11.61 Z1 ⊕ SM4SN4	√	1	1	√	mmm	$\mathrm{B1_u}$
N39.11.62 Z1 ⊕ SM3SN3	√	1	1	√	mmm	$\mathrm{B1_u}$
N39.11.63 Z1 ⊕ A1AA1	√	1	1	√	mmm	$\mathrm{B1_u}$
N39.11.64 Z1 ⊕ A3AA3	√	1	1	√	mmm	$\mathrm{B1_u}$
N39.11.65 Z1 ⊕ A2AA2	√	1	1	√	mmm	$\mathrm{B1_u}$
N39.11.66 Z1 ⊕ A4AA4	√	1	1	√	mmm	$\mathrm{B1_u}$
N39.11.67 Z2 ⊕ SM1SN1	√	1	1	√	mmm	$\mathrm{B1_u}$
N39.11.68 Z2 ⊕ SM2SN2	√	1	1	√	mmm	$\mathrm{B1_u}$
N39.11.69 Z2 ⊕ SM4SN4	√	1	1	√	mmm	$\mathrm{B1_u}$
N39.11.70 Z2 ⊕ SM3SN3	√	1	1	√	mmm	$\mathrm{B1_u}$
N39.11.71 Z2 ⊕ A1AA1	√	1	1	√	mmm	$\mathrm{B1_u}$
N39.11.72 Z2 ⊕ A3AA3	√	1	1	√	mmm	$\mathrm{B1_u}$
N39.11.73 Z2 ⊕ A2AA2	√	1	1	√	mmm	$\mathrm{B1_u}$
N39.11.74 Z2 ⊕ A4AA4	√	1	1	√	mmm	$\mathrm{B1_u}$
N39.14.1 GM2 ⊕ DT1	√	1	1	√	$mm2$	B2
N39.14.2 GM2 ⊕ DT2	√	1	1	√	$mm2$	B2
N39.14.3 GM2 ⊕ B1	√	1	1	×	-	-
N39.14.4 GM2 ⊕ LD1	√	1	1	√	$mm2$	B1
N39.14.5 GM2 ⊕ LD2	√	1	1	√	$mm2$	B1
N39.14.6 GM2 ⊕ H2	√	1	1	×	-	-
N39.14.7 GM2 ⊕ H1	√	1	1	×	-	-
N39.14.8 GM3 ⊕ DT1	√	1	1	√	222	B2
N39.14.9 GM3 ⊕ DT2	√	1	1	√	222	B2
N39.14.10 GM3 ⊕ B1	√	1	1	×	-	-
N39.14.11 GM3 ⊕ LD1	√	1	1	√	$mm2$	B1
N39.14.12 GM3 ⊕ LD2	√	1	1	√	$mm2$	B1
N39.14.13 GM3 ⊕ H2	√	1	1	×	-	-
N39.14.14 GM3 ⊕ H1	√	1	1	×	-	-
N39.14.15 GM4 ⊕ DT1	√	1	1	√	$mm2$	B2
N39.14.16 GM4 ⊕ DT2	√	1	1	√	$mm2$	B2
N39.14.17 GM4 ⊕ B1	√	1	1	×	-	-
N39.14.18 GM4 ⊕ LD1	√	1	1	√	222	B3
N39.14.19 GM4 ⊕ LD2	√	1	1	√	222	B3
N39.14.20 GM4 ⊕ H2	√	1	1	√	222	B3
N39.14.21 GM4 ⊕ H1	√	1	1	√	222	B3
N39.14.22 T1 ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N39.14.23 T1 ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
N39.14.24 T1 ⊕ B1	√	1	1	√	mmm	$\mathrm{B2_u}$
N39.14.25 T1 ⊕ B2	√	1	1	√	mmm	$\mathrm{B2_u}$
N39.14.26 T1 ⊕ LD1	√	1	1	√	mmm	$\mathrm{B3_u}$
N39.14.27 T1 ⊕ LD2	√	1	1	√	mmm	$\mathrm{B3_u}$

Non-coplanar SSGs with parent space group $Aem2$ (No. 39) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N39.14.28 T1 ⊕ H2	√	1	1	√	mmm	$\mathrm{B3_u}$
N39.14.29 T1 ⊕ H1	√	1	1	√	mmm	$\mathrm{B3_u}$
N39.14.30 T2 ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N39.14.31 T2 ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
N39.14.32 T2 ⊕ B1	√	1	1	√	mmm	$\mathrm{B2_u}$
N39.14.33 T2 ⊕ B2	√	1	1	√	mmm	$\mathrm{B2_u}$
N39.14.34 T2 ⊕ LD1	√	1	1	√	mmm	$\mathrm{B3_u}$
N39.14.35 T2 ⊕ LD2	√	1	1	√	mmm	$\mathrm{B3_u}$
N39.14.36 T2 ⊕ H2	√	1	1	√	mmm	$\mathrm{B3_u}$
N39.14.37 T2 ⊕ H1	√	1	1	√	mmm	$\mathrm{B3_u}$
N39.14.38 Y1 ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N39.14.39 Y1 ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
N39.14.40 Y1 ⊕ B1	√	1	1	×	-	-
N39.14.41 Y1 ⊕ LD1	√	1	1	√	mmm	$\mathrm{B3_u}$
N39.14.42 Y1 ⊕ LD2	√	1	1	√	mmm	$\mathrm{B3_u}$
N39.14.43 Y1 ⊕ H2	√	1	1	√	mmm	$\mathrm{B3_u}$
N39.14.44 Y1 ⊕ H1	√	1	1	√	mmm	$\mathrm{B3_u}$
N39.14.45 Y2 ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N39.14.46 Y2 ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
N39.14.47 Y2 ⊕ B1	√	1	1	×	-	-
N39.14.48 Y2 ⊕ LD1	√	1	1	√	mmm	$\mathrm{B3_u}$
N39.14.49 Y2 ⊕ LD2	√	1	1	√	mmm	$\mathrm{B3_u}$
N39.14.50 Y2 ⊕ H2	√	1	1	√	mmm	$\mathrm{B3_u}$
N39.14.51 Y2 ⊕ H1	√	1	1	√	mmm	$\mathrm{B3_u}$
N39.14.52 Y3 ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N39.14.53 Y3 ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
N39.14.54 Y3 ⊕ B1	√	1	1	×	-	-
N39.14.55 Y3 ⊕ LD1	√	1	1	√	mmm	$\mathrm{B3_u}$
N39.14.56 Y3 ⊕ LD2	√	1	1	√	mmm	$\mathrm{B3_u}$
N39.14.57 Y3 ⊕ H2	√	1	1	√	mmm	$\mathrm{B3_u}$
N39.14.58 Y3 ⊕ H1	√	1	1	√	mmm	$\mathrm{B3_u}$
N39.14.59 Y4 ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N39.14.60 Y4 ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
N39.14.61 Y4 ⊕ B1	√	1	1	×	-	-
N39.14.62 Y4 ⊕ LD1	√	1	1	√	mmm	$\mathrm{B3_u}$
N39.14.63 Y4 ⊕ LD2	√	1	1	√	mmm	$\mathrm{B3_u}$
N39.14.64 Y4 ⊕ H2	√	1	1	√	mmm	$\mathrm{B3_u}$
N39.14.65 Y4 ⊕ H1	√	1	1	√	mmm	$\mathrm{B3_u}$
N39.14.66 Z1 ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N39.14.67 Z1 ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
N39.14.68 Z1 ⊕ B1	√	1	1	√	mmm	$\mathrm{B2_u}$
N39.14.69 Z1 ⊕ B2	√	1	1	√	mmm	$\mathrm{B2_u}$
N39.14.70 Z1 ⊕ LD1	√	1	1	√	mmm	$\mathrm{B3_u}$
N39.14.71 Z1 ⊕ LD2	√	1	1	√	mmm	$\mathrm{B3_u}$
N39.14.72 Z1 ⊕ H2	√	1	1	×	-	-
N39.14.73 Z1 ⊕ H1	√	1	1	×	-	-

Non-coplanar SSGs with parent space group $Aem2$ (No. 39) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N39.14.74 Z2 $\oplus$ DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N39.14.75 Z2 $\oplus$ DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N39.14.76 Z2 $\oplus$ B1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N39.14.77 Z2 $\oplus$ B2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N39.14.78 Z2 $\oplus$ LD1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N39.14.79 Z2 $\oplus$ LD2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N39.14.80 Z2 $\oplus$ H2	$\surd$	1	1	$\times$	-	-
N39.14.81 Z2 $\oplus$ H1	$\surd$	1	1	$\times$	-	-

TABLE S118: Collinear SSGs with parent space group $Ama2$ (No. 40).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L40.1.1 GM1	1	mmm	$\mathrm{A_g}$
L40.2.1 GM2	1	mmm	$\mathrm{B1_g}$
L40.2.2 GM3	1	mmm	$\mathrm{B2_g}$
L40.2.3 GM4	1	mmm	$\mathrm{B3_g}$
L40.2.4 Y1	0	-	-
L40.2.5 Y2	0	-	-
L40.2.6 Y3	0	-	-
L40.2.7 Y4	0	-	-

TABLE S119: Coplanar SSGs with parent space group $Ama2$ (No. 40).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P40.1.1 GM1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B1_u}$
P40.2.1 GM2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$
P40.2.2 GM3	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u} \oplus \mathrm{B2_g}$
P40.2.3 GM4	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
P40.2.4 Y1	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P40.2.5 Y2	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P40.2.6 Y3	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P40.2.7 Y4	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P40.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
P40.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
P40.3.3 GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
P40.3.4 GM2 $\oplus$ Y1	$\surd$	1	1	$\times$	-	-
P40.3.5 GM2 $\oplus$ Y2	$\surd$	1	1	$\times$	-	-
P40.3.6 GM2 $\oplus$ Y3	$\surd$	1	1	$\times$	-	-
P40.3.7 GM2 $\oplus$ Y4	$\surd$	1	1	$\times$	-	-
P40.3.8 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
P40.3.9 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
P40.3.10 GM3 $\oplus$ Y1	$\surd$	1	1	$\times$	-	-
P40.3.11 GM3 $\oplus$ Y2	$\surd$	1	1	$\times$	-	-
P40.3.12 GM3 $\oplus$ Y3	$\surd$	1	1	$\times$	-	-
P40.3.13 GM3 $\oplus$ Y4	$\surd$	1	1	$\times$	-	-

Coplanar SSGs with parent space group $Ama2$ (No. 40) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P40.3.14 GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
P40.3.15 GM4 $\oplus$ Y1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
P40.3.16 GM4 $\oplus$ Y2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
P40.3.17 GM4 $\oplus$ Y3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
P40.3.18 GM4 $\oplus$ Y4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
P40.3.19 Y1 $\oplus$ Y1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P40.3.20 Y1 $\oplus$ Y2	$\surd$	1	1	$\times$	-	-
P40.3.21 Y1 $\oplus$ Y3	$\surd$	1	1	$\times$	-	-
P40.3.22 Y1 $\oplus$ Y4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P40.3.23 Y2 $\oplus$ Y2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P40.3.24 Y2 $\oplus$ Y3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P40.3.25 Y2 $\oplus$ Y4	$\surd$	1	1	$\times$	-	-
P40.3.26 Y3 $\oplus$ Y3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P40.3.27 Y3 $\oplus$ Y4	$\surd$	1	1	$\times$	-	-
P40.3.28 Y4 $\oplus$ Y4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P40.5.1 SM1SN1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P40.5.2 SM2SN2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P40.5.3 SM4SN4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P40.5.4 SM3SN3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P40.6.1 T1	$\surd$	1	1	$\times$	-	-
P40.6.2 Z1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P40.7.1 S1	$\times$	-	-	-	-	-
P40.7.2 S2	$\times$	-	-	-	-	-
P40.7.3 R1	$\times$	-	-	-	-	-
P40.8.1 DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P40.8.2 DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P40.8.3 LD1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P40.8.4 H1	$\surd$	1	1	$\times$	-	-

TABLE S120: Non-coplanar SSGs with parent space group $Ama2$ (No. 40).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N40.1.1 GM1	$\surd$	3	3	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{A1}$
N40.2.1 GM2	$\surd$	3	3	$\surd$	222	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{B1}$
N40.2.2 GM3	$\surd$	3	3	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{B1}$
N40.2.3 GM4	$\surd$	3	3	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{B2}$
N40.2.4 Y1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B1_u}$
N40.2.5 Y2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B1_u}$
N40.2.6 Y3	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B1_u}$
N40.2.7 Y4	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B1_u}$
N40.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{A2} \oplus \mathrm{A2}$
N40.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{A2} \oplus \mathrm{B1}$
N40.3.3 GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{A2} \oplus \mathrm{B2}$
N40.3.4 GM2 $\oplus$ Y1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$
N40.3.5 GM2 $\oplus$ Y2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$
N40.3.6 GM2 $\oplus$ Y3	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$

Non-coplanar SSGs with parent space group $Ama2$ (No. 40) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N40.3.7 GM2 ⊕ Y4	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$
N40.3.8 GM3 ⊕ GM3	√	3	3	√	$mm2$	A1 ⊕ B1 ⊕ B1
N40.3.9 GM3 ⊕ GM4	√	3	3	√	222	A1 ⊕ B3 ⊕ B2
N40.3.10 GM3 ⊕ Y1	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u} \oplus \mathrm{B2_g}$
N40.3.11 GM3 ⊕ Y2	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u} \oplus \mathrm{B2_g}$
N40.3.12 GM3 ⊕ Y3	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u} \oplus \mathrm{B2_g}$
N40.3.13 GM3 ⊕ Y4	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u} \oplus \mathrm{B2_g}$
N40.3.14 GM4 ⊕ GM4	√	3	3	√	$mm2$	A1 ⊕ B2 ⊕ B2
N40.3.15 GM4 ⊕ Y1	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N40.3.16 GM4 ⊕ Y2	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N40.3.17 GM4 ⊕ Y3	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N40.3.18 GM4 ⊕ Y4	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N40.3.19 Y1 ⊕ Y1	√	1	1	√	$mm2$	A1
N40.3.20 Y1 ⊕ Y2	√	1	1	√	222	A1
N40.3.21 Y1 ⊕ Y3	√	1	1	√	$mm2$	A1
N40.3.22 Y1 ⊕ Y4	√	1	1	√	$mm2$	A1
N40.3.23 Y2 ⊕ Y2	√	1	1	√	$mm2$	A1
N40.3.24 Y2 ⊕ Y3	√	1	1	√	$mm2$	A1
N40.3.25 Y2 ⊕ Y4	√	1	1	√	$mm2$	A1
N40.3.26 Y3 ⊕ Y3	√	1	1	√	$mm2$	A1
N40.3.27 Y3 ⊕ Y4	√	1	1	√	222	A1
N40.3.28 Y4 ⊕ Y4	√	1	1	√	$mm2$	A1
N40.5.1 SM1SN1	√	1	1	√	$mm2$	A1
N40.5.2 SM2SN2	√	1	1	√	$mm2$	A1
N40.5.3 SM4SN4	√	1	1	√	$mm2$	A1
N40.5.4 SM3SN3	√	1	1	√	$mm2$	A1
N40.6.1 T1	√	1	1	√	$mm2$	A1
N40.6.2 Z1	√	1	1	√	$mm2$	A1
N40.7.1 S1	√	1	1	√	mmm	$\mathrm{A_g}$
N40.7.2 S2	√	1	1	√	mmm	$\mathrm{A_g}$
N40.7.3 R1	√	1	1	√	mmm	$\mathrm{A_g}$
N40.8.1 DT1	√	1	1	√	$mm2$	A1
N40.8.2 DT2	√	1	1	√	$mm2$	A1
N40.8.3 LD1	√	1	1	√	$mm2$	A1
N40.8.4 H1	√	1	1	√	$mm2$	A1
N40.9.1 GM2 ⊕ GM2 ⊕ GM2	√	3	3	√	222	B1 ⊕ B1 ⊕ B1
N40.9.2 GM2 ⊕ GM2 ⊕ GM3	√	3	3	√	$mm2$	B2 ⊕ B2 ⊕ B1
N40.9.3 GM2 ⊕ GM2 ⊕ GM4	√	3	3	√	$mm2$	B2 ⊕ B1 ⊕ B1
N40.9.4 GM2 ⊕ GM2 ⊕ Y1	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N40.9.5 GM2 ⊕ GM2 ⊕ Y2	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N40.9.6 GM2 ⊕ GM2 ⊕ Y3	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N40.9.7 GM2 ⊕ GM2 ⊕ Y4	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N40.9.8 GM2 ⊕ GM3 ⊕ GM3	√	3	3	√	222	B1 ⊕ B2 ⊕ B2
N40.9.9 GM2 ⊕ GM3 ⊕ GM4	√	3	3	√	$mm2$	A2 ⊕ B2 ⊕ B1
N40.9.10 GM2 ⊕ GM3 ⊕ Y1	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N40.9.11 GM2 ⊕ GM3 ⊕ Y2	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$

Non-coplanar SSGs with parent space group $Ama2$ (No. 40) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N40.9.12 GM2 ⊕ GM3 ⊕ Y3	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N40.9.13 GM2 ⊕ GM3 ⊕ Y4	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N40.9.14 GM2 ⊕ GM4 ⊕ GM4	√	3	3	√	222	$\mathrm{B1} \oplus \mathrm{B3} \oplus \mathrm{B3}$
N40.9.15 GM2 ⊕ GM4 ⊕ Y1	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N40.9.16 GM2 ⊕ GM4 ⊕ Y2	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N40.9.17 GM2 ⊕ GM4 ⊕ Y3	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N40.9.18 GM2 ⊕ GM4 ⊕ Y4	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N40.9.19 GM2 ⊕ Y1 ⊕ Y1	√	1	1	√	222	B1
N40.9.20 GM2 ⊕ Y1 ⊕ Y2	√	1	1	×	-	-
N40.9.21 GM2 ⊕ Y1 ⊕ Y3	√	1	1	×	-	-
N40.9.22 GM2 ⊕ Y1 ⊕ Y4	√	1	1	√	$mm2$	B2
N40.9.23 GM2 ⊕ Y2 ⊕ Y2	√	1	1	√	222	B1
N40.9.24 GM2 ⊕ Y2 ⊕ Y3	√	1	1	√	$mm2$	B2
N40.9.25 GM2 ⊕ Y2 ⊕ Y4	√	1	1	×	-	-
N40.9.26 GM2 ⊕ Y3 ⊕ Y3	√	1	1	√	222	B1
N40.9.27 GM2 ⊕ Y3 ⊕ Y4	√	1	1	×	-	-
N40.9.28 GM2 ⊕ Y4 ⊕ Y4	√	1	1	√	222	B1
N40.9.29 GM3 ⊕ GM3 ⊕ GM3	√	3	3	√	$mm2$	$\mathrm{B1} \oplus \mathrm{B1} \oplus \mathrm{B1}$
N40.9.30 GM3 ⊕ GM3 ⊕ GM4	√	3	3	√	$mm2$	$\mathrm{A2} \oplus \mathrm{A2} \oplus \mathrm{B2}$
N40.9.31 GM3 ⊕ GM3 ⊕ Y1	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N40.9.32 GM3 ⊕ GM3 ⊕ Y2	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N40.9.33 GM3 ⊕ GM3 ⊕ Y3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N40.9.34 GM3 ⊕ GM3 ⊕ Y4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N40.9.35 GM3 ⊕ GM4 ⊕ GM4	√	3	3	√	$mm2$	$\mathrm{A2} \oplus \mathrm{A2} \oplus \mathrm{B1}$
N40.9.36 GM3 ⊕ GM4 ⊕ Y1	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N40.9.37 GM3 ⊕ GM4 ⊕ Y2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N40.9.38 GM3 ⊕ GM4 ⊕ Y3	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N40.9.39 GM3 ⊕ GM4 ⊕ Y4	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N40.9.40 GM3 ⊕ Y1 ⊕ Y1	√	1	1	√	$mm2$	B1
N40.9.41 GM3 ⊕ Y1 ⊕ Y2	√	1	1	×	-	-
N40.9.42 GM3 ⊕ Y1 ⊕ Y3	√	1	1	×	-	-
N40.9.43 GM3 ⊕ Y1 ⊕ Y4	√	1	1	√	222	B2
N40.9.44 GM3 ⊕ Y2 ⊕ Y2	√	1	1	√	$mm2$	B1
N40.9.45 GM3 ⊕ Y2 ⊕ Y3	√	1	1	√	222	B2
N40.9.46 GM3 ⊕ Y2 ⊕ Y4	√	1	1	×	-	-
N40.9.47 GM3 ⊕ Y3 ⊕ Y3	√	1	1	√	$mm2$	B1
N40.9.48 GM3 ⊕ Y3 ⊕ Y4	√	1	1	×	-	-
N40.9.49 GM3 ⊕ Y4 ⊕ Y4	√	1	1	√	$mm2$	B1
N40.9.50 GM4 ⊕ GM4 ⊕ GM4	√	3	3	√	$mm2$	$\mathrm{B2} \oplus \mathrm{B2} \oplus \mathrm{B2}$
N40.9.51 GM4 ⊕ GM4 ⊕ Y1	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N40.9.52 GM4 ⊕ GM4 ⊕ Y2	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N40.9.53 GM4 ⊕ GM4 ⊕ Y3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N40.9.54 GM4 ⊕ GM4 ⊕ Y4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N40.9.55 GM4 ⊕ Y1 ⊕ Y1	√	1	1	√	$mm2$	B2
N40.9.56 GM4 ⊕ Y1 ⊕ Y2	√	1	1	√	$mm2$	A2
N40.9.57 GM4 ⊕ Y1 ⊕ Y3	√	1	1	√	222	B3

Non-coplanar SSGs with parent space group $Ama2$ (No. 40) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N40.9.58 GM4 ⊕ Y1 ⊕ Y4	√	1	1	√	$mm2$	B2
N40.9.59 GM4 ⊕ Y2 ⊕ Y2	√	1	1	√	$mm2$	B2
N40.9.60 GM4 ⊕ Y2 ⊕ Y3	√	1	1	√	$mm2$	B2
N40.9.61 GM4 ⊕ Y2 ⊕ Y4	√	1	1	√	222	B3
N40.9.62 GM4 ⊕ Y3 ⊕ Y3	√	1	1	√	$mm2$	B2
N40.9.63 GM4 ⊕ Y3 ⊕ Y4	√	1	1	√	$mm2$	A2
N40.9.64 GM4 ⊕ Y4 ⊕ Y4	√	1	1	√	$mm2$	B2
N40.9.65 Y1 ⊕ Y1 ⊕ Y1	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N40.9.66 Y1 ⊕ Y1 ⊕ Y2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N40.9.67 Y1 ⊕ Y1 ⊕ Y3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N40.9.68 Y1 ⊕ Y1 ⊕ Y4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N40.9.69 Y1 ⊕ Y2 ⊕ Y2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N40.9.70 Y1 ⊕ Y2 ⊕ Y3	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N40.9.71 Y1 ⊕ Y2 ⊕ Y4	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N40.9.72 Y1 ⊕ Y3 ⊕ Y3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N40.9.73 Y1 ⊕ Y3 ⊕ Y4	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N40.9.74 Y1 ⊕ Y4 ⊕ Y4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N40.9.75 Y2 ⊕ Y2 ⊕ Y2	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N40.9.76 Y2 ⊕ Y2 ⊕ Y3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N40.9.77 Y2 ⊕ Y2 ⊕ Y4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N40.9.78 Y2 ⊕ Y3 ⊕ Y3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N40.9.79 Y2 ⊕ Y3 ⊕ Y4	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N40.9.80 Y2 ⊕ Y4 ⊕ Y4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N40.9.81 Y3 ⊕ Y3 ⊕ Y3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N40.9.82 Y3 ⊕ Y3 ⊕ Y4	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N40.9.83 Y3 ⊕ Y4 ⊕ Y4	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N40.9.84 Y4 ⊕ Y4 ⊕ Y4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N40.11.1 GM2 ⊕ SM1SN1	√	1	1	√	222	B1
N40.11.2 GM2 ⊕ SM2SN2	√	1	1	√	222	B1
N40.11.3 GM2 ⊕ SM4SN4	√	1	1	√	222	B1
N40.11.4 GM2 ⊕ SM3SN3	√	1	1	√	222	B1
N40.11.5 GM3 ⊕ SM1SN1	√	1	1	√	$mm2$	B1
N40.11.6 GM3 ⊕ SM2SN2	√	1	1	√	$mm2$	B1
N40.11.7 GM3 ⊕ SM4SN4	√	1	1	√	$mm2$	B1
N40.11.8 GM3 ⊕ SM3SN3	√	1	1	√	$mm2$	B1
N40.11.9 GM4 ⊕ SM1SN1	√	1	1	√	$mm2$	B2
N40.11.10 GM4 ⊕ SM2SN2	√	1	1	√	$mm2$	B2
N40.11.11 GM4 ⊕ SM4SN4	√	1	1	√	$mm2$	B2
N40.11.12 GM4 ⊕ SM3SN3	√	1	1	√	$mm2$	B2
N40.11.13 Y1 ⊕ SM1SN1	√	1	1	√	mmm	$\mathrm{B1_u}$
N40.11.14 Y1 ⊕ SM2SN2	√	1	1	√	mmm	$\mathrm{B1_u}$
N40.11.15 Y1 ⊕ SM4SN4	√	1	1	√	mmm	$\mathrm{B1_u}$
N40.11.16 Y1 ⊕ SM3SN3	√	1	1	√	mmm	$\mathrm{B1_u}$
N40.11.17 Y2 ⊕ SM1SN1	√	1	1	√	mmm	$\mathrm{B1_u}$
N40.11.18 Y2 ⊕ SM2SN2	√	1	1	√	mmm	$\mathrm{B1_u}$
N40.11.19 Y2 ⊕ SM4SN4	√	1	1	√	mmm	$\mathrm{B1_u}$

Non-coplanar SSGs with parent space group $Ama2$ (No. 40) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N40.11.20 Y2 ⊕ SM3SN3	√	1	1	√	mmm	$\mathrm{B1_u}$
N40.11.21 Y3 ⊕ SM1SN1	√	1	1	√	mmm	$\mathrm{B1_u}$
N40.11.22 Y3 ⊕ SM2SN2	√	1	1	√	mmm	$\mathrm{B1_u}$
N40.11.23 Y3 ⊕ SM4SN4	√	1	1	√	mmm	$\mathrm{B1_u}$
N40.11.24 Y3 ⊕ SM3SN3	√	1	1	√	mmm	$\mathrm{B1_u}$
N40.11.25 Y4 ⊕ SM1SN1	√	1	1	√	mmm	$\mathrm{B1_u}$
N40.11.26 Y4 ⊕ SM2SN2	√	1	1	√	mmm	$\mathrm{B1_u}$
N40.11.27 Y4 ⊕ SM4SN4	√	1	1	√	mmm	$\mathrm{B1_u}$
N40.11.28 Y4 ⊕ SM3SN3	√	1	1	√	mmm	$\mathrm{B1_u}$
N40.12.1 GM2 ⊕ T1	√	1	1	×	-	-
N40.12.2 GM2 ⊕ Z1	√	1	1	√	$mm2$	B1
N40.12.3 GM3 ⊕ T1	√	1	1	×	-	-
N40.12.4 GM3 ⊕ Z1	√	1	1	√	$mm2$	B1
N40.12.5 GM4 ⊕ T1	√	1	1	√	222	B3
N40.12.6 GM4 ⊕ Z1	√	1	1	√	222	B3
N40.12.7 Y1 ⊕ T1	√	1	1	√	mmm	$\mathrm{B3_u}$
N40.12.8 Y1 ⊕ Z1	√	1	1	√	mmm	$\mathrm{B3_u}$
N40.12.9 Y2 ⊕ T1	√	1	1	√	mmm	$\mathrm{B3_u}$
N40.12.10 Y2 ⊕ Z1	√	1	1	√	mmm	$\mathrm{B3_u}$
N40.12.11 Y3 ⊕ T1	√	1	1	√	mmm	$\mathrm{B3_u}$
N40.12.12 Y3 ⊕ Z1	√	1	1	√	mmm	$\mathrm{B3_u}$
N40.12.13 Y4 ⊕ T1	√	1	1	√	mmm	$\mathrm{B3_u}$
N40.12.14 Y4 ⊕ Z1	√	1	1	√	mmm	$\mathrm{B3_u}$
N40.13.1 GM2 ⊕ S1	√	1	1	×	-	-
N40.13.2 GM2 ⊕ S2	√	1	1	×	-	-
N40.13.3 GM2 ⊕ R1	√	1	1	×	-	-
N40.13.4 GM3 ⊕ S1	√	1	1	×	-	-
N40.13.5 GM3 ⊕ S2	√	1	1	×	-	-
N40.13.6 GM3 ⊕ R1	√	1	1	×	-	-
N40.13.7 GM4 ⊕ S1	√	1	1	×	-	-
N40.13.8 GM4 ⊕ S2	√	1	1	×	-	-
N40.13.9 GM4 ⊕ R1	√	1	1	×	-	-
N40.13.10 Y1 ⊕ S1	×	-	-	-	-	-
N40.13.11 Y1 ⊕ S2	×	-	-	-	-	-
N40.13.12 Y1 ⊕ R1	×	-	-	-	-	-
N40.13.13 Y2 ⊕ S1	×	-	-	-	-	-
N40.13.14 Y2 ⊕ S2	×	-	-	-	-	-
N40.13.15 Y2 ⊕ R1	×	-	-	-	-	-
N40.13.16 Y3 ⊕ S1	×	-	-	-	-	-
N40.13.17 Y3 ⊕ S2	×	-	-	-	-	-
N40.13.18 Y3 ⊕ R1	×	-	-	-	-	-
N40.13.19 Y4 ⊕ S1	×	-	-	-	-	-
N40.13.20 Y4 ⊕ S2	×	-	-	-	-	-
N40.13.21 Y4 ⊕ R1	×	-	-	-	-	-
N40.14.1 GM2 ⊕ DT1	√	1	1	√	$mm2$	B2
N40.14.2 GM2 ⊕ DT2	√	1	1	√	$mm2$	B2

Non-coplanar SSGs with parent space group $Ama2$ (No. 40) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N40.14.3 GM2 $\oplus$ LD1	$\surd$	1	1	$\surd$	$mm2$	B1
N40.14.4 GM2 $\oplus$ H1	$\surd$	1	1	$\times$	-	-
N40.14.5 GM3 $\oplus$ DT1	$\surd$	1	1	$\surd$	222	B2
N40.14.6 GM3 $\oplus$ DT2	$\surd$	1	1	$\surd$	222	B2
N40.14.7 GM3 $\oplus$ LD1	$\surd$	1	1	$\surd$	$mm2$	B1
N40.14.8 GM3 $\oplus$ H1	$\surd$	1	1	$\times$	-	-
N40.14.9 GM4 $\oplus$ DT1	$\surd$	1	1	$\surd$	$mm2$	B2
N40.14.10 GM4 $\oplus$ DT2	$\surd$	1	1	$\surd$	$mm2$	B2
N40.14.11 GM4 $\oplus$ LD1	$\surd$	1	1	$\surd$	222	B3
N40.14.12 GM4 $\oplus$ H1	$\surd$	1	1	$\surd$	222	B3
N40.14.13 Y1 $\oplus$ DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N40.14.14 Y1 $\oplus$ DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N40.14.15 Y1 $\oplus$ LD1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N40.14.16 Y1 $\oplus$ H1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N40.14.17 Y2 $\oplus$ DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N40.14.18 Y2 $\oplus$ DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N40.14.19 Y2 $\oplus$ LD1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N40.14.20 Y2 $\oplus$ H1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N40.14.21 Y3 $\oplus$ DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N40.14.22 Y3 $\oplus$ DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N40.14.23 Y3 $\oplus$ LD1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N40.14.24 Y3 $\oplus$ H1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N40.14.25 Y4 $\oplus$ DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N40.14.26 Y4 $\oplus$ DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N40.14.27 Y4 $\oplus$ LD1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N40.14.28 Y4 $\oplus$ H1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$

TABLE S121: Collinear SSGs with parent space group $Aea2$ (No. 41).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L41.1.1 GM1	1	mmm	$\mathrm{A_g}$
L41.2.1 GM2	1	mmm	$\mathrm{B1_g}$
L41.2.2 GM3	1	mmm	$\mathrm{B2_g}$
L41.2.3 GM4	1	mmm	$\mathrm{B3_g}$
L41.2.4 Y1	0	-	-
L41.2.5 Y2	0	-	-
L41.2.6 Y3	0	-	-
L41.2.7 Y4	0	-	-

TABLE S122: Coplanar SSGs with parent space group $Aea2$ (No. 41).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P41.1.1 GM1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B1_u}$
P41.2.1 GM2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$
P41.2.2 GM3	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u} \oplus \mathrm{B2_g}$
P41.2.3 GM4	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$

Coplanar SSGs with parent space group $Aea2$ (No. 41) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P41.2.4 Y1	√	1	1	√	mmm	$\mathrm{A_g}$
P41.2.5 Y2	√	1	1	√	mmm	$\mathrm{A_g}$
P41.2.6 Y3	√	1	1	√	mmm	$\mathrm{A_g}$
P41.2.7 Y4	√	1	1	√	mmm	$\mathrm{A_g}$
P41.3.1 GM2 ⊕ GM2	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
P41.3.2 GM2 ⊕ GM3	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
P41.3.3 GM2 ⊕ GM4	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
P41.3.4 GM2 ⊕ Y1	√	1	1	×	-	-
P41.3.5 GM2 ⊕ Y2	√	1	1	×	-	-
P41.3.6 GM2 ⊕ Y3	√	1	1	×	-	-
P41.3.7 GM2 ⊕ Y4	√	1	1	×	-	-
P41.3.8 GM3 ⊕ GM3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
P41.3.9 GM3 ⊕ GM4	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
P41.3.10 GM3 ⊕ Y1	√	1	1	×	-	-
P41.3.11 GM3 ⊕ Y2	√	1	1	×	-	-
P41.3.12 GM3 ⊕ Y3	√	1	1	×	-	-
P41.3.13 GM3 ⊕ Y4	√	1	1	×	-	-
P41.3.14 GM4 ⊕ GM4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
P41.3.15 GM4 ⊕ Y1	√	1	1	√	mmm	$\mathrm{B3_g}$
P41.3.16 GM4 ⊕ Y2	√	1	1	√	mmm	$\mathrm{B3_g}$
P41.3.17 GM4 ⊕ Y3	√	1	1	√	mmm	$\mathrm{B3_g}$
P41.3.18 GM4 ⊕ Y4	√	1	1	√	mmm	$\mathrm{B3_g}$
P41.3.19 Y1 ⊕ Y1	√	1	1	√	mmm	$\mathrm{B1_u}$
P41.3.20 Y1 ⊕ Y2	√	1	1	×	-	-
P41.3.21 Y1 ⊕ Y3	√	1	1	×	-	-
P41.3.22 Y1 ⊕ Y4	√	1	1	√	mmm	$\mathrm{B2_u}$
P41.3.23 Y2 ⊕ Y2	√	1	1	√	mmm	$\mathrm{B1_u}$
P41.3.24 Y2 ⊕ Y3	√	1	1	√	mmm	$\mathrm{B2_u}$
P41.3.25 Y2 ⊕ Y4	√	1	1	×	-	-
P41.3.26 Y3 ⊕ Y3	√	1	1	√	mmm	$\mathrm{B1_u}$
P41.3.27 Y3 ⊕ Y4	√	1	1	×	-	-
P41.3.28 Y4 ⊕ Y4	√	1	1	√	mmm	$\mathrm{B1_u}$
P41.5.1 SM1SN1	√	1	1	√	mmm	$\mathrm{B1_u}$
P41.5.2 SM2SN2	√	1	1	√	mmm	$\mathrm{B1_u}$
P41.5.3 SM4SN4	√	1	1	√	mmm	$\mathrm{B1_u}$
P41.5.4 SM3SN3	√	1	1	√	mmm	$\mathrm{B1_u}$
P41.6.1 T1	√	1	1	×	-	-
P41.6.2 Z1	√	1	1	√	mmm	$\mathrm{B3_u}$
P41.8.1 DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
P41.8.2 DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
P41.8.3 LD1	√	1	1	√	mmm	$\mathrm{B3_u}$
P41.8.4 H1	√	1	1	×	-	-

TABLE S123: Non-coplanar SSGs with parent space group $Aea2$ (No. 41).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N41.1.1 GM1	√	3	3	√	$mm2$	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{A1}$
N41.2.1 GM2	√	3	3	√	222	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{B1}$
N41.2.2 GM3	√	3	3	√	$mm2$	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{B1}$
N41.2.3 GM4	√	3	3	√	$mm2$	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{B2}$
N41.2.4 Y1	√	3	3	√	mmm	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{B1_u}$
N41.2.5 Y2	√	3	3	√	mmm	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{B1_u}$
N41.2.6 Y3	√	3	3	√	mmm	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{B1_u}$
N41.2.7 Y4	√	3	3	√	mmm	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{B1_u}$
N41.3.1 GM2 ⊕ GM2	√	3	3	√	$mm2$	$\mathrm{A1}\oplus\mathrm{A2}\oplus\mathrm{A2}$
N41.3.2 GM2 ⊕ GM3	√	3	3	√	$mm2$	$\mathrm{A1}\oplus\mathrm{A2}\oplus\mathrm{B1}$
N41.3.3 GM2 ⊕ GM4	√	3	3	√	$mm2$	$\mathrm{A1}\oplus\mathrm{A2}\oplus\mathrm{B2}$
N41.3.4 GM2 ⊕ Y1	√	3	3	√	mmm	$\mathrm{A_g}\oplus\mathrm{A_u}\oplus\mathrm{B1_g}$
N41.3.5 GM2 ⊕ Y2	√	3	3	√	mmm	$\mathrm{A_g}\oplus\mathrm{A_u}\oplus\mathrm{B1_g}$
N41.3.6 GM2 ⊕ Y3	√	3	3	√	mmm	$\mathrm{A_g}\oplus\mathrm{A_u}\oplus\mathrm{B1_g}$
N41.3.7 GM2 ⊕ Y4	√	3	3	√	mmm	$\mathrm{A_g}\oplus\mathrm{A_u}\oplus\mathrm{B1_g}$
N41.3.8 GM3 ⊕ GM3	√	3	3	√	$mm2$	$\mathrm{A1}\oplus\mathrm{B1}\oplus\mathrm{B1}$
N41.3.9 GM3 ⊕ GM4	√	3	3	√	222	$\mathrm{A1}\oplus\mathrm{B3}\oplus\mathrm{B2}$
N41.3.10 GM3 ⊕ Y1	√	3	3	√	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}\oplus\mathrm{B2_g}$
N41.3.11 GM3 ⊕ Y2	√	3	3	√	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}\oplus\mathrm{B2_g}$
N41.3.12 GM3 ⊕ Y3	√	3	3	√	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}\oplus\mathrm{B2_g}$
N41.3.13 GM3 ⊕ Y4	√	3	3	√	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}\oplus\mathrm{B2_g}$
N41.3.14 GM4 ⊕ GM4	√	3	3	√	$mm2$	$\mathrm{A1}\oplus\mathrm{B2}\oplus\mathrm{B2}$
N41.3.15 GM4 ⊕ Y1	√	3	3	√	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}\oplus\mathrm{B2_u}$
N41.3.16 GM4 ⊕ Y2	√	3	3	√	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}\oplus\mathrm{B2_u}$
N41.3.17 GM4 ⊕ Y3	√	3	3	√	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}\oplus\mathrm{B2_u}$
N41.3.18 GM4 ⊕ Y4	√	3	3	√	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}\oplus\mathrm{B2_u}$
N41.3.19 Y1 ⊕ Y1	√	1	1	√	$mm2$	A1
N41.3.20 Y1 ⊕ Y2	√	1	1	√	222	A1
N41.3.21 Y1 ⊕ Y3	√	1	1	√	$mm2$	A1
N41.3.22 Y1 ⊕ Y4	√	1	1	√	$mm2$	A1
N41.3.23 Y2 ⊕ Y2	√	1	1	√	$mm2$	A1
N41.3.24 Y2 ⊕ Y3	√	1	1	√	$mm2$	A1
N41.3.25 Y2 ⊕ Y4	√	1	1	√	$mm2$	A1
N41.3.26 Y3 ⊕ Y3	√	1	1	√	$mm2$	A1
N41.3.27 Y3 ⊕ Y4	√	1	1	√	222	A1
N41.3.28 Y4 ⊕ Y4	√	1	1	√	$mm2$	A1
N41.5.1 SM1SN1	√	1	1	√	$mm2$	A1
N41.5.2 SM2SN2	√	1	1	√	$mm2$	A1
N41.5.3 SM4SN4	√	1	1	√	$mm2$	A1
N41.5.4 SM3SN3	√	1	1	√	$mm2$	A1
N41.6.1 T1	√	1	1	√	$mm2$	A1
N41.6.2 Z1	√	1	1	√	$mm2$	A1
N41.8.1 DT1	√	1	1	√	$mm2$	A1
N41.8.2 DT2	√	1	1	√	$mm2$	A1
N41.8.3 LD1	√	1	1	√	$mm2$	A1
N41.8.4 H1	√	1	1	√	$mm2$	A1

Non-coplanar SSGs with parent space group $Aea2$ (No. 41) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N41.9.1 GM2 $\oplus$ GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	222	B1 $\oplus$ B1 $\oplus$ B1
N41.9.2 GM2 $\oplus$ GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$mm2$	B2 $\oplus$ B2 $\oplus$ B1
N41.9.3 GM2 $\oplus$ GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	$mm2$	B2 $\oplus$ B1 $\oplus$ B1
N41.9.4 GM2 $\oplus$ GM2 $\oplus$ Y1	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N41.9.5 GM2 $\oplus$ GM2 $\oplus$ Y2	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N41.9.6 GM2 $\oplus$ GM2 $\oplus$ Y3	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N41.9.7 GM2 $\oplus$ GM2 $\oplus$ Y4	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N41.9.8 GM2 $\oplus$ GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	222	B1 $\oplus$ B2 $\oplus$ B2
N41.9.9 GM2 $\oplus$ GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	$mm2$	A2 $\oplus$ B2 $\oplus$ B1
N41.9.10 GM2 $\oplus$ GM3 $\oplus$ Y1	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N41.9.11 GM2 $\oplus$ GM3 $\oplus$ Y2	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N41.9.12 GM2 $\oplus$ GM3 $\oplus$ Y3	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N41.9.13 GM2 $\oplus$ GM3 $\oplus$ Y4	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N41.9.14 GM2 $\oplus$ GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	222	B1 $\oplus$ B3 $\oplus$ B3
N41.9.15 GM2 $\oplus$ GM4 $\oplus$ Y1	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N41.9.16 GM2 $\oplus$ GM4 $\oplus$ Y2	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N41.9.17 GM2 $\oplus$ GM4 $\oplus$ Y3	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N41.9.18 GM2 $\oplus$ GM4 $\oplus$ Y4	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N41.9.19 GM2 $\oplus$ Y1 $\oplus$ Y1	$\surd$	1	1	$\surd$	222	B1
N41.9.20 GM2 $\oplus$ Y1 $\oplus$ Y2	$\surd$	1	1	$\times$	-	-
N41.9.21 GM2 $\oplus$ Y1 $\oplus$ Y3	$\surd$	1	1	$\times$	-	-
N41.9.22 GM2 $\oplus$ Y1 $\oplus$ Y4	$\surd$	1	1	$\surd$	$mm2$	B2
N41.9.23 GM2 $\oplus$ Y2 $\oplus$ Y2	$\surd$	1	1	$\surd$	222	B1
N41.9.24 GM2 $\oplus$ Y2 $\oplus$ Y3	$\surd$	1	1	$\surd$	$mm2$	B2
N41.9.25 GM2 $\oplus$ Y2 $\oplus$ Y4	$\surd$	1	1	$\times$	-	-
N41.9.26 GM2 $\oplus$ Y3 $\oplus$ Y3	$\surd$	1	1	$\surd$	222	B1
N41.9.27 GM2 $\oplus$ Y3 $\oplus$ Y4	$\surd$	1	1	$\times$	-	-
N41.9.28 GM2 $\oplus$ Y4 $\oplus$ Y4	$\surd$	1	1	$\surd$	222	B1
N41.9.29 GM3 $\oplus$ GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	$mm2$	B1 $\oplus$ B1 $\oplus$ B1
N41.9.30 GM3 $\oplus$ GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	$mm2$	A2 $\oplus$ A2 $\oplus$ B2
N41.9.31 GM3 $\oplus$ GM3 $\oplus$ Y1	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N41.9.32 GM3 $\oplus$ GM3 $\oplus$ Y2	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N41.9.33 GM3 $\oplus$ GM3 $\oplus$ Y3	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N41.9.34 GM3 $\oplus$ GM3 $\oplus$ Y4	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N41.9.35 GM3 $\oplus$ GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	$mm2$	A2 $\oplus$ A2 $\oplus$ B1
N41.9.36 GM3 $\oplus$ GM4 $\oplus$ Y1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N41.9.37 GM3 $\oplus$ GM4 $\oplus$ Y2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N41.9.38 GM3 $\oplus$ GM4 $\oplus$ Y3	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N41.9.39 GM3 $\oplus$ GM4 $\oplus$ Y4	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N41.9.40 GM3 $\oplus$ Y1 $\oplus$ Y1	$\surd$	1	1	$\surd$	$mm2$	B1
N41.9.41 GM3 $\oplus$ Y1 $\oplus$ Y2	$\surd$	1	1	$\times$	-	-
N41.9.42 GM3 $\oplus$ Y1 $\oplus$ Y3	$\surd$	1	1	$\times$	-	-
N41.9.43 GM3 $\oplus$ Y1 $\oplus$ Y4	$\surd$	1	1	$\surd$	222	B2
N41.9.44 GM3 $\oplus$ Y2 $\oplus$ Y2	$\surd$	1	1	$\surd$	$mm2$	B1
N41.9.45 GM3 $\oplus$ Y2 $\oplus$ Y3	$\surd$	1	1	$\surd$	222	B2
N41.9.46 GM3 $\oplus$ Y2 $\oplus$ Y4	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $Aea2$ (No. 41) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N41.9.47 GM3 ⊕ Y3 ⊕ Y3	√	1	1	√	$mm2$	B1
N41.9.48 GM3 ⊕ Y3 ⊕ Y4	√	1	1	×	-	-
N41.9.49 GM3 ⊕ Y4 ⊕ Y4	√	1	1	√	$mm2$	B1
N41.9.50 GM4 ⊕ GM4 ⊕ GM4	√	3	3	√	$mm2$	B2 ⊕ B2 ⊕ B2
N41.9.51 GM4 ⊕ GM4 ⊕ Y1	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N41.9.52 GM4 ⊕ GM4 ⊕ Y2	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N41.9.53 GM4 ⊕ GM4 ⊕ Y3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N41.9.54 GM4 ⊕ GM4 ⊕ Y4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N41.9.55 GM4 ⊕ Y1 ⊕ Y1	√	1	1	√	$mm2$	B2
N41.9.56 GM4 ⊕ Y1 ⊕ Y2	√	1	1	√	$mm2$	A2
N41.9.57 GM4 ⊕ Y1 ⊕ Y3	√	1	1	√	222	B3
N41.9.58 GM4 ⊕ Y1 ⊕ Y4	√	1	1	√	$mm2$	B2
N41.9.59 GM4 ⊕ Y2 ⊕ Y2	√	1	1	√	$mm2$	B2
N41.9.60 GM4 ⊕ Y2 ⊕ Y3	√	1	1	√	$mm2$	B2
N41.9.61 GM4 ⊕ Y2 ⊕ Y4	√	1	1	√	222	B3
N41.9.62 GM4 ⊕ Y3 ⊕ Y3	√	1	1	√	$mm2$	B2
N41.9.63 GM4 ⊕ Y3 ⊕ Y4	√	1	1	√	$mm2$	A2
N41.9.64 GM4 ⊕ Y4 ⊕ Y4	√	1	1	√	$mm2$	B2
N41.9.65 Y1 ⊕ Y1 ⊕ Y1	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N41.9.66 Y1 ⊕ Y1 ⊕ Y2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N41.9.67 Y1 ⊕ Y1 ⊕ Y3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N41.9.68 Y1 ⊕ Y1 ⊕ Y4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N41.9.69 Y1 ⊕ Y2 ⊕ Y2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N41.9.70 Y1 ⊕ Y2 ⊕ Y3	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N41.9.71 Y1 ⊕ Y2 ⊕ Y4	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N41.9.72 Y1 ⊕ Y3 ⊕ Y3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N41.9.73 Y1 ⊕ Y3 ⊕ Y4	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N41.9.74 Y1 ⊕ Y4 ⊕ Y4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N41.9.75 Y2 ⊕ Y2 ⊕ Y2	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N41.9.76 Y2 ⊕ Y2 ⊕ Y3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N41.9.77 Y2 ⊕ Y2 ⊕ Y4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N41.9.78 Y2 ⊕ Y3 ⊕ Y3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N41.9.79 Y2 ⊕ Y3 ⊕ Y4	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N41.9.80 Y2 ⊕ Y4 ⊕ Y4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N41.9.81 Y3 ⊕ Y3 ⊕ Y3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N41.9.82 Y3 ⊕ Y3 ⊕ Y4	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N41.9.83 Y3 ⊕ Y4 ⊕ Y4	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N41.9.84 Y4 ⊕ Y4 ⊕ Y4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N41.11.1 GM2 ⊕ SM1SN1	√	1	1	√	222	B1
N41.11.2 GM2 ⊕ SM2SN2	√	1	1	√	222	B1
N41.11.3 GM2 ⊕ SM4SN4	√	1	1	√	222	B1
N41.11.4 GM2 ⊕ SM3SN3	√	1	1	√	222	B1
N41.11.5 GM3 ⊕ SM1SN1	√	1	1	√	$mm2$	B1
N41.11.6 GM3 ⊕ SM2SN2	√	1	1	√	$mm2$	B1
N41.11.7 GM3 ⊕ SM4SN4	√	1	1	√	$mm2$	B1
N41.11.8 GM3 ⊕ SM3SN3	√	1	1	√	$mm2$	B1

Non-coplanar SSGs with parent space group $Aea2$ (No. 41) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N41.11.9 GM4 $\oplus$ SM1SN1	$\surd$	1	1	$\surd$	$mm2$	B2
N41.11.10 GM4 $\oplus$ SM2SN2	$\surd$	1	1	$\surd$	$mm2$	B2
N41.11.11 GM4 $\oplus$ SM4SN4	$\surd$	1	1	$\surd$	$mm2$	B2
N41.11.12 GM4 $\oplus$ SM3SN3	$\surd$	1	1	$\surd$	$mm2$	B2
N41.11.13 Y1 $\oplus$ SM1SN1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N41.11.14 Y1 $\oplus$ SM2SN2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N41.11.15 Y1 $\oplus$ SM4SN4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N41.11.16 Y1 $\oplus$ SM3SN3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N41.11.17 Y2 $\oplus$ SM1SN1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N41.11.18 Y2 $\oplus$ SM2SN2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N41.11.19 Y2 $\oplus$ SM4SN4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N41.11.20 Y2 $\oplus$ SM3SN3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N41.11.21 Y3 $\oplus$ SM1SN1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N41.11.22 Y3 $\oplus$ SM2SN2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N41.11.23 Y3 $\oplus$ SM4SN4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N41.11.24 Y3 $\oplus$ SM3SN3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N41.11.25 Y4 $\oplus$ SM1SN1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N41.11.26 Y4 $\oplus$ SM2SN2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N41.11.27 Y4 $\oplus$ SM4SN4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N41.11.28 Y4 $\oplus$ SM3SN3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N41.12.1 GM2 $\oplus$ T1	$\surd$	1	1	$\times$	-	-
N41.12.2 GM2 $\oplus$ Z1	$\surd$	1	1	$\surd$	$mm2$	B1
N41.12.3 GM3 $\oplus$ T1	$\surd$	1	1	$\times$	-	-
N41.12.4 GM3 $\oplus$ Z1	$\surd$	1	1	$\surd$	$mm2$	B1
N41.12.5 GM4 $\oplus$ T1	$\surd$	1	1	$\surd$	222	B3
N41.12.6 GM4 $\oplus$ Z1	$\surd$	1	1	$\surd$	222	B3
N41.12.7 Y1 $\oplus$ T1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N41.12.8 Y1 $\oplus$ Z1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N41.12.9 Y2 $\oplus$ T1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N41.12.10 Y2 $\oplus$ Z1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N41.12.11 Y3 $\oplus$ T1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N41.12.12 Y3 $\oplus$ Z1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N41.12.13 Y4 $\oplus$ T1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N41.12.14 Y4 $\oplus$ Z1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N41.14.1 GM2 $\oplus$ DT1	$\surd$	1	1	$\surd$	$mm2$	B2
N41.14.2 GM2 $\oplus$ DT2	$\surd$	1	1	$\surd$	$mm2$	B2
N41.14.3 GM2 $\oplus$ LD1	$\surd$	1	1	$\surd$	$mm2$	B1
N41.14.4 GM2 $\oplus$ H1	$\surd$	1	1	$\times$	-	-
N41.14.5 GM3 $\oplus$ DT1	$\surd$	1	1	$\surd$	222	B2
N41.14.6 GM3 $\oplus$ DT2	$\surd$	1	1	$\surd$	222	B2
N41.14.7 GM3 $\oplus$ LD1	$\surd$	1	1	$\surd$	$mm2$	B1
N41.14.8 GM3 $\oplus$ H1	$\surd$	1	1	$\times$	-	-
N41.14.9 GM4 $\oplus$ DT1	$\surd$	1	1	$\surd$	$mm2$	B2
N41.14.10 GM4 $\oplus$ DT2	$\surd$	1	1	$\surd$	$mm2$	B2
N41.14.11 GM4 $\oplus$ LD1	$\surd$	1	1	$\surd$	222	B3
N41.14.12 GM4 $\oplus$ H1	$\surd$	1	1	$\surd$	222	B3

Non-coplanar SSGs with parent space group $Aea2$ (No. 41) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N41.14.13 Y1 $\oplus$ DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N41.14.14 Y1 $\oplus$ DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N41.14.15 Y1 $\oplus$ LD1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N41.14.16 Y1 $\oplus$ H1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N41.14.17 Y2 $\oplus$ DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N41.14.18 Y2 $\oplus$ DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N41.14.19 Y2 $\oplus$ LD1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N41.14.20 Y2 $\oplus$ H1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N41.14.21 Y3 $\oplus$ DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N41.14.22 Y3 $\oplus$ DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N41.14.23 Y3 $\oplus$ LD1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N41.14.24 Y3 $\oplus$ H1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N41.14.25 Y4 $\oplus$ DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N41.14.26 Y4 $\oplus$ DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N41.14.27 Y4 $\oplus$ LD1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N41.14.28 Y4 $\oplus$ H1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$

TABLE S124: Collinear SSGs with parent space group $Fmm2$ (No. 42).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L42.1.1 GM1	1	mmm	$\mathrm{A_g}$
L42.2.1 GM2	1	mmm	$\mathrm{B1_g}$
L42.2.2 GM3	1	mmm	$\mathrm{B3_g}$
L42.2.3 T1	0	-	-
L42.2.4 T2	0	-	-
L42.2.5 T3	0	-	-
L42.2.6 T4	0	-	-
L42.2.7 Z1	0	-	-
L42.2.8 Z2	0	-	-
L42.2.9 Z3	0	-	-

TABLE S125: Coplanar SSGs with parent space group $Fmm2$ (No. 42).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P42.1.1 GM1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B1_u}$
P42.2.1 GM2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$
P42.2.2 GM3	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
P42.2.3 T1	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P42.2.4 T2	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P42.2.5 T3	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P42.2.6 T4	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P42.2.7 Z1	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P42.2.8 Z2	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P42.2.9 Z3	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$

Coplanar SSGs with parent space group $Fmm2$ (No. 42) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P42.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
P42.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
P42.3.3 GM2 $\oplus$ T1	$\surd$	1	1	$\times$	-	-
P42.3.4 GM2 $\oplus$ T2	$\surd$	1	1	$\times$	-	-
P42.3.5 GM2 $\oplus$ T3	$\surd$	1	1	$\times$	-	-
P42.3.6 GM2 $\oplus$ T4	$\surd$	1	1	$\times$	-	-
P42.3.7 GM2 $\oplus$ Z1	$\surd$	1	1	$\times$	-	-
P42.3.8 GM2 $\oplus$ Z2	$\surd$	1	1	$\times$	-	-
P42.3.9 GM2 $\oplus$ Z3	$\surd$	1	1	$\times$	-	-
P42.3.10 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
P42.3.11 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
P42.3.12 GM3 $\oplus$ T1	$\surd$	1	1	$\times$	-	-
P42.3.13 GM3 $\oplus$ Y1	$\surd$	1	1	$\times$	-	-
P42.3.14 GM3 $\oplus$ T2	$\surd$	1	1	$\times$	-	-
P42.3.15 GM3 $\oplus$ Y2	$\surd$	1	1	$\times$	-	-
P42.3.16 GM3 $\oplus$ T3	$\surd$	1	1	$\times$	-	-
P42.3.17 GM3 $\oplus$ Y4	$\surd$	1	1	$\times$	-	-
P42.3.18 GM3 $\oplus$ T4	$\surd$	1	1	$\times$	-	-
P42.3.19 GM3 $\oplus$ Y3	$\surd$	1	1	$\times$	-	-
P42.3.20 GM3 $\oplus$ Z1	$\surd$	1	1	$\times$	-	-
P42.3.21 GM3 $\oplus$ Z2	$\surd$	1	1	$\times$	-	-
P42.3.22 GM3 $\oplus$ Z3	$\surd$	1	1	$\times$	-	-
P42.3.23 GM3 $\oplus$ Z4	$\surd$	1	1	$\times$	-	-
P42.3.24 T1 $\oplus$ T1	$\surd$	1	1	$\times$	-	-
P42.3.25 T1 $\oplus$ Y1	$\times$	-	-	-	-	-
P42.3.26 T1 $\oplus$ T2	$\surd$	1	1	$\times$	-	-
P42.3.27 T1 $\oplus$ Y2	$\times$	-	-	-	-	-
P42.3.28 T1 $\oplus$ T3	$\surd$	1	1	$\times$	-	-
P42.3.29 T1 $\oplus$ Y4	$\times$	-	-	-	-	-
P42.3.30 T1 $\oplus$ T4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P42.3.31 T1 $\oplus$ Y3	$\times$	-	-	-	-	-
P42.3.32 T1 $\oplus$ Z1	$\times$	-	-	-	-	-
P42.3.33 T1 $\oplus$ Z2	$\times$	-	-	-	-	-
P42.3.34 T1 $\oplus$ Z3	$\times$	-	-	-	-	-
P42.3.35 T1 $\oplus$ Z4	$\times$	-	-	-	-	-
P42.3.36 T2 $\oplus$ T2	$\surd$	1	1	$\times$	-	-
P42.3.37 T2 $\oplus$ Y2	$\times$	-	-	-	-	-
P42.3.38 T2 $\oplus$ T3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P42.3.39 T2 $\oplus$ Y4	$\times$	-	-	-	-	-
P42.3.40 T2 $\oplus$ T4	$\surd$	1	1	$\times$	-	-
P42.3.41 T2 $\oplus$ Y3	$\times$	-	-	-	-	-
P42.3.42 T2 $\oplus$ Z1	$\times$	-	-	-	-	-
P42.3.43 T2 $\oplus$ Z2	$\times$	-	-	-	-	-
P42.3.44 T2 $\oplus$ Z3	$\times$	-	-	-	-	-
P42.3.45 T2 $\oplus$ Z4	$\times$	-	-	-	-	-
P42.3.46 T3 $\oplus$ T3	$\surd$	1	1	$\times$	-	-

Coplanar SSGs with parent space group $Fmm2$ (No. 42) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P42.3.47 T3 $\oplus$ Y4	$\times$	-	-	-	-	-
P42.3.48 T3 $\oplus$ T4	$\surd$	1	1	$\times$	-	-
P42.3.49 T3 $\oplus$ Y3	$\times$	-	-	-	-	-
P42.3.50 T3 $\oplus$ Z1	$\times$	-	-	-	-	-
P42.3.51 T3 $\oplus$ Z2	$\times$	-	-	-	-	-
P42.3.52 T3 $\oplus$ Z3	$\times$	-	-	-	-	-
P42.3.53 T3 $\oplus$ Z4	$\times$	-	-	-	-	-
P42.3.54 T4 $\oplus$ T4	$\surd$	1	1	$\times$	-	-
P42.3.55 T4 $\oplus$ Y3	$\times$	-	-	-	-	-
P42.3.56 T4 $\oplus$ Z1	$\times$	-	-	-	-	-
P42.3.57 T4 $\oplus$ Z2	$\times$	-	-	-	-	-
P42.3.58 T4 $\oplus$ Z3	$\times$	-	-	-	-	-
P42.3.59 T4 $\oplus$ Z4	$\times$	-	-	-	-	-
P42.3.60 Z1 $\oplus$ Z1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P42.3.61 Z1 $\oplus$ Z2	$\surd$	1	1	$\times$	-	-
P42.3.62 Z1 $\oplus$ Z3	$\surd$	1	1	$\times$	-	-
P42.3.63 Z2 $\oplus$ Z2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P42.3.64 Z2 $\oplus$ Z3	$\surd$	1	1	$\times$	-	-
P42.3.65 Z3 $\oplus$ Z3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P42.3.66 Z3 $\oplus$ Z4	$\surd$	1	1	$\times$	-	-
P42.5.1 LD1LE1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P42.5.2 LD2LE2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P42.5.3 LD3LE3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P42.5.4 H1HA1	$\surd$	1	1	$\times$	-	-
P42.5.5 H2HA2	$\surd$	1	1	$\times$	-	-
P42.5.6 H3HA3	$\surd$	1	1	$\times$	-	-
P42.8.1 DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P42.8.2 DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P42.8.3 A1	$\surd$	1	1	$\times$	-	-
P42.8.4 A2	$\surd$	1	1	$\times$	-	-

TABLE S126: Non-coplanar SSGs with parent space group $Fmm2$ (No. 42).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N42.1.1 GM1	$\surd$	3	3	$\surd$	$mm2$	A1 $\oplus$ A1 $\oplus$ A1
N42.2.1 GM2	$\surd$	3	3	$\surd$	222	A1 $\oplus$ A1 $\oplus$ B1
N42.2.2 GM3	$\surd$	3	3	$\surd$	$mm2$	A1 $\oplus$ A1 $\oplus$ B2
N42.2.3 T1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B1_u}$
N42.2.4 T2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B1_u}$
N42.2.5 T3	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B1_u}$
N42.2.6 T4	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B1_u}$
N42.2.7 Z1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B1_u}$
N42.2.8 Z2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B1_u}$
N42.2.9 Z3	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B1_u}$
N42.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$mm2$	A1 $\oplus$ A2 $\oplus$ A2
N42.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$mm2$	A1 $\oplus$ A2 $\oplus$ B2

Non-coplanar SSGs with parent space group $Fmm2$ (No. 42) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N42.3.3 GM2 ⊕ T1	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$
N42.3.4 GM2 ⊕ T2	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$
N42.3.5 GM2 ⊕ T3	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$
N42.3.6 GM2 ⊕ T4	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$
N42.3.7 GM2 ⊕ Z1	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$
N42.3.8 GM2 ⊕ Z2	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$
N42.3.9 GM2 ⊕ Z3	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$
N42.3.10 GM3 ⊕ GM3	√	3	3	√	$mm2$	A1 ⊕ B2 ⊕ B2
N42.3.11 GM3 ⊕ GM4	√	3	3	√	222	A1 ⊕ B3 ⊕ B2
N42.3.12 GM3 ⊕ T1	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N42.3.13 GM3 ⊕ Y1	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N42.3.14 GM3 ⊕ T2	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N42.3.15 GM3 ⊕ Y2	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N42.3.16 GM3 ⊕ T3	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N42.3.17 GM3 ⊕ Y4	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N42.3.18 GM3 ⊕ T4	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N42.3.19 GM3 ⊕ Y3	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N42.3.20 GM3 ⊕ Z1	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N42.3.21 GM3 ⊕ Z2	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N42.3.22 GM3 ⊕ Z3	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N42.3.23 GM3 ⊕ Z4	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N42.3.24 T1 ⊕ T1	√	1	1	√	$mm2$	A1
N42.3.25 T1 ⊕ Y1	√	1	1	√	mmm	$\mathrm{A_g}$
N42.3.26 T1 ⊕ T2	√	1	1	√	222	A1
N42.3.27 T1 ⊕ Y2	√	1	1	√	mmm	$\mathrm{A_g}$
N42.3.28 T1 ⊕ T3	√	1	1	√	$mm2$	A1
N42.3.29 T1 ⊕ Y4	√	1	1	√	mmm	$\mathrm{A_g}$
N42.3.30 T1 ⊕ T4	√	1	1	√	$mm2$	A1
N42.3.31 T1 ⊕ Y3	√	1	1	√	mmm	$\mathrm{A_g}$
N42.3.32 T1 ⊕ Z1	√	1	1	√	mmm	$\mathrm{A_g}$
N42.3.33 T1 ⊕ Z2	√	1	1	√	mmm	$\mathrm{A_g}$
N42.3.34 T1 ⊕ Z3	√	1	1	√	mmm	$\mathrm{A_g}$
N42.3.35 T1 ⊕ Z4	√	1	1	√	mmm	$\mathrm{A_g}$
N42.3.36 T2 ⊕ T2	√	1	1	√	$mm2$	A1
N42.3.37 T2 ⊕ Y2	√	1	1	√	mmm	$\mathrm{A_g}$
N42.3.38 T2 ⊕ T3	√	1	1	√	$mm2$	A1
N42.3.39 T2 ⊕ Y4	√	1	1	√	mmm	$\mathrm{A_g}$
N42.3.40 T2 ⊕ T4	√	1	1	√	$mm2$	A1
N42.3.41 T2 ⊕ Y3	√	1	1	√	mmm	$\mathrm{A_g}$
N42.3.42 T2 ⊕ Z1	√	1	1	√	mmm	$\mathrm{A_g}$
N42.3.43 T2 ⊕ Z2	√	1	1	√	mmm	$\mathrm{A_g}$
N42.3.44 T2 ⊕ Z3	√	1	1	√	mmm	$\mathrm{A_g}$
N42.3.45 T2 ⊕ Z4	√	1	1	√	mmm	$\mathrm{A_g}$
N42.3.46 T3 ⊕ T3	√	1	1	√	$mm2$	A1
N42.3.47 T3 ⊕ Y4	√	1	1	√	mmm	$\mathrm{A_g}$
N42.3.48 T3 ⊕ T4	√	1	1	√	222	A1

Non-coplanar SSGs with parent space group $Fmm2$ (No. 42) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N42.3.49 T3 ⊕ Y3	√	1	1	√	mmm	$\mathrm{A_g}$
N42.3.50 T3 ⊕ Z1	√	1	1	√	mmm	$\mathrm{A_g}$
N42.3.51 T3 ⊕ Z2	√	1	1	√	mmm	$\mathrm{A_g}$
N42.3.52 T3 ⊕ Z3	√	1	1	√	mmm	$\mathrm{A_g}$
N42.3.53 T3 ⊕ Z4	√	1	1	√	mmm	$\mathrm{A_g}$
N42.3.54 T4 ⊕ T4	√	1	1	√	$mm2$	A1
N42.3.55 T4 ⊕ Y3	√	1	1	√	mmm	$\mathrm{A_g}$
N42.3.56 T4 ⊕ Z1	√	1	1	√	mmm	$\mathrm{A_g}$
N42.3.57 T4 ⊕ Z2	√	1	1	√	mmm	$\mathrm{A_g}$
N42.3.58 T4 ⊕ Z3	√	1	1	√	mmm	$\mathrm{A_g}$
N42.3.59 T4 ⊕ Z4	√	1	1	√	mmm	$\mathrm{A_g}$
N42.3.60 Z1 ⊕ Z1	√	1	1	√	$mm2$	A1
N42.3.61 Z1 ⊕ Z2	√	1	1	√	222	A1
N42.3.62 Z1 ⊕ Z3	√	1	1	√	$mm2$	A1
N42.3.63 Z2 ⊕ Z2	√	1	1	√	$mm2$	A1
N42.3.64 Z2 ⊕ Z3	√	1	1	√	$mm2$	A1
N42.3.65 Z3 ⊕ Z3	√	1	1	√	$mm2$	A1
N42.3.66 Z3 ⊕ Z4	√	1	1	√	222	A1
N42.5.1 LD1LE1	√	1	1	√	$mm2$	A1
N42.5.2 LD2LE2	√	1	1	√	$mm2$	A1
N42.5.3 LD3LE3	√	1	1	√	$mm2$	A1
N42.5.4 H1HA1	√	1	1	√	$mm2$	A1
N42.5.5 H2HA2	√	1	1	√	$mm2$	A1
N42.5.6 H3HA3	√	1	1	√	$mm2$	A1
N42.8.1 DT1	√	1	1	√	$mm2$	A1
N42.8.2 DT2	√	1	1	√	$mm2$	A1
N42.8.3 A1	√	1	1	√	$mm2$	A1
N42.8.4 A2	√	1	1	√	$mm2$	A1
N42.9.1 GM2 ⊕ GM2 ⊕ GM2	√	3	3	√	222	B1 ⊕ B1 ⊕ B1
N42.9.2 GM2 ⊕ GM2 ⊕ GM3	√	3	3	√	$mm2$	B2 ⊕ B1 ⊕ B1
N42.9.3 GM2 ⊕ GM2 ⊕ T1	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N42.9.4 GM2 ⊕ GM2 ⊕ T2	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N42.9.5 GM2 ⊕ GM2 ⊕ T3	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N42.9.6 GM2 ⊕ GM2 ⊕ T4	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N42.9.7 GM2 ⊕ GM2 ⊕ Z1	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N42.9.8 GM2 ⊕ GM2 ⊕ Z2	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N42.9.9 GM2 ⊕ GM2 ⊕ Z3	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N42.9.10 GM2 ⊕ GM3 ⊕ GM3	√	3	3	√	222	B1 ⊕ B3 ⊕ B3
N42.9.11 GM2 ⊕ GM3 ⊕ GM4	√	3	3	√	$mm2$	A2 ⊕ B2 ⊕ B1
N42.9.12 GM2 ⊕ GM3 ⊕ T1	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N42.9.13 GM2 ⊕ GM3 ⊕ Y1	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N42.9.14 GM2 ⊕ GM3 ⊕ T2	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N42.9.15 GM2 ⊕ GM3 ⊕ Y2	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N42.9.16 GM2 ⊕ GM3 ⊕ T3	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N42.9.17 GM2 ⊕ GM3 ⊕ Y4	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N42.9.18 GM2 ⊕ GM3 ⊕ T4	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$

Non-coplanar SSGs with parent space group $Fmm2$ (No. 42) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N42.9.19 GM2 ⊕ GM3 ⊕ Y3	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N42.9.20 GM2 ⊕ GM3 ⊕ Z1	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N42.9.21 GM2 ⊕ GM3 ⊕ Z2	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N42.9.22 GM2 ⊕ GM3 ⊕ Z3	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N42.9.23 GM2 ⊕ GM3 ⊕ Z4	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N42.9.24 GM2 ⊕ T1 ⊕ T1	√	1	1	×	-	-
N42.9.25 GM2 ⊕ T1 ⊕ Y1	√	1	1	√	mmm	$\mathrm{B1_g}$
N42.9.26 GM2 ⊕ T1 ⊕ T2	√	1	1	×	-	-
N42.9.27 GM2 ⊕ T1 ⊕ Y2	√	1	1	√	mmm	$\mathrm{B1_g}$
N42.9.28 GM2 ⊕ T1 ⊕ T3	√	1	1	×	-	-
N42.9.29 GM2 ⊕ T1 ⊕ Y4	√	1	1	√	mmm	$\mathrm{B1_g}$
N42.9.30 GM2 ⊕ T1 ⊕ T4	√	1	1	√	$mm2$	B1
N42.9.31 GM2 ⊕ T1 ⊕ Y3	√	1	1	√	mmm	$\mathrm{B1_g}$
N42.9.32 GM2 ⊕ T1 ⊕ Z1	√	1	1	×	-	-
N42.9.33 GM2 ⊕ T1 ⊕ Z2	√	1	1	×	-	-
N42.9.34 GM2 ⊕ T1 ⊕ Z3	√	1	1	×	-	-
N42.9.35 GM2 ⊕ T1 ⊕ Z4	√	1	1	×	-	-
N42.9.36 GM2 ⊕ T2 ⊕ T2	√	1	1	×	-	-
N42.9.37 GM2 ⊕ T2 ⊕ Y2	√	1	1	√	mmm	$\mathrm{B1_g}$
N42.9.38 GM2 ⊕ T2 ⊕ T3	√	1	1	√	$mm2$	B1
N42.9.39 GM2 ⊕ T2 ⊕ Y4	√	1	1	√	mmm	$\mathrm{B1_g}$
N42.9.40 GM2 ⊕ T2 ⊕ T4	√	1	1	×	-	-
N42.9.41 GM2 ⊕ T2 ⊕ Y3	√	1	1	√	mmm	$\mathrm{B1_g}$
N42.9.42 GM2 ⊕ T2 ⊕ Z1	√	1	1	×	-	-
N42.9.43 GM2 ⊕ T2 ⊕ Z2	√	1	1	×	-	-
N42.9.44 GM2 ⊕ T2 ⊕ Z3	√	1	1	×	-	-
N42.9.45 GM2 ⊕ T2 ⊕ Z4	√	1	1	×	-	-
N42.9.46 GM2 ⊕ T3 ⊕ T3	√	1	1	×	-	-
N42.9.47 GM2 ⊕ T3 ⊕ Y4	√	1	1	√	mmm	$\mathrm{B1_g}$
N42.9.48 GM2 ⊕ T3 ⊕ T4	√	1	1	×	-	-
N42.9.49 GM2 ⊕ T3 ⊕ Y3	√	1	1	√	mmm	$\mathrm{B1_g}$
N42.9.50 GM2 ⊕ T3 ⊕ Z1	√	1	1	×	-	-
N42.9.51 GM2 ⊕ T3 ⊕ Z2	√	1	1	×	-	-
N42.9.52 GM2 ⊕ T3 ⊕ Z3	√	1	1	×	-	-
N42.9.53 GM2 ⊕ T3 ⊕ Z4	√	1	1	×	-	-
N42.9.54 GM2 ⊕ T4 ⊕ T4	√	1	1	×	-	-
N42.9.55 GM2 ⊕ T4 ⊕ Y3	√	1	1	√	mmm	$\mathrm{B1_g}$
N42.9.56 GM2 ⊕ T4 ⊕ Z1	√	1	1	×	-	-
N42.9.57 GM2 ⊕ T4 ⊕ Z2	√	1	1	×	-	-
N42.9.58 GM2 ⊕ T4 ⊕ Z3	√	1	1	×	-	-
N42.9.59 GM2 ⊕ T4 ⊕ Z4	√	1	1	×	-	-
N42.9.60 GM2 ⊕ Z1 ⊕ Z1	√	1	1	√	222	B1
N42.9.61 GM2 ⊕ Z1 ⊕ Z2	√	1	1	×	-	-
N42.9.62 GM2 ⊕ Z1 ⊕ Z3	√	1	1	×	-	-
N42.9.63 GM2 ⊕ Z2 ⊕ Z2	√	1	1	√	222	B1
N42.9.64 GM2 ⊕ Z2 ⊕ Z3	√	1	1	×	-	-

Non-coplanar SSGs with parent space group $Fmm2$ (No. 42) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N42.9.65 GM2 ⊕ Z3 ⊕ Z3	√	1	1	√	222	B1
N42.9.66 GM2 ⊕ Z3 ⊕ Z4	√	1	1	×	-	-
N42.9.67 GM3 ⊕ GM3 ⊕ GM3	√	3	3	√	$mm2$	B2 ⊕ B2 ⊕ B2
N42.9.68 GM3 ⊕ GM3 ⊕ GM4	√	3	3	√	$mm2$	A2 ⊕ A2 ⊕ B1
N42.9.69 GM3 ⊕ GM3 ⊕ T1	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N42.9.70 GM3 ⊕ GM3 ⊕ Y1	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N42.9.71 GM3 ⊕ GM4 ⊕ T1	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N42.9.72 GM3 ⊕ GM3 ⊕ T2	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N42.9.73 GM3 ⊕ GM3 ⊕ Y2	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N42.9.74 GM3 ⊕ GM4 ⊕ T2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N42.9.75 GM3 ⊕ GM3 ⊕ T3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N42.9.76 GM3 ⊕ GM3 ⊕ Y4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N42.9.77 GM3 ⊕ GM4 ⊕ T3	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N42.9.78 GM3 ⊕ GM3 ⊕ T4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N42.9.79 GM3 ⊕ GM3 ⊕ Y3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N42.9.80 GM3 ⊕ GM4 ⊕ T4	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N42.9.81 GM3 ⊕ GM3 ⊕ Z1	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N42.9.82 GM3 ⊕ GM4 ⊕ Z1	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N42.9.83 GM3 ⊕ GM3 ⊕ Z2	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N42.9.84 GM3 ⊕ GM4 ⊕ Z2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N42.9.85 GM3 ⊕ GM3 ⊕ Z3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N42.9.86 GM3 ⊕ GM3 ⊕ Z4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N42.9.87 GM3 ⊕ GM4 ⊕ Z3	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N42.9.88 GM3 ⊕ T1 ⊕ T1	√	1	1	×	-	-
N42.9.89 GM3 ⊕ T1 ⊕ Y1	√	1	1	×	-	-
N42.9.90 GM3 ⊕ Y1 ⊕ Y1	√	1	1	×	-	-
N42.9.91 GM3 ⊕ T1 ⊕ T2	√	1	1	×	-	-
N42.9.92 GM3 ⊕ T1 ⊕ Y2	√	1	1	×	-	-
N42.9.93 GM3 ⊕ Y1 ⊕ T2	√	1	1	×	-	-
N42.9.94 GM3 ⊕ Y1 ⊕ Y2	√	1	1	×	-	-
N42.9.95 GM3 ⊕ T1 ⊕ T3	√	1	1	×	-	-
N42.9.96 GM3 ⊕ T1 ⊕ Y4	√	1	1	×	-	-
N42.9.97 GM3 ⊕ Y1 ⊕ T3	√	1	1	×	-	-
N42.9.98 GM3 ⊕ Y1 ⊕ Y4	√	1	1	×	-	-
N42.9.99 GM3 ⊕ T1 ⊕ T4	√	1	1	√	222	B3
N42.9.100 GM3 ⊕ T1 ⊕ Y3	√	1	1	×	-	-
N42.9.101 GM3 ⊕ Y1 ⊕ T4	√	1	1	×	-	-
N42.9.102 GM3 ⊕ Y1 ⊕ Y3	√	1	1	√	$mm2$	B2
N42.9.103 GM3 ⊕ T1 ⊕ Z1	√	1	1	×	-	-
N42.9.104 GM3 ⊕ Y1 ⊕ Z1	√	1	1	√	mmm	$\mathrm{B3_g}$
N42.9.105 GM3 ⊕ T1 ⊕ Z2	√	1	1	×	-	-
N42.9.106 GM3 ⊕ Y1 ⊕ Z2	√	1	1	√	mmm	$\mathrm{B3_g}$
N42.9.107 GM3 ⊕ T1 ⊕ Z3	√	1	1	×	-	-
N42.9.108 GM3 ⊕ T1 ⊕ Z4	√	1	1	×	-	-
N42.9.109 GM3 ⊕ Y1 ⊕ Z3	√	1	1	√	mmm	$\mathrm{B3_g}$
N42.9.110 GM3 ⊕ Y1 ⊕ Z4	√	1	1	√	mmm	$\mathrm{B3_g}$

Non-coplanar SSGs with parent space group $Fmm2$ (No. 42) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N42.9.111 GM3 $\oplus$ T2 $\oplus$ T2	$\surd$	1	1	$\times$	-	-
N42.9.112 GM3 $\oplus$ T2 $\oplus$ Y2	$\surd$	1	1	$\times$	-	-
N42.9.113 GM3 $\oplus$ Y2 $\oplus$ Y2	$\surd$	1	1	$\times$	-	-
N42.9.114 GM3 $\oplus$ T2 $\oplus$ T3	$\surd$	1	1	$\surd$	222	B3
N42.9.115 GM3 $\oplus$ T2 $\oplus$ Y4	$\surd$	1	1	$\times$	-	-
N42.9.116 GM3 $\oplus$ Y2 $\oplus$ T3	$\surd$	1	1	$\times$	-	-
N42.9.117 GM3 $\oplus$ Y2 $\oplus$ Y4	$\surd$	1	1	$\surd$	$mm2$	B2
N42.9.118 GM3 $\oplus$ T2 $\oplus$ T4	$\surd$	1	1	$\times$	-	-
N42.9.119 GM3 $\oplus$ T2 $\oplus$ Y3	$\surd$	1	1	$\times$	-	-
N42.9.120 GM3 $\oplus$ Y2 $\oplus$ T4	$\surd$	1	1	$\times$	-	-
N42.9.121 GM3 $\oplus$ Y2 $\oplus$ Y3	$\surd$	1	1	$\times$	-	-
N42.9.122 GM3 $\oplus$ T2 $\oplus$ Z1	$\surd$	1	1	$\times$	-	-
N42.9.123 GM3 $\oplus$ Y2 $\oplus$ Z1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N42.9.124 GM3 $\oplus$ T2 $\oplus$ Z2	$\surd$	1	1	$\times$	-	-
N42.9.125 GM3 $\oplus$ Y2 $\oplus$ Z2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N42.9.126 GM3 $\oplus$ T2 $\oplus$ Z3	$\surd$	1	1	$\times$	-	-
N42.9.127 GM3 $\oplus$ T2 $\oplus$ Z4	$\surd$	1	1	$\times$	-	-
N42.9.128 GM3 $\oplus$ Y2 $\oplus$ Z3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N42.9.129 GM3 $\oplus$ Y2 $\oplus$ Z4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N42.9.130 GM3 $\oplus$ T3 $\oplus$ T3	$\surd$	1	1	$\times$	-	-
N42.9.131 GM3 $\oplus$ T3 $\oplus$ Y4	$\surd$	1	1	$\times$	-	-
N42.9.132 GM3 $\oplus$ Y4 $\oplus$ Y4	$\surd$	1	1	$\times$	-	-
N42.9.133 GM3 $\oplus$ T3 $\oplus$ T4	$\surd$	1	1	$\times$	-	-
N42.9.134 GM3 $\oplus$ T3 $\oplus$ Y3	$\surd$	1	1	$\times$	-	-
N42.9.135 GM3 $\oplus$ Y4 $\oplus$ T4	$\surd$	1	1	$\times$	-	-
N42.9.136 GM3 $\oplus$ Y4 $\oplus$ Y3	$\surd$	1	1	$\times$	-	-
N42.9.137 GM3 $\oplus$ T3 $\oplus$ Z1	$\surd$	1	1	$\times$	-	-
N42.9.138 GM3 $\oplus$ Y4 $\oplus$ Z1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N42.9.139 GM3 $\oplus$ T3 $\oplus$ Z2	$\surd$	1	1	$\times$	-	-
N42.9.140 GM3 $\oplus$ Y4 $\oplus$ Z2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N42.9.141 GM3 $\oplus$ T3 $\oplus$ Z3	$\surd$	1	1	$\times$	-	-
N42.9.142 GM3 $\oplus$ T3 $\oplus$ Z4	$\surd$	1	1	$\times$	-	-
N42.9.143 GM3 $\oplus$ Y4 $\oplus$ Z3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N42.9.144 GM3 $\oplus$ Y4 $\oplus$ Z4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N42.9.145 GM3 $\oplus$ T4 $\oplus$ T4	$\surd$	1	1	$\times$	-	-
N42.9.146 GM3 $\oplus$ T4 $\oplus$ Y3	$\surd$	1	1	$\times$	-	-
N42.9.147 GM3 $\oplus$ Y3 $\oplus$ Y3	$\surd$	1	1	$\times$	-	-
N42.9.148 GM3 $\oplus$ T4 $\oplus$ Z1	$\surd$	1	1	$\times$	-	-
N42.9.149 GM3 $\oplus$ Y3 $\oplus$ Z1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N42.9.150 GM3 $\oplus$ T4 $\oplus$ Z2	$\surd$	1	1	$\times$	-	-
N42.9.151 GM3 $\oplus$ Y3 $\oplus$ Z2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N42.9.152 GM3 $\oplus$ T4 $\oplus$ Z3	$\surd$	1	1	$\times$	-	-
N42.9.153 GM3 $\oplus$ T4 $\oplus$ Z4	$\surd$	1	1	$\times$	-	-
N42.9.154 GM3 $\oplus$ Y3 $\oplus$ Z3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N42.9.155 GM3 $\oplus$ Y3 $\oplus$ Z4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N42.9.156 GM3 $\oplus$ Z1 $\oplus$ Z1	$\surd$	1	1	$\surd$	$mm2$	B2

Non-coplanar SSGs with parent space group $Fmm2$ (No. 42) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N42.9.157 GM3 $\oplus$ Z1 $\oplus$ Z2	$\surd$	1	1	$\times$	-	-
N42.9.158 GM3 $\oplus$ Z1 $\oplus$ Z3	$\surd$	1	1	$\times$	-	-
N42.9.159 GM3 $\oplus$ Z1 $\oplus$ Z4	$\surd$	1	1	$\times$	-	-
N42.9.160 GM3 $\oplus$ Z2 $\oplus$ Z2	$\surd$	1	1	$\surd$	$mm2$	B2
N42.9.161 GM3 $\oplus$ Z2 $\oplus$ Z3	$\surd$	1	1	$\times$	-	-
N42.9.162 GM3 $\oplus$ Z2 $\oplus$ Z4	$\surd$	1	1	$\times$	-	-
N42.9.163 GM3 $\oplus$ Z3 $\oplus$ Z3	$\surd$	1	1	$\surd$	$mm2$	B2
N42.9.164 GM3 $\oplus$ Z3 $\oplus$ Z4	$\surd$	1	1	$\times$	-	-
N42.9.165 GM3 $\oplus$ Z4 $\oplus$ Z4	$\surd$	1	1	$\surd$	$mm2$	B2
N42.9.166 T1 $\oplus$ T1 $\oplus$ T1	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N42.9.167 T1 $\oplus$ T1 $\oplus$ Y1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N42.9.168 T1 $\oplus$ T1 $\oplus$ T2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N42.9.169 T1 $\oplus$ T1 $\oplus$ Y2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N42.9.170 T1 $\oplus$ Y1 $\oplus$ T2	$\surd$	1	1	$\times$	-	-
N42.9.171 T1 $\oplus$ T1 $\oplus$ T3	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N42.9.172 T1 $\oplus$ T1 $\oplus$ Y4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N42.9.173 T1 $\oplus$ Y1 $\oplus$ T3	$\surd$	1	1	$\times$	-	-
N42.9.174 T1 $\oplus$ T1 $\oplus$ T4	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N42.9.175 T1 $\oplus$ T1 $\oplus$ Y3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N42.9.176 T1 $\oplus$ Y1 $\oplus$ T4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N42.9.177 T1 $\oplus$ T1 $\oplus$ Z1	$\surd$	1	1	$\times$	-	-
N42.9.178 T1 $\oplus$ Y1 $\oplus$ Z1	$\times$	-	-	-	-	-
N42.9.179 T1 $\oplus$ T1 $\oplus$ Z2	$\surd$	1	1	$\times$	-	-
N42.9.180 T1 $\oplus$ Y1 $\oplus$ Z2	$\times$	-	-	-	-	-
N42.9.181 T1 $\oplus$ T1 $\oplus$ Z3	$\surd$	1	1	$\times$	-	-
N42.9.182 T1 $\oplus$ T1 $\oplus$ Z4	$\surd$	1	1	$\times$	-	-
N42.9.183 T1 $\oplus$ Y1 $\oplus$ Z3	$\times$	-	-	-	-	-
N42.9.184 T1 $\oplus$ T2 $\oplus$ T2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N42.9.185 T1 $\oplus$ T2 $\oplus$ Y2	$\surd$	1	1	$\times$	-	-
N42.9.186 T1 $\oplus$ Y2 $\oplus$ Y2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N42.9.187 T1 $\oplus$ T2 $\oplus$ T3	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N42.9.188 T1 $\oplus$ T2 $\oplus$ Y4	$\surd$	1	1	$\times$	-	-
N42.9.189 T1 $\oplus$ Y2 $\oplus$ T3	$\surd$	1	1	$\times$	-	-
N42.9.190 T1 $\oplus$ Y2 $\oplus$ Y4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N42.9.191 T1 $\oplus$ T2 $\oplus$ T4	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N42.9.192 T1 $\oplus$ T2 $\oplus$ Y3	$\surd$	1	1	$\times$	-	-
N42.9.193 T1 $\oplus$ Y2 $\oplus$ T4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N42.9.194 T1 $\oplus$ Y2 $\oplus$ Y3	$\surd$	1	1	$\times$	-	-
N42.9.195 T1 $\oplus$ T2 $\oplus$ Z1	$\surd$	1	1	$\times$	-	-
N42.9.196 T1 $\oplus$ Y2 $\oplus$ Z1	$\times$	-	-	-	-	-
N42.9.197 T1 $\oplus$ T2 $\oplus$ Z2	$\surd$	1	1	$\times$	-	-
N42.9.198 T1 $\oplus$ Y2 $\oplus$ Z2	$\times$	-	-	-	-	-
N42.9.199 T1 $\oplus$ T2 $\oplus$ Z3	$\surd$	1	1	$\times$	-	-
N42.9.200 T1 $\oplus$ T2 $\oplus$ Z4	$\surd$	1	1	$\times$	-	-
N42.9.201 T1 $\oplus$ Y2 $\oplus$ Z3	$\times$	-	-	-	-	-
N42.9.202 T1 $\oplus$ Y2 $\oplus$ Z4	$\times$	-	-	-	-	-

Non-coplanar SSGs with parent space group $Fmm2$ (No. 42) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N42.9.203 T1 ⊕ T3 ⊕ T3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N42.9.204 T1 ⊕ T3 ⊕ Y4	√	1	1	×	-	-
N42.9.205 T1 ⊕ Y4 ⊕ Y4	√	1	1	√	mmm	$\mathrm{B1_u}$
N42.9.206 T1 ⊕ T3 ⊕ T4	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N42.9.207 T1 ⊕ T3 ⊕ Y3	√	1	1	×	-	-
N42.9.208 T1 ⊕ Y4 ⊕ T4	√	1	1	√	mmm	$\mathrm{B3_u}$
N42.9.209 T1 ⊕ Y4 ⊕ Y3	√	1	1	×	-	-
N42.9.210 T1 ⊕ T3 ⊕ Z1	√	1	1	√	mmm	$\mathrm{B2_u}$
N42.9.211 T1 ⊕ Y4 ⊕ Z1	×	-	-	-	-	-
N42.9.212 T1 ⊕ T3 ⊕ Z2	√	1	1	√	mmm	$\mathrm{B2_u}$
N42.9.213 T1 ⊕ Y4 ⊕ Z2	×	-	-	-	-	-
N42.9.214 T1 ⊕ T3 ⊕ Z3	√	1	1	√	mmm	$\mathrm{B2_u}$
N42.9.215 T1 ⊕ T3 ⊕ Z4	√	1	1	√	mmm	$\mathrm{B2_u}$
N42.9.216 T1 ⊕ Y4 ⊕ Z3	×	-	-	-	-	-
N42.9.217 T1 ⊕ Y4 ⊕ Z4	×	-	-	-	-	-
N42.9.218 T1 ⊕ T4 ⊕ T4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N42.9.219 T1 ⊕ T4 ⊕ Y3	√	1	1	√	mmm	$\mathrm{B3_u}$
N42.9.220 T1 ⊕ Y3 ⊕ Y3	√	1	1	√	mmm	$\mathrm{B1_u}$
N42.9.221 T1 ⊕ T4 ⊕ Z1	√	1	1	√	mmm	$\mathrm{B3_u}$
N42.9.222 T1 ⊕ Y3 ⊕ Z1	×	-	-	-	-	-
N42.9.223 T1 ⊕ T4 ⊕ Z2	√	1	1	√	mmm	$\mathrm{B3_u}$
N42.9.224 T1 ⊕ Y3 ⊕ Z2	×	-	-	-	-	-
N42.9.225 T1 ⊕ T4 ⊕ Z3	√	1	1	√	mmm	$\mathrm{B3_u}$
N42.9.226 T1 ⊕ T4 ⊕ Z4	√	1	1	√	mmm	$\mathrm{B3_u}$
N42.9.227 T1 ⊕ Y3 ⊕ Z3	×	-	-	-	-	-
N42.9.228 T1 ⊕ Y3 ⊕ Z4	×	-	-	-	-	-
N42.9.229 T1 ⊕ Z1 ⊕ Z1	√	1	1	√	mmm	$\mathrm{B1_u}$
N42.9.230 T1 ⊕ Z1 ⊕ Z2	√	1	1	×	-	-
N42.9.231 T1 ⊕ Z1 ⊕ Z3	√	1	1	√	mmm	$\mathrm{B2_u}$
N42.9.232 T1 ⊕ Z1 ⊕ Z4	√	1	1	×	-	-
N42.9.233 T1 ⊕ Z2 ⊕ Z2	√	1	1	√	mmm	$\mathrm{B1_u}$
N42.9.234 T1 ⊕ Z2 ⊕ Z3	√	1	1	×	-	-
N42.9.235 T1 ⊕ Z2 ⊕ Z4	√	1	1	√	mmm	$\mathrm{B2_u}$
N42.9.236 T1 ⊕ Z3 ⊕ Z3	√	1	1	√	mmm	$\mathrm{B1_u}$
N42.9.237 T1 ⊕ Z3 ⊕ Z4	√	1	1	×	-	-
N42.9.238 T1 ⊕ Z4 ⊕ Z4	√	1	1	√	mmm	$\mathrm{B1_u}$
N42.9.239 T2 ⊕ T2 ⊕ T2	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N42.9.240 T2 ⊕ T2 ⊕ Y2	√	1	1	√	mmm	$\mathrm{B1_u}$
N42.9.241 T2 ⊕ T2 ⊕ T3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N42.9.242 T2 ⊕ T2 ⊕ Y4	√	1	1	√	mmm	$\mathrm{B1_u}$
N42.9.243 T2 ⊕ Y2 ⊕ T3	√	1	1	√	mmm	$\mathrm{B3_u}$
N42.9.244 T2 ⊕ T2 ⊕ T4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N42.9.245 T2 ⊕ T2 ⊕ Y3	√	1	1	√	mmm	$\mathrm{B1_u}$
N42.9.246 T2 ⊕ Y2 ⊕ T4	√	1	1	×	-	-
N42.9.247 T2 ⊕ T2 ⊕ Z1	√	1	1	×	-	-
N42.9.248 T2 ⊕ Y2 ⊕ Z1	×	-	-	-	-	-

Non-coplanar SSGs with parent space group $Fmm2$ (No. 42) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N42.9.249 T2 ⊕ T2 ⊕ Z2	√	1	1	×	-	-
N42.9.250 T2 ⊕ Y2 ⊕ Z2	×	-	-	-	-	-
N42.9.251 T2 ⊕ T2 ⊕ Z3	√	1	1	×	-	-
N42.9.252 T2 ⊕ T2 ⊕ Z4	√	1	1	×	-	-
N42.9.253 T2 ⊕ Y2 ⊕ Z3	×	-	-	-	-	-
N42.9.254 T2 ⊕ T3 ⊕ T3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N42.9.255 T2 ⊕ T3 ⊕ Y4	√	1	1	√	mmm	$\mathrm{B3_u}$
N42.9.256 T2 ⊕ Y4 ⊕ Y4	√	1	1	√	mmm	$\mathrm{B1_u}$
N42.9.257 T2 ⊕ T3 ⊕ T4	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N42.9.258 T2 ⊕ T3 ⊕ Y3	√	1	1	√	mmm	$\mathrm{B3_u}$
N42.9.259 T2 ⊕ Y4 ⊕ T4	√	1	1	×	-	-
N42.9.260 T2 ⊕ Y4 ⊕ Y3	√	1	1	×	-	-
N42.9.261 T2 ⊕ T3 ⊕ Z1	√	1	1	√	mmm	$\mathrm{B3_u}$
N42.9.262 T2 ⊕ Y4 ⊕ Z1	×	-	-	-	-	-
N42.9.263 T2 ⊕ T3 ⊕ Z2	√	1	1	√	mmm	$\mathrm{B3_u}$
N42.9.264 T2 ⊕ Y4 ⊕ Z2	×	-	-	-	-	-
N42.9.265 T2 ⊕ T3 ⊕ Z3	√	1	1	√	mmm	$\mathrm{B3_u}$
N42.9.266 T2 ⊕ T3 ⊕ Z4	√	1	1	√	mmm	$\mathrm{B3_u}$
N42.9.267 T2 ⊕ Y4 ⊕ Z3	×	-	-	-	-	-
N42.9.268 T2 ⊕ Y4 ⊕ Z4	×	-	-	-	-	-
N42.9.269 T2 ⊕ T4 ⊕ T4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N42.9.270 T2 ⊕ T4 ⊕ Y3	√	1	1	×	-	-
N42.9.271 T2 ⊕ Y3 ⊕ Y3	√	1	1	√	mmm	$\mathrm{B1_u}$
N42.9.272 T2 ⊕ T4 ⊕ Z1	√	1	1	√	mmm	$\mathrm{B2_u}$
N42.9.273 T2 ⊕ Y3 ⊕ Z1	×	-	-	-	-	-
N42.9.274 T2 ⊕ T4 ⊕ Z2	√	1	1	√	mmm	$\mathrm{B2_u}$
N42.9.275 T2 ⊕ Y3 ⊕ Z2	×	-	-	-	-	-
N42.9.276 T2 ⊕ T4 ⊕ Z3	√	1	1	√	mmm	$\mathrm{B2_u}$
N42.9.277 T2 ⊕ T4 ⊕ Z4	√	1	1	√	mmm	$\mathrm{B2_u}$
N42.9.278 T2 ⊕ Y3 ⊕ Z3	×	-	-	-	-	-
N42.9.279 T2 ⊕ Y3 ⊕ Z4	×	-	-	-	-	-
N42.9.280 T2 ⊕ Z1 ⊕ Z1	√	1	1	√	mmm	$\mathrm{B1_u}$
N42.9.281 T2 ⊕ Z1 ⊕ Z2	√	1	1	×	-	-
N42.9.282 T2 ⊕ Z1 ⊕ Z3	√	1	1	√	mmm	$\mathrm{B2_u}$
N42.9.283 T2 ⊕ Z1 ⊕ Z4	√	1	1	×	-	-
N42.9.284 T2 ⊕ Z2 ⊕ Z2	√	1	1	√	mmm	$\mathrm{B1_u}$
N42.9.285 T2 ⊕ Z2 ⊕ Z3	√	1	1	×	-	-
N42.9.286 T2 ⊕ Z2 ⊕ Z4	√	1	1	√	mmm	$\mathrm{B2_u}$
N42.9.287 T2 ⊕ Z3 ⊕ Z3	√	1	1	√	mmm	$\mathrm{B1_u}$
N42.9.288 T2 ⊕ Z3 ⊕ Z4	√	1	1	×	-	-
N42.9.289 T2 ⊕ Z4 ⊕ Z4	√	1	1	√	mmm	$\mathrm{B1_u}$
N42.9.290 T3 ⊕ T3 ⊕ T3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N42.9.291 T3 ⊕ T3 ⊕ Y4	√	1	1	√	mmm	$\mathrm{B1_u}$
N42.9.292 T3 ⊕ T3 ⊕ T4	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N42.9.293 T3 ⊕ T3 ⊕ Y3	√	1	1	√	mmm	$\mathrm{B1_u}$
N42.9.294 T3 ⊕ Y4 ⊕ T4	√	1	1	×	-	-

Non-coplanar SSGs with parent space group $Fmm2$ (No. 42) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N42.9.295 T3 $\oplus$ T3 $\oplus$ Z1	$\surd$	1	1	$\times$	-	-
N42.9.296 T3 $\oplus$ Y4 $\oplus$ Z1	$\times$	-	-	-	-	-
N42.9.297 T3 $\oplus$ T3 $\oplus$ Z2	$\surd$	1	1	$\times$	-	-
N42.9.298 T3 $\oplus$ Y4 $\oplus$ Z2	$\times$	-	-	-	-	-
N42.9.299 T3 $\oplus$ T3 $\oplus$ Z3	$\surd$	1	1	$\times$	-	-
N42.9.300 T3 $\oplus$ T3 $\oplus$ Z4	$\surd$	1	1	$\times$	-	-
N42.9.301 T3 $\oplus$ Y4 $\oplus$ Z3	$\times$	-	-	-	-	-
N42.9.302 T3 $\oplus$ T4 $\oplus$ T4	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N42.9.303 T3 $\oplus$ T4 $\oplus$ Y3	$\surd$	1	1	$\times$	-	-
N42.9.304 T3 $\oplus$ Y3 $\oplus$ Y3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N42.9.305 T3 $\oplus$ T4 $\oplus$ Z1	$\surd$	1	1	$\times$	-	-
N42.9.306 T3 $\oplus$ Y3 $\oplus$ Z1	$\times$	-	-	-	-	-
N42.9.307 T3 $\oplus$ T4 $\oplus$ Z2	$\surd$	1	1	$\times$	-	-
N42.9.308 T3 $\oplus$ Y3 $\oplus$ Z2	$\times$	-	-	-	-	-
N42.9.309 T3 $\oplus$ T4 $\oplus$ Z3	$\surd$	1	1	$\times$	-	-
N42.9.310 T3 $\oplus$ T4 $\oplus$ Z4	$\surd$	1	1	$\times$	-	-
N42.9.311 T3 $\oplus$ Y3 $\oplus$ Z3	$\times$	-	-	-	-	-
N42.9.312 T3 $\oplus$ Y3 $\oplus$ Z4	$\times$	-	-	-	-	-
N42.9.313 T3 $\oplus$ Z1 $\oplus$ Z1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N42.9.314 T3 $\oplus$ Z1 $\oplus$ Z2	$\surd$	1	1	$\times$	-	-
N42.9.315 T3 $\oplus$ Z1 $\oplus$ Z3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N42.9.316 T3 $\oplus$ Z1 $\oplus$ Z4	$\surd$	1	1	$\times$	-	-
N42.9.317 T3 $\oplus$ Z2 $\oplus$ Z2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N42.9.318 T3 $\oplus$ Z2 $\oplus$ Z3	$\surd$	1	1	$\times$	-	-
N42.9.319 T3 $\oplus$ Z2 $\oplus$ Z4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N42.9.320 T3 $\oplus$ Z3 $\oplus$ Z3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N42.9.321 T3 $\oplus$ Z3 $\oplus$ Z4	$\surd$	1	1	$\times$	-	-
N42.9.322 T3 $\oplus$ Z4 $\oplus$ Z4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N42.9.323 T4 $\oplus$ T4 $\oplus$ T4	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N42.9.324 T4 $\oplus$ T4 $\oplus$ Y3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N42.9.325 T4 $\oplus$ T4 $\oplus$ Z1	$\surd$	1	1	$\times$	-	-
N42.9.326 T4 $\oplus$ Y3 $\oplus$ Z1	$\times$	-	-	-	-	-
N42.9.327 T4 $\oplus$ T4 $\oplus$ Z2	$\surd$	1	1	$\times$	-	-
N42.9.328 T4 $\oplus$ Y3 $\oplus$ Z2	$\times$	-	-	-	-	-
N42.9.329 T4 $\oplus$ T4 $\oplus$ Z3	$\surd$	1	1	$\times$	-	-
N42.9.330 T4 $\oplus$ T4 $\oplus$ Z4	$\surd$	1	1	$\times$	-	-
N42.9.331 T4 $\oplus$ Y3 $\oplus$ Z3	$\times$	-	-	-	-	-
N42.9.332 T4 $\oplus$ Z1 $\oplus$ Z1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N42.9.333 T4 $\oplus$ Z1 $\oplus$ Z2	$\surd$	1	1	$\times$	-	-
N42.9.334 T4 $\oplus$ Z1 $\oplus$ Z3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N42.9.335 T4 $\oplus$ Z1 $\oplus$ Z4	$\surd$	1	1	$\times$	-	-
N42.9.336 T4 $\oplus$ Z2 $\oplus$ Z2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N42.9.337 T4 $\oplus$ Z2 $\oplus$ Z3	$\surd$	1	1	$\times$	-	-
N42.9.338 T4 $\oplus$ Z2 $\oplus$ Z4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N42.9.339 T4 $\oplus$ Z3 $\oplus$ Z3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N42.9.340 T4 $\oplus$ Z3 $\oplus$ Z4	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $Fmm2$ (No. 42) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N42.9.341 T4 ⊕ Z4 ⊕ Z4	√	1	1	√	mmm	$\mathrm{B1_u}$
N42.9.342 Z1 ⊕ Z1 ⊕ Z1	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N42.9.343 Z1 ⊕ Z1 ⊕ Z2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N42.9.344 Z1 ⊕ Z1 ⊕ Z3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N42.9.345 Z1 ⊕ Z2 ⊕ Z2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N42.9.346 Z1 ⊕ Z2 ⊕ Z3	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N42.9.347 Z1 ⊕ Z3 ⊕ Z3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N42.9.348 Z1 ⊕ Z3 ⊕ Z4	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N42.9.349 Z2 ⊕ Z2 ⊕ Z2	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N42.9.350 Z2 ⊕ Z2 ⊕ Z3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N42.9.351 Z2 ⊕ Z3 ⊕ Z3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N42.9.352 Z2 ⊕ Z3 ⊕ Z4	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N42.9.353 Z3 ⊕ Z3 ⊕ Z3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N42.9.354 Z3 ⊕ Z3 ⊕ Z4	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N42.11.1 GM2 ⊕ LD1LE1	√	1	1	√	222	B1
N42.11.2 GM2 ⊕ LD2LE2	√	1	1	√	222	B1
N42.11.3 GM2 ⊕ LD3LE3	√	1	1	√	222	B1
N42.11.4 GM2 ⊕ H1HA1	√	1	1	×	-	-
N42.11.5 GM2 ⊕ H2HA2	√	1	1	×	-	-
N42.11.6 GM2 ⊕ H3HA3	√	1	1	×	-	-
N42.11.7 GM3 ⊕ LD1LE1	√	1	1	√	$mm2$	B2
N42.11.8 GM3 ⊕ LD2LE2	√	1	1	√	$mm2$	B2
N42.11.9 GM3 ⊕ LD3LE3	√	1	1	√	$mm2$	B2
N42.11.10 GM3 ⊕ LD4LE4	√	1	1	√	$mm2$	B2
N42.11.11 GM3 ⊕ H1HA1	√	1	1	×	-	-
N42.11.12 GM3 ⊕ H2HA2	√	1	1	×	-	-
N42.11.13 GM3 ⊕ H3HA3	√	1	1	×	-	-
N42.11.14 GM3 ⊕ H4HA4	√	1	1	×	-	-
N42.11.15 T1 ⊕ LD1LE1	√	1	1	√	mmm	$\mathrm{B1_u}$
N42.11.16 T1 ⊕ LD2LE2	√	1	1	√	mmm	$\mathrm{B1_u}$
N42.11.17 T1 ⊕ LD3LE3	√	1	1	√	mmm	$\mathrm{B1_u}$
N42.11.18 T1 ⊕ LD4LE4	√	1	1	√	mmm	$\mathrm{B1_u}$
N42.11.19 T1 ⊕ H1HA1	√	1	1	√	mmm	$\mathrm{B1_u}$
N42.11.20 T1 ⊕ H2HA2	√	1	1	√	mmm	$\mathrm{B1_u}$
N42.11.21 T1 ⊕ H3HA3	√	1	1	√	mmm	$\mathrm{B1_u}$
N42.11.22 T1 ⊕ H4HA4	√	1	1	√	mmm	$\mathrm{B1_u}$
N42.11.23 T2 ⊕ LD1LE1	√	1	1	√	mmm	$\mathrm{B1_u}$
N42.11.24 T2 ⊕ LD2LE2	√	1	1	√	mmm	$\mathrm{B1_u}$
N42.11.25 T2 ⊕ LD3LE3	√	1	1	√	mmm	$\mathrm{B1_u}$
N42.11.26 T2 ⊕ LD4LE4	√	1	1	√	mmm	$\mathrm{B1_u}$
N42.11.27 T2 ⊕ H1HA1	√	1	1	√	mmm	$\mathrm{B1_u}$
N42.11.28 T2 ⊕ H2HA2	√	1	1	√	mmm	$\mathrm{B1_u}$
N42.11.29 T2 ⊕ H3HA3	√	1	1	√	mmm	$\mathrm{B1_u}$
N42.11.30 T2 ⊕ H4HA4	√	1	1	√	mmm	$\mathrm{B1_u}$
N42.11.31 T3 ⊕ LD1LE1	√	1	1	√	mmm	$\mathrm{B1_u}$
N42.11.32 T3 ⊕ LD2LE2	√	1	1	√	mmm	$\mathrm{B1_u}$

Non-coplanar SSGs with parent space group $Fmm2$ (No. 42) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N42.11.33 T3 ⊕ LD3LE3	√	1	1	√	mmm	$\mathrm{B1_u}$
N42.11.34 T3 ⊕ LD4LE4	√	1	1	√	mmm	$\mathrm{B1_u}$
N42.11.35 T3 ⊕ H1HA1	√	1	1	√	mmm	$\mathrm{B1_u}$
N42.11.36 T3 ⊕ H2HA2	√	1	1	√	mmm	$\mathrm{B1_u}$
N42.11.37 T3 ⊕ H3HA3	√	1	1	√	mmm	$\mathrm{B1_u}$
N42.11.38 T3 ⊕ H4HA4	√	1	1	√	mmm	$\mathrm{B1_u}$
N42.11.39 T4 ⊕ LD1LE1	√	1	1	√	mmm	$\mathrm{B1_u}$
N42.11.40 T4 ⊕ LD2LE2	√	1	1	√	mmm	$\mathrm{B1_u}$
N42.11.41 T4 ⊕ LD3LE3	√	1	1	√	mmm	$\mathrm{B1_u}$
N42.11.42 T4 ⊕ LD4LE4	√	1	1	√	mmm	$\mathrm{B1_u}$
N42.11.43 T4 ⊕ H1HA1	√	1	1	√	mmm	$\mathrm{B1_u}$
N42.11.44 T4 ⊕ H2HA2	√	1	1	√	mmm	$\mathrm{B1_u}$
N42.11.45 T4 ⊕ H3HA3	√	1	1	√	mmm	$\mathrm{B1_u}$
N42.11.46 T4 ⊕ H4HA4	√	1	1	√	mmm	$\mathrm{B1_u}$
N42.11.47 Z1 ⊕ LD1LE1	√	1	1	√	mmm	$\mathrm{B1_u}$
N42.11.48 Z1 ⊕ LD2LE2	√	1	1	√	mmm	$\mathrm{B1_u}$
N42.11.49 Z1 ⊕ LD3LE3	√	1	1	√	mmm	$\mathrm{B1_u}$
N42.11.50 Z1 ⊕ H1HA1	√	1	1	×	-	-
N42.11.51 Z1 ⊕ H2HA2	√	1	1	×	-	-
N42.11.52 Z1 ⊕ H3HA3	√	1	1	×	-	-
N42.11.53 Z2 ⊕ LD1LE1	√	1	1	√	mmm	$\mathrm{B1_u}$
N42.11.54 Z2 ⊕ LD2LE2	√	1	1	√	mmm	$\mathrm{B1_u}$
N42.11.55 Z2 ⊕ LD3LE3	√	1	1	√	mmm	$\mathrm{B1_u}$
N42.11.56 Z2 ⊕ H1HA1	√	1	1	×	-	-
N42.11.57 Z2 ⊕ H2HA2	√	1	1	×	-	-
N42.11.58 Z2 ⊕ H3HA3	√	1	1	×	-	-
N42.11.59 Z3 ⊕ LD1LE1	√	1	1	√	mmm	$\mathrm{B1_u}$
N42.11.60 Z3 ⊕ LD2LE2	√	1	1	√	mmm	$\mathrm{B1_u}$
N42.11.61 Z3 ⊕ LD3LE3	√	1	1	√	mmm	$\mathrm{B1_u}$
N42.11.62 Z3 ⊕ LD4LE4	√	1	1	√	mmm	$\mathrm{B1_u}$
N42.11.63 Z3 ⊕ H1HA1	√	1	1	×	-	-
N42.11.64 Z3 ⊕ H2HA2	√	1	1	×	-	-
N42.11.65 Z3 ⊕ H3HA3	√	1	1	×	-	-
N42.11.66 Z3 ⊕ H4HA4	√	1	1	×	-	-
N42.14.1 GM2 ⊕ DT1	√	1	1	√	$mm2$	B2
N42.14.2 GM2 ⊕ DT2	√	1	1	√	$mm2$	B2
N42.14.3 GM2 ⊕ A1	√	1	1	×	-	-
N42.14.4 GM2 ⊕ A2	√	1	1	×	-	-
N42.14.5 GM3 ⊕ SM1	√	1	1	√	222	B3
N42.14.6 GM3 ⊕ DT1	√	1	1	√	$mm2$	B2
N42.14.7 GM3 ⊕ SM2	√	1	1	√	222	B3
N42.14.8 GM3 ⊕ DT2	√	1	1	√	$mm2$	B2
N42.14.9 GM3 ⊕ A1	√	1	1	×	-	-
N42.14.10 GM3 ⊕ B1	√	1	1	×	-	-
N42.14.11 GM3 ⊕ A2	√	1	1	×	-	-
N42.14.12 GM3 ⊕ B2	√	1	1	×	-	-

Non-coplanar SSGs with parent space group $Fmm2$ (No. 42) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N42.14.13 T1 $\oplus$ SM1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N42.14.14 T1 $\oplus$ DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N42.14.15 T1 $\oplus$ SM2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N42.14.16 T1 $\oplus$ DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N42.14.17 T1 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
N42.14.18 T1 $\oplus$ B1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N42.14.19 T1 $\oplus$ A2	$\surd$	1	1	$\times$	-	-
N42.14.20 T1 $\oplus$ B2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N42.14.21 T2 $\oplus$ SM1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N42.14.22 T2 $\oplus$ DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N42.14.23 T2 $\oplus$ SM2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N42.14.24 T2 $\oplus$ DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N42.14.25 T2 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
N42.14.26 T2 $\oplus$ B1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N42.14.27 T2 $\oplus$ A2	$\surd$	1	1	$\times$	-	-
N42.14.28 T2 $\oplus$ B2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N42.14.29 T3 $\oplus$ SM1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N42.14.30 T3 $\oplus$ DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N42.14.31 T3 $\oplus$ SM2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N42.14.32 T3 $\oplus$ DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N42.14.33 T3 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
N42.14.34 T3 $\oplus$ B1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N42.14.35 T3 $\oplus$ A2	$\surd$	1	1	$\times$	-	-
N42.14.36 T3 $\oplus$ B2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N42.14.37 T4 $\oplus$ SM1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N42.14.38 T4 $\oplus$ DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N42.14.39 T4 $\oplus$ SM2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N42.14.40 T4 $\oplus$ DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N42.14.41 T4 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
N42.14.42 T4 $\oplus$ B1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N42.14.43 T4 $\oplus$ A2	$\surd$	1	1	$\times$	-	-
N42.14.44 T4 $\oplus$ B2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N42.14.45 Z1 $\oplus$ DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N42.14.46 Z1 $\oplus$ DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N42.14.47 Z1 $\oplus$ A1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N42.14.48 Z1 $\oplus$ A2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N42.14.49 Z2 $\oplus$ DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N42.14.50 Z2 $\oplus$ DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N42.14.51 Z2 $\oplus$ A1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N42.14.52 Z2 $\oplus$ A2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N42.14.53 Z3 $\oplus$ SM1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N42.14.54 Z3 $\oplus$ DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N42.14.55 Z3 $\oplus$ SM2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N42.14.56 Z3 $\oplus$ DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N42.14.57 Z3 $\oplus$ A1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N42.14.58 Z3 $\oplus$ B1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$

Non-coplanar SSGs with parent space group $Fmm2$ (No. 42) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N42.14.59 Z3 $\oplus$ A2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N42.14.60 Z3 $\oplus$ B2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$

TABLE S127: Collinear SSGs with parent space group $Fdd2$ (No. 43).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L43.1.1 GM1	1	mmm	$\mathrm{A_g}$
L43.2.1 GM2	1	mmm	$\mathrm{B1_g}$
L43.2.2 GM3	1	mmm	$\mathrm{B3_g}$

TABLE S128: Coplanar SSGs with parent space group $Fdd2$ (No. 43).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P43.1.1 GM1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B1_u}$
P43.2.1 GM2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$
P43.2.2 GM3	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
P43.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
P43.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
P43.3.3 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
P43.3.4 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
P43.4.1 Z1Z2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P43.4.2 Z3Z4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P43.5.1 LD1LE1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P43.5.2 LD3LE3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P43.6.1 T1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P43.8.1 DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$

TABLE S129: Non-coplanar SSGs with parent space group $Fdd2$ (No. 43).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N43.1.1 GM1	$\surd$	3	3	$\surd$	$mm2$	A1 $\oplus$ A1 $\oplus$ A1
N43.2.1 GM2	$\surd$	3	3	$\surd$	222	A1 $\oplus$ A1 $\oplus$ B1
N43.2.2 GM3	$\surd$	3	3	$\surd$	$mm2$	A1 $\oplus$ A1 $\oplus$ B2
N43.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$mm2$	A1 $\oplus$ A2 $\oplus$ A2
N43.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$mm2$	A1 $\oplus$ A2 $\oplus$ B2
N43.3.3 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	$mm2$	A1 $\oplus$ B2 $\oplus$ B2
N43.3.4 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	222	A1 $\oplus$ B3 $\oplus$ B2
N43.4.1 Z1Z2	$\surd$	1	1	$\surd$	$mm2$	A1
N43.4.2 Z3Z4	$\surd$	1	1	$\surd$	$mm2$	A1
N43.5.1 LD1LE1	$\surd$	1	1	$\surd$	$mm2$	A1
N43.5.2 LD3LE3	$\surd$	1	1	$\surd$	$mm2$	A1
N43.6.1 T1	$\surd$	1	1	$\surd$	$mm2$	A1
N43.8.1 DT1	$\surd$	1	1	$\surd$	$mm2$	A1

Non-coplanar SSGs with parent space group $Fdd2$ (No. 43) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N43.9.1 GM2 $\oplus$ GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	222	B1 $\oplus$ B1 $\oplus$ B1
N43.9.2 GM2 $\oplus$ GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$mm2$	B2 $\oplus$ B1 $\oplus$ B1
N43.9.3 GM2 $\oplus$ GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	222	B1 $\oplus$ B3 $\oplus$ B3
N43.9.4 GM2 $\oplus$ GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	$mm2$	A2 $\oplus$ B2 $\oplus$ B1
N43.9.5 GM3 $\oplus$ GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	$mm2$	B2 $\oplus$ B2 $\oplus$ B2
N43.9.6 GM3 $\oplus$ GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	$mm2$	A2 $\oplus$ A2 $\oplus$ B1
N43.10.1 GM2 $\oplus$ Z1Z2	$\surd$	1	1	$\surd$	222	B1
N43.10.2 GM2 $\oplus$ Z3Z4	$\surd$	1	1	$\surd$	222	B1
N43.10.3 GM3 $\oplus$ Z1Z2	$\surd$	1	1	$\surd$	$mm2$	B2
N43.10.4 GM3 $\oplus$ Z3Z4	$\surd$	1	1	$\surd$	$mm2$	B2
N43.11.1 GM2 $\oplus$ LD1LE1	$\surd$	1	1	$\surd$	222	B1
N43.11.2 GM2 $\oplus$ LD3LE3	$\surd$	1	1	$\surd$	222	B1
N43.11.3 GM3 $\oplus$ LD1LE1	$\surd$	1	1	$\surd$	$mm2$	B2
N43.11.4 GM3 $\oplus$ LD3LE3	$\surd$	1	1	$\surd$	$mm2$	B2
N43.12.1 GM2 $\oplus$ T1	$\surd$	1	1	$\surd$	$mm2$	B1
N43.12.2 GM3 $\oplus$ T1	$\surd$	1	1	$\surd$	222	B3
N43.12.3 GM3 $\oplus$ Y1	$\surd$	1	1	$\surd$	$mm2$	B2
N43.14.1 GM2 $\oplus$ DT1	$\surd$	1	1	$\surd$	$mm2$	B2
N43.14.2 GM3 $\oplus$ SM1	$\surd$	1	1	$\surd$	222	B3
N43.14.3 GM3 $\oplus$ DT1	$\surd$	1	1	$\surd$	$mm2$	B2

TABLE S130: Collinear SSGs with parent space group $Imm2$ (No. 44).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L44.1.1 GM1	1	mmm	$\mathrm{A_g}$
L44.2.1 GM2	1	mmm	$\mathrm{B1_g}$
L44.2.2 GM3	1	mmm	$\mathrm{B3_g}$
L44.2.3 X1	0	-	-
L44.2.4 X2	0	-	-
L44.2.5 X3	0	-	-

TABLE S131: Coplanar SSGs with parent space group $Imm2$ (No. 44).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P44.1.1 GM1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B1_u}$
P44.2.1 GM2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$
P44.2.2 GM3	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
P44.2.3 X1	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P44.2.4 X2	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P44.2.5 X3	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P44.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
P44.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
P44.3.3 GM2 $\oplus$ X1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
P44.3.4 GM2 $\oplus$ X2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
P44.3.5 GM2 $\oplus$ X3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$

Coplanar SSGs with parent space group $Imm2$ (No. 44) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P44.3.6 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
P44.3.7 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
P44.3.8 GM3 $\oplus$ X1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
P44.3.9 GM3 $\oplus$ X2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
P44.3.10 GM3 $\oplus$ X3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
P44.3.11 GM3 $\oplus$ X4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
P44.3.12 X1 $\oplus$ X1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P44.3.13 X1 $\oplus$ X2	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_u}$
P44.3.14 X1 $\oplus$ X3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P44.3.15 X2 $\oplus$ X2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P44.3.16 X2 $\oplus$ X3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P44.3.17 X3 $\oplus$ X3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P44.3.18 X3 $\oplus$ X4	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_u}$
P44.5.1 LD1LE1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P44.5.2 LD2LE2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P44.5.3 LD3LE3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P44.7.1 R1	$\times$	-	-	-	-	-
P44.7.2 R2	$\times$	-	-	-	-	-
P44.7.3 T1	$\times$	-	-	-	-	-
P44.7.4 W1	$\surd$	1	1	$\times$	-	-
P44.8.1 DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P44.8.2 DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$

TABLE S132: Non-coplanar SSGs with parent space group $Imm2$ (No. 44).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N44.1.1 GM1	$\surd$	3	3	$\surd$	$mm2$	A1 $\oplus$ A1 $\oplus$ A1
N44.2.1 GM2	$\surd$	3	3	$\surd$	222	A1 $\oplus$ A1 $\oplus$ B1
N44.2.2 GM3	$\surd$	3	3	$\surd$	$mm2$	A1 $\oplus$ A1 $\oplus$ B2
N44.2.3 X1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B1_u}$
N44.2.4 X2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B1_u}$
N44.2.5 X3	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B1_u}$
N44.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$mm2$	A1 $\oplus$ A2 $\oplus$ A2
N44.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$mm2$	A1 $\oplus$ A2 $\oplus$ B2
N44.3.3 GM2 $\oplus$ X1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$
N44.3.4 GM2 $\oplus$ X2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$
N44.3.5 GM2 $\oplus$ X3	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$
N44.3.6 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	$mm2$	A1 $\oplus$ B2 $\oplus$ B2
N44.3.7 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	222	A1 $\oplus$ B3 $\oplus$ B2
N44.3.8 GM3 $\oplus$ X1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N44.3.9 GM3 $\oplus$ X2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N44.3.10 GM3 $\oplus$ X3	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N44.3.11 GM3 $\oplus$ X4	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N44.3.12 X1 $\oplus$ X1	$\surd$	1	1	$\surd$	$mm2$	A1
N44.3.13 X1 $\oplus$ X2	$\surd$	1	1	$\surd$	222	A1
N44.3.14 X1 $\oplus$ X3	$\surd$	1	1	$\surd$	$mm2$	A1

Non-coplanar SSGs with parent space group $Imm2$ (No. 44) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N44.3.15 X2 ⊕ X2	√	1	1	√	$mm2$	A1
N44.3.16 X2 ⊕ X3	√	1	1	√	$mm2$	A1
N44.3.17 X3 ⊕ X3	√	1	1	√	$mm2$	A1
N44.3.18 X3 ⊕ X4	√	1	1	√	222	A1
N44.5.1 LD1LE1	√	1	1	√	$mm2$	A1
N44.5.2 LD2LE2	√	1	1	√	$mm2$	A1
N44.5.3 LD3LE3	√	1	1	√	$mm2$	A1
N44.7.1 R1	√	1	1	√	mmm	$\mathrm{A_g}$
N44.7.2 R2	√	1	1	√	mmm	$\mathrm{A_g}$
N44.7.3 T1	√	1	1	√	mmm	$\mathrm{A_g}$
N44.7.4 W1	√	1	1	√	222	A1
N44.8.1 DT1	√	1	1	√	$mm2$	A1
N44.8.2 DT2	√	1	1	√	$mm2$	A1
N44.9.1 GM2 ⊕ GM2 ⊕ GM2	√	3	3	√	222	B1 ⊕ B1 ⊕ B1
N44.9.2 GM2 ⊕ GM2 ⊕ GM3	√	3	3	√	$mm2$	B2 ⊕ B1 ⊕ B1
N44.9.3 GM2 ⊕ GM2 ⊕ X1	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N44.9.4 GM2 ⊕ GM2 ⊕ X2	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N44.9.5 GM2 ⊕ GM2 ⊕ X3	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N44.9.6 GM2 ⊕ GM3 ⊕ GM3	√	3	3	√	222	B1 ⊕ B3 ⊕ B3
N44.9.7 GM2 ⊕ GM3 ⊕ GM4	√	3	3	√	$mm2$	A2 ⊕ B2 ⊕ B1
N44.9.8 GM2 ⊕ GM3 ⊕ X1	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N44.9.9 GM2 ⊕ GM3 ⊕ X2	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N44.9.10 GM2 ⊕ GM3 ⊕ X3	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N44.9.11 GM2 ⊕ GM3 ⊕ X4	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N44.9.12 GM2 ⊕ X1 ⊕ X1	√	1	1	√	222	B1
N44.9.13 GM2 ⊕ X1 ⊕ X2	√	1	1	√	$mm2$	A2
N44.9.14 GM2 ⊕ X1 ⊕ X3	√	1	1	√	$mm2$	B2
N44.9.15 GM2 ⊕ X2 ⊕ X2	√	1	1	√	222	B1
N44.9.16 GM2 ⊕ X2 ⊕ X3	√	1	1	√	$mm2$	B1
N44.9.17 GM2 ⊕ X3 ⊕ X3	√	1	1	√	222	B1
N44.9.18 GM2 ⊕ X3 ⊕ X4	√	1	1	√	$mm2$	A2
N44.9.19 GM3 ⊕ GM3 ⊕ GM3	√	3	3	√	$mm2$	B2 ⊕ B2 ⊕ B2
N44.9.20 GM3 ⊕ GM3 ⊕ GM4	√	3	3	√	$mm2$	A2 ⊕ A2 ⊕ B1
N44.9.21 GM3 ⊕ GM3 ⊕ X1	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N44.9.22 GM3 ⊕ GM4 ⊕ X1	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N44.9.23 GM3 ⊕ GM3 ⊕ X2	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N44.9.24 GM3 ⊕ GM4 ⊕ X2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N44.9.25 GM3 ⊕ GM3 ⊕ X3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N44.9.26 GM3 ⊕ GM3 ⊕ X4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N44.9.27 GM3 ⊕ GM4 ⊕ X3	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N44.9.28 GM3 ⊕ X1 ⊕ X1	√	1	1	√	$mm2$	B2
N44.9.29 GM3 ⊕ X1 ⊕ X2	√	1	1	√	$mm2$	A2
N44.9.30 GM3 ⊕ X1 ⊕ X3	√	1	1	√	$mm2$	B2
N44.9.31 GM3 ⊕ X1 ⊕ X4	√	1	1	√	222	B3
N44.9.32 GM3 ⊕ X2 ⊕ X2	√	1	1	√	$mm2$	B2
N44.9.33 GM3 ⊕ X2 ⊕ X3	√	1	1	√	222	B3

Non-coplanar SSGs with parent space group $Imm2$ (No. 44) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N44.9.34 GM3 ⊕ X2 ⊕ X4	√	1	1	√	$mm2$	B2
N44.9.35 GM3 ⊕ X3 ⊕ X3	√	1	1	√	$mm2$	B2
N44.9.36 GM3 ⊕ X3 ⊕ X4	√	1	1	√	$mm2$	A2
N44.9.37 GM3 ⊕ X4 ⊕ X4	√	1	1	√	$mm2$	B2
N44.9.38 X1 ⊕ X1 ⊕ X1	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N44.9.39 X1 ⊕ X1 ⊕ X2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N44.9.40 X1 ⊕ X1 ⊕ X3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N44.9.41 X1 ⊕ X2 ⊕ X2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N44.9.42 X1 ⊕ X2 ⊕ X3	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N44.9.43 X1 ⊕ X3 ⊕ X3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N44.9.44 X1 ⊕ X3 ⊕ X4	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N44.9.45 X2 ⊕ X2 ⊕ X2	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N44.9.46 X2 ⊕ X2 ⊕ X3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N44.9.47 X2 ⊕ X3 ⊕ X3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N44.9.48 X2 ⊕ X3 ⊕ X4	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N44.9.49 X3 ⊕ X3 ⊕ X3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N44.9.50 X3 ⊕ X3 ⊕ X4	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N44.11.1 GM2 ⊕ LD1LE1	√	1	1	√	222	B1
N44.11.2 GM2 ⊕ LD2LE2	√	1	1	√	222	B1
N44.11.3 GM2 ⊕ LD3LE3	√	1	1	√	222	B1
N44.11.4 GM3 ⊕ LD1LE1	√	1	1	√	$mm2$	B2
N44.11.5 GM3 ⊕ LD2LE2	√	1	1	√	$mm2$	B2
N44.11.6 GM3 ⊕ LD3LE3	√	1	1	√	$mm2$	B2
N44.11.7 GM3 ⊕ LD4LE4	√	1	1	√	$mm2$	B2
N44.11.8 X1 ⊕ LD1LE1	√	1	1	√	mmm	$\mathrm{B1_u}$
N44.11.9 X1 ⊕ LD2LE2	√	1	1	√	mmm	$\mathrm{B1_u}$
N44.11.10 X1 ⊕ LD3LE3	√	1	1	√	mmm	$\mathrm{B1_u}$
N44.11.11 X2 ⊕ LD1LE1	√	1	1	√	mmm	$\mathrm{B1_u}$
N44.11.12 X2 ⊕ LD2LE2	√	1	1	√	mmm	$\mathrm{B1_u}$
N44.11.13 X2 ⊕ LD3LE3	√	1	1	√	mmm	$\mathrm{B1_u}$
N44.11.14 X3 ⊕ LD1LE1	√	1	1	√	mmm	$\mathrm{B1_u}$
N44.11.15 X3 ⊕ LD2LE2	√	1	1	√	mmm	$\mathrm{B1_u}$
N44.11.16 X3 ⊕ LD3LE3	√	1	1	√	mmm	$\mathrm{B1_u}$
N44.11.17 X3 ⊕ LD4LE4	√	1	1	√	mmm	$\mathrm{B1_u}$
N44.13.1 GM2 ⊕ R1	√	1	1	×	-	-
N44.13.2 GM2 ⊕ R2	√	1	1	×	-	-
N44.13.3 GM2 ⊕ T1	√	1	1	×	-	-
N44.13.4 GM2 ⊕ W1	√	1	1	×	-	-
N44.13.5 GM3 ⊕ S1	√	1	1	×	-	-
N44.13.6 GM3 ⊕ R1	√	1	1	×	-	-
N44.13.7 GM3 ⊕ S2	√	1	1	×	-	-
N44.13.8 GM3 ⊕ R2	√	1	1	×	-	-
N44.13.9 GM3 ⊕ T1	√	1	1	×	-	-
N44.13.10 GM3 ⊕ W1	√	1	1	×	-	-
N44.13.11 X1 ⊕ R1	×	-	-	-	-	-
N44.13.12 X1 ⊕ R2	×	-	-	-	-	-

Non-coplanar SSGs with parent space group $Imm2$ (No. 44) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N44.13.13 X1 $\oplus$ T1	$\times$	-	-	-	-	-
N44.13.14 X1 $\oplus$ W1	$\surd$	1	1	$\times$	-	-
N44.13.15 X2 $\oplus$ R1	$\times$	-	-	-	-	-
N44.13.16 X2 $\oplus$ R2	$\times$	-	-	-	-	-
N44.13.17 X2 $\oplus$ T1	$\times$	-	-	-	-	-
N44.13.18 X2 $\oplus$ W1	$\surd$	1	1	$\times$	-	-
N44.13.19 X3 $\oplus$ S1	$\times$	-	-	-	-	-
N44.13.20 X3 $\oplus$ R1	$\times$	-	-	-	-	-
N44.13.21 X3 $\oplus$ S2	$\times$	-	-	-	-	-
N44.13.22 X3 $\oplus$ R2	$\times$	-	-	-	-	-
N44.13.23 X3 $\oplus$ T1	$\times$	-	-	-	-	-
N44.13.24 X3 $\oplus$ W1	$\surd$	1	1	$\times$	-	-
N44.14.1 GM2 $\oplus$ DT1	$\surd$	1	1	$\surd$	$mm2$	B2
N44.14.2 GM2 $\oplus$ DT2	$\surd$	1	1	$\surd$	$mm2$	B2
N44.14.3 GM3 $\oplus$ SM1	$\surd$	1	1	$\surd$	222	B3
N44.14.4 GM3 $\oplus$ DT1	$\surd$	1	1	$\surd$	$mm2$	B2
N44.14.5 GM3 $\oplus$ SM2	$\surd$	1	1	$\surd$	222	B3
N44.14.6 GM3 $\oplus$ DT2	$\surd$	1	1	$\surd$	$mm2$	B2
N44.14.7 X1 $\oplus$ DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N44.14.8 X1 $\oplus$ DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N44.14.9 X2 $\oplus$ DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N44.14.10 X2 $\oplus$ DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N44.14.11 X3 $\oplus$ SM1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N44.14.12 X3 $\oplus$ DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N44.14.13 X3 $\oplus$ SM2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N44.14.14 X3 $\oplus$ DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$

TABLE S133: Collinear SSGs with parent space group $Iba2$ (No. 45).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L45.1.1 GM1	1	mmm	$\mathrm{A_g}$
L45.2.1 GM2	1	mmm	$\mathrm{B1_g}$
L45.2.2 GM3	1	mmm	$\mathrm{B3_g}$
L45.2.3 X1	0	-	-
L45.2.4 X2	0	-	-
L45.2.5 X3	0	-	-

TABLE S134: Coplanar SSGs with parent space group $Iba2$ (No. 45).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P45.1.1 GM1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B1_u}$
P45.2.1 GM2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$
P45.2.2 GM3	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
P45.2.3 X1	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P45.2.4 X2	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P45.2.5 X3	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$

Coplanar SSGs with parent space group $Iba2$ (No. 45) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P45.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
P45.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
P45.3.3 GM2 $\oplus$ X1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
P45.3.4 GM2 $\oplus$ X2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
P45.3.5 GM2 $\oplus$ X3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
P45.3.6 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
P45.3.7 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
P45.3.8 GM3 $\oplus$ X1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
P45.3.9 GM3 $\oplus$ X2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
P45.3.10 GM3 $\oplus$ X3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
P45.3.11 GM3 $\oplus$ X4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
P45.3.12 X1 $\oplus$ X1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P45.3.13 X1 $\oplus$ X2	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_u}$
P45.3.14 X1 $\oplus$ X3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P45.3.15 X2 $\oplus$ X2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P45.3.16 X2 $\oplus$ X3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P45.3.17 X3 $\oplus$ X3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P45.3.18 X3 $\oplus$ X4	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_u}$
P45.5.1 LD1LE1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P45.5.2 LD2LE2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P45.5.3 LD3LE3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P45.7.1 T1	$\times$	-	-	-	-	-
P45.8.1 DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P45.8.2 DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$

TABLE S135: Non-coplanar SSGs with parent space group $Iba2$ (No. 45).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N45.1.1 GM1	$\surd$	3	3	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{A1}$
N45.2.1 GM2	$\surd$	3	3	$\surd$	222	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{B1}$
N45.2.2 GM3	$\surd$	3	3	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{B2}$
N45.2.3 X1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B1_u}$
N45.2.4 X2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B1_u}$
N45.2.5 X3	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B1_u}$
N45.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{A2} \oplus \mathrm{A2}$
N45.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{A2} \oplus \mathrm{B2}$
N45.3.3 GM2 $\oplus$ X1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$
N45.3.4 GM2 $\oplus$ X2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$
N45.3.5 GM2 $\oplus$ X3	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$
N45.3.6 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{B2} \oplus \mathrm{B2}$
N45.3.7 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	222	$\mathrm{A1} \oplus \mathrm{B3} \oplus \mathrm{B2}$
N45.3.8 GM3 $\oplus$ X1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N45.3.9 GM3 $\oplus$ X2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N45.3.10 GM3 $\oplus$ X3	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N45.3.11 GM3 $\oplus$ X4	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N45.3.12 X1 $\oplus$ X1	$\surd$	1	1	$\surd$	$mm2$	A1

Non-coplanar SSGs with parent space group $Iba2$ (No. 45) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N45.3.13 X1 ⊕ X2	√	1	1	√	222	A1
N45.3.14 X1 ⊕ X3	√	1	1	√	$mm2$	A1
N45.3.15 X2 ⊕ X2	√	1	1	√	$mm2$	A1
N45.3.16 X2 ⊕ X3	√	1	1	√	$mm2$	A1
N45.3.17 X3 ⊕ X3	√	1	1	√	$mm2$	A1
N45.3.18 X3 ⊕ X4	√	1	1	√	222	A1
N45.5.1 LD1LE1	√	1	1	√	$mm2$	A1
N45.5.2 LD2LE2	√	1	1	√	$mm2$	A1
N45.5.3 LD3LE3	√	1	1	√	$mm2$	A1
N45.7.1 T1	√	1	1	√	mmm	$\mathrm{A_g}$
N45.8.1 DT1	√	1	1	√	$mm2$	A1
N45.8.2 DT2	√	1	1	√	$mm2$	A1
N45.9.1 GM2 ⊕ GM2 ⊕ GM2	√	3	3	√	222	B1 ⊕ B1 ⊕ B1
N45.9.2 GM2 ⊕ GM2 ⊕ GM3	√	3	3	√	$mm2$	B2 ⊕ B1 ⊕ B1
N45.9.3 GM2 ⊕ GM2 ⊕ X1	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N45.9.4 GM2 ⊕ GM2 ⊕ X2	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N45.9.5 GM2 ⊕ GM2 ⊕ X3	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N45.9.6 GM2 ⊕ GM3 ⊕ GM3	√	3	3	√	222	B1 ⊕ B3 ⊕ B3
N45.9.7 GM2 ⊕ GM3 ⊕ GM4	√	3	3	√	$mm2$	A2 ⊕ B2 ⊕ B1
N45.9.8 GM2 ⊕ GM3 ⊕ X1	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N45.9.9 GM2 ⊕ GM3 ⊕ X2	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N45.9.10 GM2 ⊕ GM3 ⊕ X3	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N45.9.11 GM2 ⊕ GM3 ⊕ X4	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N45.9.12 GM2 ⊕ X1 ⊕ X1	√	1	1	√	222	B1
N45.9.13 GM2 ⊕ X1 ⊕ X2	√	1	1	√	$mm2$	A2
N45.9.14 GM2 ⊕ X1 ⊕ X3	√	1	1	√	$mm2$	B2
N45.9.15 GM2 ⊕ X2 ⊕ X2	√	1	1	√	222	B1
N45.9.16 GM2 ⊕ X2 ⊕ X3	√	1	1	√	$mm2$	B1
N45.9.17 GM2 ⊕ X3 ⊕ X3	√	1	1	√	222	B1
N45.9.18 GM2 ⊕ X3 ⊕ X4	√	1	1	√	$mm2$	A2
N45.9.19 GM3 ⊕ GM3 ⊕ GM3	√	3	3	√	$mm2$	B2 ⊕ B2 ⊕ B2
N45.9.20 GM3 ⊕ GM3 ⊕ GM4	√	3	3	√	$mm2$	A2 ⊕ A2 ⊕ B1
N45.9.21 GM3 ⊕ GM3 ⊕ X1	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N45.9.22 GM3 ⊕ GM4 ⊕ X1	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N45.9.23 GM3 ⊕ GM3 ⊕ X2	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N45.9.24 GM3 ⊕ GM4 ⊕ X2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N45.9.25 GM3 ⊕ GM3 ⊕ X3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N45.9.26 GM3 ⊕ GM3 ⊕ X4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N45.9.27 GM3 ⊕ GM4 ⊕ X3	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N45.9.28 GM3 ⊕ X1 ⊕ X1	√	1	1	√	$mm2$	B2
N45.9.29 GM3 ⊕ X1 ⊕ X2	√	1	1	√	$mm2$	A2
N45.9.30 GM3 ⊕ X1 ⊕ X3	√	1	1	√	$mm2$	B2
N45.9.31 GM3 ⊕ X1 ⊕ X4	√	1	1	√	222	B3
N45.9.32 GM3 ⊕ X2 ⊕ X2	√	1	1	√	$mm2$	B2
N45.9.33 GM3 ⊕ X2 ⊕ X3	√	1	1	√	222	B3
N45.9.34 GM3 ⊕ X2 ⊕ X4	√	1	1	√	$mm2$	B2

Non-coplanar SSGs with parent space group $Iba2$ (No. 45) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N45.9.35 GM3 ⊕ X3 ⊕ X3	√	1	1	√	$mm2$	B2
N45.9.36 GM3 ⊕ X3 ⊕ X4	√	1	1	√	$mm2$	A2
N45.9.37 GM3 ⊕ X4 ⊕ X4	√	1	1	√	$mm2$	B2
N45.9.38 X1 ⊕ X1 ⊕ X1	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N45.9.39 X1 ⊕ X1 ⊕ X2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N45.9.40 X1 ⊕ X1 ⊕ X3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N45.9.41 X1 ⊕ X2 ⊕ X2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N45.9.42 X1 ⊕ X2 ⊕ X3	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N45.9.43 X1 ⊕ X3 ⊕ X3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N45.9.44 X1 ⊕ X3 ⊕ X4	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N45.9.45 X2 ⊕ X2 ⊕ X2	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N45.9.46 X2 ⊕ X2 ⊕ X3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N45.9.47 X2 ⊕ X3 ⊕ X3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N45.9.48 X2 ⊕ X3 ⊕ X4	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N45.9.49 X3 ⊕ X3 ⊕ X3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N45.9.50 X3 ⊕ X3 ⊕ X4	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N45.11.1 GM2 ⊕ LD1LE1	√	1	1	√	222	B1
N45.11.2 GM2 ⊕ LD2LE2	√	1	1	√	222	B1
N45.11.3 GM2 ⊕ LD3LE3	√	1	1	√	222	B1
N45.11.4 GM3 ⊕ LD1LE1	√	1	1	√	$mm2$	B2
N45.11.5 GM3 ⊕ LD2LE2	√	1	1	√	$mm2$	B2
N45.11.6 GM3 ⊕ LD3LE3	√	1	1	√	$mm2$	B2
N45.11.7 GM3 ⊕ LD4LE4	√	1	1	√	$mm2$	B2
N45.11.8 X1 ⊕ LD1LE1	√	1	1	√	mmm	$\mathrm{B1_u}$
N45.11.9 X1 ⊕ LD2LE2	√	1	1	√	mmm	$\mathrm{B1_u}$
N45.11.10 X1 ⊕ LD3LE3	√	1	1	√	mmm	$\mathrm{B1_u}$
N45.11.11 X2 ⊕ LD1LE1	√	1	1	√	mmm	$\mathrm{B1_u}$
N45.11.12 X2 ⊕ LD2LE2	√	1	1	√	mmm	$\mathrm{B1_u}$
N45.11.13 X2 ⊕ LD3LE3	√	1	1	√	mmm	$\mathrm{B1_u}$
N45.11.14 X3 ⊕ LD1LE1	√	1	1	√	mmm	$\mathrm{B1_u}$
N45.11.15 X3 ⊕ LD2LE2	√	1	1	√	mmm	$\mathrm{B1_u}$
N45.11.16 X3 ⊕ LD3LE3	√	1	1	√	mmm	$\mathrm{B1_u}$
N45.11.17 X3 ⊕ LD4LE4	√	1	1	√	mmm	$\mathrm{B1_u}$
N45.13.1 GM2 ⊕ T1	√	1	1	×	-	-
N45.13.2 GM3 ⊕ T1	√	1	1	×	-	-
N45.13.3 X1 ⊕ T1	×	-	-	-	-	-
N45.13.4 X2 ⊕ T1	×	-	-	-	-	-
N45.13.5 X3 ⊕ T1	×	-	-	-	-	-
N45.14.1 GM2 ⊕ DT1	√	1	1	√	$mm2$	B2
N45.14.2 GM2 ⊕ DT2	√	1	1	√	$mm2$	B2
N45.14.3 GM3 ⊕ SM1	√	1	1	√	222	B3
N45.14.4 GM3 ⊕ DT1	√	1	1	√	$mm2$	B2
N45.14.5 GM3 ⊕ SM2	√	1	1	√	222	B3
N45.14.6 GM3 ⊕ DT2	√	1	1	√	$mm2$	B2
N45.14.7 X1 ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N45.14.8 X1 ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$

Non-coplanar SSGs with parent space group $Iba2$ (No. 45) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N45.14.9 X2 $\oplus$ DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N45.14.10 X2 $\oplus$ DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N45.14.11 X3 $\oplus$ SM1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N45.14.12 X3 $\oplus$ DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N45.14.13 X3 $\oplus$ SM2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N45.14.14 X3 $\oplus$ DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$

TABLE S136: Collinear SSGs with parent space group $Ima2$ (No. 46).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L46.1.1 GM1	1	mmm	$\mathrm{A_g}$
L46.2.1 GM2	1	mmm	$\mathrm{B1_g}$
L46.2.2 GM3	1	mmm	$\mathrm{B3_g}$
L46.2.3 GM4	1	mmm	$\mathrm{B2_g}$
L46.2.4 X1	0	-	-
L46.2.5 X2	0	-	-
L46.2.6 X3	0	-	-
L46.2.7 X4	0	-	-

TABLE S137: Coplanar SSGs with parent space group $Ima2$ (No. 46).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P46.1.1 GM1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B1_u}$
P46.2.1 GM2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$
P46.2.2 GM3	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
P46.2.3 GM4	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u} \oplus \mathrm{B2_g}$
P46.2.4 X1	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P46.2.5 X2	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P46.2.6 X3	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P46.2.7 X4	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P46.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
P46.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
P46.3.3 GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
P46.3.4 GM2 $\oplus$ X1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
P46.3.5 GM2 $\oplus$ X2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
P46.3.6 GM2 $\oplus$ X3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
P46.3.7 GM2 $\oplus$ X4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
P46.3.8 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
P46.3.9 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
P46.3.10 GM3 $\oplus$ X1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
P46.3.11 GM3 $\oplus$ X2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
P46.3.12 GM3 $\oplus$ X3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
P46.3.13 GM3 $\oplus$ X4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
P46.3.14 GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
P46.3.15 GM4 $\oplus$ X1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_g}$

Coplanar SSGs with parent space group $Ima2$ (No. 46) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P46.3.16 GM4 $\oplus$ X2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_g}$
P46.3.17 GM4 $\oplus$ X3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_g}$
P46.3.18 GM4 $\oplus$ X4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_g}$
P46.3.19 X1 $\oplus$ X1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P46.3.20 X1 $\oplus$ X2	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_u}$
P46.3.21 X1 $\oplus$ X3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P46.3.22 X1 $\oplus$ X4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P46.3.23 X2 $\oplus$ X2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P46.3.24 X2 $\oplus$ X3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P46.3.25 X2 $\oplus$ X4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P46.3.26 X3 $\oplus$ X3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P46.3.27 X3 $\oplus$ X4	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_u}$
P46.3.28 X4 $\oplus$ X4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P46.5.1 LD1LE1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P46.5.2 LD2LE2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P46.5.3 LD3LE3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P46.5.4 LD4LE4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P46.7.1 S1	$\times$	-	-	-	-	-
P46.7.2 S2	$\times$	-	-	-	-	-
P46.7.3 T1	$\times$	-	-	-	-	-
P46.8.1 SM1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P46.8.2 SM2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P46.8.3 DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P46.8.4 DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$

TABLE S138: Non-coplanar SSGs with parent space group $Ima2$ (No. 46).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N46.1.1 GM1	$\surd$	3	3	$\surd$	$mm2$	A1 $\oplus$ A1 $\oplus$ A1
N46.2.1 GM2	$\surd$	3	3	$\surd$	222	A1 $\oplus$ A1 $\oplus$ B1
N46.2.2 GM3	$\surd$	3	3	$\surd$	$mm2$	A1 $\oplus$ A1 $\oplus$ B2
N46.2.3 GM4	$\surd$	3	3	$\surd$	$mm2$	A1 $\oplus$ A1 $\oplus$ B1
N46.2.4 X1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B1_u}$
N46.2.5 X2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B1_u}$
N46.2.6 X3	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B1_u}$
N46.2.7 X4	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B1_u}$
N46.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$mm2$	A1 $\oplus$ A2 $\oplus$ A2
N46.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$mm2$	A1 $\oplus$ A2 $\oplus$ B2
N46.3.3 GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	$mm2$	A1 $\oplus$ A2 $\oplus$ B1
N46.3.4 GM2 $\oplus$ X1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$
N46.3.5 GM2 $\oplus$ X2	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$
N46.3.6 GM2 $\oplus$ X3	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$
N46.3.7 GM2 $\oplus$ X4	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$
N46.3.8 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	$mm2$	A1 $\oplus$ B2 $\oplus$ B2
N46.3.9 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	222	A1 $\oplus$ B3 $\oplus$ B2
N46.3.10 GM3 $\oplus$ X1	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$

Non-coplanar SSGs with parent space group $Ima2$ (No. 46) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N46.3.11 GM3 ⊕ X2	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N46.3.12 GM3 ⊕ X3	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N46.3.13 GM3 ⊕ X4	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N46.3.14 GM4 ⊕ GM4	√	3	3	√	$mm2$	A1 ⊕ B1 ⊕ B1
N46.3.15 GM4 ⊕ X1	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u} \oplus \mathrm{B2_g}$
N46.3.16 GM4 ⊕ X2	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u} \oplus \mathrm{B2_g}$
N46.3.17 GM4 ⊕ X3	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u} \oplus \mathrm{B2_g}$
N46.3.18 GM4 ⊕ X4	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u} \oplus \mathrm{B2_g}$
N46.3.19 X1 ⊕ X1	√	1	1	√	$mm2$	A1
N46.3.20 X1 ⊕ X2	√	1	1	√	222	A1
N46.3.21 X1 ⊕ X3	√	1	1	√	$mm2$	A1
N46.3.22 X1 ⊕ X4	√	1	1	√	$mm2$	A1
N46.3.23 X2 ⊕ X2	√	1	1	√	$mm2$	A1
N46.3.24 X2 ⊕ X3	√	1	1	√	$mm2$	A1
N46.3.25 X2 ⊕ X4	√	1	1	√	$mm2$	A1
N46.3.26 X3 ⊕ X3	√	1	1	√	$mm2$	A1
N46.3.27 X3 ⊕ X4	√	1	1	√	222	A1
N46.3.28 X4 ⊕ X4	√	1	1	√	$mm2$	A1
N46.5.1 LD1LE1	√	1	1	√	$mm2$	A1
N46.5.2 LD2LE2	√	1	1	√	$mm2$	A1
N46.5.3 LD3LE3	√	1	1	√	$mm2$	A1
N46.5.4 LD4LE4	√	1	1	√	$mm2$	A1
N46.7.1 S1	√	1	1	√	mmm	$\mathrm{A_g}$
N46.7.2 S2	√	1	1	√	mmm	$\mathrm{A_g}$
N46.7.3 T1	√	1	1	√	mmm	$\mathrm{A_g}$
N46.8.1 SM1	√	1	1	√	$mm2$	A1
N46.8.2 SM2	√	1	1	√	$mm2$	A1
N46.8.3 DT1	√	1	1	√	$mm2$	A1
N46.8.4 DT2	√	1	1	√	$mm2$	A1
N46.9.1 GM2 ⊕ GM2 ⊕ GM2	√	3	3	√	222	B1 ⊕ B1 ⊕ B1
N46.9.2 GM2 ⊕ GM2 ⊕ GM3	√	3	3	√	$mm2$	B2 ⊕ B1 ⊕ B1
N46.9.3 GM2 ⊕ GM2 ⊕ GM4	√	3	3	√	$mm2$	B2 ⊕ B2 ⊕ B1
N46.9.4 GM2 ⊕ GM2 ⊕ X1	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N46.9.5 GM2 ⊕ GM2 ⊕ X2	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N46.9.6 GM2 ⊕ GM2 ⊕ X3	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N46.9.7 GM2 ⊕ GM2 ⊕ X4	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N46.9.8 GM2 ⊕ GM3 ⊕ GM3	√	3	3	√	222	B1 ⊕ B3 ⊕ B3
N46.9.9 GM2 ⊕ GM3 ⊕ GM4	√	3	3	√	$mm2$	A2 ⊕ B2 ⊕ B1
N46.9.10 GM2 ⊕ GM3 ⊕ X1	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N46.9.11 GM2 ⊕ GM3 ⊕ X2	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N46.9.12 GM2 ⊕ GM3 ⊕ X3	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N46.9.13 GM2 ⊕ GM3 ⊕ X4	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N46.9.14 GM2 ⊕ GM4 ⊕ GM4	√	3	3	√	222	B1 ⊕ B2 ⊕ B2
N46.9.15 GM2 ⊕ GM4 ⊕ X1	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N46.9.16 GM2 ⊕ GM4 ⊕ X2	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N46.9.17 GM2 ⊕ GM4 ⊕ X3	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$

Non-coplanar SSGs with parent space group $Ima2$ (No. 46) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N46.9.18 GM2 ⊕ GM4 ⊕ X4	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N46.9.19 GM2 ⊕ X1 ⊕ X1	√	1	1	√	222	B1
N46.9.20 GM2 ⊕ X1 ⊕ X2	√	1	1	√	$mm2$	A2
N46.9.21 GM2 ⊕ X1 ⊕ X3	√	1	1	√	$mm2$	B2
N46.9.22 GM2 ⊕ X1 ⊕ X4	√	1	1	√	$mm2$	B1
N46.9.23 GM2 ⊕ X2 ⊕ X2	√	1	1	√	222	B1
N46.9.24 GM2 ⊕ X2 ⊕ X3	√	1	1	√	$mm2$	B1
N46.9.25 GM2 ⊕ X2 ⊕ X4	√	1	1	√	$mm2$	B2
N46.9.26 GM2 ⊕ X3 ⊕ X3	√	1	1	√	222	B1
N46.9.27 GM2 ⊕ X3 ⊕ X4	√	1	1	√	$mm2$	A2
N46.9.28 GM2 ⊕ X4 ⊕ X4	√	1	1	√	222	B1
N46.9.29 GM3 ⊕ GM3 ⊕ GM3	√	3	3	√	$mm2$	B2 ⊕ B2 ⊕ B2
N46.9.30 GM3 ⊕ GM3 ⊕ GM4	√	3	3	√	$mm2$	A2 ⊕ A2 ⊕ B1
N46.9.31 GM3 ⊕ GM3 ⊕ X1	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N46.9.32 GM3 ⊕ GM3 ⊕ X2	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N46.9.33 GM3 ⊕ GM3 ⊕ X3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N46.9.34 GM3 ⊕ GM3 ⊕ X4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N46.9.35 GM3 ⊕ GM4 ⊕ GM4	√	3	3	√	$mm2$	A2 ⊕ A2 ⊕ B2
N46.9.36 GM3 ⊕ GM4 ⊕ X1	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N46.9.37 GM3 ⊕ GM4 ⊕ X2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N46.9.38 GM3 ⊕ GM4 ⊕ X3	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N46.9.39 GM3 ⊕ GM4 ⊕ X4	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N46.9.40 GM3 ⊕ X1 ⊕ X1	√	1	1	√	$mm2$	B2
N46.9.41 GM3 ⊕ X1 ⊕ X2	√	1	1	√	$mm2$	A2
N46.9.42 GM3 ⊕ X1 ⊕ X3	√	1	1	√	$mm2$	B2
N46.9.43 GM3 ⊕ X1 ⊕ X4	√	1	1	√	222	B3
N46.9.44 GM3 ⊕ X2 ⊕ X2	√	1	1	√	$mm2$	B2
N46.9.45 GM3 ⊕ X2 ⊕ X3	√	1	1	√	222	B3
N46.9.46 GM3 ⊕ X2 ⊕ X4	√	1	1	√	$mm2$	B2
N46.9.47 GM3 ⊕ X3 ⊕ X3	√	1	1	√	$mm2$	B2
N46.9.48 GM3 ⊕ X3 ⊕ X4	√	1	1	√	$mm2$	A2
N46.9.49 GM3 ⊕ X4 ⊕ X4	√	1	1	√	$mm2$	B2
N46.9.50 GM4 ⊕ GM4 ⊕ GM4	√	3	3	√	$mm2$	B1 ⊕ B1 ⊕ B1
N46.9.51 GM4 ⊕ GM4 ⊕ X1	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N46.9.52 GM4 ⊕ GM4 ⊕ X2	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N46.9.53 GM4 ⊕ GM4 ⊕ X3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N46.9.54 GM4 ⊕ GM4 ⊕ X4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N46.9.55 GM4 ⊕ X1 ⊕ X1	√	1	1	√	$mm2$	B1
N46.9.56 GM4 ⊕ X1 ⊕ X2	√	1	1	√	$mm2$	A2
N46.9.57 GM4 ⊕ X1 ⊕ X3	√	1	1	√	222	B2
N46.9.58 GM4 ⊕ X1 ⊕ X4	√	1	1	√	$mm2$	B1
N46.9.59 GM4 ⊕ X2 ⊕ X2	√	1	1	√	$mm2$	B1
N46.9.60 GM4 ⊕ X2 ⊕ X3	√	1	1	√	$mm2$	B1
N46.9.61 GM4 ⊕ X2 ⊕ X4	√	1	1	√	222	B2
N46.9.62 GM4 ⊕ X3 ⊕ X3	√	1	1	√	$mm2$	B1
N46.9.63 GM4 ⊕ X3 ⊕ X4	√	1	1	√	$mm2$	A2

Non-coplanar SSGs with parent space group $Ima2$ (No. 46) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N46.9.64 GM4 ⊕ X4 ⊕ X4	√	1	1	√	$m2$	B1
N46.9.65 X1 ⊕ X1 ⊕ X1	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N46.9.66 X1 ⊕ X1 ⊕ X2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N46.9.67 X1 ⊕ X1 ⊕ X3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N46.9.68 X1 ⊕ X1 ⊕ X4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N46.9.69 X1 ⊕ X2 ⊕ X2	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N46.9.70 X1 ⊕ X2 ⊕ X3	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N46.9.71 X1 ⊕ X2 ⊕ X4	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N46.9.72 X1 ⊕ X3 ⊕ X3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N46.9.73 X1 ⊕ X3 ⊕ X4	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N46.9.74 X1 ⊕ X4 ⊕ X4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N46.9.75 X2 ⊕ X2 ⊕ X2	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N46.9.76 X2 ⊕ X2 ⊕ X3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N46.9.77 X2 ⊕ X2 ⊕ X4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N46.9.78 X2 ⊕ X3 ⊕ X3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N46.9.79 X2 ⊕ X3 ⊕ X4	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N46.9.80 X2 ⊕ X4 ⊕ X4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N46.9.81 X3 ⊕ X3 ⊕ X3	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N46.9.82 X3 ⊕ X3 ⊕ X4	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N46.9.83 X3 ⊕ X4 ⊕ X4	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N46.9.84 X4 ⊕ X4 ⊕ X4	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N46.11.1 GM2 ⊕ LD1LE1	√	1	1	√	222	B1
N46.11.2 GM2 ⊕ LD2LE2	√	1	1	√	222	B1
N46.11.3 GM2 ⊕ LD3LE3	√	1	1	√	222	B1
N46.11.4 GM2 ⊕ LD4LE4	√	1	1	√	222	B1
N46.11.5 GM3 ⊕ LD1LE1	√	1	1	√	$m2$	B2
N46.11.6 GM3 ⊕ LD2LE2	√	1	1	√	$m2$	B2
N46.11.7 GM3 ⊕ LD3LE3	√	1	1	√	$m2$	B2
N46.11.8 GM3 ⊕ LD4LE4	√	1	1	√	$m2$	B2
N46.11.9 GM4 ⊕ LD1LE1	√	1	1	√	$m2$	B1
N46.11.10 GM4 ⊕ LD2LE2	√	1	1	√	$m2$	B1
N46.11.11 GM4 ⊕ LD3LE3	√	1	1	√	$m2$	B1
N46.11.12 GM4 ⊕ LD4LE4	√	1	1	√	$m2$	B1
N46.11.13 X1 ⊕ LD1LE1	√	1	1	√	mmm	$\mathrm{B1_u}$
N46.11.14 X1 ⊕ LD2LE2	√	1	1	√	mmm	$\mathrm{B1_u}$
N46.11.15 X1 ⊕ LD3LE3	√	1	1	√	mmm	$\mathrm{B1_u}$
N46.11.16 X1 ⊕ LD4LE4	√	1	1	√	mmm	$\mathrm{B1_u}$
N46.11.17 X2 ⊕ LD1LE1	√	1	1	√	mmm	$\mathrm{B1_u}$
N46.11.18 X2 ⊕ LD2LE2	√	1	1	√	mmm	$\mathrm{B1_u}$
N46.11.19 X2 ⊕ LD3LE3	√	1	1	√	mmm	$\mathrm{B1_u}$
N46.11.20 X2 ⊕ LD4LE4	√	1	1	√	mmm	$\mathrm{B1_u}$
N46.11.21 X3 ⊕ LD1LE1	√	1	1	√	mmm	$\mathrm{B1_u}$
N46.11.22 X3 ⊕ LD2LE2	√	1	1	√	mmm	$\mathrm{B1_u}$
N46.11.23 X3 ⊕ LD3LE3	√	1	1	√	mmm	$\mathrm{B1_u}$
N46.11.24 X3 ⊕ LD4LE4	√	1	1	√	mmm	$\mathrm{B1_u}$
N46.11.25 X4 ⊕ LD1LE1	√	1	1	√	mmm	$\mathrm{B1_u}$

Non-coplanar SSGs with parent space group $Ima2$ (No. 46) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N46.11.26 X4 ⊕ LD2LE2	√	1	1	√	mmm	$\mathrm{B1_u}$
N46.11.27 X4 ⊕ LD3LE3	√	1	1	√	mmm	$\mathrm{B1_u}$
N46.11.28 X4 ⊕ LD4LE4	√	1	1	√	mmm	$\mathrm{B1_u}$
N46.13.1 GM2 ⊕ S1	√	1	1	×	-	-
N46.13.2 GM2 ⊕ S2	√	1	1	×	-	-
N46.13.3 GM2 ⊕ T1	√	1	1	×	-	-
N46.13.4 GM3 ⊕ S1	√	1	1	×	-	-
N46.13.5 GM3 ⊕ S2	√	1	1	×	-	-
N46.13.6 GM3 ⊕ T1	√	1	1	×	-	-
N46.13.7 GM4 ⊕ S1	√	1	1	×	-	-
N46.13.8 GM4 ⊕ S2	√	1	1	×	-	-
N46.13.9 GM4 ⊕ T1	√	1	1	×	-	-
N46.13.10 X1 ⊕ S1	×	-	-	-	-	-
N46.13.11 X1 ⊕ S2	×	-	-	-	-	-
N46.13.12 X1 ⊕ T1	×	-	-	-	-	-
N46.13.13 X2 ⊕ S1	×	-	-	-	-	-
N46.13.14 X2 ⊕ S2	×	-	-	-	-	-
N46.13.15 X2 ⊕ T1	×	-	-	-	-	-
N46.13.16 X3 ⊕ S1	×	-	-	-	-	-
N46.13.17 X3 ⊕ S2	×	-	-	-	-	-
N46.13.18 X3 ⊕ T1	×	-	-	-	-	-
N46.13.19 X4 ⊕ S1	×	-	-	-	-	-
N46.13.20 X4 ⊕ S2	×	-	-	-	-	-
N46.13.21 X4 ⊕ T1	×	-	-	-	-	-
N46.14.1 GM2 ⊕ SM1	√	1	1	√	$mm2$	B1
N46.14.2 GM2 ⊕ SM2	√	1	1	√	$mm2$	B1
N46.14.3 GM2 ⊕ DT1	√	1	1	√	$mm2$	B2
N46.14.4 GM2 ⊕ DT2	√	1	1	√	$mm2$	B2
N46.14.5 GM3 ⊕ SM1	√	1	1	√	222	B3
N46.14.6 GM3 ⊕ SM2	√	1	1	√	222	B3
N46.14.7 GM3 ⊕ DT1	√	1	1	√	$mm2$	B2
N46.14.8 GM3 ⊕ DT2	√	1	1	√	$mm2$	B2
N46.14.9 GM4 ⊕ SM1	√	1	1	√	$mm2$	B1
N46.14.10 GM4 ⊕ SM2	√	1	1	√	$mm2$	B1
N46.14.11 GM4 ⊕ DT1	√	1	1	√	222	B2
N46.14.12 GM4 ⊕ DT2	√	1	1	√	222	B2
N46.14.13 X1 ⊕ SM1	√	1	1	√	mmm	$\mathrm{B3_u}$
N46.14.14 X1 ⊕ SM2	√	1	1	√	mmm	$\mathrm{B3_u}$
N46.14.15 X1 ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N46.14.16 X1 ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
N46.14.17 X2 ⊕ SM1	√	1	1	√	mmm	$\mathrm{B3_u}$
N46.14.18 X2 ⊕ SM2	√	1	1	√	mmm	$\mathrm{B3_u}$
N46.14.19 X2 ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N46.14.20 X2 ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
N46.14.21 X3 ⊕ SM1	√	1	1	√	mmm	$\mathrm{B3_u}$
N46.14.22 X3 ⊕ SM2	√	1	1	√	mmm	$\mathrm{B3_u}$

Non-coplanar SSGs with parent space group $Ima2$ (No. 46) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N46.14.23 X3 $\oplus$ DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N46.14.24 X3 $\oplus$ DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N46.14.25 X4 $\oplus$ SM1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N46.14.26 X4 $\oplus$ SM2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N46.14.27 X4 $\oplus$ DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N46.14.28 X4 $\oplus$ DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$

TABLE S139: Collinear SSGs with parent space group $Pmmm$ (No. 47).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L47.1.1 $\mathrm{GM1^+}$	1	mmm	$\mathrm{A_g}$
L47.2.1 $\mathrm{GM1^-}$	0	-	-
L47.2.2 $\mathrm{GM2^+}$	1	mmm	$\mathrm{B1_g}$
L47.2.3 $\mathrm{GM2^-}$	0	-	-
L47.2.4 $\mathrm{R1^+}$	0	-	-
L47.2.5 $\mathrm{S1^+}$	0	-	-
L47.2.6 $\mathrm{S1^-}$	0	-	-
L47.2.7 $\mathrm{X1^+}$	0	-	-
L47.2.8 $\mathrm{X1^-}$	0	-	-
L47.2.9 $\mathrm{X2^+}$	0	-	-

TABLE S140: Coplanar SSGs with parent space group $Pmmm$ (No. 47).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P47.1.1 $\mathrm{GM1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
P47.2.1 $\mathrm{GM1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
P47.2.2 $\mathrm{GM2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
P47.2.3 $\mathrm{GM2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
P47.2.4 $\mathrm{R1^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P47.2.5 $\mathrm{S1^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P47.2.6 $\mathrm{S1^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P47.2.7 $\mathrm{X1^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P47.2.8 $\mathrm{X1^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P47.2.9 $\mathrm{X2^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P47.3.1 $\mathrm{GM1^-} \oplus \mathrm{GM1^-}$	$\surd$	0	0	$\surd$	-	-
P47.3.2 $\mathrm{GM1^-} \oplus \mathrm{GM2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
P47.3.3 $\mathrm{GM1^-} \oplus \mathrm{GM2^-}$	$\surd$	0	0	$\surd$	-	-
P47.3.4 $\mathrm{GM1^-} \oplus \mathrm{R1^+}$	$\surd$	1	1	$\times$	-	-
P47.3.5 $\mathrm{GM1^-} \oplus \mathrm{S1^+}$	$\surd$	1	1	$\times$	-	-
P47.3.6 $\mathrm{GM1^-} \oplus \mathrm{S1^-}$	$\surd$	1	1	$\times$	-	-
P47.3.7 $\mathrm{GM1^-} \oplus \mathrm{X1^+}$	$\surd$	1	1	$\times$	-	-
P47.3.8 $\mathrm{GM1^-} \oplus \mathrm{X1^-}$	$\surd$	1	1	$\times$	-	-
P47.3.9 $\mathrm{GM1^-} \oplus \mathrm{X2^+}$	$\surd$	1	1	$\times$	-	-
P47.3.10 $\mathrm{GM2^+} \oplus \mathrm{GM2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
P47.3.11 $\mathrm{GM2^+} \oplus \mathrm{GM3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$

Coplanar SSGs with parent space group $Pmmm$ (No. 47) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P47.3.12 $\mathrm{GM2}^{+} \oplus \mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
P47.3.13 $\mathrm{GM2}^{+} \oplus \mathrm{GM3}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
P47.3.14 $\mathrm{GM2}^{+} \oplus \mathrm{R1}^{+}$	$\surd$	1	0	$\times$	-	-
P47.3.15 $\mathrm{GM2}^{+} \oplus \mathrm{S1}^{+}$	$\surd$	1	0	$\times$	-	-
P47.3.16 $\mathrm{GM2}^{+} \oplus \mathrm{T1}^{+}$	$\surd$	1	0	$\times$	-	-
P47.3.17 $\mathrm{GM2}^{+} \oplus \mathrm{S1}^{-}$	$\surd$	1	0	$\times$	-	-
P47.3.18 $\mathrm{GM2}^{+} \oplus \mathrm{T1}^{-}$	$\surd$	1	0	$\times$	-	-
P47.3.19 $\mathrm{GM2}^{+} \oplus \mathrm{X1}^{+}$	$\surd$	1	0	$\times$	-	-
P47.3.20 $\mathrm{GM2}^{+} \oplus \mathrm{Z1}^{+}$	$\surd$	1	0	$\times$	-	-
P47.3.21 $\mathrm{GM2}^{+} \oplus \mathrm{X1}^{-}$	$\surd$	1	0	$\times$	-	-
P47.3.22 $\mathrm{GM2}^{+} \oplus \mathrm{Z1}^{-}$	$\surd$	1	0	$\times$	-	-
P47.3.23 $\mathrm{GM2}^{+} \oplus \mathrm{X2}^{+}$	$\surd$	1	0	$\times$	-	-
P47.3.24 $\mathrm{GM2}^{+} \oplus \mathrm{X2}^{-}$	$\surd$	1	0	$\times$	-	-
P47.3.25 $\mathrm{GM2}^{+} \oplus \mathrm{Z3}^{+}$	$\surd$	1	0	$\times$	-	-
P47.3.26 $\mathrm{GM2}^{-} \oplus \mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
P47.3.27 $\mathrm{GM2}^{-} \oplus \mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
P47.3.28 $\mathrm{GM2}^{-} \oplus \mathrm{R1}^{+}$	$\surd$	1	1	$\times$	-	-
P47.3.29 $\mathrm{GM2}^{-} \oplus \mathrm{S1}^{+}$	$\surd$	1	1	$\times$	-	-
P47.3.30 $\mathrm{GM2}^{-} \oplus \mathrm{T1}^{+}$	$\surd$	1	1	$\times$	-	-
P47.3.31 $\mathrm{GM2}^{-} \oplus \mathrm{S1}^{-}$	$\surd$	1	1	$\times$	-	-
P47.3.32 $\mathrm{GM2}^{-} \oplus \mathrm{T1}^{-}$	$\surd$	1	1	$\times$	-	-
P47.3.33 $\mathrm{GM2}^{-} \oplus \mathrm{X1}^{+}$	$\surd$	1	1	$\times$	-	-
P47.3.34 $\mathrm{GM2}^{-} \oplus \mathrm{Z1}^{+}$	$\surd$	1	1	$\times$	-	-
P47.3.35 $\mathrm{GM2}^{-} \oplus \mathrm{X1}^{-}$	$\surd$	1	1	$\times$	-	-
P47.3.36 $\mathrm{GM2}^{-} \oplus \mathrm{Z1}^{-}$	$\surd$	1	1	$\times$	-	-
P47.3.37 $\mathrm{GM2}^{-} \oplus \mathrm{X2}^{+}$	$\surd$	1	1	$\times$	-	-
P47.3.38 $\mathrm{GM2}^{-} \oplus \mathrm{X2}^{-}$	$\surd$	1	1	$\times$	-	-
P47.3.39 $\mathrm{GM2}^{-} \oplus \mathrm{Z3}^{+}$	$\surd$	1	1	$\times$	-	-
P47.3.40 $\mathrm{R1}^{+} \oplus \mathrm{R1}^{+}$	$\surd$	1	0	$\times$	-	-
P47.3.41 $\mathrm{R1}^{+} \oplus \mathrm{R1}^{-}$	$\surd$	1	1	$\times$	-	-
P47.3.42 $\mathrm{R1}^{+} \oplus \mathrm{R2}^{+}$	$\surd$	1	0	$\times$	-	-
P47.3.43 $\mathrm{R1}^{+} \oplus \mathrm{R2}^{-}$	$\surd$	1	1	$\times$	-	-
P47.3.44 $\mathrm{R1}^{+} \oplus \mathrm{S1}^{+}$	$\times$	-	-	-	-	-
P47.3.45 $\mathrm{R1}^{+} \oplus \mathrm{S2}^{+}$	$\times$	-	-	-	-	-
P47.3.46 $\mathrm{R1}^{+} \oplus \mathrm{S3}^{-}$	$\times$	-	-	-	-	-
P47.3.47 $\mathrm{R1}^{+} \oplus \mathrm{S1}^{-}$	$\times$	-	-	-	-	-
P47.3.48 $\mathrm{R1}^{+} \oplus \mathrm{S2}^{-}$	$\times$	-	-	-	-	-
P47.3.49 $\mathrm{R1}^{+} \oplus \mathrm{S3}^{+}$	$\times$	-	-	-	-	-
P47.3.50 $\mathrm{R1}^{+} \oplus \mathrm{X1}^{+}$	$\times$	-	-	-	-	-
P47.3.51 $\mathrm{R1}^{+} \oplus \mathrm{X3}^{-}$	$\times$	-	-	-	-	-
P47.3.52 $\mathrm{R1}^{+} \oplus \mathrm{X1}^{-}$	$\times$	-	-	-	-	-
P47.3.53 $\mathrm{R1}^{+} \oplus \mathrm{X3}^{+}$	$\times$	-	-	-	-	-
P47.3.54 $\mathrm{R1}^{+} \oplus \mathrm{X2}^{+}$	$\times$	-	-	-	-	-
P47.3.55 $\mathrm{R1}^{+} \oplus \mathrm{X2}^{-}$	$\times$	-	-	-	-	-
P47.3.56 $\mathrm{S1}^{+} \oplus \mathrm{S1}^{+}$	$\surd$	1	0	$\times$	-	-
P47.3.57 $\mathrm{S1}^{+} \oplus \mathrm{S2}^{+}$	$\surd$	1	0	$\times$	-	-

Coplanar SSGs with parent space group $Pmmm$ (No. 47) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P47.3.58 $\mathrm{S1}^{+} \oplus \mathrm{S3}^{-}$	$\surd$	1	1	$\times$	-	-
P47.3.59 $\mathrm{S1}^{+} \oplus \mathrm{T1}^{+}$	$\times$	-	-	-	-	-
P47.3.60 $\mathrm{S1}^{+} \oplus \mathrm{T3}^{+}$	$\times$	-	-	-	-	-
P47.3.61 $\mathrm{S1}^{+} \oplus \mathrm{S1}^{-}$	$\surd$	1	1	$\times$	-	-
P47.3.62 $\mathrm{S1}^{+} \oplus \mathrm{S2}^{-}$	$\surd$	1	1	$\times$	-	-
P47.3.63 $\mathrm{S1}^{+} \oplus \mathrm{S3}^{+}$	$\surd$	1	0	$\times$	-	-
P47.3.64 $\mathrm{S1}^{+} \oplus \mathrm{T1}^{-}$	$\times$	-	-	-	-	-
P47.3.65 $\mathrm{S1}^{+} \oplus \mathrm{T3}^{-}$	$\times$	-	-	-	-	-
P47.3.66 $\mathrm{S1}^{+} \oplus \mathrm{X1}^{+}$	$\times$	-	-	-	-	-
P47.3.67 $\mathrm{S1}^{+} \oplus \mathrm{X3}^{-}$	$\times$	-	-	-	-	-
P47.3.68 $\mathrm{S1}^{+} \oplus \mathrm{Z1}^{+}$	$\times$	-	-	-	-	-
P47.3.69 $\mathrm{S1}^{+} \oplus \mathrm{X1}^{-}$	$\times$	-	-	-	-	-
P47.3.70 $\mathrm{S1}^{+} \oplus \mathrm{X3}^{+}$	$\times$	-	-	-	-	-
P47.3.71 $\mathrm{S1}^{+} \oplus \mathrm{Z1}^{-}$	$\times$	-	-	-	-	-
P47.3.72 $\mathrm{S1}^{+} \oplus \mathrm{X2}^{+}$	$\times$	-	-	-	-	-
P47.3.73 $\mathrm{S1}^{+} \oplus \mathrm{X2}^{-}$	$\times$	-	-	-	-	-
P47.3.74 $\mathrm{S1}^{+} \oplus \mathrm{X4}^{+}$	$\times$	-	-	-	-	-
P47.3.75 $\mathrm{S1}^{+} \oplus \mathrm{X4}^{-}$	$\times$	-	-	-	-	-
P47.3.76 $\mathrm{S1}^{+} \oplus \mathrm{Z3}^{+}$	$\times$	-	-	-	-	-
P47.3.77 $\mathrm{S1}^{-} \oplus \mathrm{S1}^{-}$	$\surd$	1	0	$\times$	-	-
P47.3.78 $\mathrm{S1}^{-} \oplus \mathrm{S2}^{-}$	$\surd$	1	0	$\times$	-	-
P47.3.79 $\mathrm{S1}^{-} \oplus \mathrm{S3}^{+}$	$\surd$	1	1	$\times$	-	-
P47.3.80 $\mathrm{S1}^{-} \oplus \mathrm{T1}^{-}$	$\times$	-	-	-	-	-
P47.3.81 $\mathrm{S1}^{-} \oplus \mathrm{T3}^{-}$	$\times$	-	-	-	-	-
P47.3.82 $\mathrm{S1}^{-} \oplus \mathrm{X1}^{+}$	$\times$	-	-	-	-	-
P47.3.83 $\mathrm{S1}^{-} \oplus \mathrm{X3}^{-}$	$\times$	-	-	-	-	-
P47.3.84 $\mathrm{S1}^{-} \oplus \mathrm{Z1}^{+}$	$\times$	-	-	-	-	-
P47.3.85 $\mathrm{S1}^{-} \oplus \mathrm{X1}^{-}$	$\times$	-	-	-	-	-
P47.3.86 $\mathrm{S1}^{-} \oplus \mathrm{X3}^{+}$	$\times$	-	-	-	-	-
P47.3.87 $\mathrm{S1}^{-} \oplus \mathrm{Z1}^{-}$	$\times$	-	-	-	-	-
P47.3.88 $\mathrm{S1}^{-} \oplus \mathrm{X2}^{+}$	$\times$	-	-	-	-	-
P47.3.89 $\mathrm{S1}^{-} \oplus \mathrm{X2}^{-}$	$\times$	-	-	-	-	-
P47.3.90 $\mathrm{S1}^{-} \oplus \mathrm{X4}^{+}$	$\times$	-	-	-	-	-
P47.3.91 $\mathrm{S1}^{-} \oplus \mathrm{X4}^{-}$	$\times$	-	-	-	-	-
P47.3.92 $\mathrm{S1}^{-} \oplus \mathrm{Z3}^{+}$	$\times$	-	-	-	-	-
P47.3.93 $\mathrm{X1}^{+} \oplus \mathrm{X1}^{+}$	$\surd$	1	0	$\times$	-	-
P47.3.94 $\mathrm{X1}^{+} \oplus \mathrm{X3}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P47.3.95 $\mathrm{X1}^{+} \oplus \mathrm{Y1}^{+}$	$\times$	-	-	-	-	-
P47.3.96 $\mathrm{X1}^{+} \oplus \mathrm{X1}^{-}$	$\surd$	1	1	$\times$	-	-
P47.3.97 $\mathrm{X1}^{+} \oplus \mathrm{X3}^{+}$	$\surd$	1	0	$\times$	-	-
P47.3.98 $\mathrm{X1}^{+} \oplus \mathrm{Y1}^{-}$	$\times$	-	-	-	-	-
P47.3.99 $\mathrm{X1}^{+} \oplus \mathrm{X2}^{+}$	$\surd$	1	0	$\times$	-	-
P47.3.100 $\mathrm{X1}^{+} \oplus \mathrm{X2}^{-}$	$\surd$	1	1	$\times$	-	-
P47.3.101 $\mathrm{X1}^{+} \oplus \mathrm{Y2}^{+}$	$\times$	-	-	-	-	-
P47.3.102 $\mathrm{X1}^{+} \oplus \mathrm{Y2}^{-}$	$\times$	-	-	-	-	-
P47.3.103 $\mathrm{X1}^{-} \oplus \mathrm{X1}^{-}$	$\surd$	1	0	$\times$	-	-

Coplanar SSGs with parent space group $Pmmm$ (No. 47) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P47.3.104 $\mathrm{X1}^- \oplus \mathrm{X3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P47.3.105 $\mathrm{X1}^- \oplus \mathrm{Y1}^-$	$\times$	-	-	-	-	-
P47.3.106 $\mathrm{X1}^- \oplus \mathrm{X2}^+$	$\surd$	1	1	$\times$	-	-
P47.3.107 $\mathrm{X1}^- \oplus \mathrm{X2}^-$	$\surd$	1	0	$\times$	-	-
P47.3.108 $\mathrm{X1}^- \oplus \mathrm{Y2}^+$	$\times$	-	-	-	-	-
P47.3.109 $\mathrm{X1}^- \oplus \mathrm{Y2}^-$	$\times$	-	-	-	-	-
P47.3.110 $\mathrm{X2}^+ \oplus \mathrm{X2}^+$	$\surd$	1	0	$\times$	-	-
P47.3.111 $\mathrm{X2}^+ \oplus \mathrm{X2}^-$	$\surd$	1	1	$\times$	-	-
P47.3.112 $\mathrm{X2}^+ \oplus \mathrm{X4}^+$	$\surd$	1	0	$\times$	-	-
P47.3.113 $\mathrm{X2}^+ \oplus \mathrm{X4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P47.3.114 $\mathrm{X2}^+ \oplus \mathrm{Y2}^+$	$\times$	-	-	-	-	-
P47.3.115 $\mathrm{X2}^+ \oplus \mathrm{Y2}^-$	$\times$	-	-	-	-	-
P47.3.116 $\mathrm{X2}^+ \oplus \mathrm{Z3}^+$	$\times$	-	-	-	-	-
P47.8.1 DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P47.8.2 DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P47.8.3 DT3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P47.8.4 A1	$\surd$	1	1	$\times$	-	-
P47.8.5 A2	$\surd$	1	1	$\times$	-	-
P47.8.6 E1	$\surd$	1	1	$\times$	-	-

TABLE S141: Non-coplanar SSGs with parent space group $Pmmm$ (No. 47).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N47.1.1 $\mathrm{GM1}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{A_g}$
N47.2.1 $\mathrm{GM1}^-$	$\surd$	2	2	$\surd$	222	$\mathrm{A1} \oplus \mathrm{A1}$
N47.2.2 $\mathrm{GM2}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B1_g}$
N47.2.3 $\mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{A1}$
N47.2.4 $\mathrm{R1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
N47.2.5 $\mathrm{S1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
N47.2.6 $\mathrm{S1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
N47.2.7 $\mathrm{X1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
N47.2.8 $\mathrm{X1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
N47.2.9 $\mathrm{X2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
N47.3.1 $\mathrm{GM1}^- \oplus \mathrm{GM1}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{A_u}$
N47.3.2 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{A2}$
N47.3.3 $\mathrm{GM1}^- \oplus \mathrm{GM2}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N47.3.4 $\mathrm{GM1}^- \oplus \mathrm{R1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
N47.3.5 $\mathrm{GM1}^- \oplus \mathrm{S1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
N47.3.6 $\mathrm{GM1}^- \oplus \mathrm{S1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
N47.3.7 $\mathrm{GM1}^- \oplus \mathrm{X1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
N47.3.8 $\mathrm{GM1}^- \oplus \mathrm{X1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
N47.3.9 $\mathrm{GM1}^- \oplus \mathrm{X2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
N47.3.10 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N47.3.11 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g} \oplus \mathrm{B3_g}$
N47.3.12 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	2	2	$\surd$	222	$\mathrm{A1} \oplus \mathrm{B1}$
N47.3.13 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{B1}$

Non-coplanar SSGs with parent space group $Pmmm$ (No. 47) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N47.3.14 $\mathrm{GM2}^{+} \oplus \mathrm{R1}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
N47.3.15 $\mathrm{GM2}^{+} \oplus \mathrm{S1}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
N47.3.16 $\mathrm{GM2}^{+} \oplus \mathrm{T1}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
N47.3.17 $\mathrm{GM2}^{+} \oplus \mathrm{S1}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
N47.3.18 $\mathrm{GM2}^{+} \oplus \mathrm{T1}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
N47.3.19 $\mathrm{GM2}^{+} \oplus \mathrm{X1}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
N47.3.20 $\mathrm{GM2}^{+} \oplus \mathrm{Z1}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
N47.3.21 $\mathrm{GM2}^{+} \oplus \mathrm{X1}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
N47.3.22 $\mathrm{GM2}^{+} \oplus \mathrm{Z1}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
N47.3.23 $\mathrm{GM2}^{+} \oplus \mathrm{X2}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
N47.3.24 $\mathrm{GM2}^{+} \oplus \mathrm{X2}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
N47.3.25 $\mathrm{GM2}^{+} \oplus \mathrm{Z3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
N47.3.26 $\mathrm{GM2}^{-} \oplus \mathrm{GM2}^{-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N47.3.27 $\mathrm{GM2}^{-} \oplus \mathrm{GM3}^{-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u} \oplus \mathrm{B3_u}$
N47.3.28 $\mathrm{GM2}^{-} \oplus \mathrm{R1}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
N47.3.29 $\mathrm{GM2}^{-} \oplus \mathrm{S1}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
N47.3.30 $\mathrm{GM2}^{-} \oplus \mathrm{T1}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
N47.3.31 $\mathrm{GM2}^{-} \oplus \mathrm{S1}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
N47.3.32 $\mathrm{GM2}^{-} \oplus \mathrm{T1}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
N47.3.33 $\mathrm{GM2}^{-} \oplus \mathrm{X1}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
N47.3.34 $\mathrm{GM2}^{-} \oplus \mathrm{Z1}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
N47.3.35 $\mathrm{GM2}^{-} \oplus \mathrm{X1}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
N47.3.36 $\mathrm{GM2}^{-} \oplus \mathrm{Z1}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
N47.3.37 $\mathrm{GM2}^{-} \oplus \mathrm{X2}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
N47.3.38 $\mathrm{GM2}^{-} \oplus \mathrm{X2}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
N47.3.39 $\mathrm{GM2}^{-} \oplus \mathrm{Z3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
N47.3.40 $\mathrm{R1}^{+} \oplus \mathrm{R1}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N47.3.41 $\mathrm{R1}^{+} \oplus \mathrm{R1}^{-}$	$\surd$	1	1	$\surd$	222	A1
N47.3.42 $\mathrm{R1}^{+} \oplus \mathrm{R2}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N47.3.43 $\mathrm{R1}^{+} \oplus \mathrm{R2}^{-}$	$\surd$	1	1	$\surd$	$mm2$	A1
N47.3.44 $\mathrm{R1}^{+} \oplus \mathrm{S1}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N47.3.45 $\mathrm{R1}^{+} \oplus \mathrm{S2}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N47.3.46 $\mathrm{R1}^{+} \oplus \mathrm{S3}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N47.3.47 $\mathrm{R1}^{+} \oplus \mathrm{S1}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N47.3.48 $\mathrm{R1}^{+} \oplus \mathrm{S2}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N47.3.49 $\mathrm{R1}^{+} \oplus \mathrm{S3}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N47.3.50 $\mathrm{R1}^{+} \oplus \mathrm{X1}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N47.3.51 $\mathrm{R1}^{+} \oplus \mathrm{X3}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N47.3.52 $\mathrm{R1}^{+} \oplus \mathrm{X1}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N47.3.53 $\mathrm{R1}^{+} \oplus \mathrm{X3}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N47.3.54 $\mathrm{R1}^{+} \oplus \mathrm{X2}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N47.3.55 $\mathrm{R1}^{+} \oplus \mathrm{X2}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N47.3.56 $\mathrm{S1}^{+} \oplus \mathrm{S1}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N47.3.57 $\mathrm{S1}^{+} \oplus \mathrm{S2}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N47.3.58 $\mathrm{S1}^{+} \oplus \mathrm{S3}^{-}$	$\surd$	1	1	$\surd$	$mm2$	A1
N47.3.59 $\mathrm{S1}^{+} \oplus \mathrm{T1}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$

Non-coplanar SSGs with parent space group $Pmmm$ (No. 47) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N47.3.60 $\mathrm{S1}^{+}\oplus\mathrm{T3}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N47.3.61 $\mathrm{S1}^{+}\oplus\mathrm{S1}^{-}$	√	1	1	√	222	A1
N47.3.62 $\mathrm{S1}^{+}\oplus\mathrm{S2}^{-}$	√	1	1	√	$mm2$	A1
N47.3.63 $\mathrm{S1}^{+}\oplus\mathrm{S3}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N47.3.64 $\mathrm{S1}^{+}\oplus\mathrm{T1}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N47.3.65 $\mathrm{S1}^{+}\oplus\mathrm{T3}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N47.3.66 $\mathrm{S1}^{+}\oplus\mathrm{X1}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N47.3.67 $\mathrm{S1}^{+}\oplus\mathrm{X3}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N47.3.68 $\mathrm{S1}^{+}\oplus\mathrm{Z1}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N47.3.69 $\mathrm{S1}^{+}\oplus\mathrm{X1}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N47.3.70 $\mathrm{S1}^{+}\oplus\mathrm{X3}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N47.3.71 $\mathrm{S1}^{+}\oplus\mathrm{Z1}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N47.3.72 $\mathrm{S1}^{+}\oplus\mathrm{X2}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N47.3.73 $\mathrm{S1}^{+}\oplus\mathrm{X2}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N47.3.74 $\mathrm{S1}^{+}\oplus\mathrm{X4}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N47.3.75 $\mathrm{S1}^{+}\oplus\mathrm{X4}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N47.3.76 $\mathrm{S1}^{+}\oplus\mathrm{Z3}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N47.3.77 $\mathrm{S1}^{-}\oplus\mathrm{S1}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N47.3.78 $\mathrm{S1}^{-}\oplus\mathrm{S2}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N47.3.79 $\mathrm{S1}^{-}\oplus\mathrm{S3}^{+}$	√	1	1	√	$mm2$	A1
N47.3.80 $\mathrm{S1}^{-}\oplus\mathrm{T1}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N47.3.81 $\mathrm{S1}^{-}\oplus\mathrm{T3}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N47.3.82 $\mathrm{S1}^{-}\oplus\mathrm{X1}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N47.3.83 $\mathrm{S1}^{-}\oplus\mathrm{X3}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N47.3.84 $\mathrm{S1}^{-}\oplus\mathrm{Z1}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N47.3.85 $\mathrm{S1}^{-}\oplus\mathrm{X1}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N47.3.86 $\mathrm{S1}^{-}\oplus\mathrm{X3}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N47.3.87 $\mathrm{S1}^{-}\oplus\mathrm{Z1}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N47.3.88 $\mathrm{S1}^{-}\oplus\mathrm{X2}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N47.3.89 $\mathrm{S1}^{-}\oplus\mathrm{X2}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N47.3.90 $\mathrm{S1}^{-}\oplus\mathrm{X4}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N47.3.91 $\mathrm{S1}^{-}\oplus\mathrm{X4}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N47.3.92 $\mathrm{S1}^{-}\oplus\mathrm{Z3}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N47.3.93 $\mathrm{X1}^{+}\oplus\mathrm{X1}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N47.3.94 $\mathrm{X1}^{+}\oplus\mathrm{X3}^{-}$	√	1	1	√	$mm2$	A1
N47.3.95 $\mathrm{X1}^{+}\oplus\mathrm{Y1}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N47.3.96 $\mathrm{X1}^{+}\oplus\mathrm{X1}^{-}$	√	1	1	√	222	A1
N47.3.97 $\mathrm{X1}^{+}\oplus\mathrm{X3}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N47.3.98 $\mathrm{X1}^{+}\oplus\mathrm{Y1}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N47.3.99 $\mathrm{X1}^{+}\oplus\mathrm{X2}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N47.3.100 $\mathrm{X1}^{+}\oplus\mathrm{X2}^{-}$	√	1	1	√	$mm2$	A1
N47.3.101 $\mathrm{X1}^{+}\oplus\mathrm{Y2}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N47.3.102 $\mathrm{X1}^{+}\oplus\mathrm{Y2}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N47.3.103 $\mathrm{X1}^{-}\oplus\mathrm{X1}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N47.3.104 $\mathrm{X1}^{-}\oplus\mathrm{X3}^{+}$	√	1	1	√	$mm2$	A1
N47.3.105 $\mathrm{X1}^{-}\oplus\mathrm{Y1}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$

Non-coplanar SSGs with parent space group $Pmmm$ (No. 47) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N47.3.106 $\mathrm{X1^-} \oplus \mathrm{X2^+}$	√	1	1	√	$mm2$	A1
N47.3.107 $\mathrm{X1^-} \oplus \mathrm{X2^-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N47.3.108 $\mathrm{X1^-} \oplus \mathrm{Y2^+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N47.3.109 $\mathrm{X1^-} \oplus \mathrm{Y2^-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N47.3.110 $\mathrm{X2^+} \oplus \mathrm{X2^+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N47.3.111 $\mathrm{X2^+} \oplus \mathrm{X2^-}$	√	1	1	√	222	A1
N47.3.112 $\mathrm{X2^+} \oplus \mathrm{X4^+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N47.3.113 $\mathrm{X2^+} \oplus \mathrm{X4^-}$	√	1	1	√	$mm2$	A1
N47.3.114 $\mathrm{X2^+} \oplus \mathrm{Y2^+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N47.3.115 $\mathrm{X2^+} \oplus \mathrm{Y2^-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N47.3.116 $\mathrm{X2^+} \oplus \mathrm{Z3^+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N47.8.1 DT1	√	1	1	√	$mm2$	A1
N47.8.2 DT2	√	1	1	√	$mm2$	A1
N47.8.3 DT3	√	1	1	√	$mm2$	A1
N47.8.4 A1	√	1	1	√	$mm2$	A1
N47.8.5 A2	√	1	1	√	$mm2$	A1
N47.8.6 E1	√	1	1	√	$mm2$	A1
N47.9.1 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM1^-}$	√	0	0	√	-	-
N47.9.2 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM2^+}$	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N47.9.3 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM2^-}$	√	0	0	√	-	-
N47.9.4 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{R1^+}$	√	0	0	√	-	-
N47.9.5 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{S1^+}$	√	0	0	√	-	-
N47.9.6 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{S1^-}$	√	0	0	√	-	-
N47.9.7 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{X1^+}$	√	0	0	√	-	-
N47.9.8 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{X1^-}$	√	0	0	√	-	-
N47.9.9 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{X2^+}$	√	0	0	√	-	-
N47.9.10 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{GM2^+}$	√	2	2	√	222	$\mathrm{B1} \oplus \mathrm{B1}$
N47.9.11 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{GM3^+}$	√	2	2	√	$mm2$	$\mathrm{B2} \oplus \mathrm{B1}$
N47.9.12 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{GM2^-}$	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N47.9.13 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{GM3^-}$	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_u}$
N47.9.14 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{R1^+}$	√	2	2	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N47.9.15 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{S1^+}$	√	2	2	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N47.9.16 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{T1^+}$	√	2	2	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N47.9.17 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{S1^-}$	√	2	2	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N47.9.18 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{T1^-}$	√	2	2	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N47.9.19 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{X1^+}$	√	2	2	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N47.9.20 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{Z1^+}$	√	2	2	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N47.9.21 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{X1^-}$	√	2	2	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N47.9.22 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{Z1^-}$	√	2	2	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N47.9.23 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{X2^+}$	√	2	2	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N47.9.24 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{X2^-}$	√	2	2	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N47.9.25 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{Z3^+}$	√	2	2	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N47.9.26 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{GM2^-}$	√	0	0	√	-	-
N47.9.27 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{GM3^-}$	√	0	0	√	-	-
N47.9.28 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{R1^+}$	√	0	0	√	-	-
N47.9.29 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{S1^+}$	√	0	0	√	-	-

Non-coplanar SSGs with parent space group $Pmmm$ (No. 47) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N47.9.30 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{T1}^+$	$\surd$	0	0	$\surd$	-	-
N47.9.31 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{S1}^-$	$\surd$	0	0	$\surd$	-	-
N47.9.32 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{T1}^-$	$\surd$	0	0	$\surd$	-	-
N47.9.33 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{X1}^+$	$\surd$	0	0	$\surd$	-	-
N47.9.34 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Z1}^+$	$\surd$	0	0	$\surd$	-	-
N47.9.35 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{X1}^-$	$\surd$	0	0	$\surd$	-	-
N47.9.36 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Z1}^-$	$\surd$	0	0	$\surd$	-	-
N47.9.37 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{X2}^+$	$\surd$	0	0	$\surd$	-	-
N47.9.38 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{X2}^-$	$\surd$	0	0	$\surd$	-	-
N47.9.39 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Z3}^+$	$\surd$	0	0	$\surd$	-	-
N47.9.40 $\mathrm{GM1}^- \oplus \mathrm{R1}^+ \oplus \mathrm{R1}^+$	$\surd$	1	0	$\times$	-	-
N47.9.41 $\mathrm{GM1}^- \oplus \mathrm{R1}^+ \oplus \mathrm{R1}^-$	$\surd$	1	1	$\times$	-	-
N47.9.42 $\mathrm{GM1}^- \oplus \mathrm{R1}^+ \oplus \mathrm{R2}^+$	$\surd$	1	0	$\times$	-	-
N47.9.43 $\mathrm{GM1}^- \oplus \mathrm{R1}^+ \oplus \mathrm{R2}^-$	$\surd$	1	1	$\times$	-	-
N47.9.44 $\mathrm{GM1}^- \oplus \mathrm{R1}^+ \oplus \mathrm{S1}^+$	$\surd$	1	0	$\times$	-	-
N47.9.45 $\mathrm{GM1}^- \oplus \mathrm{R1}^+ \oplus \mathrm{S2}^+$	$\surd$	1	0	$\times$	-	-
N47.9.46 $\mathrm{GM1}^- \oplus \mathrm{R1}^+ \oplus \mathrm{S3}^-$	$\surd$	1	0	$\times$	-	-
N47.9.47 $\mathrm{GM1}^- \oplus \mathrm{R1}^+ \oplus \mathrm{S1}^-$	$\surd$	1	0	$\times$	-	-
N47.9.48 $\mathrm{GM1}^- \oplus \mathrm{R1}^+ \oplus \mathrm{S2}^-$	$\surd$	1	0	$\times$	-	-
N47.9.49 $\mathrm{GM1}^- \oplus \mathrm{R1}^+ \oplus \mathrm{S3}^+$	$\surd$	1	0	$\times$	-	-
N47.9.50 $\mathrm{GM1}^- \oplus \mathrm{R1}^+ \oplus \mathrm{X1}^+$	$\surd$	1	0	$\times$	-	-
N47.9.51 $\mathrm{GM1}^- \oplus \mathrm{R1}^+ \oplus \mathrm{X3}^-$	$\surd$	1	0	$\times$	-	-
N47.9.52 $\mathrm{GM1}^- \oplus \mathrm{R1}^+ \oplus \mathrm{X1}^-$	$\surd$	1	0	$\times$	-	-
N47.9.53 $\mathrm{GM1}^- \oplus \mathrm{R1}^+ \oplus \mathrm{X3}^+$	$\surd$	1	0	$\times$	-	-
N47.9.54 $\mathrm{GM1}^- \oplus \mathrm{R1}^+ \oplus \mathrm{X2}^+$	$\surd$	1	0	$\times$	-	-
N47.9.55 $\mathrm{GM1}^- \oplus \mathrm{R1}^+ \oplus \mathrm{X2}^-$	$\surd$	1	0	$\times$	-	-
N47.9.56 $\mathrm{GM1}^- \oplus \mathrm{S1}^+ \oplus \mathrm{S1}^+$	$\surd$	1	0	$\times$	-	-
N47.9.57 $\mathrm{GM1}^- \oplus \mathrm{S1}^+ \oplus \mathrm{S2}^+$	$\surd$	1	0	$\times$	-	-
N47.9.58 $\mathrm{GM1}^- \oplus \mathrm{S1}^+ \oplus \mathrm{S3}^-$	$\surd$	1	1	$\times$	-	-
N47.9.59 $\mathrm{GM1}^- \oplus \mathrm{S1}^+ \oplus \mathrm{T1}^+$	$\surd$	1	0	$\times$	-	-
N47.9.60 $\mathrm{GM1}^- \oplus \mathrm{S1}^+ \oplus \mathrm{T3}^+$	$\surd$	1	0	$\times$	-	-
N47.9.61 $\mathrm{GM1}^- \oplus \mathrm{S1}^+ \oplus \mathrm{S1}^-$	$\surd$	1	1	$\times$	-	-
N47.9.62 $\mathrm{GM1}^- \oplus \mathrm{S1}^+ \oplus \mathrm{S2}^-$	$\surd$	1	1	$\times$	-	-
N47.9.63 $\mathrm{GM1}^- \oplus \mathrm{S1}^+ \oplus \mathrm{S3}^+$	$\surd$	1	0	$\times$	-	-
N47.9.64 $\mathrm{GM1}^- \oplus \mathrm{S1}^+ \oplus \mathrm{T1}^-$	$\surd$	1	0	$\times$	-	-
N47.9.65 $\mathrm{GM1}^- \oplus \mathrm{S1}^+ \oplus \mathrm{T3}^-$	$\surd$	1	0	$\times$	-	-
N47.9.66 $\mathrm{GM1}^- \oplus \mathrm{S1}^+ \oplus \mathrm{X1}^+$	$\surd$	1	0	$\times$	-	-
N47.9.67 $\mathrm{GM1}^- \oplus \mathrm{S1}^+ \oplus \mathrm{X3}^-$	$\surd$	1	0	$\times$	-	-
N47.9.68 $\mathrm{GM1}^- \oplus \mathrm{S1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N47.9.69 $\mathrm{GM1}^- \oplus \mathrm{S1}^+ \oplus \mathrm{X1}^-$	$\surd$	1	0	$\times$	-	-
N47.9.70 $\mathrm{GM1}^- \oplus \mathrm{S1}^+ \oplus \mathrm{X3}^+$	$\surd$	1	0	$\times$	-	-
N47.9.71 $\mathrm{GM1}^- \oplus \mathrm{S1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N47.9.72 $\mathrm{GM1}^- \oplus \mathrm{S1}^+ \oplus \mathrm{X2}^+$	$\surd$	1	0	$\times$	-	-
N47.9.73 $\mathrm{GM1}^- \oplus \mathrm{S1}^+ \oplus \mathrm{X2}^-$	$\surd$	1	0	$\times$	-	-
N47.9.74 $\mathrm{GM1}^- \oplus \mathrm{S1}^+ \oplus \mathrm{X4}^+$	$\surd$	1	0	$\times$	-	-
N47.9.75 $\mathrm{GM1}^- \oplus \mathrm{S1}^+ \oplus \mathrm{X4}^-$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $Pmmm$ (No. 47) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N47.9.76 $\mathrm{GM1^-} \oplus \mathrm{S1^+} \oplus \mathrm{Z3^+}$	$\surd$	1	0	$\times$	-	-
N47.9.77 $\mathrm{GM1^-} \oplus \mathrm{S1^-} \oplus \mathrm{S1^-}$	$\surd$	1	0	$\times$	-	-
N47.9.78 $\mathrm{GM1^-} \oplus \mathrm{S1^-} \oplus \mathrm{S2^-}$	$\surd$	1	0	$\times$	-	-
N47.9.79 $\mathrm{GM1^-} \oplus \mathrm{S1^-} \oplus \mathrm{S3^+}$	$\surd$	1	1	$\times$	-	-
N47.9.80 $\mathrm{GM1^-} \oplus \mathrm{S1^-} \oplus \mathrm{T1^-}$	$\surd$	1	0	$\times$	-	-
N47.9.81 $\mathrm{GM1^-} \oplus \mathrm{S1^-} \oplus \mathrm{T3^-}$	$\surd$	1	0	$\times$	-	-
N47.9.82 $\mathrm{GM1^-} \oplus \mathrm{S1^-} \oplus \mathrm{X1^+}$	$\surd$	1	0	$\times$	-	-
N47.9.83 $\mathrm{GM1^-} \oplus \mathrm{S1^-} \oplus \mathrm{X3^-}$	$\surd$	1	0	$\times$	-	-
N47.9.84 $\mathrm{GM1^-} \oplus \mathrm{S1^-} \oplus \mathrm{Z1^+}$	$\surd$	1	0	$\times$	-	-
N47.9.85 $\mathrm{GM1^-} \oplus \mathrm{S1^-} \oplus \mathrm{X1^-}$	$\surd$	1	0	$\times$	-	-
N47.9.86 $\mathrm{GM1^-} \oplus \mathrm{S1^-} \oplus \mathrm{X3^+}$	$\surd$	1	0	$\times$	-	-
N47.9.87 $\mathrm{GM1^-} \oplus \mathrm{S1^-} \oplus \mathrm{Z1^-}$	$\surd$	1	0	$\times$	-	-
N47.9.88 $\mathrm{GM1^-} \oplus \mathrm{S1^-} \oplus \mathrm{X2^+}$	$\surd$	1	0	$\times$	-	-
N47.9.89 $\mathrm{GM1^-} \oplus \mathrm{S1^-} \oplus \mathrm{X2^-}$	$\surd$	1	0	$\times$	-	-
N47.9.90 $\mathrm{GM1^-} \oplus \mathrm{S1^-} \oplus \mathrm{X4^+}$	$\surd$	1	0	$\times$	-	-
N47.9.91 $\mathrm{GM1^-} \oplus \mathrm{S1^-} \oplus \mathrm{X4^-}$	$\surd$	1	0	$\times$	-	-
N47.9.92 $\mathrm{GM1^-} \oplus \mathrm{S1^-} \oplus \mathrm{Z3^+}$	$\surd$	1	0	$\times$	-	-
N47.9.93 $\mathrm{GM1^-} \oplus \mathrm{X1^+} \oplus \mathrm{X1^+}$	$\surd$	1	0	$\times$	-	-
N47.9.94 $\mathrm{GM1^-} \oplus \mathrm{X1^+} \oplus \mathrm{X3^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N47.9.95 $\mathrm{GM1^-} \oplus \mathrm{X1^+} \oplus \mathrm{Y1^+}$	$\surd$	1	0	$\times$	-	-
N47.9.96 $\mathrm{GM1^-} \oplus \mathrm{X1^+} \oplus \mathrm{X1^-}$	$\surd$	1	1	$\times$	-	-
N47.9.97 $\mathrm{GM1^-} \oplus \mathrm{X1^+} \oplus \mathrm{X3^+}$	$\surd$	1	0	$\times$	-	-
N47.9.98 $\mathrm{GM1^-} \oplus \mathrm{X1^+} \oplus \mathrm{Y1^-}$	$\surd$	1	0	$\times$	-	-
N47.9.99 $\mathrm{GM1^-} \oplus \mathrm{X1^+} \oplus \mathrm{X2^+}$	$\surd$	1	0	$\times$	-	-
N47.9.100 $\mathrm{GM1^-} \oplus \mathrm{X1^+} \oplus \mathrm{X2^-}$	$\surd$	1	1	$\times$	-	-
N47.9.101 $\mathrm{GM1^-} \oplus \mathrm{X1^+} \oplus \mathrm{Y2^+}$	$\surd$	1	0	$\times$	-	-
N47.9.102 $\mathrm{GM1^-} \oplus \mathrm{X1^+} \oplus \mathrm{Y2^-}$	$\surd$	1	0	$\times$	-	-
N47.9.103 $\mathrm{GM1^-} \oplus \mathrm{X1^-} \oplus \mathrm{X1^-}$	$\surd$	1	0	$\times$	-	-
N47.9.104 $\mathrm{GM1^-} \oplus \mathrm{X1^-} \oplus \mathrm{X3^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N47.9.105 $\mathrm{GM1^-} \oplus \mathrm{X1^-} \oplus \mathrm{Y1^-}$	$\surd$	1	0	$\times$	-	-
N47.9.106 $\mathrm{GM1^-} \oplus \mathrm{X1^-} \oplus \mathrm{X2^+}$	$\surd$	1	1	$\times$	-	-
N47.9.107 $\mathrm{GM1^-} \oplus \mathrm{X1^-} \oplus \mathrm{X2^-}$	$\surd$	1	0	$\times$	-	-
N47.9.108 $\mathrm{GM1^-} \oplus \mathrm{X1^-} \oplus \mathrm{Y2^+}$	$\surd$	1	0	$\times$	-	-
N47.9.109 $\mathrm{GM1^-} \oplus \mathrm{X1^-} \oplus \mathrm{Y2^-}$	$\surd$	1	0	$\times$	-	-
N47.9.110 $\mathrm{GM1^-} \oplus \mathrm{X2^+} \oplus \mathrm{X2^+}$	$\surd$	1	0	$\times$	-	-
N47.9.111 $\mathrm{GM1^-} \oplus \mathrm{X2^+} \oplus \mathrm{X2^-}$	$\surd$	1	1	$\times$	-	-
N47.9.112 $\mathrm{GM1^-} \oplus \mathrm{X2^+} \oplus \mathrm{X4^+}$	$\surd$	1	0	$\times$	-	-
N47.9.113 $\mathrm{GM1^-} \oplus \mathrm{X2^+} \oplus \mathrm{X4^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N47.9.114 $\mathrm{GM1^-} \oplus \mathrm{X2^+} \oplus \mathrm{Y2^+}$	$\surd$	1	0	$\times$	-	-
N47.9.115 $\mathrm{GM1^-} \oplus \mathrm{X2^+} \oplus \mathrm{Y2^-}$	$\surd$	1	0	$\times$	-	-
N47.9.116 $\mathrm{GM1^-} \oplus \mathrm{X2^+} \oplus \mathrm{Z3^+}$	$\surd$	1	0	$\times$	-	-
N47.9.117 $\mathrm{GM2^+} \oplus \mathrm{GM2^+} \oplus \mathrm{GM2^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N47.9.118 $\mathrm{GM2^+} \oplus \mathrm{GM2^+} \oplus \mathrm{GM3^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B3_g}$
N47.9.119 $\mathrm{GM2^+} \oplus \mathrm{GM3^+} \oplus \mathrm{GM4^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N47.9.120 $\mathrm{GM2^+} \oplus \mathrm{GM2^+} \oplus \mathrm{GM2^-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{A2}$
N47.9.121 $\mathrm{GM2^+} \oplus \mathrm{GM2^+} \oplus \mathrm{GM3^-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2} \oplus \mathrm{B2}$

Non-coplanar SSGs with parent space group $Pmmm$ (No. 47) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N47.9.122 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{B2}$
N47.9.123 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	222	$\mathrm{B1} \oplus \mathrm{B3}$
N47.9.124 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{R1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N47.9.125 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{R1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N47.9.126 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{S1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N47.9.127 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{T1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N47.9.128 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{S1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N47.9.129 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{U1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N47.9.130 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{S1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N47.9.131 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{T1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N47.9.132 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{S1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N47.9.133 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{U1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N47.9.134 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{X1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N47.9.135 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{Z1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N47.9.136 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{X1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N47.9.137 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N47.9.138 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{X1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N47.9.139 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{Z1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N47.9.140 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{X1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N47.9.141 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N47.9.142 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{X2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N47.9.143 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{X2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N47.9.144 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{Z3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N47.9.145 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{X2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N47.9.146 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{X2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N47.9.147 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N47.9.148 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$
N47.9.149 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g} \oplus \mathrm{B2_u}$
N47.9.150 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N47.9.151 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N47.9.152 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{R1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
N47.9.153 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{R1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N47.9.154 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{S1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
N47.9.155 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{T1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
N47.9.156 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{S1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N47.9.157 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{T1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N47.9.158 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{U1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N47.9.159 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{S1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
N47.9.160 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{T1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
N47.9.161 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{S1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N47.9.162 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{T1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N47.9.163 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{U1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N47.9.164 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{X1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
N47.9.165 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{Z1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
N47.9.166 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{X1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N47.9.167 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$

Non-coplanar SSGs with parent space group $Pmmm$ (No. 47) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N47.9.168 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Z1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N47.9.169 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{X1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
N47.9.170 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{Z1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
N47.9.171 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{X1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N47.9.172 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N47.9.173 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Z1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N47.9.174 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{X2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
N47.9.175 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{X2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
N47.9.176 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{Z3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
N47.9.177 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{X2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N47.9.178 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{X2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N47.9.179 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N47.9.180 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N47.9.181 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Z3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N47.9.182 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Z3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N47.9.183 $\mathrm{GM2}^+ \oplus \mathrm{R1}^+ \oplus \mathrm{R1}^+$	$\surd$	1	1	$\times$	-	-
N47.9.184 $\mathrm{GM2}^+ \oplus \mathrm{R1}^+ \oplus \mathrm{R1}^-$	$\surd$	1	1	$\times$	-	-
N47.9.185 $\mathrm{GM2}^+ \oplus \mathrm{R1}^+ \oplus \mathrm{R2}^+$	$\surd$	1	1	$\times$	-	-
N47.9.186 $\mathrm{GM2}^+ \oplus \mathrm{R1}^+ \oplus \mathrm{R2}^-$	$\surd$	1	1	$\times$	-	-
N47.9.187 $\mathrm{GM2}^+ \oplus \mathrm{R1}^+ \oplus \mathrm{R3}^+$	$\surd$	1	1	$\times$	-	-
N47.9.188 $\mathrm{GM2}^+ \oplus \mathrm{R1}^+ \oplus \mathrm{R3}^-$	$\surd$	1	1	$\times$	-	-
N47.9.189 $\mathrm{GM2}^+ \oplus \mathrm{R1}^+ \oplus \mathrm{S1}^+$	$\surd$	1	1	$\times$	-	-
N47.9.190 $\mathrm{GM2}^+ \oplus \mathrm{R1}^+ \oplus \mathrm{S2}^+$	$\surd$	1	1	$\times$	-	-
N47.9.191 $\mathrm{GM2}^+ \oplus \mathrm{R1}^+ \oplus \mathrm{S3}^-$	$\surd$	1	1	$\times$	-	-
N47.9.192 $\mathrm{GM2}^+ \oplus \mathrm{R1}^+ \oplus \mathrm{T1}^+$	$\surd$	1	1	$\times$	-	-
N47.9.193 $\mathrm{GM2}^+ \oplus \mathrm{R1}^+ \oplus \mathrm{T2}^-$	$\surd$	1	1	$\times$	-	-
N47.9.194 $\mathrm{GM2}^+ \oplus \mathrm{R1}^+ \oplus \mathrm{T3}^+$	$\surd$	1	1	$\times$	-	-
N47.9.195 $\mathrm{GM2}^+ \oplus \mathrm{R1}^+ \oplus \mathrm{T4}^-$	$\surd$	1	1	$\times$	-	-
N47.9.196 $\mathrm{GM2}^+ \oplus \mathrm{R1}^+ \oplus \mathrm{S1}^-$	$\surd$	1	1	$\times$	-	-
N47.9.197 $\mathrm{GM2}^+ \oplus \mathrm{R1}^+ \oplus \mathrm{S2}^-$	$\surd$	1	1	$\times$	-	-
N47.9.198 $\mathrm{GM2}^+ \oplus \mathrm{R1}^+ \oplus \mathrm{S3}^+$	$\surd$	1	1	$\times$	-	-
N47.9.199 $\mathrm{GM2}^+ \oplus \mathrm{R1}^+ \oplus \mathrm{T1}^-$	$\surd$	1	1	$\times$	-	-
N47.9.200 $\mathrm{GM2}^+ \oplus \mathrm{R1}^+ \oplus \mathrm{T2}^+$	$\surd$	1	1	$\times$	-	-
N47.9.201 $\mathrm{GM2}^+ \oplus \mathrm{R1}^+ \oplus \mathrm{T3}^-$	$\surd$	1	1	$\times$	-	-
N47.9.202 $\mathrm{GM2}^+ \oplus \mathrm{R1}^+ \oplus \mathrm{T4}^+$	$\surd$	1	1	$\times$	-	-
N47.9.203 $\mathrm{GM2}^+ \oplus \mathrm{R1}^+ \oplus \mathrm{X1}^+$	$\surd$	1	1	$\times$	-	-
N47.9.204 $\mathrm{GM2}^+ \oplus \mathrm{R1}^+ \oplus \mathrm{X3}^-$	$\surd$	1	1	$\times$	-	-
N47.9.205 $\mathrm{GM2}^+ \oplus \mathrm{R1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\times$	-	-
N47.9.206 $\mathrm{GM2}^+ \oplus \mathrm{R1}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\times$	-	-
N47.9.207 $\mathrm{GM2}^+ \oplus \mathrm{R1}^+ \oplus \mathrm{X1}^-$	$\surd$	1	1	$\times$	-	-
N47.9.208 $\mathrm{GM2}^+ \oplus \mathrm{R1}^+ \oplus \mathrm{X3}^+$	$\surd$	1	1	$\times$	-	-
N47.9.209 $\mathrm{GM2}^+ \oplus \mathrm{R1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
N47.9.210 $\mathrm{GM2}^+ \oplus \mathrm{R1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\times$	-	-
N47.9.211 $\mathrm{GM2}^+ \oplus \mathrm{R1}^+ \oplus \mathrm{X2}^+$	$\surd$	1	1	$\times$	-	-
N47.9.212 $\mathrm{GM2}^+ \oplus \mathrm{R1}^+ \oplus \mathrm{X2}^-$	$\surd$	1	1	$\times$	-	-
N47.9.213 $\mathrm{GM2}^+ \oplus \mathrm{R1}^+ \oplus \mathrm{X4}^+$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $Pmmm$ (No. 47) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N47.9.214 $\mathrm{GM2}^{+}\oplus\mathrm{R1}^{+}\oplus\mathrm{X4}^{-}$	$\surd$	1	1	$\times$	-	-
N47.9.215 $\mathrm{GM2}^{+}\oplus\mathrm{R1}^{+}\oplus\mathrm{Z3}^{+}$	$\surd$	1	1	$\times$	-	-
N47.9.216 $\mathrm{GM2}^{+}\oplus\mathrm{R1}^{+}\oplus\mathrm{Z3}^{-}$	$\surd$	1	1	$\times$	-	-
N47.9.217 $\mathrm{GM2}^{+}\oplus\mathrm{S1}^{+}\oplus\mathrm{S1}^{+}$	$\surd$	1	1	$\times$	-	-
N47.9.218 $\mathrm{GM2}^{+}\oplus\mathrm{S1}^{+}\oplus\mathrm{S2}^{+}$	$\surd$	1	1	$\times$	-	-
N47.9.219 $\mathrm{GM2}^{+}\oplus\mathrm{S1}^{+}\oplus\mathrm{S3}^{-}$	$\surd$	1	1	$\times$	-	-
N47.9.220 $\mathrm{GM2}^{+}\oplus\mathrm{S1}^{+}\oplus\mathrm{T1}^{+}$	$\surd$	1	1	$\times$	-	-
N47.9.221 $\mathrm{GM2}^{+}\oplus\mathrm{S1}^{+}\oplus\mathrm{T3}^{+}$	$\surd$	1	1	$\times$	-	-
N47.9.222 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{+}\oplus\mathrm{T1}^{+}$	$\surd$	1	1	$\times$	-	-
N47.9.223 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{+}\oplus\mathrm{T2}^{-}$	$\surd$	1	1	$\times$	-	-
N47.9.224 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{+}\oplus\mathrm{T3}^{+}$	$\surd$	1	1	$\times$	-	-
N47.9.225 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{+}\oplus\mathrm{T4}^{-}$	$\surd$	1	1	$\times$	-	-
N47.9.226 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{+}\oplus\mathrm{U1}^{+}$	$\surd$	1	1	$\times$	-	-
N47.9.227 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{+}\oplus\mathrm{U2}^{-}$	$\surd$	1	1	$\times$	-	-
N47.9.228 $\mathrm{GM2}^{+}\oplus\mathrm{S1}^{+}\oplus\mathrm{S1}^{-}$	$\surd$	1	1	$\times$	-	-
N47.9.229 $\mathrm{GM2}^{+}\oplus\mathrm{S1}^{+}\oplus\mathrm{S2}^{-}$	$\surd$	1	1	$\times$	-	-
N47.9.230 $\mathrm{GM2}^{+}\oplus\mathrm{S1}^{+}\oplus\mathrm{S3}^{+}$	$\surd$	1	1	$\times$	-	-
N47.9.231 $\mathrm{GM2}^{+}\oplus\mathrm{S1}^{+}\oplus\mathrm{T1}^{-}$	$\surd$	1	1	$\times$	-	-
N47.9.232 $\mathrm{GM2}^{+}\oplus\mathrm{S1}^{+}\oplus\mathrm{T3}^{-}$	$\surd$	1	1	$\times$	-	-
N47.9.233 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{+}\oplus\mathrm{S1}^{-}$	$\surd$	1	1	$\times$	-	-
N47.9.234 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{+}\oplus\mathrm{S2}^{-}$	$\surd$	1	1	$\times$	-	-
N47.9.235 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{+}\oplus\mathrm{T1}^{-}$	$\surd$	1	1	$\times$	-	-
N47.9.236 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{+}\oplus\mathrm{T2}^{+}$	$\surd$	1	1	$\times$	-	-
N47.9.237 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{+}\oplus\mathrm{T3}^{-}$	$\surd$	1	1	$\times$	-	-
N47.9.238 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{+}\oplus\mathrm{T4}^{+}$	$\surd$	1	1	$\times$	-	-
N47.9.239 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{+}\oplus\mathrm{U1}^{-}$	$\surd$	1	1	$\times$	-	-
N47.9.240 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{+}\oplus\mathrm{U2}^{+}$	$\surd$	1	1	$\times$	-	-
N47.9.241 $\mathrm{GM2}^{+}\oplus\mathrm{S1}^{+}\oplus\mathrm{X1}^{+}$	$\surd$	1	1	$\times$	-	-
N47.9.242 $\mathrm{GM2}^{+}\oplus\mathrm{S1}^{+}\oplus\mathrm{X3}^{-}$	$\surd$	1	1	$\times$	-	-
N47.9.243 $\mathrm{GM2}^{+}\oplus\mathrm{S1}^{+}\oplus\mathrm{Z1}^{+}$	$\surd$	1	1	$\times$	-	-
N47.9.244 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{+}\oplus\mathrm{X1}^{+}$	$\surd$	1	1	$\times$	-	-
N47.9.245 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{+}\oplus\mathrm{Y1}^{+}$	$\surd$	1	1	$\times$	-	-
N47.9.246 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{+}\oplus\mathrm{Y4}^{-}$	$\surd$	1	1	$\times$	-	-
N47.9.247 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{+}\oplus\mathrm{Z1}^{+}$	$\surd$	1	1	$\times$	-	-
N47.9.248 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{+}\oplus\mathrm{Z2}^{-}$	$\surd$	1	1	$\times$	-	-
N47.9.249 $\mathrm{GM2}^{+}\oplus\mathrm{S1}^{+}\oplus\mathrm{X1}^{-}$	$\surd$	1	1	$\times$	-	-
N47.9.250 $\mathrm{GM2}^{+}\oplus\mathrm{S1}^{+}\oplus\mathrm{X3}^{+}$	$\surd$	1	1	$\times$	-	-
N47.9.251 $\mathrm{GM2}^{+}\oplus\mathrm{S1}^{+}\oplus\mathrm{Z1}^{-}$	$\surd$	1	1	$\times$	-	-
N47.9.252 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{+}\oplus\mathrm{X1}^{-}$	$\surd$	1	1	$\times$	-	-
N47.9.253 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{+}\oplus\mathrm{Y1}^{-}$	$\surd$	1	1	$\times$	-	-
N47.9.254 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{+}\oplus\mathrm{Y4}^{+}$	$\surd$	1	1	$\times$	-	-
N47.9.255 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{+}\oplus\mathrm{Z1}^{-}$	$\surd$	1	1	$\times$	-	-
N47.9.256 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{+}\oplus\mathrm{Z2}^{+}$	$\surd$	1	1	$\times$	-	-
N47.9.257 $\mathrm{GM2}^{+}\oplus\mathrm{S1}^{+}\oplus\mathrm{X2}^{+}$	$\surd$	1	1	$\times$	-	-
N47.9.258 $\mathrm{GM2}^{+}\oplus\mathrm{S1}^{+}\oplus\mathrm{X2}^{-}$	$\surd$	1	1	$\times$	-	-
N47.9.259 $\mathrm{GM2}^{+}\oplus\mathrm{S1}^{+}\oplus\mathrm{X4}^{+}$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $Pmmm$ (No. 47) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N47.9.260 $\mathrm{GM2}^{+} \oplus \mathrm{S1}^{+} \oplus \mathrm{X4}^{-}$	$\surd$	1	1	$\times$	-	-
N47.9.261 $\mathrm{GM2}^{+} \oplus \mathrm{S1}^{+} \oplus \mathrm{Z3}^{+}$	$\surd$	1	1	$\times$	-	-
N47.9.262 $\mathrm{GM2}^{+} \oplus \mathrm{T1}^{+} \oplus \mathrm{X2}^{+}$	$\surd$	1	1	$\times$	-	-
N47.9.263 $\mathrm{GM2}^{+} \oplus \mathrm{T1}^{+} \oplus \mathrm{X2}^{-}$	$\surd$	1	1	$\times$	-	-
N47.9.264 $\mathrm{GM2}^{+} \oplus \mathrm{T1}^{+} \oplus \mathrm{Y2}^{+}$	$\surd$	1	1	$\times$	-	-
N47.9.265 $\mathrm{GM2}^{+} \oplus \mathrm{T1}^{+} \oplus \mathrm{Y2}^{-}$	$\surd$	1	1	$\times$	-	-
N47.9.266 $\mathrm{GM2}^{+} \oplus \mathrm{T1}^{+} \oplus \mathrm{Y3}^{+}$	$\surd$	1	1	$\times$	-	-
N47.9.267 $\mathrm{GM2}^{+} \oplus \mathrm{T1}^{+} \oplus \mathrm{Y3}^{-}$	$\surd$	1	1	$\times$	-	-
N47.9.268 $\mathrm{GM2}^{+} \oplus \mathrm{T1}^{+} \oplus \mathrm{Z3}^{+}$	$\surd$	1	1	$\times$	-	-
N47.9.269 $\mathrm{GM2}^{+} \oplus \mathrm{T1}^{+} \oplus \mathrm{Z3}^{-}$	$\surd$	1	1	$\times$	-	-
N47.9.270 $\mathrm{GM2}^{+} \oplus \mathrm{T1}^{+} \oplus \mathrm{Z4}^{+}$	$\surd$	1	1	$\times$	-	-
N47.9.271 $\mathrm{GM2}^{+} \oplus \mathrm{T1}^{+} \oplus \mathrm{Z4}^{-}$	$\surd$	1	1	$\times$	-	-
N47.9.272 $\mathrm{GM2}^{+} \oplus \mathrm{S1}^{-} \oplus \mathrm{S1}^{-}$	$\surd$	1	1	$\times$	-	-
N47.9.273 $\mathrm{GM2}^{+} \oplus \mathrm{S1}^{-} \oplus \mathrm{S2}^{-}$	$\surd$	1	1	$\times$	-	-
N47.9.274 $\mathrm{GM2}^{+} \oplus \mathrm{S1}^{-} \oplus \mathrm{S3}^{+}$	$\surd$	1	1	$\times$	-	-
N47.9.275 $\mathrm{GM2}^{+} \oplus \mathrm{S1}^{-} \oplus \mathrm{T1}^{-}$	$\surd$	1	1	$\times$	-	-
N47.9.276 $\mathrm{GM2}^{+} \oplus \mathrm{S1}^{-} \oplus \mathrm{T3}^{-}$	$\surd$	1	1	$\times$	-	-
N47.9.277 $\mathrm{GM2}^{+} \oplus \mathrm{T1}^{-} \oplus \mathrm{T1}^{-}$	$\surd$	1	1	$\times$	-	-
N47.9.278 $\mathrm{GM2}^{+} \oplus \mathrm{T1}^{-} \oplus \mathrm{T2}^{+}$	$\surd$	1	1	$\times$	-	-
N47.9.279 $\mathrm{GM2}^{+} \oplus \mathrm{T1}^{-} \oplus \mathrm{T3}^{-}$	$\surd$	1	1	$\times$	-	-
N47.9.280 $\mathrm{GM2}^{+} \oplus \mathrm{T1}^{-} \oplus \mathrm{T4}^{+}$	$\surd$	1	1	$\times$	-	-
N47.9.281 $\mathrm{GM2}^{+} \oplus \mathrm{T1}^{-} \oplus \mathrm{U1}^{-}$	$\surd$	1	1	$\times$	-	-
N47.9.282 $\mathrm{GM2}^{+} \oplus \mathrm{T1}^{-} \oplus \mathrm{U2}^{+}$	$\surd$	1	1	$\times$	-	-
N47.9.283 $\mathrm{GM2}^{+} \oplus \mathrm{S1}^{-} \oplus \mathrm{X1}^{+}$	$\surd$	1	1	$\times$	-	-
N47.9.284 $\mathrm{GM2}^{+} \oplus \mathrm{S1}^{-} \oplus \mathrm{X3}^{-}$	$\surd$	1	1	$\times$	-	-
N47.9.285 $\mathrm{GM2}^{+} \oplus \mathrm{S1}^{-} \oplus \mathrm{Z1}^{+}$	$\surd$	1	1	$\times$	-	-
N47.9.286 $\mathrm{GM2}^{+} \oplus \mathrm{T1}^{-} \oplus \mathrm{X1}^{+}$	$\surd$	1	1	$\times$	-	-
N47.9.287 $\mathrm{GM2}^{+} \oplus \mathrm{T1}^{-} \oplus \mathrm{Y1}^{+}$	$\surd$	1	1	$\times$	-	-
N47.9.288 $\mathrm{GM2}^{+} \oplus \mathrm{T1}^{-} \oplus \mathrm{Y4}^{-}$	$\surd$	1	1	$\times$	-	-
N47.9.289 $\mathrm{GM2}^{+} \oplus \mathrm{T1}^{-} \oplus \mathrm{Z1}^{+}$	$\surd$	1	1	$\times$	-	-
N47.9.290 $\mathrm{GM2}^{+} \oplus \mathrm{T1}^{-} \oplus \mathrm{Z2}^{-}$	$\surd$	1	1	$\times$	-	-
N47.9.291 $\mathrm{GM2}^{+} \oplus \mathrm{S1}^{-} \oplus \mathrm{X1}^{-}$	$\surd$	1	1	$\times$	-	-
N47.9.292 $\mathrm{GM2}^{+} \oplus \mathrm{S1}^{-} \oplus \mathrm{X3}^{+}$	$\surd$	1	1	$\times$	-	-
N47.9.293 $\mathrm{GM2}^{+} \oplus \mathrm{S1}^{-} \oplus \mathrm{Z1}^{-}$	$\surd$	1	1	$\times$	-	-
N47.9.294 $\mathrm{GM2}^{+} \oplus \mathrm{T1}^{-} \oplus \mathrm{X1}^{-}$	$\surd$	1	1	$\times$	-	-
N47.9.295 $\mathrm{GM2}^{+} \oplus \mathrm{T1}^{-} \oplus \mathrm{Y1}^{-}$	$\surd$	1	1	$\times$	-	-
N47.9.296 $\mathrm{GM2}^{+} \oplus \mathrm{T1}^{-} \oplus \mathrm{Y4}^{+}$	$\surd$	1	1	$\times$	-	-
N47.9.297 $\mathrm{GM2}^{+} \oplus \mathrm{T1}^{-} \oplus \mathrm{Z1}^{-}$	$\surd$	1	1	$\times$	-	-
N47.9.298 $\mathrm{GM2}^{+} \oplus \mathrm{T1}^{-} \oplus \mathrm{Z2}^{+}$	$\surd$	1	1	$\times$	-	-
N47.9.299 $\mathrm{GM2}^{+} \oplus \mathrm{S1}^{-} \oplus \mathrm{X2}^{+}$	$\surd$	1	1	$\times$	-	-
N47.9.300 $\mathrm{GM2}^{+} \oplus \mathrm{S1}^{-} \oplus \mathrm{X2}^{-}$	$\surd$	1	1	$\times$	-	-
N47.9.301 $\mathrm{GM2}^{+} \oplus \mathrm{S1}^{-} \oplus \mathrm{X4}^{+}$	$\surd$	1	1	$\times$	-	-
N47.9.302 $\mathrm{GM2}^{+} \oplus \mathrm{S1}^{-} \oplus \mathrm{X4}^{-}$	$\surd$	1	1	$\times$	-	-
N47.9.303 $\mathrm{GM2}^{+} \oplus \mathrm{S1}^{-} \oplus \mathrm{Z3}^{+}$	$\surd$	1	1	$\times$	-	-
N47.9.304 $\mathrm{GM2}^{+} \oplus \mathrm{T1}^{-} \oplus \mathrm{X2}^{+}$	$\surd$	1	1	$\times$	-	-
N47.9.305 $\mathrm{GM2}^{+} \oplus \mathrm{T1}^{-} \oplus \mathrm{X2}^{-}$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $Pmmm$ (No. 47) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N47.9.306 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{-}\oplus\mathrm{Y2}^{+}$	$\surd$	1	1	$\times$	-	-
N47.9.307 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{-}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\times$	-	-
N47.9.308 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{-}\oplus\mathrm{Y3}^{+}$	$\surd$	1	1	$\times$	-	-
N47.9.309 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{-}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\times$	-	-
N47.9.310 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{-}\oplus\mathrm{Z3}^{+}$	$\surd$	1	1	$\times$	-	-
N47.9.311 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{-}\oplus\mathrm{Z3}^{-}$	$\surd$	1	1	$\times$	-	-
N47.9.312 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{-}\oplus\mathrm{Z4}^{+}$	$\surd$	1	1	$\times$	-	-
N47.9.313 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{-}\oplus\mathrm{Z4}^{-}$	$\surd$	1	1	$\times$	-	-
N47.9.314 $\mathrm{GM2}^{+}\oplus\mathrm{X1}^{+}\oplus\mathrm{X1}^{+}$	$\surd$	1	1	$\times$	-	-
N47.9.315 $\mathrm{GM2}^{+}\oplus\mathrm{X1}^{+}\oplus\mathrm{X3}^{-}$	$\surd$	1	1	$\surd$	$mm2$	B1
N47.9.316 $\mathrm{GM2}^{+}\oplus\mathrm{X1}^{+}\oplus\mathrm{Y1}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N47.9.317 $\mathrm{GM2}^{+}\oplus\mathrm{X1}^{+}\oplus\mathrm{Z1}^{+}$	$\surd$	1	1	$\times$	-	-
N47.9.318 $\mathrm{GM2}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z1}^{+}$	$\surd$	1	1	$\times$	-	-
N47.9.319 $\mathrm{GM2}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z2}^{-}$	$\surd$	1	1	$\surd$	222	B1
N47.9.320 $\mathrm{GM2}^{+}\oplus\mathrm{X1}^{+}\oplus\mathrm{X1}^{-}$	$\surd$	1	1	$\times$	-	-
N47.9.321 $\mathrm{GM2}^{+}\oplus\mathrm{X1}^{+}\oplus\mathrm{X3}^{+}$	$\surd$	1	1	$\times$	-	-
N47.9.322 $\mathrm{GM2}^{+}\oplus\mathrm{X1}^{+}\oplus\mathrm{Y1}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N47.9.323 $\mathrm{GM2}^{+}\oplus\mathrm{X1}^{+}\oplus\mathrm{Z1}^{-}$	$\surd$	1	1	$\times$	-	-
N47.9.324 $\mathrm{GM2}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{X1}^{-}$	$\surd$	1	1	$\times$	-	-
N47.9.325 $\mathrm{GM2}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z1}^{-}$	$\surd$	1	1	$\times$	-	-
N47.9.326 $\mathrm{GM2}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z2}^{+}$	$\surd$	1	1	$\times$	-	-
N47.9.327 $\mathrm{GM2}^{+}\oplus\mathrm{X1}^{+}\oplus\mathrm{X2}^{+}$	$\surd$	1	1	$\times$	-	-
N47.9.328 $\mathrm{GM2}^{+}\oplus\mathrm{X1}^{+}\oplus\mathrm{X2}^{-}$	$\surd$	1	1	$\times$	-	-
N47.9.329 $\mathrm{GM2}^{+}\oplus\mathrm{X1}^{+}\oplus\mathrm{X4}^{+}$	$\surd$	1	1	$\times$	-	-
N47.9.330 $\mathrm{GM2}^{+}\oplus\mathrm{X1}^{+}\oplus\mathrm{X4}^{-}$	$\surd$	1	1	$\times$	-	-
N47.9.331 $\mathrm{GM2}^{+}\oplus\mathrm{X1}^{+}\oplus\mathrm{Y2}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N47.9.332 $\mathrm{GM2}^{+}\oplus\mathrm{X1}^{+}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N47.9.333 $\mathrm{GM2}^{+}\oplus\mathrm{X1}^{+}\oplus\mathrm{Z3}^{+}$	$\surd$	1	1	$\times$	-	-
N47.9.334 $\mathrm{GM2}^{+}\oplus\mathrm{X1}^{+}\oplus\mathrm{Z3}^{-}$	$\surd$	1	1	$\times$	-	-
N47.9.335 $\mathrm{GM2}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{X2}^{+}$	$\surd$	1	1	$\times$	-	-
N47.9.336 $\mathrm{GM2}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{X2}^{-}$	$\surd$	1	1	$\times$	-	-
N47.9.337 $\mathrm{GM2}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z3}^{+}$	$\surd$	1	1	$\times$	-	-
N47.9.338 $\mathrm{GM2}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z3}^{-}$	$\surd$	1	1	$\times$	-	-
N47.9.339 $\mathrm{GM2}^{+}\oplus\mathrm{X1}^{-}\oplus\mathrm{X1}^{-}$	$\surd$	1	1	$\times$	-	-
N47.9.340 $\mathrm{GM2}^{+}\oplus\mathrm{X1}^{-}\oplus\mathrm{X3}^{+}$	$\surd$	1	1	$\surd$	$mm2$	B1
N47.9.341 $\mathrm{GM2}^{+}\oplus\mathrm{X1}^{-}\oplus\mathrm{Y1}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N47.9.342 $\mathrm{GM2}^{+}\oplus\mathrm{X1}^{-}\oplus\mathrm{Z1}^{-}$	$\surd$	1	1	$\times$	-	-
N47.9.343 $\mathrm{GM2}^{+}\oplus\mathrm{Z1}^{-}\oplus\mathrm{Z1}^{-}$	$\surd$	1	1	$\times$	-	-
N47.9.344 $\mathrm{GM2}^{+}\oplus\mathrm{Z1}^{-}\oplus\mathrm{Z2}^{+}$	$\surd$	1	1	$\surd$	222	B1
N47.9.345 $\mathrm{GM2}^{+}\oplus\mathrm{X1}^{-}\oplus\mathrm{X2}^{+}$	$\surd$	1	1	$\times$	-	-
N47.9.346 $\mathrm{GM2}^{+}\oplus\mathrm{X1}^{-}\oplus\mathrm{X2}^{-}$	$\surd$	1	1	$\times$	-	-
N47.9.347 $\mathrm{GM2}^{+}\oplus\mathrm{X1}^{-}\oplus\mathrm{X4}^{+}$	$\surd$	1	1	$\times$	-	-
N47.9.348 $\mathrm{GM2}^{+}\oplus\mathrm{X1}^{-}\oplus\mathrm{X4}^{-}$	$\surd$	1	1	$\times$	-	-
N47.9.349 $\mathrm{GM2}^{+}\oplus\mathrm{X1}^{-}\oplus\mathrm{Y2}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N47.9.350 $\mathrm{GM2}^{+}\oplus\mathrm{X1}^{-}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N47.9.351 $\mathrm{GM2}^{+}\oplus\mathrm{X1}^{-}\oplus\mathrm{Z3}^{+}$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $Pmmm$ (No. 47) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N47.9.352 $\mathrm{GM2}^{+}\oplus\mathrm{X1}^{-}\oplus\mathrm{Z3}^{-}$	$\surd$	1	1	$\times$	-	-
N47.9.353 $\mathrm{GM2}^{+}\oplus\mathrm{Z1}^{-}\oplus\mathrm{X2}^{+}$	$\surd$	1	1	$\times$	-	-
N47.9.354 $\mathrm{GM2}^{+}\oplus\mathrm{Z1}^{-}\oplus\mathrm{X2}^{-}$	$\surd$	1	1	$\times$	-	-
N47.9.355 $\mathrm{GM2}^{+}\oplus\mathrm{Z1}^{-}\oplus\mathrm{Z3}^{+}$	$\surd$	1	1	$\times$	-	-
N47.9.356 $\mathrm{GM2}^{+}\oplus\mathrm{Z1}^{-}\oplus\mathrm{Z3}^{-}$	$\surd$	1	1	$\times$	-	-
N47.9.357 $\mathrm{GM2}^{+}\oplus\mathrm{X2}^{+}\oplus\mathrm{X2}^{+}$	$\surd$	1	1	$\times$	-	-
N47.9.358 $\mathrm{GM2}^{+}\oplus\mathrm{X2}^{+}\oplus\mathrm{X2}^{-}$	$\surd$	1	1	$\times$	-	-
N47.9.359 $\mathrm{GM2}^{+}\oplus\mathrm{X2}^{+}\oplus\mathrm{X4}^{+}$	$\surd$	1	1	$\times$	-	-
N47.9.360 $\mathrm{GM2}^{+}\oplus\mathrm{X2}^{+}\oplus\mathrm{X4}^{-}$	$\surd$	1	1	$\surd$	$mm2$	B1
N47.9.361 $\mathrm{GM2}^{+}\oplus\mathrm{X2}^{+}\oplus\mathrm{Y2}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N47.9.362 $\mathrm{GM2}^{+}\oplus\mathrm{X2}^{+}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N47.9.363 $\mathrm{GM2}^{+}\oplus\mathrm{X2}^{+}\oplus\mathrm{Z3}^{+}$	$\surd$	1	1	$\times$	-	-
N47.9.364 $\mathrm{GM2}^{+}\oplus\mathrm{X2}^{+}\oplus\mathrm{Z3}^{-}$	$\surd$	1	1	$\times$	-	-
N47.9.365 $\mathrm{GM2}^{+}\oplus\mathrm{X2}^{-}\oplus\mathrm{X2}^{-}$	$\surd$	1	1	$\times$	-	-
N47.9.366 $\mathrm{GM2}^{+}\oplus\mathrm{X2}^{-}\oplus\mathrm{X4}^{+}$	$\surd$	1	1	$\surd$	$mm2$	B1
N47.9.367 $\mathrm{GM2}^{+}\oplus\mathrm{X2}^{-}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N47.9.368 $\mathrm{GM2}^{+}\oplus\mathrm{X2}^{-}\oplus\mathrm{Z3}^{+}$	$\surd$	1	1	$\times$	-	-
N47.9.369 $\mathrm{GM2}^{+}\oplus\mathrm{X2}^{-}\oplus\mathrm{Z3}^{-}$	$\surd$	1	1	$\times$	-	-
N47.9.370 $\mathrm{GM2}^{+}\oplus\mathrm{Z3}^{+}\oplus\mathrm{Z3}^{+}$	$\surd$	1	1	$\times$	-	-
N47.9.371 $\mathrm{GM2}^{+}\oplus\mathrm{Z3}^{+}\oplus\mathrm{Z3}^{-}$	$\surd$	1	1	$\times$	-	-
N47.9.372 $\mathrm{GM2}^{+}\oplus\mathrm{Z3}^{+}\oplus\mathrm{Z4}^{+}$	$\surd$	1	1	$\times$	-	-
N47.9.373 $\mathrm{GM2}^{+}\oplus\mathrm{Z3}^{+}\oplus\mathrm{Z4}^{-}$	$\surd$	1	1	$\surd$	222	B1
N47.9.374 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
N47.9.375 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
N47.9.376 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
N47.9.377 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{R1}^{+}$	$\surd$	0	0	$\surd$	-	-
N47.9.378 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{R1}^{+}$	$\surd$	0	0	$\surd$	-	-
N47.9.379 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{S1}^{+}$	$\surd$	0	0	$\surd$	-	-
N47.9.380 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{T1}^{+}$	$\surd$	0	0	$\surd$	-	-
N47.9.381 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{S1}^{+}$	$\surd$	0	0	$\surd$	-	-
N47.9.382 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{U1}^{+}$	$\surd$	0	0	$\surd$	-	-
N47.9.383 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{S1}^{-}$	$\surd$	0	0	$\surd$	-	-
N47.9.384 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{T1}^{-}$	$\surd$	0	0	$\surd$	-	-
N47.9.385 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{S1}^{-}$	$\surd$	0	0	$\surd$	-	-
N47.9.386 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{U1}^{-}$	$\surd$	0	0	$\surd$	-	-
N47.9.387 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{X1}^{+}$	$\surd$	0	0	$\surd$	-	-
N47.9.388 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{Z1}^{+}$	$\surd$	0	0	$\surd$	-	-
N47.9.389 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{X1}^{+}$	$\surd$	0	0	$\surd$	-	-
N47.9.390 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{Y1}^{+}$	$\surd$	0	0	$\surd$	-	-
N47.9.391 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{X1}^{-}$	$\surd$	0	0	$\surd$	-	-
N47.9.392 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{Z1}^{-}$	$\surd$	0	0	$\surd$	-	-
N47.9.393 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{X1}^{-}$	$\surd$	0	0	$\surd$	-	-
N47.9.394 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{Y1}^{-}$	$\surd$	0	0	$\surd$	-	-
N47.9.395 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{X2}^{+}$	$\surd$	0	0	$\surd$	-	-
N47.9.396 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{X2}^{-}$	$\surd$	0	0	$\surd$	-	-
N47.9.397 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{Z3}^{+}$	$\surd$	0	0	$\surd$	-	-

Non-coplanar SSGs with parent space group $Pmmm$ (No. 47) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N47.9.398 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{X2}^+$	$\surd$	0	0	$\surd$	-	-
N47.9.399 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{X2}^-$	$\surd$	0	0	$\surd$	-	-
N47.9.400 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y2}^+$	$\surd$	0	0	$\surd$	-	-
N47.9.401 $\mathrm{GM2}^- \oplus \mathrm{R1}^+ \oplus \mathrm{R1}^+$	$\surd$	1	0	$\times$	-	-
N47.9.402 $\mathrm{GM2}^- \oplus \mathrm{R1}^+ \oplus \mathrm{R1}^-$	$\surd$	1	1	$\times$	-	-
N47.9.403 $\mathrm{GM2}^- \oplus \mathrm{R1}^+ \oplus \mathrm{R2}^+$	$\surd$	1	0	$\times$	-	-
N47.9.404 $\mathrm{GM2}^- \oplus \mathrm{R1}^+ \oplus \mathrm{R2}^-$	$\surd$	1	1	$\times$	-	-
N47.9.405 $\mathrm{GM2}^- \oplus \mathrm{R1}^+ \oplus \mathrm{R3}^+$	$\surd$	1	0	$\times$	-	-
N47.9.406 $\mathrm{GM2}^- \oplus \mathrm{R1}^+ \oplus \mathrm{R3}^-$	$\surd$	1	1	$\times$	-	-
N47.9.407 $\mathrm{GM2}^- \oplus \mathrm{R1}^+ \oplus \mathrm{S1}^+$	$\surd$	1	0	$\times$	-	-
N47.9.408 $\mathrm{GM2}^- \oplus \mathrm{R1}^+ \oplus \mathrm{S2}^+$	$\surd$	1	0	$\times$	-	-
N47.9.409 $\mathrm{GM2}^- \oplus \mathrm{R1}^+ \oplus \mathrm{S3}^-$	$\surd$	1	0	$\times$	-	-
N47.9.410 $\mathrm{GM2}^- \oplus \mathrm{R1}^+ \oplus \mathrm{T1}^+$	$\surd$	1	0	$\times$	-	-
N47.9.411 $\mathrm{GM2}^- \oplus \mathrm{R1}^+ \oplus \mathrm{T2}^-$	$\surd$	1	0	$\times$	-	-
N47.9.412 $\mathrm{GM2}^- \oplus \mathrm{R1}^+ \oplus \mathrm{T3}^+$	$\surd$	1	0	$\times$	-	-
N47.9.413 $\mathrm{GM2}^- \oplus \mathrm{R1}^+ \oplus \mathrm{T4}^-$	$\surd$	1	0	$\times$	-	-
N47.9.414 $\mathrm{GM2}^- \oplus \mathrm{R1}^+ \oplus \mathrm{S1}^-$	$\surd$	1	0	$\times$	-	-
N47.9.415 $\mathrm{GM2}^- \oplus \mathrm{R1}^+ \oplus \mathrm{S2}^-$	$\surd$	1	0	$\times$	-	-
N47.9.416 $\mathrm{GM2}^- \oplus \mathrm{R1}^+ \oplus \mathrm{S3}^+$	$\surd$	1	0	$\times$	-	-
N47.9.417 $\mathrm{GM2}^- \oplus \mathrm{R1}^+ \oplus \mathrm{T1}^-$	$\surd$	1	0	$\times$	-	-
N47.9.418 $\mathrm{GM2}^- \oplus \mathrm{R1}^+ \oplus \mathrm{T2}^+$	$\surd$	1	0	$\times$	-	-
N47.9.419 $\mathrm{GM2}^- \oplus \mathrm{R1}^+ \oplus \mathrm{T3}^-$	$\surd$	1	0	$\times$	-	-
N47.9.420 $\mathrm{GM2}^- \oplus \mathrm{R1}^+ \oplus \mathrm{T4}^+$	$\surd$	1	0	$\times$	-	-
N47.9.421 $\mathrm{GM2}^- \oplus \mathrm{R1}^+ \oplus \mathrm{X1}^+$	$\surd$	1	0	$\times$	-	-
N47.9.422 $\mathrm{GM2}^- \oplus \mathrm{R1}^+ \oplus \mathrm{X3}^-$	$\surd$	1	0	$\times$	-	-
N47.9.423 $\mathrm{GM2}^- \oplus \mathrm{R1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N47.9.424 $\mathrm{GM2}^- \oplus \mathrm{R1}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-
N47.9.425 $\mathrm{GM2}^- \oplus \mathrm{R1}^+ \oplus \mathrm{X1}^-$	$\surd$	1	0	$\times$	-	-
N47.9.426 $\mathrm{GM2}^- \oplus \mathrm{R1}^+ \oplus \mathrm{X3}^+$	$\surd$	1	0	$\times$	-	-
N47.9.427 $\mathrm{GM2}^- \oplus \mathrm{R1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N47.9.428 $\mathrm{GM2}^- \oplus \mathrm{R1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N47.9.429 $\mathrm{GM2}^- \oplus \mathrm{R1}^+ \oplus \mathrm{X2}^+$	$\surd$	1	0	$\times$	-	-
N47.9.430 $\mathrm{GM2}^- \oplus \mathrm{R1}^+ \oplus \mathrm{X2}^-$	$\surd$	1	0	$\times$	-	-
N47.9.431 $\mathrm{GM2}^- \oplus \mathrm{R1}^+ \oplus \mathrm{X4}^+$	$\surd$	1	0	$\times$	-	-
N47.9.432 $\mathrm{GM2}^- \oplus \mathrm{R1}^+ \oplus \mathrm{X4}^-$	$\surd$	1	0	$\times$	-	-
N47.9.433 $\mathrm{GM2}^- \oplus \mathrm{R1}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N47.9.434 $\mathrm{GM2}^- \oplus \mathrm{R1}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N47.9.435 $\mathrm{GM2}^- \oplus \mathrm{S1}^+ \oplus \mathrm{S1}^+$	$\surd$	1	0	$\times$	-	-
N47.9.436 $\mathrm{GM2}^- \oplus \mathrm{S1}^+ \oplus \mathrm{S2}^+$	$\surd$	1	0	$\times$	-	-
N47.9.437 $\mathrm{GM2}^- \oplus \mathrm{S1}^+ \oplus \mathrm{S3}^-$	$\surd$	1	1	$\times$	-	-
N47.9.438 $\mathrm{GM2}^- \oplus \mathrm{S1}^+ \oplus \mathrm{T1}^+$	$\surd$	1	0	$\times$	-	-
N47.9.439 $\mathrm{GM2}^- \oplus \mathrm{S1}^+ \oplus \mathrm{T3}^+$	$\surd$	1	0	$\times$	-	-
N47.9.440 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{T1}^+$	$\surd$	1	0	$\times$	-	-
N47.9.441 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{T2}^-$	$\surd$	1	1	$\times$	-	-
N47.9.442 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{T3}^+$	$\surd$	1	0	$\times$	-	-
N47.9.443 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{T4}^-$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $Pmmm$ (No. 47) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N47.9.444 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{U1}^+$	$\surd$	1	0	$\times$	-	-
N47.9.445 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{U2}^-$	$\surd$	1	0	$\times$	-	-
N47.9.446 $\mathrm{GM2}^- \oplus \mathrm{S1}^+ \oplus \mathrm{S1}^-$	$\surd$	1	1	$\times$	-	-
N47.9.447 $\mathrm{GM2}^- \oplus \mathrm{S1}^+ \oplus \mathrm{S2}^-$	$\surd$	1	1	$\times$	-	-
N47.9.448 $\mathrm{GM2}^- \oplus \mathrm{S1}^+ \oplus \mathrm{S3}^+$	$\surd$	1	0	$\times$	-	-
N47.9.449 $\mathrm{GM2}^- \oplus \mathrm{S1}^+ \oplus \mathrm{T1}^-$	$\surd$	1	0	$\times$	-	-
N47.9.450 $\mathrm{GM2}^- \oplus \mathrm{S1}^+ \oplus \mathrm{T3}^-$	$\surd$	1	0	$\times$	-	-
N47.9.451 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{S1}^-$	$\surd$	1	0	$\times$	-	-
N47.9.452 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{S2}^-$	$\surd$	1	0	$\times$	-	-
N47.9.453 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{T1}^-$	$\surd$	1	1	$\times$	-	-
N47.9.454 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{T2}^+$	$\surd$	1	0	$\times$	-	-
N47.9.455 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{T3}^-$	$\surd$	1	1	$\times$	-	-
N47.9.456 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{T4}^+$	$\surd$	1	0	$\times$	-	-
N47.9.457 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{U1}^-$	$\surd$	1	0	$\times$	-	-
N47.9.458 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{U2}^+$	$\surd$	1	0	$\times$	-	-
N47.9.459 $\mathrm{GM2}^- \oplus \mathrm{S1}^+ \oplus \mathrm{X1}^+$	$\surd$	1	0	$\times$	-	-
N47.9.460 $\mathrm{GM2}^- \oplus \mathrm{S1}^+ \oplus \mathrm{X3}^-$	$\surd$	1	0	$\times$	-	-
N47.9.461 $\mathrm{GM2}^- \oplus \mathrm{S1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N47.9.462 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{X1}^+$	$\surd$	1	0	$\times$	-	-
N47.9.463 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	0	$\times$	-	-
N47.9.464 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	0	$\times$	-	-
N47.9.465 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N47.9.466 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-
N47.9.467 $\mathrm{GM2}^- \oplus \mathrm{S1}^+ \oplus \mathrm{X1}^-$	$\surd$	1	0	$\times$	-	-
N47.9.468 $\mathrm{GM2}^- \oplus \mathrm{S1}^+ \oplus \mathrm{X3}^+$	$\surd$	1	0	$\times$	-	-
N47.9.469 $\mathrm{GM2}^- \oplus \mathrm{S1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N47.9.470 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{X1}^-$	$\surd$	1	0	$\times$	-	-
N47.9.471 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Y1}^-$	$\surd$	1	0	$\times$	-	-
N47.9.472 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
N47.9.473 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N47.9.474 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N47.9.475 $\mathrm{GM2}^- \oplus \mathrm{S1}^+ \oplus \mathrm{X2}^+$	$\surd$	1	0	$\times$	-	-
N47.9.476 $\mathrm{GM2}^- \oplus \mathrm{S1}^+ \oplus \mathrm{X2}^-$	$\surd$	1	0	$\times$	-	-
N47.9.477 $\mathrm{GM2}^- \oplus \mathrm{S1}^+ \oplus \mathrm{X4}^+$	$\surd$	1	0	$\times$	-	-
N47.9.478 $\mathrm{GM2}^- \oplus \mathrm{S1}^+ \oplus \mathrm{X4}^-$	$\surd$	1	0	$\times$	-	-
N47.9.479 $\mathrm{GM2}^- \oplus \mathrm{S1}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N47.9.480 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{X2}^+$	$\surd$	1	0	$\times$	-	-
N47.9.481 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{X2}^-$	$\surd$	1	0	$\times$	-	-
N47.9.482 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N47.9.483 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N47.9.484 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N47.9.485 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N47.9.486 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N47.9.487 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N47.9.488 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N47.9.489 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $Pmmm$ (No. 47) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N47.9.490 $\mathrm{GM2^-}\oplus\mathrm{S1^-}\oplus\mathrm{S1^-}$	$\surd$	1	0	$\times$	-	-
N47.9.491 $\mathrm{GM2^-}\oplus\mathrm{S1^-}\oplus\mathrm{S2^-}$	$\surd$	1	0	$\times$	-	-
N47.9.492 $\mathrm{GM2^-}\oplus\mathrm{S1^-}\oplus\mathrm{S3^+}$	$\surd$	1	1	$\times$	-	-
N47.9.493 $\mathrm{GM2^-}\oplus\mathrm{S1^-}\oplus\mathrm{T1^-}$	$\surd$	1	0	$\times$	-	-
N47.9.494 $\mathrm{GM2^-}\oplus\mathrm{S1^-}\oplus\mathrm{T3^-}$	$\surd$	1	0	$\times$	-	-
N47.9.495 $\mathrm{GM2^-}\oplus\mathrm{T1^-}\oplus\mathrm{T1^-}$	$\surd$	1	0	$\times$	-	-
N47.9.496 $\mathrm{GM2^-}\oplus\mathrm{T1^-}\oplus\mathrm{T2^+}$	$\surd$	1	1	$\times$	-	-
N47.9.497 $\mathrm{GM2^-}\oplus\mathrm{T1^-}\oplus\mathrm{T3^-}$	$\surd$	1	0	$\times$	-	-
N47.9.498 $\mathrm{GM2^-}\oplus\mathrm{T1^-}\oplus\mathrm{T4^+}$	$\surd$	1	1	$\times$	-	-
N47.9.499 $\mathrm{GM2^-}\oplus\mathrm{T1^-}\oplus\mathrm{U1^-}$	$\surd$	1	0	$\times$	-	-
N47.9.500 $\mathrm{GM2^-}\oplus\mathrm{T1^-}\oplus\mathrm{U2^+}$	$\surd$	1	0	$\times$	-	-
N47.9.501 $\mathrm{GM2^-}\oplus\mathrm{S1^-}\oplus\mathrm{X1^+}$	$\surd$	1	0	$\times$	-	-
N47.9.502 $\mathrm{GM2^-}\oplus\mathrm{S1^-}\oplus\mathrm{X3^-}$	$\surd$	1	0	$\times$	-	-
N47.9.503 $\mathrm{GM2^-}\oplus\mathrm{S1^-}\oplus\mathrm{Z1^+}$	$\surd$	1	0	$\times$	-	-
N47.9.504 $\mathrm{GM2^-}\oplus\mathrm{T1^-}\oplus\mathrm{X1^+}$	$\surd$	1	0	$\times$	-	-
N47.9.505 $\mathrm{GM2^-}\oplus\mathrm{T1^-}\oplus\mathrm{Y1^+}$	$\surd$	1	0	$\times$	-	-
N47.9.506 $\mathrm{GM2^-}\oplus\mathrm{T1^-}\oplus\mathrm{Y4^-}$	$\surd$	1	0	$\times$	-	-
N47.9.507 $\mathrm{GM2^-}\oplus\mathrm{T1^-}\oplus\mathrm{Z1^+}$	$\surd$	1	0	$\times$	-	-
N47.9.508 $\mathrm{GM2^-}\oplus\mathrm{T1^-}\oplus\mathrm{Z2^-}$	$\surd$	1	0	$\times$	-	-
N47.9.509 $\mathrm{GM2^-}\oplus\mathrm{S1^-}\oplus\mathrm{X1^-}$	$\surd$	1	0	$\times$	-	-
N47.9.510 $\mathrm{GM2^-}\oplus\mathrm{S1^-}\oplus\mathrm{X3^+}$	$\surd$	1	0	$\times$	-	-
N47.9.511 $\mathrm{GM2^-}\oplus\mathrm{S1^-}\oplus\mathrm{Z1^-}$	$\surd$	1	0	$\times$	-	-
N47.9.512 $\mathrm{GM2^-}\oplus\mathrm{T1^-}\oplus\mathrm{X1^-}$	$\surd$	1	0	$\times$	-	-
N47.9.513 $\mathrm{GM2^-}\oplus\mathrm{T1^-}\oplus\mathrm{Y1^-}$	$\surd$	1	0	$\times$	-	-
N47.9.514 $\mathrm{GM2^-}\oplus\mathrm{T1^-}\oplus\mathrm{Y4^+}$	$\surd$	1	0	$\times$	-	-
N47.9.515 $\mathrm{GM2^-}\oplus\mathrm{T1^-}\oplus\mathrm{Z1^-}$	$\surd$	1	0	$\times$	-	-
N47.9.516 $\mathrm{GM2^-}\oplus\mathrm{T1^-}\oplus\mathrm{Z2^+}$	$\surd$	1	0	$\times$	-	-
N47.9.517 $\mathrm{GM2^-}\oplus\mathrm{S1^-}\oplus\mathrm{X2^+}$	$\surd$	1	0	$\times$	-	-
N47.9.518 $\mathrm{GM2^-}\oplus\mathrm{S1^-}\oplus\mathrm{X2^-}$	$\surd$	1	0	$\times$	-	-
N47.9.519 $\mathrm{GM2^-}\oplus\mathrm{S1^-}\oplus\mathrm{X4^+}$	$\surd$	1	0	$\times$	-	-
N47.9.520 $\mathrm{GM2^-}\oplus\mathrm{S1^-}\oplus\mathrm{X4^-}$	$\surd$	1	0	$\times$	-	-
N47.9.521 $\mathrm{GM2^-}\oplus\mathrm{S1^-}\oplus\mathrm{Z3^+}$	$\surd$	1	0	$\times$	-	-
N47.9.522 $\mathrm{GM2^-}\oplus\mathrm{T1^-}\oplus\mathrm{X2^+}$	$\surd$	1	0	$\times$	-	-
N47.9.523 $\mathrm{GM2^-}\oplus\mathrm{T1^-}\oplus\mathrm{X2^-}$	$\surd$	1	0	$\times$	-	-
N47.9.524 $\mathrm{GM2^-}\oplus\mathrm{T1^-}\oplus\mathrm{Y2^+}$	$\surd$	1	0	$\times$	-	-
N47.9.525 $\mathrm{GM2^-}\oplus\mathrm{T1^-}\oplus\mathrm{Y2^-}$	$\surd$	1	0	$\times$	-	-
N47.9.526 $\mathrm{GM2^-}\oplus\mathrm{T1^-}\oplus\mathrm{Y3^+}$	$\surd$	1	0	$\times$	-	-
N47.9.527 $\mathrm{GM2^-}\oplus\mathrm{T1^-}\oplus\mathrm{Y3^-}$	$\surd$	1	0	$\times$	-	-
N47.9.528 $\mathrm{GM2^-}\oplus\mathrm{T1^-}\oplus\mathrm{Z3^+}$	$\surd$	1	0	$\times$	-	-
N47.9.529 $\mathrm{GM2^-}\oplus\mathrm{T1^-}\oplus\mathrm{Z3^-}$	$\surd$	1	0	$\times$	-	-
N47.9.530 $\mathrm{GM2^-}\oplus\mathrm{T1^-}\oplus\mathrm{Z4^+}$	$\surd$	1	0	$\times$	-	-
N47.9.531 $\mathrm{GM2^-}\oplus\mathrm{T1^-}\oplus\mathrm{Z4^-}$	$\surd$	1	0	$\times$	-	-
N47.9.532 $\mathrm{GM2^-}\oplus\mathrm{X1^+}\oplus\mathrm{X1^+}$	$\surd$	1	0	$\times$	-	-
N47.9.533 $\mathrm{GM2^-}\oplus\mathrm{X1^+}\oplus\mathrm{X3^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N47.9.534 $\mathrm{GM2^-}\oplus\mathrm{X1^+}\oplus\mathrm{Y1^+}$	$\surd$	1	0	$\times$	-	-
N47.9.535 $\mathrm{GM2^-}\oplus\mathrm{X1^+}\oplus\mathrm{Z1^+}$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $Pmmm$ (No. 47) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N47.9.536 $\mathrm{GM2}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N47.9.537 $\mathrm{GM2}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N47.9.538 $\mathrm{GM2}^- \oplus \mathrm{X1}^+ \oplus \mathrm{X1}^-$	$\surd$	1	1	$\times$	-	-
N47.9.539 $\mathrm{GM2}^- \oplus \mathrm{X1}^+ \oplus \mathrm{X3}^+$	$\surd$	1	0	$\times$	-	-
N47.9.540 $\mathrm{GM2}^- \oplus \mathrm{X1}^+ \oplus \mathrm{Y1}^-$	$\surd$	1	0	$\times$	-	-
N47.9.541 $\mathrm{GM2}^- \oplus \mathrm{X1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N47.9.542 $\mathrm{GM2}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{X1}^-$	$\surd$	1	0	$\times$	-	-
N47.9.543 $\mathrm{GM2}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
N47.9.544 $\mathrm{GM2}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N47.9.545 $\mathrm{GM2}^- \oplus \mathrm{X1}^+ \oplus \mathrm{X2}^+$	$\surd$	1	0	$\times$	-	-
N47.9.546 $\mathrm{GM2}^- \oplus \mathrm{X1}^+ \oplus \mathrm{X2}^-$	$\surd$	1	1	$\times$	-	-
N47.9.547 $\mathrm{GM2}^- \oplus \mathrm{X1}^+ \oplus \mathrm{X4}^+$	$\surd$	1	0	$\times$	-	-
N47.9.548 $\mathrm{GM2}^- \oplus \mathrm{X1}^+ \oplus \mathrm{X4}^-$	$\surd$	1	1	$\times$	-	-
N47.9.549 $\mathrm{GM2}^- \oplus \mathrm{X1}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N47.9.550 $\mathrm{GM2}^- \oplus \mathrm{X1}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N47.9.551 $\mathrm{GM2}^- \oplus \mathrm{X1}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N47.9.552 $\mathrm{GM2}^- \oplus \mathrm{X1}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N47.9.553 $\mathrm{GM2}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{X2}^+$	$\surd$	1	0	$\times$	-	-
N47.9.554 $\mathrm{GM2}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{X2}^-$	$\surd$	1	0	$\times$	-	-
N47.9.555 $\mathrm{GM2}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N47.9.556 $\mathrm{GM2}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N47.9.557 $\mathrm{GM2}^- \oplus \mathrm{X1}^- \oplus \mathrm{X1}^-$	$\surd$	1	0	$\times$	-	-
N47.9.558 $\mathrm{GM2}^- \oplus \mathrm{X1}^- \oplus \mathrm{X3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N47.9.559 $\mathrm{GM2}^- \oplus \mathrm{X1}^- \oplus \mathrm{Y1}^-$	$\surd$	1	0	$\times$	-	-
N47.9.560 $\mathrm{GM2}^- \oplus \mathrm{X1}^- \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N47.9.561 $\mathrm{GM2}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N47.9.562 $\mathrm{GM2}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N47.9.563 $\mathrm{GM2}^- \oplus \mathrm{X1}^- \oplus \mathrm{X2}^+$	$\surd$	1	1	$\times$	-	-
N47.9.564 $\mathrm{GM2}^- \oplus \mathrm{X1}^- \oplus \mathrm{X2}^-$	$\surd$	1	0	$\times$	-	-
N47.9.565 $\mathrm{GM2}^- \oplus \mathrm{X1}^- \oplus \mathrm{X4}^+$	$\surd$	1	1	$\times$	-	-
N47.9.566 $\mathrm{GM2}^- \oplus \mathrm{X1}^- \oplus \mathrm{X4}^-$	$\surd$	1	0	$\times$	-	-
N47.9.567 $\mathrm{GM2}^- \oplus \mathrm{X1}^- \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N47.9.568 $\mathrm{GM2}^- \oplus \mathrm{X1}^- \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N47.9.569 $\mathrm{GM2}^- \oplus \mathrm{X1}^- \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N47.9.570 $\mathrm{GM2}^- \oplus \mathrm{X1}^- \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N47.9.571 $\mathrm{GM2}^- \oplus \mathrm{Z1}^- \oplus \mathrm{X2}^+$	$\surd$	1	0	$\times$	-	-
N47.9.572 $\mathrm{GM2}^- \oplus \mathrm{Z1}^- \oplus \mathrm{X2}^-$	$\surd$	1	0	$\times$	-	-
N47.9.573 $\mathrm{GM2}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
N47.9.574 $\mathrm{GM2}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N47.9.575 $\mathrm{GM2}^- \oplus \mathrm{X2}^+ \oplus \mathrm{X2}^+$	$\surd$	1	0	$\times$	-	-
N47.9.576 $\mathrm{GM2}^- \oplus \mathrm{X2}^+ \oplus \mathrm{X2}^-$	$\surd$	1	1	$\times$	-	-
N47.9.577 $\mathrm{GM2}^- \oplus \mathrm{X2}^+ \oplus \mathrm{X4}^+$	$\surd$	1	0	$\times$	-	-
N47.9.578 $\mathrm{GM2}^- \oplus \mathrm{X2}^+ \oplus \mathrm{X4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N47.9.579 $\mathrm{GM2}^- \oplus \mathrm{X2}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N47.9.580 $\mathrm{GM2}^- \oplus \mathrm{X2}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N47.9.581 $\mathrm{GM2}^- \oplus \mathrm{X2}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $Pmmm$ (No. 47) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N47.9.582 $\mathrm{GM2}^- \oplus \mathrm{X2}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N47.9.583 $\mathrm{GM2}^- \oplus \mathrm{X2}^- \oplus \mathrm{X2}^-$	$\surd$	1	0	$\times$	-	-
N47.9.584 $\mathrm{GM2}^- \oplus \mathrm{X2}^- \oplus \mathrm{X4}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N47.9.585 $\mathrm{GM2}^- \oplus \mathrm{X2}^- \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N47.9.586 $\mathrm{GM2}^- \oplus \mathrm{X2}^- \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N47.9.587 $\mathrm{GM2}^- \oplus \mathrm{X2}^- \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N47.9.588 $\mathrm{GM2}^- \oplus \mathrm{Z3}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N47.9.589 $\mathrm{GM2}^- \oplus \mathrm{Z3}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N47.9.590 $\mathrm{GM2}^- \oplus \mathrm{Z3}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N47.9.591 $\mathrm{GM2}^- \oplus \mathrm{Z3}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N47.9.592 $\mathrm{R1}^+ \oplus \mathrm{R1}^+ \oplus \mathrm{R1}^+$	$\surd$	0	0	$\surd$	-	-
N47.9.593 $\mathrm{R1}^+ \oplus \mathrm{R1}^+ \oplus \mathrm{R1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u}$
N47.9.594 $\mathrm{R1}^+ \oplus \mathrm{R1}^+ \oplus \mathrm{R2}^+$	$\surd$	0	0	$\surd$	-	-
N47.9.595 $\mathrm{R1}^+ \oplus \mathrm{R1}^+ \oplus \mathrm{R2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N47.9.596 $\mathrm{R1}^+ \oplus \mathrm{R1}^- \oplus \mathrm{R2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u}$
N47.9.597 $\mathrm{R1}^+ \oplus \mathrm{R2}^+ \oplus \mathrm{R3}^+$	$\surd$	0	0	$\surd$	-	-
N47.9.598 $\mathrm{R1}^+ \oplus \mathrm{R2}^+ \oplus \mathrm{R3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_u}$
N47.9.599 $\mathrm{R1}^+ \oplus \mathrm{R1}^+ \oplus \mathrm{S1}^+$	$\surd$	1	0	$\times$	-	-
N47.9.600 $\mathrm{R1}^+ \oplus \mathrm{R1}^+ \oplus \mathrm{S2}^+$	$\surd$	1	0	$\times$	-	-
N47.9.601 $\mathrm{R1}^+ \oplus \mathrm{R1}^+ \oplus \mathrm{S3}^-$	$\surd$	1	0	$\times$	-	-
N47.9.602 $\mathrm{R1}^+ \oplus \mathrm{R1}^- \oplus \mathrm{S1}^+$	$\surd$	1	1	$\times$	-	-
N47.9.603 $\mathrm{R1}^+ \oplus \mathrm{R1}^- \oplus \mathrm{S3}^-$	$\surd$	1	1	$\times$	-	-
N47.9.604 $\mathrm{R1}^+ \oplus \mathrm{R2}^+ \oplus \mathrm{S1}^+$	$\surd$	1	0	$\times$	-	-
N47.9.605 $\mathrm{R1}^+ \oplus \mathrm{R2}^+ \oplus \mathrm{S3}^-$	$\surd$	1	0	$\times$	-	-
N47.9.606 $\mathrm{R1}^+ \oplus \mathrm{R2}^+ \oplus \mathrm{T1}^+$	$\surd$	1	0	$\times$	-	-
N47.9.607 $\mathrm{R1}^+ \oplus \mathrm{R2}^+ \oplus \mathrm{T2}^-$	$\surd$	1	0	$\times$	-	-
N47.9.608 $\mathrm{R1}^+ \oplus \mathrm{R2}^- \oplus \mathrm{S1}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N47.9.609 $\mathrm{R1}^+ \oplus \mathrm{R2}^- \oplus \mathrm{S2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N47.9.610 $\mathrm{R1}^+ \oplus \mathrm{R2}^- \oplus \mathrm{S3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N47.9.611 $\mathrm{R1}^+ \oplus \mathrm{R2}^- \oplus \mathrm{T1}^+$	$\surd$	1	1	$\times$	-	-
N47.9.612 $\mathrm{R1}^+ \oplus \mathrm{R2}^- \oplus \mathrm{T3}^+$	$\surd$	1	1	$\times$	-	-
N47.9.613 $\mathrm{R1}^+ \oplus \mathrm{R1}^+ \oplus \mathrm{S1}^-$	$\surd$	1	0	$\times$	-	-
N47.9.614 $\mathrm{R1}^+ \oplus \mathrm{R1}^+ \oplus \mathrm{S2}^-$	$\surd$	1	0	$\times$	-	-
N47.9.615 $\mathrm{R1}^+ \oplus \mathrm{R1}^+ \oplus \mathrm{S3}^+$	$\surd$	1	0	$\times$	-	-
N47.9.616 $\mathrm{R1}^+ \oplus \mathrm{R1}^- \oplus \mathrm{S1}^-$	$\surd$	1	1	$\times$	-	-
N47.9.617 $\mathrm{R1}^+ \oplus \mathrm{R1}^- \oplus \mathrm{S3}^+$	$\surd$	1	1	$\times$	-	-
N47.9.618 $\mathrm{R1}^+ \oplus \mathrm{R2}^+ \oplus \mathrm{S1}^-$	$\surd$	1	0	$\times$	-	-
N47.9.619 $\mathrm{R1}^+ \oplus \mathrm{R2}^+ \oplus \mathrm{S3}^+$	$\surd$	1	0	$\times$	-	-
N47.9.620 $\mathrm{R1}^+ \oplus \mathrm{R2}^+ \oplus \mathrm{T1}^-$	$\surd$	1	0	$\times$	-	-
N47.9.621 $\mathrm{R1}^+ \oplus \mathrm{R2}^+ \oplus \mathrm{T2}^+$	$\surd$	1	0	$\times$	-	-
N47.9.622 $\mathrm{R1}^+ \oplus \mathrm{R2}^- \oplus \mathrm{S1}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N47.9.623 $\mathrm{R1}^+ \oplus \mathrm{R2}^- \oplus \mathrm{S2}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N47.9.624 $\mathrm{R1}^+ \oplus \mathrm{R2}^- \oplus \mathrm{S3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N47.9.625 $\mathrm{R1}^+ \oplus \mathrm{R2}^- \oplus \mathrm{T1}^-$	$\surd$	1	1	$\times$	-	-
N47.9.626 $\mathrm{R1}^+ \oplus \mathrm{R2}^- \oplus \mathrm{T3}^-$	$\surd$	1	1	$\times$	-	-
N47.9.627 $\mathrm{R1}^+ \oplus \mathrm{R1}^+ \oplus \mathrm{X1}^+$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $Pmmm$ (No. 47) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N47.9.628 $\mathrm{R1}^+ \oplus \mathrm{R1}^+ \oplus \mathrm{X3}^-$	$\surd$	1	0	$\times$	-	-
N47.9.629 $\mathrm{R1}^+ \oplus \mathrm{R1}^- \oplus \mathrm{X1}^+$	$\surd$	1	1	$\times$	-	-
N47.9.630 $\mathrm{R1}^+ \oplus \mathrm{R2}^+ \oplus \mathrm{X1}^+$	$\surd$	1	0	$\times$	-	-
N47.9.631 $\mathrm{R1}^+ \oplus \mathrm{R2}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N47.9.632 $\mathrm{R1}^+ \oplus \mathrm{R2}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-
N47.9.633 $\mathrm{R1}^+ \oplus \mathrm{R2}^- \oplus \mathrm{X1}^+$	$\surd$	1	1	$\times$	-	-
N47.9.634 $\mathrm{R1}^+ \oplus \mathrm{R2}^- \oplus \mathrm{X3}^-$	$\surd$	1	1	$\times$	-	-
N47.9.635 $\mathrm{R1}^+ \oplus \mathrm{R2}^- \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\times$	-	-
N47.9.636 $\mathrm{R1}^+ \oplus \mathrm{R1}^+ \oplus \mathrm{X1}^-$	$\surd$	1	0	$\times$	-	-
N47.9.637 $\mathrm{R1}^+ \oplus \mathrm{R1}^+ \oplus \mathrm{X3}^+$	$\surd$	1	0	$\times$	-	-
N47.9.638 $\mathrm{R1}^+ \oplus \mathrm{R1}^- \oplus \mathrm{X1}^-$	$\surd$	1	1	$\times$	-	-
N47.9.639 $\mathrm{R1}^+ \oplus \mathrm{R2}^+ \oplus \mathrm{X1}^-$	$\surd$	1	0	$\times$	-	-
N47.9.640 $\mathrm{R1}^+ \oplus \mathrm{R2}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N47.9.641 $\mathrm{R1}^+ \oplus \mathrm{R2}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N47.9.642 $\mathrm{R1}^+ \oplus \mathrm{R2}^- \oplus \mathrm{X1}^-$	$\surd$	1	1	$\times$	-	-
N47.9.643 $\mathrm{R1}^+ \oplus \mathrm{R2}^- \oplus \mathrm{X3}^+$	$\surd$	1	1	$\times$	-	-
N47.9.644 $\mathrm{R1}^+ \oplus \mathrm{R2}^- \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
N47.9.645 $\mathrm{R1}^+ \oplus \mathrm{R1}^+ \oplus \mathrm{X2}^+$	$\surd$	1	0	$\times$	-	-
N47.9.646 $\mathrm{R1}^+ \oplus \mathrm{R1}^+ \oplus \mathrm{X2}^-$	$\surd$	1	0	$\times$	-	-
N47.9.647 $\mathrm{R1}^+ \oplus \mathrm{R1}^- \oplus \mathrm{X2}^+$	$\surd$	1	1	$\times$	-	-
N47.9.648 $\mathrm{R1}^+ \oplus \mathrm{R2}^+ \oplus \mathrm{X2}^+$	$\surd$	1	0	$\times$	-	-
N47.9.649 $\mathrm{R1}^+ \oplus \mathrm{R2}^+ \oplus \mathrm{X2}^-$	$\surd$	1	0	$\times$	-	-
N47.9.650 $\mathrm{R1}^+ \oplus \mathrm{R2}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N47.9.651 $\mathrm{R1}^+ \oplus \mathrm{R2}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N47.9.652 $\mathrm{R1}^+ \oplus \mathrm{R2}^- \oplus \mathrm{X2}^+$	$\surd$	1	1	$\times$	-	-
N47.9.653 $\mathrm{R1}^+ \oplus \mathrm{R2}^- \oplus \mathrm{X2}^-$	$\surd$	1	1	$\times$	-	-
N47.9.654 $\mathrm{R1}^+ \oplus \mathrm{R2}^- \oplus \mathrm{X4}^+$	$\surd$	1	1	$\times$	-	-
N47.9.655 $\mathrm{R1}^+ \oplus \mathrm{R2}^- \oplus \mathrm{X4}^-$	$\surd$	1	1	$\times$	-	-
N47.9.656 $\mathrm{R1}^+ \oplus \mathrm{R2}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
N47.9.657 $\mathrm{R1}^+ \oplus \mathrm{S1}^+ \oplus \mathrm{S1}^+$	$\surd$	1	0	$\times$	-	-
N47.9.658 $\mathrm{R1}^+ \oplus \mathrm{S1}^+ \oplus \mathrm{S2}^+$	$\surd$	1	0	$\times$	-	-
N47.9.659 $\mathrm{R1}^+ \oplus \mathrm{S1}^+ \oplus \mathrm{S3}^-$	$\surd$	1	1	$\times$	-	-
N47.9.660 $\mathrm{R1}^+ \oplus \mathrm{S1}^+ \oplus \mathrm{T1}^+$	$\times$	-	-	-	-	-
N47.9.661 $\mathrm{R1}^+ \oplus \mathrm{S1}^+ \oplus \mathrm{T2}^-$	$\times$	-	-	-	-	-
N47.9.662 $\mathrm{R1}^+ \oplus \mathrm{S1}^+ \oplus \mathrm{T3}^+$	$\times$	-	-	-	-	-
N47.9.663 $\mathrm{R1}^+ \oplus \mathrm{S1}^+ \oplus \mathrm{T4}^-$	$\times$	-	-	-	-	-
N47.9.664 $\mathrm{R1}^+ \oplus \mathrm{S2}^+ \oplus \mathrm{S2}^+$	$\surd$	1	0	$\times$	-	-
N47.9.665 $\mathrm{R1}^+ \oplus \mathrm{S2}^+ \oplus \mathrm{S3}^-$	$\surd$	1	1	$\times$	-	-
N47.9.666 $\mathrm{R1}^+ \oplus \mathrm{S2}^+ \oplus \mathrm{T2}^-$	$\times$	-	-	-	-	-
N47.9.667 $\mathrm{R1}^+ \oplus \mathrm{S2}^+ \oplus \mathrm{T3}^+$	$\times$	-	-	-	-	-
N47.9.668 $\mathrm{R1}^+ \oplus \mathrm{S2}^+ \oplus \mathrm{T4}^-$	$\times$	-	-	-	-	-
N47.9.669 $\mathrm{R1}^+ \oplus \mathrm{S3}^- \oplus \mathrm{S3}^-$	$\surd$	1	0	$\times$	-	-
N47.9.670 $\mathrm{R1}^+ \oplus \mathrm{S3}^- \oplus \mathrm{S4}^-$	$\surd$	1	0	$\times$	-	-
N47.9.671 $\mathrm{R1}^+ \oplus \mathrm{S3}^- \oplus \mathrm{T2}^-$	$\times$	-	-	-	-	-
N47.9.672 $\mathrm{R1}^+ \oplus \mathrm{S3}^- \oplus \mathrm{T4}^-$	$\times$	-	-	-	-	-
N47.9.673 $\mathrm{R1}^+ \oplus \mathrm{S3}^- \oplus \mathrm{U3}^-$	$\times$	-	-	-	-	-

Non-coplanar SSGs with parent space group $Pmmm$ (No. 47) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N47.9.674 $\mathrm{R1}^+ \oplus \mathrm{S1}^+ \oplus \mathrm{S1}^-$	$\surd$	1	1	$\times$	-	-
N47.9.675 $\mathrm{R1}^+ \oplus \mathrm{S1}^+ \oplus \mathrm{S2}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N47.9.676 $\mathrm{R1}^+ \oplus \mathrm{S1}^+ \oplus \mathrm{S3}^+$	$\surd$	1	0	$\times$	-	-
N47.9.677 $\mathrm{R1}^+ \oplus \mathrm{S1}^+ \oplus \mathrm{T1}^-$	$\times$	-	-	-	-	-
N47.9.678 $\mathrm{R1}^+ \oplus \mathrm{S1}^+ \oplus \mathrm{T2}^+$	$\times$	-	-	-	-	-
N47.9.679 $\mathrm{R1}^+ \oplus \mathrm{S1}^+ \oplus \mathrm{T3}^-$	$\times$	-	-	-	-	-
N47.9.680 $\mathrm{R1}^+ \oplus \mathrm{S1}^+ \oplus \mathrm{T4}^+$	$\times$	-	-	-	-	-
N47.9.681 $\mathrm{R1}^+ \oplus \mathrm{S2}^+ \oplus \mathrm{S1}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N47.9.682 $\mathrm{R1}^+ \oplus \mathrm{S2}^+ \oplus \mathrm{S2}^-$	$\surd$	1	1	$\times$	-	-
N47.9.683 $\mathrm{R1}^+ \oplus \mathrm{S2}^+ \oplus \mathrm{S3}^+$	$\surd$	1	0	$\times$	-	-
N47.9.684 $\mathrm{R1}^+ \oplus \mathrm{S2}^+ \oplus \mathrm{T1}^-$	$\times$	-	-	-	-	-
N47.9.685 $\mathrm{R1}^+ \oplus \mathrm{S2}^+ \oplus \mathrm{T2}^+$	$\times$	-	-	-	-	-
N47.9.686 $\mathrm{R1}^+ \oplus \mathrm{S2}^+ \oplus \mathrm{T3}^-$	$\times$	-	-	-	-	-
N47.9.687 $\mathrm{R1}^+ \oplus \mathrm{S2}^+ \oplus \mathrm{T4}^+$	$\times$	-	-	-	-	-
N47.9.688 $\mathrm{R1}^+ \oplus \mathrm{S3}^- \oplus \mathrm{S1}^-$	$\surd$	1	0	$\times$	-	-
N47.9.689 $\mathrm{R1}^+ \oplus \mathrm{S3}^- \oplus \mathrm{S2}^-$	$\surd$	1	0	$\times$	-	-
N47.9.690 $\mathrm{R1}^+ \oplus \mathrm{S3}^- \oplus \mathrm{S3}^+$	$\surd$	1	1	$\times$	-	-
N47.9.691 $\mathrm{R1}^+ \oplus \mathrm{S3}^- \oplus \mathrm{S4}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N47.9.692 $\mathrm{R1}^+ \oplus \mathrm{S3}^- \oplus \mathrm{T1}^-$	$\times$	-	-	-	-	-
N47.9.693 $\mathrm{R1}^+ \oplus \mathrm{S3}^- \oplus \mathrm{T2}^+$	$\times$	-	-	-	-	-
N47.9.694 $\mathrm{R1}^+ \oplus \mathrm{S3}^- \oplus \mathrm{T3}^-$	$\times$	-	-	-	-	-
N47.9.695 $\mathrm{R1}^+ \oplus \mathrm{S3}^- \oplus \mathrm{T4}^+$	$\times$	-	-	-	-	-
N47.9.696 $\mathrm{R1}^+ \oplus \mathrm{S3}^- \oplus \mathrm{U1}^-$	$\times$	-	-	-	-	-
N47.9.697 $\mathrm{R1}^+ \oplus \mathrm{S3}^- \oplus \mathrm{U2}^+$	$\times$	-	-	-	-	-
N47.9.698 $\mathrm{R1}^+ \oplus \mathrm{S3}^- \oplus \mathrm{U3}^+$	$\times$	-	-	-	-	-
N47.9.699 $\mathrm{R1}^+ \oplus \mathrm{S3}^- \oplus \mathrm{U4}^-$	$\times$	-	-	-	-	-
N47.9.700 $\mathrm{R1}^+ \oplus \mathrm{S1}^+ \oplus \mathrm{X1}^+$	$\times$	-	-	-	-	-
N47.9.701 $\mathrm{R1}^+ \oplus \mathrm{S1}^+ \oplus \mathrm{X3}^-$	$\times$	-	-	-	-	-
N47.9.702 $\mathrm{R1}^+ \oplus \mathrm{S1}^+ \oplus \mathrm{Z1}^+$	$\times$	-	-	-	-	-
N47.9.703 $\mathrm{R1}^+ \oplus \mathrm{S1}^+ \oplus \mathrm{Z2}^-$	$\times$	-	-	-	-	-
N47.9.704 $\mathrm{R1}^+ \oplus \mathrm{S2}^+ \oplus \mathrm{X1}^+$	$\times$	-	-	-	-	-
N47.9.705 $\mathrm{R1}^+ \oplus \mathrm{S2}^+ \oplus \mathrm{X3}^-$	$\times$	-	-	-	-	-
N47.9.706 $\mathrm{R1}^+ \oplus \mathrm{S2}^+ \oplus \mathrm{Z1}^+$	$\times$	-	-	-	-	-
N47.9.707 $\mathrm{R1}^+ \oplus \mathrm{S2}^+ \oplus \mathrm{Z2}^-$	$\times$	-	-	-	-	-
N47.9.708 $\mathrm{R1}^+ \oplus \mathrm{S3}^- \oplus \mathrm{X1}^+$	$\times$	-	-	-	-	-
N47.9.709 $\mathrm{R1}^+ \oplus \mathrm{S3}^- \oplus \mathrm{X3}^-$	$\times$	-	-	-	-	-
N47.9.710 $\mathrm{R1}^+ \oplus \mathrm{S3}^- \oplus \mathrm{Y1}^+$	$\times$	-	-	-	-	-
N47.9.711 $\mathrm{R1}^+ \oplus \mathrm{S3}^- \oplus \mathrm{Y4}^-$	$\times$	-	-	-	-	-
N47.9.712 $\mathrm{R1}^+ \oplus \mathrm{S3}^- \oplus \mathrm{Z1}^+$	$\times$	-	-	-	-	-
N47.9.713 $\mathrm{R1}^+ \oplus \mathrm{S3}^- \oplus \mathrm{Z2}^-$	$\times$	-	-	-	-	-
N47.9.714 $\mathrm{R1}^+ \oplus \mathrm{S1}^+ \oplus \mathrm{X1}^-$	$\times$	-	-	-	-	-
N47.9.715 $\mathrm{R1}^+ \oplus \mathrm{S1}^+ \oplus \mathrm{X3}^+$	$\times$	-	-	-	-	-
N47.9.716 $\mathrm{R1}^+ \oplus \mathrm{S1}^+ \oplus \mathrm{Z1}^-$	$\times$	-	-	-	-	-
N47.9.717 $\mathrm{R1}^+ \oplus \mathrm{S1}^+ \oplus \mathrm{Z2}^+$	$\times$	-	-	-	-	-
N47.9.718 $\mathrm{R1}^+ \oplus \mathrm{S2}^+ \oplus \mathrm{X1}^-$	$\times$	-	-	-	-	-
N47.9.719 $\mathrm{R1}^+ \oplus \mathrm{S2}^+ \oplus \mathrm{X3}^+$	$\times$	-	-	-	-	-

Non-coplanar SSGs with parent space group $Pmmm$ (No. 47) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N47.9.720 $\mathrm{R1}^+ \oplus \mathrm{S2}^+ \oplus \mathrm{Z1}^-$	$\times$	-	-	-	-	-
N47.9.721 $\mathrm{R1}^+ \oplus \mathrm{S2}^+ \oplus \mathrm{Z2}^+$	$\times$	-	-	-	-	-
N47.9.722 $\mathrm{R1}^+ \oplus \mathrm{S3}^- \oplus \mathrm{X1}^-$	$\times$	-	-	-	-	-
N47.9.723 $\mathrm{R1}^+ \oplus \mathrm{S3}^- \oplus \mathrm{X3}^+$	$\times$	-	-	-	-	-
N47.9.724 $\mathrm{R1}^+ \oplus \mathrm{S3}^- \oplus \mathrm{Y1}^-$	$\times$	-	-	-	-	-
N47.9.725 $\mathrm{R1}^+ \oplus \mathrm{S3}^- \oplus \mathrm{Y4}^+$	$\times$	-	-	-	-	-
N47.9.726 $\mathrm{R1}^+ \oplus \mathrm{S3}^- \oplus \mathrm{Z1}^-$	$\times$	-	-	-	-	-
N47.9.727 $\mathrm{R1}^+ \oplus \mathrm{S3}^- \oplus \mathrm{Z2}^+$	$\times$	-	-	-	-	-
N47.9.728 $\mathrm{R1}^+ \oplus \mathrm{S1}^+ \oplus \mathrm{X2}^+$	$\times$	-	-	-	-	-
N47.9.729 $\mathrm{R1}^+ \oplus \mathrm{S1}^+ \oplus \mathrm{X2}^-$	$\times$	-	-	-	-	-
N47.9.730 $\mathrm{R1}^+ \oplus \mathrm{S1}^+ \oplus \mathrm{X4}^+$	$\times$	-	-	-	-	-
N47.9.731 $\mathrm{R1}^+ \oplus \mathrm{S1}^+ \oplus \mathrm{X4}^-$	$\times$	-	-	-	-	-
N47.9.732 $\mathrm{R1}^+ \oplus \mathrm{S1}^+ \oplus \mathrm{Z3}^+$	$\times$	-	-	-	-	-
N47.9.733 $\mathrm{R1}^+ \oplus \mathrm{S1}^+ \oplus \mathrm{Z3}^-$	$\times$	-	-	-	-	-
N47.9.734 $\mathrm{R1}^+ \oplus \mathrm{S2}^+ \oplus \mathrm{X2}^+$	$\times$	-	-	-	-	-
N47.9.735 $\mathrm{R1}^+ \oplus \mathrm{S2}^+ \oplus \mathrm{X2}^-$	$\times$	-	-	-	-	-
N47.9.736 $\mathrm{R1}^+ \oplus \mathrm{S2}^+ \oplus \mathrm{X4}^+$	$\times$	-	-	-	-	-
N47.9.737 $\mathrm{R1}^+ \oplus \mathrm{S2}^+ \oplus \mathrm{X4}^-$	$\times$	-	-	-	-	-
N47.9.738 $\mathrm{R1}^+ \oplus \mathrm{S2}^+ \oplus \mathrm{Z3}^+$	$\times$	-	-	-	-	-
N47.9.739 $\mathrm{R1}^+ \oplus \mathrm{S2}^+ \oplus \mathrm{Z3}^-$	$\times$	-	-	-	-	-
N47.9.740 $\mathrm{R1}^+ \oplus \mathrm{S3}^- \oplus \mathrm{X2}^+$	$\times$	-	-	-	-	-
N47.9.741 $\mathrm{R1}^+ \oplus \mathrm{S3}^- \oplus \mathrm{X2}^-$	$\times$	-	-	-	-	-
N47.9.742 $\mathrm{R1}^+ \oplus \mathrm{S3}^- \oplus \mathrm{X4}^+$	$\times$	-	-	-	-	-
N47.9.743 $\mathrm{R1}^+ \oplus \mathrm{S3}^- \oplus \mathrm{X4}^-$	$\times$	-	-	-	-	-
N47.9.744 $\mathrm{R1}^+ \oplus \mathrm{S3}^- \oplus \mathrm{Y2}^+$	$\times$	-	-	-	-	-
N47.9.745 $\mathrm{R1}^+ \oplus \mathrm{S3}^- \oplus \mathrm{Y2}^-$	$\times$	-	-	-	-	-
N47.9.746 $\mathrm{R1}^+ \oplus \mathrm{S3}^- \oplus \mathrm{Y3}^+$	$\times$	-	-	-	-	-
N47.9.747 $\mathrm{R1}^+ \oplus \mathrm{S3}^- \oplus \mathrm{Y3}^-$	$\times$	-	-	-	-	-
N47.9.748 $\mathrm{R1}^+ \oplus \mathrm{S3}^- \oplus \mathrm{Z3}^+$	$\times$	-	-	-	-	-
N47.9.749 $\mathrm{R1}^+ \oplus \mathrm{S3}^- \oplus \mathrm{Z3}^-$	$\times$	-	-	-	-	-
N47.9.750 $\mathrm{R1}^+ \oplus \mathrm{S3}^- \oplus \mathrm{Z4}^+$	$\times$	-	-	-	-	-
N47.9.751 $\mathrm{R1}^+ \oplus \mathrm{S3}^- \oplus \mathrm{Z4}^-$	$\times$	-	-	-	-	-
N47.9.752 $\mathrm{R1}^+ \oplus \mathrm{S1}^- \oplus \mathrm{S1}^-$	$\surd$	1	0	$\times$	-	-
N47.9.753 $\mathrm{R1}^+ \oplus \mathrm{S1}^- \oplus \mathrm{S2}^-$	$\surd$	1	0	$\times$	-	-
N47.9.754 $\mathrm{R1}^+ \oplus \mathrm{S1}^- \oplus \mathrm{S3}^+$	$\surd$	1	1	$\times$	-	-
N47.9.755 $\mathrm{R1}^+ \oplus \mathrm{S1}^- \oplus \mathrm{T1}^-$	$\times$	-	-	-	-	-
N47.9.756 $\mathrm{R1}^+ \oplus \mathrm{S1}^- \oplus \mathrm{T2}^+$	$\times$	-	-	-	-	-
N47.9.757 $\mathrm{R1}^+ \oplus \mathrm{S1}^- \oplus \mathrm{T3}^-$	$\times$	-	-	-	-	-
N47.9.758 $\mathrm{R1}^+ \oplus \mathrm{S1}^- \oplus \mathrm{T4}^+$	$\times$	-	-	-	-	-
N47.9.759 $\mathrm{R1}^+ \oplus \mathrm{S2}^- \oplus \mathrm{S2}^-$	$\surd$	1	0	$\times$	-	-
N47.9.760 $\mathrm{R1}^+ \oplus \mathrm{S2}^- \oplus \mathrm{S3}^+$	$\surd$	1	1	$\times$	-	-
N47.9.761 $\mathrm{R1}^+ \oplus \mathrm{S2}^- \oplus \mathrm{T2}^+$	$\times$	-	-	-	-	-
N47.9.762 $\mathrm{R1}^+ \oplus \mathrm{S2}^- \oplus \mathrm{T3}^-$	$\times$	-	-	-	-	-
N47.9.763 $\mathrm{R1}^+ \oplus \mathrm{S2}^- \oplus \mathrm{T4}^+$	$\times$	-	-	-	-	-
N47.9.764 $\mathrm{R1}^+ \oplus \mathrm{S3}^+ \oplus \mathrm{S3}^+$	$\surd$	1	0	$\times$	-	-
N47.9.765 $\mathrm{R1}^+ \oplus \mathrm{S3}^+ \oplus \mathrm{S4}^+$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $Pmmm$ (No. 47) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N47.9.766 $\mathrm{R1}^+ \oplus \mathrm{S3}^+ \oplus \mathrm{T2}^+$	×	-	-	-	-	-
N47.9.767 $\mathrm{R1}^+ \oplus \mathrm{S3}^+ \oplus \mathrm{T4}^+$	×	-	-	-	-	-
N47.9.768 $\mathrm{R1}^+ \oplus \mathrm{S3}^+ \oplus \mathrm{U3}^+$	×	-	-	-	-	-
N47.9.769 $\mathrm{R1}^+ \oplus \mathrm{S1}^- \oplus \mathrm{X1}^+$	×	-	-	-	-	-
N47.9.770 $\mathrm{R1}^+ \oplus \mathrm{S1}^- \oplus \mathrm{X3}^-$	×	-	-	-	-	-
N47.9.771 $\mathrm{R1}^+ \oplus \mathrm{S1}^- \oplus \mathrm{Z1}^+$	×	-	-	-	-	-
N47.9.772 $\mathrm{R1}^+ \oplus \mathrm{S1}^- \oplus \mathrm{Z2}^-$	×	-	-	-	-	-
N47.9.773 $\mathrm{R1}^+ \oplus \mathrm{S2}^- \oplus \mathrm{X1}^+$	×	-	-	-	-	-
N47.9.774 $\mathrm{R1}^+ \oplus \mathrm{S2}^- \oplus \mathrm{X3}^-$	×	-	-	-	-	-
N47.9.775 $\mathrm{R1}^+ \oplus \mathrm{S2}^- \oplus \mathrm{Z1}^+$	×	-	-	-	-	-
N47.9.776 $\mathrm{R1}^+ \oplus \mathrm{S2}^- \oplus \mathrm{Z2}^-$	×	-	-	-	-	-
N47.9.777 $\mathrm{R1}^+ \oplus \mathrm{S3}^+ \oplus \mathrm{X1}^+$	×	-	-	-	-	-
N47.9.778 $\mathrm{R1}^+ \oplus \mathrm{S3}^+ \oplus \mathrm{X3}^-$	×	-	-	-	-	-
N47.9.779 $\mathrm{R1}^+ \oplus \mathrm{S3}^+ \oplus \mathrm{Y1}^+$	×	-	-	-	-	-
N47.9.780 $\mathrm{R1}^+ \oplus \mathrm{S3}^+ \oplus \mathrm{Y4}^-$	×	-	-	-	-	-
N47.9.781 $\mathrm{R1}^+ \oplus \mathrm{S3}^+ \oplus \mathrm{Z1}^+$	×	-	-	-	-	-
N47.9.782 $\mathrm{R1}^+ \oplus \mathrm{S3}^+ \oplus \mathrm{Z2}^-$	×	-	-	-	-	-
N47.9.783 $\mathrm{R1}^+ \oplus \mathrm{S1}^- \oplus \mathrm{X1}^-$	×	-	-	-	-	-
N47.9.784 $\mathrm{R1}^+ \oplus \mathrm{S1}^- \oplus \mathrm{X3}^+$	×	-	-	-	-	-
N47.9.785 $\mathrm{R1}^+ \oplus \mathrm{S1}^- \oplus \mathrm{Z1}^-$	×	-	-	-	-	-
N47.9.786 $\mathrm{R1}^+ \oplus \mathrm{S1}^- \oplus \mathrm{Z2}^+$	×	-	-	-	-	-
N47.9.787 $\mathrm{R1}^+ \oplus \mathrm{S2}^- \oplus \mathrm{X1}^-$	×	-	-	-	-	-
N47.9.788 $\mathrm{R1}^+ \oplus \mathrm{S2}^- \oplus \mathrm{X3}^+$	×	-	-	-	-	-
N47.9.789 $\mathrm{R1}^+ \oplus \mathrm{S2}^- \oplus \mathrm{Z1}^-$	×	-	-	-	-	-
N47.9.790 $\mathrm{R1}^+ \oplus \mathrm{S2}^- \oplus \mathrm{Z2}^+$	×	-	-	-	-	-
N47.9.791 $\mathrm{R1}^+ \oplus \mathrm{S3}^+ \oplus \mathrm{X1}^-$	×	-	-	-	-	-
N47.9.792 $\mathrm{R1}^+ \oplus \mathrm{S3}^+ \oplus \mathrm{X3}^+$	×	-	-	-	-	-
N47.9.793 $\mathrm{R1}^+ \oplus \mathrm{S3}^+ \oplus \mathrm{Y1}^-$	×	-	-	-	-	-
N47.9.794 $\mathrm{R1}^+ \oplus \mathrm{S3}^+ \oplus \mathrm{Y4}^+$	×	-	-	-	-	-
N47.9.795 $\mathrm{R1}^+ \oplus \mathrm{S3}^+ \oplus \mathrm{Z1}^-$	×	-	-	-	-	-
N47.9.796 $\mathrm{R1}^+ \oplus \mathrm{S3}^+ \oplus \mathrm{Z2}^+$	×	-	-	-	-	-
N47.9.797 $\mathrm{R1}^+ \oplus \mathrm{S1}^- \oplus \mathrm{X2}^+$	×	-	-	-	-	-
N47.9.798 $\mathrm{R1}^+ \oplus \mathrm{S1}^- \oplus \mathrm{X2}^-$	×	-	-	-	-	-
N47.9.799 $\mathrm{R1}^+ \oplus \mathrm{S1}^- \oplus \mathrm{X4}^+$	×	-	-	-	-	-
N47.9.800 $\mathrm{R1}^+ \oplus \mathrm{S1}^- \oplus \mathrm{X4}^-$	×	-	-	-	-	-
N47.9.801 $\mathrm{R1}^+ \oplus \mathrm{S1}^- \oplus \mathrm{Z3}^+$	×	-	-	-	-	-
N47.9.802 $\mathrm{R1}^+ \oplus \mathrm{S1}^- \oplus \mathrm{Z3}^-$	×	-	-	-	-	-
N47.9.803 $\mathrm{R1}^+ \oplus \mathrm{S2}^- \oplus \mathrm{X2}^+$	×	-	-	-	-	-
N47.9.804 $\mathrm{R1}^+ \oplus \mathrm{S2}^- \oplus \mathrm{X2}^-$	×	-	-	-	-	-
N47.9.805 $\mathrm{R1}^+ \oplus \mathrm{S2}^- \oplus \mathrm{X4}^+$	×	-	-	-	-	-
N47.9.806 $\mathrm{R1}^+ \oplus \mathrm{S2}^- \oplus \mathrm{X4}^-$	×	-	-	-	-	-
N47.9.807 $\mathrm{R1}^+ \oplus \mathrm{S2}^- \oplus \mathrm{Z3}^+$	×	-	-	-	-	-
N47.9.808 $\mathrm{R1}^+ \oplus \mathrm{S2}^- \oplus \mathrm{Z3}^-$	×	-	-	-	-	-
N47.9.809 $\mathrm{R1}^+ \oplus \mathrm{S3}^+ \oplus \mathrm{X2}^+$	×	-	-	-	-	-
N47.9.810 $\mathrm{R1}^+ \oplus \mathrm{S3}^+ \oplus \mathrm{X2}^-$	×	-	-	-	-	-
N47.9.811 $\mathrm{R1}^+ \oplus \mathrm{S3}^+ \oplus \mathrm{X4}^+$	×	-	-	-	-	-

Non-coplanar SSGs with parent space group $Pmmm$ (No. 47) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N47.9.812 $\mathrm{R1}^+ \oplus \mathrm{S3}^+ \oplus \mathrm{X4}^-$	$\times$	-	-	-	-	-
N47.9.813 $\mathrm{R1}^+ \oplus \mathrm{S3}^+ \oplus \mathrm{Y2}^+$	$\times$	-	-	-	-	-
N47.9.814 $\mathrm{R1}^+ \oplus \mathrm{S3}^+ \oplus \mathrm{Y2}^-$	$\times$	-	-	-	-	-
N47.9.815 $\mathrm{R1}^+ \oplus \mathrm{S3}^+ \oplus \mathrm{Y3}^+$	$\times$	-	-	-	-	-
N47.9.816 $\mathrm{R1}^+ \oplus \mathrm{S3}^+ \oplus \mathrm{Y3}^-$	$\times$	-	-	-	-	-
N47.9.817 $\mathrm{R1}^+ \oplus \mathrm{S3}^+ \oplus \mathrm{Z3}^+$	$\times$	-	-	-	-	-
N47.9.818 $\mathrm{R1}^+ \oplus \mathrm{S3}^+ \oplus \mathrm{Z3}^-$	$\times$	-	-	-	-	-
N47.9.819 $\mathrm{R1}^+ \oplus \mathrm{S3}^+ \oplus \mathrm{Z4}^+$	$\times$	-	-	-	-	-
N47.9.820 $\mathrm{R1}^+ \oplus \mathrm{S3}^+ \oplus \mathrm{Z4}^-$	$\times$	-	-	-	-	-
N47.9.821 $\mathrm{R1}^+ \oplus \mathrm{X1}^+ \oplus \mathrm{X1}^+$	$\surd$	1	0	$\times$	-	-
N47.9.822 $\mathrm{R1}^+ \oplus \mathrm{X1}^+ \oplus \mathrm{X3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N47.9.823 $\mathrm{R1}^+ \oplus \mathrm{X1}^+ \oplus \mathrm{Y1}^+$	$\times$	-	-	-	-	-
N47.9.824 $\mathrm{R1}^+ \oplus \mathrm{X1}^+ \oplus \mathrm{Y4}^-$	$\times$	-	-	-	-	-
N47.9.825 $\mathrm{R1}^+ \oplus \mathrm{X3}^- \oplus \mathrm{X3}^-$	$\surd$	1	0	$\times$	-	-
N47.9.826 $\mathrm{R1}^+ \oplus \mathrm{X3}^- \oplus \mathrm{Y4}^-$	$\times$	-	-	-	-	-
N47.9.827 $\mathrm{R1}^+ \oplus \mathrm{X1}^+ \oplus \mathrm{X1}^-$	$\surd$	1	1	$\times$	-	-
N47.9.828 $\mathrm{R1}^+ \oplus \mathrm{X1}^+ \oplus \mathrm{X3}^+$	$\surd$	1	0	$\times$	-	-
N47.9.829 $\mathrm{R1}^+ \oplus \mathrm{X1}^+ \oplus \mathrm{Y1}^-$	$\times$	-	-	-	-	-
N47.9.830 $\mathrm{R1}^+ \oplus \mathrm{X1}^+ \oplus \mathrm{Y4}^+$	$\times$	-	-	-	-	-
N47.9.831 $\mathrm{R1}^+ \oplus \mathrm{X3}^- \oplus \mathrm{X1}^-$	$\surd$	1	0	$\times$	-	-
N47.9.832 $\mathrm{R1}^+ \oplus \mathrm{X3}^- \oplus \mathrm{X3}^+$	$\surd$	1	1	$\times$	-	-
N47.9.833 $\mathrm{R1}^+ \oplus \mathrm{X3}^- \oplus \mathrm{Y1}^-$	$\times$	-	-	-	-	-
N47.9.834 $\mathrm{R1}^+ \oplus \mathrm{X3}^- \oplus \mathrm{Y4}^+$	$\times$	-	-	-	-	-
N47.9.835 $\mathrm{R1}^+ \oplus \mathrm{X1}^+ \oplus \mathrm{X2}^+$	$\surd$	1	0	$\times$	-	-
N47.9.836 $\mathrm{R1}^+ \oplus \mathrm{X1}^+ \oplus \mathrm{X2}^-$	$\surd$	1	1	$\times$	-	-
N47.9.837 $\mathrm{R1}^+ \oplus \mathrm{X1}^+ \oplus \mathrm{Y2}^+$	$\times$	-	-	-	-	-
N47.9.838 $\mathrm{R1}^+ \oplus \mathrm{X1}^+ \oplus \mathrm{Y2}^-$	$\times$	-	-	-	-	-
N47.9.839 $\mathrm{R1}^+ \oplus \mathrm{X1}^+ \oplus \mathrm{Y3}^+$	$\times$	-	-	-	-	-
N47.9.840 $\mathrm{R1}^+ \oplus \mathrm{X1}^+ \oplus \mathrm{Y3}^-$	$\times$	-	-	-	-	-
N47.9.841 $\mathrm{R1}^+ \oplus \mathrm{X3}^- \oplus \mathrm{X2}^+$	$\surd$	1	1	$\times$	-	-
N47.9.842 $\mathrm{R1}^+ \oplus \mathrm{X3}^- \oplus \mathrm{X2}^-$	$\surd$	1	0	$\times$	-	-
N47.9.843 $\mathrm{R1}^+ \oplus \mathrm{X3}^- \oplus \mathrm{Y2}^+$	$\times$	-	-	-	-	-
N47.9.844 $\mathrm{R1}^+ \oplus \mathrm{X3}^- \oplus \mathrm{Y2}^-$	$\times$	-	-	-	-	-
N47.9.845 $\mathrm{R1}^+ \oplus \mathrm{X3}^- \oplus \mathrm{Y3}^+$	$\times$	-	-	-	-	-
N47.9.846 $\mathrm{R1}^+ \oplus \mathrm{X3}^- \oplus \mathrm{Y3}^-$	$\times$	-	-	-	-	-
N47.9.847 $\mathrm{R1}^+ \oplus \mathrm{X1}^- \oplus \mathrm{X1}^-$	$\surd$	1	0	$\times$	-	-
N47.9.848 $\mathrm{R1}^+ \oplus \mathrm{X1}^- \oplus \mathrm{X3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N47.9.849 $\mathrm{R1}^+ \oplus \mathrm{X1}^- \oplus \mathrm{Y1}^-$	$\times$	-	-	-	-	-
N47.9.850 $\mathrm{R1}^+ \oplus \mathrm{X1}^- \oplus \mathrm{Y4}^+$	$\times$	-	-	-	-	-
N47.9.851 $\mathrm{R1}^+ \oplus \mathrm{X3}^+ \oplus \mathrm{X3}^+$	$\surd$	1	0	$\times$	-	-
N47.9.852 $\mathrm{R1}^+ \oplus \mathrm{X3}^+ \oplus \mathrm{Y4}^+$	$\times$	-	-	-	-	-
N47.9.853 $\mathrm{R1}^+ \oplus \mathrm{X1}^- \oplus \mathrm{X2}^+$	$\surd$	1	1	$\times$	-	-
N47.9.854 $\mathrm{R1}^+ \oplus \mathrm{X1}^- \oplus \mathrm{X2}^-$	$\surd$	1	0	$\times$	-	-
N47.9.855 $\mathrm{R1}^+ \oplus \mathrm{X1}^- \oplus \mathrm{Y2}^+$	$\times$	-	-	-	-	-
N47.9.856 $\mathrm{R1}^+ \oplus \mathrm{X1}^- \oplus \mathrm{Y2}^-$	$\times$	-	-	-	-	-
N47.9.857 $\mathrm{R1}^+ \oplus \mathrm{X1}^- \oplus \mathrm{Y3}^+$	$\times$	-	-	-	-	-

Non-coplanar SSGs with parent space group $Pmmm$ (No. 47) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N47.9.858 $\mathrm{R1}^+ \oplus \mathrm{X1}^- \oplus \mathrm{Y3}^-$	×	-	-	-	-	-
N47.9.859 $\mathrm{R1}^+ \oplus \mathrm{X3}^+ \oplus \mathrm{X2}^+$	√	1	0	×	-	-
N47.9.860 $\mathrm{R1}^+ \oplus \mathrm{X3}^+ \oplus \mathrm{X2}^-$	√	1	1	×	-	-
N47.9.861 $\mathrm{R1}^+ \oplus \mathrm{X3}^+ \oplus \mathrm{Y2}^+$	×	-	-	-	-	-
N47.9.862 $\mathrm{R1}^+ \oplus \mathrm{X3}^+ \oplus \mathrm{Y2}^-$	×	-	-	-	-	-
N47.9.863 $\mathrm{R1}^+ \oplus \mathrm{X3}^+ \oplus \mathrm{Y3}^+$	×	-	-	-	-	-
N47.9.864 $\mathrm{R1}^+ \oplus \mathrm{X3}^+ \oplus \mathrm{Y3}^-$	×	-	-	-	-	-
N47.9.865 $\mathrm{R1}^+ \oplus \mathrm{X2}^+ \oplus \mathrm{X2}^+$	√	1	0	×	-	-
N47.9.866 $\mathrm{R1}^+ \oplus \mathrm{X2}^+ \oplus \mathrm{X2}^-$	√	1	1	×	-	-
N47.9.867 $\mathrm{R1}^+ \oplus \mathrm{X2}^+ \oplus \mathrm{X4}^+$	√	1	0	×	-	-
N47.9.868 $\mathrm{R1}^+ \oplus \mathrm{X2}^+ \oplus \mathrm{X4}^-$	√	1	1	√	mmm	$\mathrm{B3_u}$
N47.9.869 $\mathrm{R1}^+ \oplus \mathrm{X2}^+ \oplus \mathrm{Y2}^+$	×	-	-	-	-	-
N47.9.870 $\mathrm{R1}^+ \oplus \mathrm{X2}^+ \oplus \mathrm{Y2}^-$	×	-	-	-	-	-
N47.9.871 $\mathrm{R1}^+ \oplus \mathrm{X2}^+ \oplus \mathrm{Y3}^+$	×	-	-	-	-	-
N47.9.872 $\mathrm{R1}^+ \oplus \mathrm{X2}^+ \oplus \mathrm{Y3}^-$	×	-	-	-	-	-
N47.9.873 $\mathrm{R1}^+ \oplus \mathrm{X2}^+ \oplus \mathrm{Z3}^+$	×	-	-	-	-	-
N47.9.874 $\mathrm{R1}^+ \oplus \mathrm{X2}^+ \oplus \mathrm{Z3}^-$	×	-	-	-	-	-
N47.9.875 $\mathrm{R1}^+ \oplus \mathrm{X2}^+ \oplus \mathrm{Z4}^-$	×	-	-	-	-	-
N47.9.876 $\mathrm{R1}^+ \oplus \mathrm{X2}^- \oplus \mathrm{X2}^-$	√	1	0	×	-	-
N47.9.877 $\mathrm{R1}^+ \oplus \mathrm{X2}^- \oplus \mathrm{X4}^-$	√	1	0	×	-	-
N47.9.878 $\mathrm{R1}^+ \oplus \mathrm{X2}^- \oplus \mathrm{Y2}^-$	×	-	-	-	-	-
N47.9.879 $\mathrm{R1}^+ \oplus \mathrm{X2}^- \oplus \mathrm{Y3}^-$	×	-	-	-	-	-
N47.9.880 $\mathrm{R1}^+ \oplus \mathrm{X2}^- \oplus \mathrm{Z3}^-$	×	-	-	-	-	-
N47.9.881 $\mathrm{S1}^+ \oplus \mathrm{S1}^+ \oplus \mathrm{S1}^+$	√	0	0	√	-	-
N47.9.882 $\mathrm{S1}^+ \oplus \mathrm{S1}^+ \oplus \mathrm{S2}^+$	√	0	0	√	-	-
N47.9.883 $\mathrm{S1}^+ \oplus \mathrm{S1}^+ \oplus \mathrm{S3}^-$	√	2	2	√	mmm	$\mathrm{B3_u} \oplus \mathrm{B3_u}$
N47.9.884 $\mathrm{S1}^+ \oplus \mathrm{S1}^+ \oplus \mathrm{T1}^+$	√	1	0	×	-	-
N47.9.885 $\mathrm{S1}^+ \oplus \mathrm{S1}^+ \oplus \mathrm{T3}^+$	√	1	0	×	-	-
N47.9.886 $\mathrm{S1}^+ \oplus \mathrm{S2}^+ \oplus \mathrm{S3}^-$	√	2	2	√	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_u}$
N47.9.887 $\mathrm{S1}^+ \oplus \mathrm{S2}^+ \oplus \mathrm{T1}^+$	√	1	0	×	-	-
N47.9.888 $\mathrm{S1}^+ \oplus \mathrm{S3}^- \oplus \mathrm{T1}^+$	√	1	1	×	-	-
N47.9.889 $\mathrm{S1}^+ \oplus \mathrm{S3}^- \oplus \mathrm{T3}^+$	√	1	1	×	-	-
N47.9.890 $\mathrm{S1}^+ \oplus \mathrm{S3}^- \oplus \mathrm{U1}^+$	√	1	1	×	-	-
N47.9.891 $\mathrm{S1}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{U1}^+$	×	-	-	-	-	-
N47.9.892 $\mathrm{S1}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{U2}^-$	×	-	-	-	-	-
N47.9.893 $\mathrm{S1}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{U4}^+$	×	-	-	-	-	-
N47.9.894 $\mathrm{S1}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{U3}^-$	×	-	-	-	-	-
N47.9.895 $\mathrm{S1}^+ \oplus \mathrm{S1}^+ \oplus \mathrm{S1}^-$	√	2	2	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u}$
N47.9.896 $\mathrm{S1}^+ \oplus \mathrm{S1}^+ \oplus \mathrm{S2}^-$	√	2	2	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N47.9.897 $\mathrm{S1}^+ \oplus \mathrm{S1}^+ \oplus \mathrm{S3}^+$	√	0	0	√	-	-
N47.9.898 $\mathrm{S1}^+ \oplus \mathrm{S1}^+ \oplus \mathrm{T1}^-$	√	1	0	×	-	-
N47.9.899 $\mathrm{S1}^+ \oplus \mathrm{S1}^+ \oplus \mathrm{T3}^-$	√	1	0	×	-	-
N47.9.900 $\mathrm{S1}^+ \oplus \mathrm{S2}^+ \oplus \mathrm{S1}^-$	√	2	2	√	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u}$
N47.9.901 $\mathrm{S1}^+ \oplus \mathrm{S2}^+ \oplus \mathrm{S3}^+$	√	0	0	√	-	-
N47.9.902 $\mathrm{S1}^+ \oplus \mathrm{S2}^+ \oplus \mathrm{T1}^-$	√	1	0	×	-	-
N47.9.903 $\mathrm{S1}^+ \oplus \mathrm{S3}^- \oplus \mathrm{S1}^-$	√	2	2	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u}$

Non-coplanar SSGs with parent space group $Pmmm$ (No. 47) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N47.9.904 $\mathrm{S1}^{+} \oplus \mathrm{S3}^{-} \oplus \mathrm{S2}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u}$
N47.9.905 $\mathrm{S1}^{+} \oplus \mathrm{S3}^{-} \oplus \mathrm{T1}^{-}$	$\surd$	1	1	$\times$	-	-
N47.9.906 $\mathrm{S1}^{+} \oplus \mathrm{S3}^{-} \oplus \mathrm{T3}^{-}$	$\surd$	1	1	$\times$	-	-
N47.9.907 $\mathrm{S1}^{+} \oplus \mathrm{S3}^{-} \oplus \mathrm{U1}^{-}$	$\surd$	1	1	$\times$	-	-
N47.9.908 $\mathrm{S1}^{+} \oplus \mathrm{T1}^{+} \oplus \mathrm{S1}^{-}$	$\surd$	1	1	$\times$	-	-
N47.9.909 $\mathrm{S1}^{+} \oplus \mathrm{T1}^{+} \oplus \mathrm{S2}^{-}$	$\surd$	1	1	$\times$	-	-
N47.9.910 $\mathrm{S1}^{+} \oplus \mathrm{T1}^{+} \oplus \mathrm{S3}^{+}$	$\surd$	1	0	$\times$	-	-
N47.9.911 $\mathrm{S1}^{+} \oplus \mathrm{T1}^{+} \oplus \mathrm{S4}^{+}$	$\surd$	1	0	$\times$	-	-
N47.9.912 $\mathrm{S1}^{+} \oplus \mathrm{T1}^{+} \oplus \mathrm{U1}^{-}$	$\times$	-	-	-	-	-
N47.9.913 $\mathrm{S1}^{+} \oplus \mathrm{T1}^{+} \oplus \mathrm{U2}^{+}$	$\times$	-	-	-	-	-
N47.9.914 $\mathrm{S1}^{+} \oplus \mathrm{T1}^{+} \oplus \mathrm{U4}^{-}$	$\times$	-	-	-	-	-
N47.9.915 $\mathrm{S1}^{+} \oplus \mathrm{T3}^{+} \oplus \mathrm{S1}^{-}$	$\surd$	1	1	$\times$	-	-
N47.9.916 $\mathrm{S1}^{+} \oplus \mathrm{T3}^{+} \oplus \mathrm{S2}^{-}$	$\surd$	1	1	$\times$	-	-
N47.9.917 $\mathrm{S1}^{+} \oplus \mathrm{T3}^{+} \oplus \mathrm{S3}^{+}$	$\surd$	1	0	$\times$	-	-
N47.9.918 $\mathrm{S1}^{+} \oplus \mathrm{T3}^{+} \oplus \mathrm{S4}^{+}$	$\surd$	1	0	$\times$	-	-
N47.9.919 $\mathrm{S1}^{+} \oplus \mathrm{T3}^{+} \oplus \mathrm{U1}^{-}$	$\times$	-	-	-	-	-
N47.9.920 $\mathrm{S1}^{+} \oplus \mathrm{T3}^{+} \oplus \mathrm{U2}^{+}$	$\times$	-	-	-	-	-
N47.9.921 $\mathrm{S1}^{+} \oplus \mathrm{T3}^{+} \oplus \mathrm{U3}^{+}$	$\times$	-	-	-	-	-
N47.9.922 $\mathrm{S1}^{+} \oplus \mathrm{S1}^{+} \oplus \mathrm{X1}^{+}$	$\surd$	1	0	$\times$	-	-
N47.9.923 $\mathrm{S1}^{+} \oplus \mathrm{S1}^{+} \oplus \mathrm{X3}^{-}$	$\surd$	1	0	$\times$	-	-
N47.9.924 $\mathrm{S1}^{+} \oplus \mathrm{S1}^{+} \oplus \mathrm{Z1}^{+}$	$\surd$	1	0	$\times$	-	-
N47.9.925 $\mathrm{S1}^{+} \oplus \mathrm{S2}^{+} \oplus \mathrm{X1}^{+}$	$\surd$	1	0	$\times$	-	-
N47.9.926 $\mathrm{S1}^{+} \oplus \mathrm{S2}^{+} \oplus \mathrm{Z1}^{+}$	$\surd$	1	0	$\times$	-	-
N47.9.927 $\mathrm{S1}^{+} \oplus \mathrm{S3}^{-} \oplus \mathrm{X1}^{+}$	$\surd$	1	1	$\times$	-	-
N47.9.928 $\mathrm{S1}^{+} \oplus \mathrm{S3}^{-} \oplus \mathrm{Y1}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N47.9.929 $\mathrm{S1}^{+} \oplus \mathrm{S3}^{-} \oplus \mathrm{Y4}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N47.9.930 $\mathrm{S1}^{+} \oplus \mathrm{S3}^{-} \oplus \mathrm{Z1}^{+}$	$\surd$	1	1	$\times$	-	-
N47.9.931 $\mathrm{S1}^{+} \oplus \mathrm{T1}^{+} \oplus \mathrm{X1}^{+}$	$\times$	-	-	-	-	-
N47.9.932 $\mathrm{S1}^{+} \oplus \mathrm{T1}^{+} \oplus \mathrm{X3}^{-}$	$\times$	-	-	-	-	-
N47.9.933 $\mathrm{S1}^{+} \oplus \mathrm{T1}^{+} \oplus \mathrm{Y1}^{+}$	$\times$	-	-	-	-	-
N47.9.934 $\mathrm{S1}^{+} \oplus \mathrm{T1}^{+} \oplus \mathrm{Y4}^{-}$	$\times$	-	-	-	-	-
N47.9.935 $\mathrm{S1}^{+} \oplus \mathrm{T3}^{+} \oplus \mathrm{X1}^{+}$	$\times$	-	-	-	-	-
N47.9.936 $\mathrm{S1}^{+} \oplus \mathrm{T3}^{+} \oplus \mathrm{X3}^{-}$	$\times$	-	-	-	-	-
N47.9.937 $\mathrm{S1}^{+} \oplus \mathrm{T3}^{+} \oplus \mathrm{Y1}^{+}$	$\times$	-	-	-	-	-
N47.9.938 $\mathrm{S1}^{+} \oplus \mathrm{S1}^{+} \oplus \mathrm{X1}^{-}$	$\surd$	1	0	$\times$	-	-
N47.9.939 $\mathrm{S1}^{+} \oplus \mathrm{S1}^{+} \oplus \mathrm{X3}^{+}$	$\surd$	1	0	$\times$	-	-
N47.9.940 $\mathrm{S1}^{+} \oplus \mathrm{S1}^{+} \oplus \mathrm{Z1}^{-}$	$\surd$	1	0	$\times$	-	-
N47.9.941 $\mathrm{S1}^{+} \oplus \mathrm{S2}^{+} \oplus \mathrm{X1}^{-}$	$\surd$	1	0	$\times$	-	-
N47.9.942 $\mathrm{S1}^{+} \oplus \mathrm{S2}^{+} \oplus \mathrm{Z1}^{-}$	$\surd$	1	0	$\times$	-	-
N47.9.943 $\mathrm{S1}^{+} \oplus \mathrm{S3}^{-} \oplus \mathrm{X1}^{-}$	$\surd$	1	1	$\times$	-	-
N47.9.944 $\mathrm{S1}^{+} \oplus \mathrm{S3}^{-} \oplus \mathrm{Y1}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N47.9.945 $\mathrm{S1}^{+} \oplus \mathrm{S3}^{-} \oplus \mathrm{Y4}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N47.9.946 $\mathrm{S1}^{+} \oplus \mathrm{S3}^{-} \oplus \mathrm{Z1}^{-}$	$\surd$	1	1	$\times$	-	-
N47.9.947 $\mathrm{S1}^{+} \oplus \mathrm{T1}^{+} \oplus \mathrm{X1}^{-}$	$\times$	-	-	-	-	-
N47.9.948 $\mathrm{S1}^{+} \oplus \mathrm{T1}^{+} \oplus \mathrm{X3}^{+}$	$\times$	-	-	-	-	-
N47.9.949 $\mathrm{S1}^{+} \oplus \mathrm{T1}^{+} \oplus \mathrm{Y1}^{-}$	$\times$	-	-	-	-	-

Non-coplanar SSGs with parent space group $Pmmm$ (No. 47) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N47.9.950 $\mathrm{S1}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Y4}^+$	$\times$	-	-	-	-	-
N47.9.951 $\mathrm{S1}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{X1}^-$	$\times$	-	-	-	-	-
N47.9.952 $\mathrm{S1}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{X3}^+$	$\times$	-	-	-	-	-
N47.9.953 $\mathrm{S1}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{Y1}^-$	$\times$	-	-	-	-	-
N47.9.954 $\mathrm{S1}^+ \oplus \mathrm{S1}^+ \oplus \mathrm{X2}^+$	$\surd$	1	0	$\times$	-	-
N47.9.955 $\mathrm{S1}^+ \oplus \mathrm{S1}^+ \oplus \mathrm{X2}^-$	$\surd$	1	0	$\times$	-	-
N47.9.956 $\mathrm{S1}^+ \oplus \mathrm{S1}^+ \oplus \mathrm{X4}^+$	$\surd$	1	0	$\times$	-	-
N47.9.957 $\mathrm{S1}^+ \oplus \mathrm{S1}^+ \oplus \mathrm{X4}^-$	$\surd$	1	0	$\times$	-	-
N47.9.958 $\mathrm{S1}^+ \oplus \mathrm{S1}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N47.9.959 $\mathrm{S1}^+ \oplus \mathrm{S2}^+ \oplus \mathrm{X2}^+$	$\surd$	1	0	$\times$	-	-
N47.9.960 $\mathrm{S1}^+ \oplus \mathrm{S2}^+ \oplus \mathrm{X2}^-$	$\surd$	1	0	$\times$	-	-
N47.9.961 $\mathrm{S1}^+ \oplus \mathrm{S2}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N47.9.962 $\mathrm{S1}^+ \oplus \mathrm{S3}^- \oplus \mathrm{X2}^+$	$\surd$	1	1	$\times$	-	-
N47.9.963 $\mathrm{S1}^+ \oplus \mathrm{S3}^- \oplus \mathrm{X2}^-$	$\surd$	1	1	$\times$	-	-
N47.9.964 $\mathrm{S1}^+ \oplus \mathrm{S3}^- \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N47.9.965 $\mathrm{S1}^+ \oplus \mathrm{S3}^- \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N47.9.966 $\mathrm{S1}^+ \oplus \mathrm{S3}^- \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N47.9.967 $\mathrm{S1}^+ \oplus \mathrm{S3}^- \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N47.9.968 $\mathrm{S1}^+ \oplus \mathrm{S3}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
N47.9.969 $\mathrm{S1}^+ \oplus \mathrm{S3}^- \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N47.9.970 $\mathrm{S1}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{X2}^+$	$\times$	-	-	-	-	-
N47.9.971 $\mathrm{S1}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{X2}^-$	$\times$	-	-	-	-	-
N47.9.972 $\mathrm{S1}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{X4}^+$	$\times$	-	-	-	-	-
N47.9.973 $\mathrm{S1}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{X4}^-$	$\times$	-	-	-	-	-
N47.9.974 $\mathrm{S1}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Y2}^+$	$\times$	-	-	-	-	-
N47.9.975 $\mathrm{S1}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Y2}^-$	$\times$	-	-	-	-	-
N47.9.976 $\mathrm{S1}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{X2}^+$	$\times$	-	-	-	-	-
N47.9.977 $\mathrm{S1}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{X2}^-$	$\times$	-	-	-	-	-
N47.9.978 $\mathrm{S1}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{X4}^+$	$\times$	-	-	-	-	-
N47.9.979 $\mathrm{S1}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{X4}^-$	$\times$	-	-	-	-	-
N47.9.980 $\mathrm{S1}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{Y2}^+$	$\times$	-	-	-	-	-
N47.9.981 $\mathrm{S1}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{Y3}^+$	$\times$	-	-	-	-	-
N47.9.982 $\mathrm{S1}^+ \oplus \mathrm{S1}^- \oplus \mathrm{S1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u}$
N47.9.983 $\mathrm{S1}^+ \oplus \mathrm{S1}^- \oplus \mathrm{S2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u}$
N47.9.984 $\mathrm{S1}^+ \oplus \mathrm{S1}^- \oplus \mathrm{S3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u}$
N47.9.985 $\mathrm{S1}^+ \oplus \mathrm{S1}^- \oplus \mathrm{T1}^-$	$\surd$	1	1	$\times$	-	-
N47.9.986 $\mathrm{S1}^+ \oplus \mathrm{S1}^- \oplus \mathrm{T3}^-$	$\surd$	1	1	$\times$	-	-
N47.9.987 $\mathrm{S1}^+ \oplus \mathrm{S2}^- \oplus \mathrm{S2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N47.9.988 $\mathrm{S1}^+ \oplus \mathrm{S2}^- \oplus \mathrm{S3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N47.9.989 $\mathrm{S1}^+ \oplus \mathrm{S2}^- \oplus \mathrm{T1}^-$	$\surd$	1	1	$\times$	-	-
N47.9.990 $\mathrm{S1}^+ \oplus \mathrm{S2}^- \oplus \mathrm{T3}^-$	$\surd$	1	1	$\times$	-	-
N47.9.991 $\mathrm{S1}^+ \oplus \mathrm{S3}^+ \oplus \mathrm{S3}^+$	$\surd$	0	0	$\surd$	-	-
N47.9.992 $\mathrm{S1}^+ \oplus \mathrm{S3}^+ \oplus \mathrm{S4}^+$	$\surd$	0	0	$\surd$	-	-
N47.9.993 $\mathrm{S1}^+ \oplus \mathrm{S3}^+ \oplus \mathrm{T1}^-$	$\surd$	1	0	$\times$	-	-
N47.9.994 $\mathrm{S1}^+ \oplus \mathrm{S3}^+ \oplus \mathrm{T3}^-$	$\surd$	1	0	$\times$	-	-
N47.9.995 $\mathrm{S1}^+ \oplus \mathrm{S3}^+ \oplus \mathrm{U1}^-$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $Pmmm$ (No. 47) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N47.9.996 $\mathrm{S1}^+ \oplus \mathrm{S3}^+ \oplus \mathrm{U3}^+$	$\surd$	1	0	$\times$	-	-
N47.9.997 $\mathrm{S1}^+ \oplus \mathrm{T1}^- \oplus \mathrm{T1}^-$	$\surd$	1	0	$\times$	-	-
N47.9.998 $\mathrm{S1}^+ \oplus \mathrm{T1}^- \oplus \mathrm{T2}^+$	$\surd$	1	1	$\times$	-	-
N47.9.999 $\mathrm{S1}^+ \oplus \mathrm{T1}^- \oplus \mathrm{T3}^-$	$\surd$	1	0	$\times$	-	-
N47.9.1000 $\mathrm{S1}^+ \oplus \mathrm{T1}^- \oplus \mathrm{T4}^+$	$\surd$	1	1	$\times$	-	-
N47.9.1001 $\mathrm{S1}^+ \oplus \mathrm{T1}^- \oplus \mathrm{U1}^-$	$\times$	-	-	-	-	-
N47.9.1002 $\mathrm{S1}^+ \oplus \mathrm{T1}^- \oplus \mathrm{U2}^+$	$\times$	-	-	-	-	-
N47.9.1003 $\mathrm{S1}^+ \oplus \mathrm{T1}^- \oplus \mathrm{U3}^+$	$\times$	-	-	-	-	-
N47.9.1004 $\mathrm{S1}^+ \oplus \mathrm{T1}^- \oplus \mathrm{U4}^-$	$\times$	-	-	-	-	-
N47.9.1005 $\mathrm{S1}^+ \oplus \mathrm{T3}^- \oplus \mathrm{T3}^-$	$\surd$	1	0	$\times$	-	-
N47.9.1006 $\mathrm{S1}^+ \oplus \mathrm{T3}^- \oplus \mathrm{T4}^+$	$\surd$	1	1	$\times$	-	-
N47.9.1007 $\mathrm{S1}^+ \oplus \mathrm{T3}^- \oplus \mathrm{U3}^+$	$\times$	-	-	-	-	-
N47.9.1008 $\mathrm{S1}^+ \oplus \mathrm{T3}^- \oplus \mathrm{U4}^-$	$\times$	-	-	-	-	-
N47.9.1009 $\mathrm{S1}^+ \oplus \mathrm{S1}^- \oplus \mathrm{X1}^+$	$\surd$	1	1	$\times$	-	-
N47.9.1010 $\mathrm{S1}^+ \oplus \mathrm{S1}^- \oplus \mathrm{X3}^-$	$\surd$	1	1	$\times$	-	-
N47.9.1011 $\mathrm{S1}^+ \oplus \mathrm{S1}^- \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\times$	-	-
N47.9.1012 $\mathrm{S1}^+ \oplus \mathrm{S2}^- \oplus \mathrm{X1}^+$	$\surd$	1	1	$\times$	-	-
N47.9.1013 $\mathrm{S1}^+ \oplus \mathrm{S2}^- \oplus \mathrm{X3}^-$	$\surd$	1	1	$\times$	-	-
N47.9.1014 $\mathrm{S1}^+ \oplus \mathrm{S2}^- \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\times$	-	-
N47.9.1015 $\mathrm{S1}^+ \oplus \mathrm{S3}^+ \oplus \mathrm{X1}^+$	$\surd$	1	0	$\times$	-	-
N47.9.1016 $\mathrm{S1}^+ \oplus \mathrm{S3}^+ \oplus \mathrm{X3}^-$	$\surd$	1	0	$\times$	-	-
N47.9.1017 $\mathrm{S1}^+ \oplus \mathrm{S3}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	0	$\times$	-	-
N47.9.1018 $\mathrm{S1}^+ \oplus \mathrm{S3}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	0	$\times$	-	-
N47.9.1019 $\mathrm{S1}^+ \oplus \mathrm{S3}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N47.9.1020 $\mathrm{S1}^+ \oplus \mathrm{T1}^- \oplus \mathrm{X1}^+$	$\times$	-	-	-	-	-
N47.9.1021 $\mathrm{S1}^+ \oplus \mathrm{T1}^- \oplus \mathrm{X3}^-$	$\times$	-	-	-	-	-
N47.9.1022 $\mathrm{S1}^+ \oplus \mathrm{T1}^- \oplus \mathrm{Y1}^+$	$\times$	-	-	-	-	-
N47.9.1023 $\mathrm{S1}^+ \oplus \mathrm{T1}^- \oplus \mathrm{Y4}^-$	$\times$	-	-	-	-	-
N47.9.1024 $\mathrm{S1}^+ \oplus \mathrm{T1}^- \oplus \mathrm{Z1}^+$	$\times$	-	-	-	-	-
N47.9.1025 $\mathrm{S1}^+ \oplus \mathrm{T1}^- \oplus \mathrm{Z2}^-$	$\times$	-	-	-	-	-
N47.9.1026 $\mathrm{S1}^+ \oplus \mathrm{T3}^- \oplus \mathrm{X1}^+$	$\times$	-	-	-	-	-
N47.9.1027 $\mathrm{S1}^+ \oplus \mathrm{T3}^- \oplus \mathrm{X3}^-$	$\times$	-	-	-	-	-
N47.9.1028 $\mathrm{S1}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Y1}^+$	$\times$	-	-	-	-	-
N47.9.1029 $\mathrm{S1}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Y4}^-$	$\times$	-	-	-	-	-
N47.9.1030 $\mathrm{S1}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Z1}^+$	$\times$	-	-	-	-	-
N47.9.1031 $\mathrm{S1}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Z2}^-$	$\times$	-	-	-	-	-
N47.9.1032 $\mathrm{S1}^+ \oplus \mathrm{S1}^- \oplus \mathrm{X1}^-$	$\surd$	1	1	$\times$	-	-
N47.9.1033 $\mathrm{S1}^+ \oplus \mathrm{S1}^- \oplus \mathrm{X3}^+$	$\surd$	1	1	$\times$	-	-
N47.9.1034 $\mathrm{S1}^+ \oplus \mathrm{S1}^- \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
N47.9.1035 $\mathrm{S1}^+ \oplus \mathrm{S2}^- \oplus \mathrm{X1}^-$	$\surd$	1	1	$\times$	-	-
N47.9.1036 $\mathrm{S1}^+ \oplus \mathrm{S2}^- \oplus \mathrm{X3}^+$	$\surd$	1	1	$\times$	-	-
N47.9.1037 $\mathrm{S1}^+ \oplus \mathrm{S2}^- \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
N47.9.1038 $\mathrm{S1}^+ \oplus \mathrm{S3}^+ \oplus \mathrm{X1}^-$	$\surd$	1	0	$\times$	-	-
N47.9.1039 $\mathrm{S1}^+ \oplus \mathrm{S3}^+ \oplus \mathrm{X3}^+$	$\surd$	1	0	$\times$	-	-
N47.9.1040 $\mathrm{S1}^+ \oplus \mathrm{S3}^+ \oplus \mathrm{Y1}^-$	$\surd$	1	0	$\times$	-	-
N47.9.1041 $\mathrm{S1}^+ \oplus \mathrm{S3}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $Pmmm$ (No. 47) (continued).

SSG		Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N47.9.1042	$\mathrm{S1}^+ \oplus \mathrm{S3}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N47.9.1043	$\mathrm{S1}^+ \oplus \mathrm{T1}^- \oplus \mathrm{X1}^-$	$\times$	-	-	-	-	-
N47.9.1044	$\mathrm{S1}^+ \oplus \mathrm{T1}^- \oplus \mathrm{X3}^+$	$\times$	-	-	-	-	-
N47.9.1045	$\mathrm{S1}^+ \oplus \mathrm{T1}^- \oplus \mathrm{Y1}^-$	$\times$	-	-	-	-	-
N47.9.1046	$\mathrm{S1}^+ \oplus \mathrm{T1}^- \oplus \mathrm{Y4}^+$	$\times$	-	-	-	-	-
N47.9.1047	$\mathrm{S1}^+ \oplus \mathrm{T1}^- \oplus \mathrm{Z1}^-$	$\times$	-	-	-	-	-
N47.9.1048	$\mathrm{S1}^+ \oplus \mathrm{T1}^- \oplus \mathrm{Z2}^+$	$\times$	-	-	-	-	-
N47.9.1049	$\mathrm{S1}^+ \oplus \mathrm{T3}^- \oplus \mathrm{X1}^-$	$\times$	-	-	-	-	-
N47.9.1050	$\mathrm{S1}^+ \oplus \mathrm{T3}^- \oplus \mathrm{X3}^+$	$\times$	-	-	-	-	-
N47.9.1051	$\mathrm{S1}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Y1}^-$	$\times$	-	-	-	-	-
N47.9.1052	$\mathrm{S1}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Y4}^+$	$\times$	-	-	-	-	-
N47.9.1053	$\mathrm{S1}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Z1}^-$	$\times$	-	-	-	-	-
N47.9.1054	$\mathrm{S1}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Z2}^+$	$\times$	-	-	-	-	-
N47.9.1055	$\mathrm{S1}^+ \oplus \mathrm{S1}^- \oplus \mathrm{X2}^+$	$\surd$	1	1	$\times$	-	-
N47.9.1056	$\mathrm{S1}^+ \oplus \mathrm{S1}^- \oplus \mathrm{X2}^-$	$\surd$	1	1	$\times$	-	-
N47.9.1057	$\mathrm{S1}^+ \oplus \mathrm{S1}^- \oplus \mathrm{X4}^+$	$\surd$	1	1	$\times$	-	-
N47.9.1058	$\mathrm{S1}^+ \oplus \mathrm{S1}^- \oplus \mathrm{X4}^-$	$\surd$	1	1	$\times$	-	-
N47.9.1059	$\mathrm{S1}^+ \oplus \mathrm{S1}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
N47.9.1060	$\mathrm{S1}^+ \oplus \mathrm{S2}^- \oplus \mathrm{X2}^+$	$\surd$	1	1	$\times$	-	-
N47.9.1061	$\mathrm{S1}^+ \oplus \mathrm{S2}^- \oplus \mathrm{X2}^-$	$\surd$	1	1	$\times$	-	-
N47.9.1062	$\mathrm{S1}^+ \oplus \mathrm{S2}^- \oplus \mathrm{X4}^+$	$\surd$	1	1	$\times$	-	-
N47.9.1063	$\mathrm{S1}^+ \oplus \mathrm{S2}^- \oplus \mathrm{X4}^-$	$\surd$	1	1	$\times$	-	-
N47.9.1064	$\mathrm{S1}^+ \oplus \mathrm{S2}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
N47.9.1065	$\mathrm{S1}^+ \oplus \mathrm{S3}^+ \oplus \mathrm{X2}^+$	$\surd$	1	0	$\times$	-	-
N47.9.1066	$\mathrm{S1}^+ \oplus \mathrm{S3}^+ \oplus \mathrm{X2}^-$	$\surd$	1	0	$\times$	-	-
N47.9.1067	$\mathrm{S1}^+ \oplus \mathrm{S3}^+ \oplus \mathrm{X4}^+$	$\surd$	1	0	$\times$	-	-
N47.9.1068	$\mathrm{S1}^+ \oplus \mathrm{S3}^+ \oplus \mathrm{X4}^-$	$\surd$	1	0	$\times$	-	-
N47.9.1069	$\mathrm{S1}^+ \oplus \mathrm{S3}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N47.9.1070	$\mathrm{S1}^+ \oplus \mathrm{S3}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N47.9.1071	$\mathrm{S1}^+ \oplus \mathrm{S3}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N47.9.1072	$\mathrm{S1}^+ \oplus \mathrm{S3}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N47.9.1073	$\mathrm{S1}^+ \oplus \mathrm{S3}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N47.9.1074	$\mathrm{S1}^+ \oplus \mathrm{S3}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N47.9.1075	$\mathrm{S1}^+ \oplus \mathrm{T1}^- \oplus \mathrm{X2}^+$	$\times$	-	-	-	-	-
N47.9.1076	$\mathrm{S1}^+ \oplus \mathrm{T1}^- \oplus \mathrm{X2}^-$	$\times$	-	-	-	-	-
N47.9.1077	$\mathrm{S1}^+ \oplus \mathrm{T1}^- \oplus \mathrm{X4}^+$	$\times$	-	-	-	-	-
N47.9.1078	$\mathrm{S1}^+ \oplus \mathrm{T1}^- \oplus \mathrm{X4}^-$	$\times$	-	-	-	-	-
N47.9.1079	$\mathrm{S1}^+ \oplus \mathrm{T1}^- \oplus \mathrm{Y2}^+$	$\times$	-	-	-	-	-
N47.9.1080	$\mathrm{S1}^+ \oplus \mathrm{T1}^- \oplus \mathrm{Y2}^-$	$\times$	-	-	-	-	-
N47.9.1081	$\mathrm{S1}^+ \oplus \mathrm{T1}^- \oplus \mathrm{Y3}^+$	$\times$	-	-	-	-	-
N47.9.1082	$\mathrm{S1}^+ \oplus \mathrm{T1}^- \oplus \mathrm{Y3}^-$	$\times$	-	-	-	-	-
N47.9.1083	$\mathrm{S1}^+ \oplus \mathrm{T1}^- \oplus \mathrm{Z3}^+$	$\times$	-	-	-	-	-
N47.9.1084	$\mathrm{S1}^+ \oplus \mathrm{T1}^- \oplus \mathrm{Z3}^-$	$\times$	-	-	-	-	-
N47.9.1085	$\mathrm{S1}^+ \oplus \mathrm{T1}^- \oplus \mathrm{Z4}^+$	$\times$	-	-	-	-	-
N47.9.1086	$\mathrm{S1}^+ \oplus \mathrm{T1}^- \oplus \mathrm{Z4}^-$	$\times$	-	-	-	-	-
N47.9.1087	$\mathrm{S1}^+ \oplus \mathrm{T3}^- \oplus \mathrm{X2}^+$	$\times$	-	-	-	-	-

Non-coplanar SSGs with parent space group $Pmmm$ (No. 47) (continued).

SSG		Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N47.9.1088	$\mathrm{S1}^+ \oplus \mathrm{T3}^- \oplus \mathrm{X2}^-$	$\times$	-	-	-	-	-
N47.9.1089	$\mathrm{S1}^+ \oplus \mathrm{T3}^- \oplus \mathrm{X4}^+$	$\times$	-	-	-	-	-
N47.9.1090	$\mathrm{S1}^+ \oplus \mathrm{T3}^- \oplus \mathrm{X4}^-$	$\times$	-	-	-	-	-
N47.9.1091	$\mathrm{S1}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Y2}^+$	$\times$	-	-	-	-	-
N47.9.1092	$\mathrm{S1}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Y2}^-$	$\times$	-	-	-	-	-
N47.9.1093	$\mathrm{S1}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Y3}^+$	$\times$	-	-	-	-	-
N47.9.1094	$\mathrm{S1}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Y3}^-$	$\times$	-	-	-	-	-
N47.9.1095	$\mathrm{S1}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Z3}^+$	$\times$	-	-	-	-	-
N47.9.1096	$\mathrm{S1}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Z3}^-$	$\times$	-	-	-	-	-
N47.9.1097	$\mathrm{S1}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Z4}^+$	$\times$	-	-	-	-	-
N47.9.1098	$\mathrm{S1}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Z4}^-$	$\times$	-	-	-	-	-
N47.9.1099	$\mathrm{S1}^+ \oplus \mathrm{X1}^+ \oplus \mathrm{X1}^+$	$\surd$	1	0	$\times$	-	-
N47.9.1100	$\mathrm{S1}^+ \oplus \mathrm{X1}^+ \oplus \mathrm{X3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N47.9.1101	$\mathrm{S1}^+ \oplus \mathrm{X1}^+ \oplus \mathrm{Y1}^+$	$\times$	-	-	-	-	-
N47.9.1102	$\mathrm{S1}^+ \oplus \mathrm{X1}^+ \oplus \mathrm{Y4}^-$	$\times$	-	-	-	-	-
N47.9.1103	$\mathrm{S1}^+ \oplus \mathrm{X1}^+ \oplus \mathrm{Z1}^+$	$\times$	-	-	-	-	-
N47.9.1104	$\mathrm{S1}^+ \oplus \mathrm{X3}^- \oplus \mathrm{X3}^-$	$\surd$	1	0	$\times$	-	-
N47.9.1105	$\mathrm{S1}^+ \oplus \mathrm{X3}^- \oplus \mathrm{Y4}^-$	$\times$	-	-	-	-	-
N47.9.1106	$\mathrm{S1}^+ \oplus \mathrm{X3}^- \oplus \mathrm{Z1}^+$	$\times$	-	-	-	-	-
N47.9.1107	$\mathrm{S1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N47.9.1108	$\mathrm{S1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N47.9.1109	$\mathrm{S1}^+ \oplus \mathrm{X1}^+ \oplus \mathrm{X1}^-$	$\surd$	1	1	$\times$	-	-
N47.9.1110	$\mathrm{S1}^+ \oplus \mathrm{X1}^+ \oplus \mathrm{X3}^+$	$\surd$	1	0	$\times$	-	-
N47.9.1111	$\mathrm{S1}^+ \oplus \mathrm{X1}^+ \oplus \mathrm{Y1}^-$	$\times$	-	-	-	-	-
N47.9.1112	$\mathrm{S1}^+ \oplus \mathrm{X1}^+ \oplus \mathrm{Y4}^+$	$\times$	-	-	-	-	-
N47.9.1113	$\mathrm{S1}^+ \oplus \mathrm{X1}^+ \oplus \mathrm{Z1}^-$	$\times$	-	-	-	-	-
N47.9.1114	$\mathrm{S1}^+ \oplus \mathrm{X3}^- \oplus \mathrm{X1}^-$	$\surd$	1	0	$\times$	-	-
N47.9.1115	$\mathrm{S1}^+ \oplus \mathrm{X3}^- \oplus \mathrm{X3}^+$	$\surd$	1	1	$\times$	-	-
N47.9.1116	$\mathrm{S1}^+ \oplus \mathrm{X3}^- \oplus \mathrm{Y1}^-$	$\times$	-	-	-	-	-
N47.9.1117	$\mathrm{S1}^+ \oplus \mathrm{X3}^- \oplus \mathrm{Y4}^+$	$\times$	-	-	-	-	-
N47.9.1118	$\mathrm{S1}^+ \oplus \mathrm{X3}^- \oplus \mathrm{Z1}^-$	$\times$	-	-	-	-	-
N47.9.1119	$\mathrm{S1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{X1}^-$	$\times$	-	-	-	-	-
N47.9.1120	$\mathrm{S1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{X3}^+$	$\times$	-	-	-	-	-
N47.9.1121	$\mathrm{S1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
N47.9.1122	$\mathrm{S1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N47.9.1123	$\mathrm{S1}^+ \oplus \mathrm{X1}^+ \oplus \mathrm{X2}^+$	$\surd$	1	0	$\times$	-	-
N47.9.1124	$\mathrm{S1}^+ \oplus \mathrm{X1}^+ \oplus \mathrm{X2}^-$	$\surd$	1	1	$\times$	-	-
N47.9.1125	$\mathrm{S1}^+ \oplus \mathrm{X1}^+ \oplus \mathrm{X4}^+$	$\surd$	1	0	$\times$	-	-
N47.9.1126	$\mathrm{S1}^+ \oplus \mathrm{X1}^+ \oplus \mathrm{X4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N47.9.1127	$\mathrm{S1}^+ \oplus \mathrm{X1}^+ \oplus \mathrm{Y2}^+$	$\times$	-	-	-	-	-
N47.9.1128	$\mathrm{S1}^+ \oplus \mathrm{X1}^+ \oplus \mathrm{Y2}^-$	$\times$	-	-	-	-	-
N47.9.1129	$\mathrm{S1}^+ \oplus \mathrm{X1}^+ \oplus \mathrm{Y3}^+$	$\times$	-	-	-	-	-
N47.9.1130	$\mathrm{S1}^+ \oplus \mathrm{X1}^+ \oplus \mathrm{Y3}^-$	$\times$	-	-	-	-	-
N47.9.1131	$\mathrm{S1}^+ \oplus \mathrm{X1}^+ \oplus \mathrm{Z3}^+$	$\times$	-	-	-	-	-
N47.9.1132	$\mathrm{S1}^+ \oplus \mathrm{X1}^+ \oplus \mathrm{Z3}^-$	$\times$	-	-	-	-	-
N47.9.1133	$\mathrm{S1}^+ \oplus \mathrm{X3}^- \oplus \mathrm{X2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$

Non-coplanar SSGs with parent space group $Pmmm$ (No. 47) (continued).

SSG		Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N47.9.1134	$\mathrm{S1}^+ \oplus \mathrm{X3}^- \oplus \mathrm{X2}^-$	$\surd$	1	0	$\times$	-	-
N47.9.1135	$\mathrm{S1}^+ \oplus \mathrm{X3}^- \oplus \mathrm{X4}^+$	$\surd$	1	1	$\times$	-	-
N47.9.1136	$\mathrm{S1}^+ \oplus \mathrm{X3}^- \oplus \mathrm{X4}^-$	$\surd$	1	0	$\times$	-	-
N47.9.1137	$\mathrm{S1}^+ \oplus \mathrm{X3}^- \oplus \mathrm{Y2}^+$	$\times$	-	-	-	-	-
N47.9.1138	$\mathrm{S1}^+ \oplus \mathrm{X3}^- \oplus \mathrm{Y2}^-$	$\times$	-	-	-	-	-
N47.9.1139	$\mathrm{S1}^+ \oplus \mathrm{X3}^- \oplus \mathrm{Y3}^+$	$\times$	-	-	-	-	-
N47.9.1140	$\mathrm{S1}^+ \oplus \mathrm{X3}^- \oplus \mathrm{Y3}^-$	$\times$	-	-	-	-	-
N47.9.1141	$\mathrm{S1}^+ \oplus \mathrm{X3}^- \oplus \mathrm{Z3}^+$	$\times$	-	-	-	-	-
N47.9.1142	$\mathrm{S1}^+ \oplus \mathrm{X3}^- \oplus \mathrm{Z3}^-$	$\times$	-	-	-	-	-
N47.9.1143	$\mathrm{S1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{X2}^+$	$\times$	-	-	-	-	-
N47.9.1144	$\mathrm{S1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{X2}^-$	$\times$	-	-	-	-	-
N47.9.1145	$\mathrm{S1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{X4}^+$	$\times$	-	-	-	-	-
N47.9.1146	$\mathrm{S1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{X4}^-$	$\times$	-	-	-	-	-
N47.9.1147	$\mathrm{S1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N47.9.1148	$\mathrm{S1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N47.9.1149	$\mathrm{S1}^+ \oplus \mathrm{X1}^- \oplus \mathrm{X1}^-$	$\surd$	1	0	$\times$	-	-
N47.9.1150	$\mathrm{S1}^+ \oplus \mathrm{X1}^- \oplus \mathrm{X3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N47.9.1151	$\mathrm{S1}^+ \oplus \mathrm{X1}^- \oplus \mathrm{Y1}^-$	$\times$	-	-	-	-	-
N47.9.1152	$\mathrm{S1}^+ \oplus \mathrm{X1}^- \oplus \mathrm{Y4}^+$	$\times$	-	-	-	-	-
N47.9.1153	$\mathrm{S1}^+ \oplus \mathrm{X1}^- \oplus \mathrm{Z1}^-$	$\times$	-	-	-	-	-
N47.9.1154	$\mathrm{S1}^+ \oplus \mathrm{X3}^+ \oplus \mathrm{X3}^+$	$\surd$	1	0	$\times$	-	-
N47.9.1155	$\mathrm{S1}^+ \oplus \mathrm{X3}^+ \oplus \mathrm{Y4}^+$	$\times$	-	-	-	-	-
N47.9.1156	$\mathrm{S1}^+ \oplus \mathrm{X3}^+ \oplus \mathrm{Z1}^-$	$\times$	-	-	-	-	-
N47.9.1157	$\mathrm{S1}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N47.9.1158	$\mathrm{S1}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N47.9.1159	$\mathrm{S1}^+ \oplus \mathrm{X1}^- \oplus \mathrm{X2}^+$	$\surd$	1	1	$\times$	-	-
N47.9.1160	$\mathrm{S1}^+ \oplus \mathrm{X1}^- \oplus \mathrm{X2}^-$	$\surd$	1	0	$\times$	-	-
N47.9.1161	$\mathrm{S1}^+ \oplus \mathrm{X1}^- \oplus \mathrm{X4}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N47.9.1162	$\mathrm{S1}^+ \oplus \mathrm{X1}^- \oplus \mathrm{X4}^-$	$\surd$	1	0	$\times$	-	-
N47.9.1163	$\mathrm{S1}^+ \oplus \mathrm{X1}^- \oplus \mathrm{Y2}^+$	$\times$	-	-	-	-	-
N47.9.1164	$\mathrm{S1}^+ \oplus \mathrm{X1}^- \oplus \mathrm{Y2}^-$	$\times$	-	-	-	-	-
N47.9.1165	$\mathrm{S1}^+ \oplus \mathrm{X1}^- \oplus \mathrm{Y3}^+$	$\times$	-	-	-	-	-
N47.9.1166	$\mathrm{S1}^+ \oplus \mathrm{X1}^- \oplus \mathrm{Y3}^-$	$\times$	-	-	-	-	-
N47.9.1167	$\mathrm{S1}^+ \oplus \mathrm{X1}^- \oplus \mathrm{Z3}^+$	$\times$	-	-	-	-	-
N47.9.1168	$\mathrm{S1}^+ \oplus \mathrm{X1}^- \oplus \mathrm{Z3}^-$	$\times$	-	-	-	-	-
N47.9.1169	$\mathrm{S1}^+ \oplus \mathrm{X3}^+ \oplus \mathrm{X2}^+$	$\surd$	1	0	$\times$	-	-
N47.9.1170	$\mathrm{S1}^+ \oplus \mathrm{X3}^+ \oplus \mathrm{X2}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N47.9.1171	$\mathrm{S1}^+ \oplus \mathrm{X3}^+ \oplus \mathrm{X4}^+$	$\surd$	1	0	$\times$	-	-
N47.9.1172	$\mathrm{S1}^+ \oplus \mathrm{X3}^+ \oplus \mathrm{X4}^-$	$\surd$	1	1	$\times$	-	-
N47.9.1173	$\mathrm{S1}^+ \oplus \mathrm{X3}^+ \oplus \mathrm{Y2}^+$	$\times$	-	-	-	-	-
N47.9.1174	$\mathrm{S1}^+ \oplus \mathrm{X3}^+ \oplus \mathrm{Y2}^-$	$\times$	-	-	-	-	-
N47.9.1175	$\mathrm{S1}^+ \oplus \mathrm{X3}^+ \oplus \mathrm{Y3}^+$	$\times$	-	-	-	-	-
N47.9.1176	$\mathrm{S1}^+ \oplus \mathrm{X3}^+ \oplus \mathrm{Y3}^-$	$\times$	-	-	-	-	-
N47.9.1177	$\mathrm{S1}^+ \oplus \mathrm{X3}^+ \oplus \mathrm{Z3}^+$	$\times$	-	-	-	-	-
N47.9.1178	$\mathrm{S1}^+ \oplus \mathrm{X3}^+ \oplus \mathrm{Z3}^-$	$\times$	-	-	-	-	-
N47.9.1179	$\mathrm{S1}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{X2}^+$	$\times$	-	-	-	-	-

Non-coplanar SSGs with parent space group $Pmmm$ (No. 47) (continued).

SSG		Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N47.9.1180	$\mathrm{S1}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{X2}^-$	$\times$	-	-	-	-	-
N47.9.1181	$\mathrm{S1}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{X4}^+$	$\times$	-	-	-	-	-
N47.9.1182	$\mathrm{S1}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{X4}^-$	$\times$	-	-	-	-	-
N47.9.1183	$\mathrm{S1}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
N47.9.1184	$\mathrm{S1}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N47.9.1185	$\mathrm{S1}^+ \oplus \mathrm{X2}^+ \oplus \mathrm{X2}^+$	$\surd$	1	0	$\times$	-	-
N47.9.1186	$\mathrm{S1}^+ \oplus \mathrm{X2}^+ \oplus \mathrm{X2}^-$	$\surd$	1	1	$\times$	-	-
N47.9.1187	$\mathrm{S1}^+ \oplus \mathrm{X2}^+ \oplus \mathrm{X4}^+$	$\surd$	1	0	$\times$	-	-
N47.9.1188	$\mathrm{S1}^+ \oplus \mathrm{X2}^+ \oplus \mathrm{X4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N47.9.1189	$\mathrm{S1}^+ \oplus \mathrm{X2}^+ \oplus \mathrm{Y2}^+$	$\times$	-	-	-	-	-
N47.9.1190	$\mathrm{S1}^+ \oplus \mathrm{X2}^+ \oplus \mathrm{Y2}^-$	$\times$	-	-	-	-	-
N47.9.1191	$\mathrm{S1}^+ \oplus \mathrm{X2}^+ \oplus \mathrm{Y3}^+$	$\times$	-	-	-	-	-
N47.9.1192	$\mathrm{S1}^+ \oplus \mathrm{X2}^+ \oplus \mathrm{Y3}^-$	$\times$	-	-	-	-	-
N47.9.1193	$\mathrm{S1}^+ \oplus \mathrm{X2}^+ \oplus \mathrm{Z3}^+$	$\times$	-	-	-	-	-
N47.9.1194	$\mathrm{S1}^+ \oplus \mathrm{X2}^+ \oplus \mathrm{Z3}^-$	$\times$	-	-	-	-	-
N47.9.1195	$\mathrm{S1}^+ \oplus \mathrm{X2}^- \oplus \mathrm{X2}^-$	$\surd$	1	0	$\times$	-	-
N47.9.1196	$\mathrm{S1}^+ \oplus \mathrm{X2}^- \oplus \mathrm{X4}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N47.9.1197	$\mathrm{S1}^+ \oplus \mathrm{X2}^- \oplus \mathrm{X4}^-$	$\surd$	1	0	$\times$	-	-
N47.9.1198	$\mathrm{S1}^+ \oplus \mathrm{X2}^- \oplus \mathrm{Y2}^-$	$\times$	-	-	-	-	-
N47.9.1199	$\mathrm{S1}^+ \oplus \mathrm{X2}^- \oplus \mathrm{Y3}^+$	$\times$	-	-	-	-	-
N47.9.1200	$\mathrm{S1}^+ \oplus \mathrm{X2}^- \oplus \mathrm{Y3}^-$	$\times$	-	-	-	-	-
N47.9.1201	$\mathrm{S1}^+ \oplus \mathrm{X2}^- \oplus \mathrm{Z3}^+$	$\times$	-	-	-	-	-
N47.9.1202	$\mathrm{S1}^+ \oplus \mathrm{X2}^- \oplus \mathrm{Z3}^-$	$\times$	-	-	-	-	-
N47.9.1203	$\mathrm{S1}^+ \oplus \mathrm{X4}^+ \oplus \mathrm{X4}^+$	$\surd$	1	0	$\times$	-	-
N47.9.1204	$\mathrm{S1}^+ \oplus \mathrm{X4}^+ \oplus \mathrm{X4}^-$	$\surd$	1	1	$\times$	-	-
N47.9.1205	$\mathrm{S1}^+ \oplus \mathrm{X4}^+ \oplus \mathrm{Y3}^+$	$\times$	-	-	-	-	-
N47.9.1206	$\mathrm{S1}^+ \oplus \mathrm{X4}^+ \oplus \mathrm{Y3}^-$	$\times$	-	-	-	-	-
N47.9.1207	$\mathrm{S1}^+ \oplus \mathrm{X4}^+ \oplus \mathrm{Z3}^+$	$\times$	-	-	-	-	-
N47.9.1208	$\mathrm{S1}^+ \oplus \mathrm{X4}^+ \oplus \mathrm{Z3}^-$	$\times$	-	-	-	-	-
N47.9.1209	$\mathrm{S1}^+ \oplus \mathrm{X4}^- \oplus \mathrm{X4}^-$	$\surd$	1	0	$\times$	-	-
N47.9.1210	$\mathrm{S1}^+ \oplus \mathrm{X4}^- \oplus \mathrm{Y3}^-$	$\times$	-	-	-	-	-
N47.9.1211	$\mathrm{S1}^+ \oplus \mathrm{X4}^- \oplus \mathrm{Z3}^+$	$\times$	-	-	-	-	-
N47.9.1212	$\mathrm{S1}^+ \oplus \mathrm{X4}^- \oplus \mathrm{Z3}^-$	$\times$	-	-	-	-	-
N47.9.1213	$\mathrm{S1}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N47.9.1214	$\mathrm{S1}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N47.9.1215	$\mathrm{S1}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N47.9.1216	$\mathrm{S1}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N47.9.1217	$\mathrm{S1}^- \oplus \mathrm{S1}^- \oplus \mathrm{S1}^-$	$\surd$	0	0	$\surd$	-	-
N47.9.1218	$\mathrm{S1}^- \oplus \mathrm{S1}^- \oplus \mathrm{S2}^-$	$\surd$	0	0	$\surd$	-	-
N47.9.1219	$\mathrm{S1}^- \oplus \mathrm{S1}^- \oplus \mathrm{S3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B3_u}$
N47.9.1220	$\mathrm{S1}^- \oplus \mathrm{S1}^- \oplus \mathrm{T1}^-$	$\surd$	1	0	$\times$	-	-
N47.9.1221	$\mathrm{S1}^- \oplus \mathrm{S1}^- \oplus \mathrm{T3}^-$	$\surd$	1	0	$\times$	-	-
N47.9.1222	$\mathrm{S1}^- \oplus \mathrm{S2}^- \oplus \mathrm{S3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_u}$
N47.9.1223	$\mathrm{S1}^- \oplus \mathrm{S2}^- \oplus \mathrm{T1}^-$	$\surd$	1	0	$\times$	-	-
N47.9.1224	$\mathrm{S1}^- \oplus \mathrm{S3}^+ \oplus \mathrm{T1}^-$	$\surd$	1	1	$\times$	-	-
N47.9.1225	$\mathrm{S1}^- \oplus \mathrm{S3}^+ \oplus \mathrm{T3}^-$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $Pmmm$ (No. 47) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N47.9.1226 $\mathrm{S1}^{-} \oplus \mathrm{S3}^{+} \oplus \mathrm{U1}^{-}$	$\surd$	1	1	$\times$	-	-
N47.9.1227 $\mathrm{S1}^{-} \oplus \mathrm{T1}^{-} \oplus \mathrm{U1}^{-}$	$\times$	-	-	-	-	-
N47.9.1228 $\mathrm{S1}^{-} \oplus \mathrm{T1}^{-} \oplus \mathrm{U2}^{+}$	$\times$	-	-	-	-	-
N47.9.1229 $\mathrm{S1}^{-} \oplus \mathrm{T1}^{-} \oplus \mathrm{U4}^{-}$	$\times$	-	-	-	-	-
N47.9.1230 $\mathrm{S1}^{-} \oplus \mathrm{T3}^{-} \oplus \mathrm{U3}^{+}$	$\times$	-	-	-	-	-
N47.9.1231 $\mathrm{S1}^{-} \oplus \mathrm{S1}^{-} \oplus \mathrm{X1}^{+}$	$\surd$	1	0	$\times$	-	-
N47.9.1232 $\mathrm{S1}^{-} \oplus \mathrm{S1}^{-} \oplus \mathrm{X3}^{-}$	$\surd$	1	0	$\times$	-	-
N47.9.1233 $\mathrm{S1}^{-} \oplus \mathrm{S1}^{-} \oplus \mathrm{Z1}^{+}$	$\surd$	1	0	$\times$	-	-
N47.9.1234 $\mathrm{S1}^{-} \oplus \mathrm{S2}^{-} \oplus \mathrm{X1}^{+}$	$\surd$	1	0	$\times$	-	-
N47.9.1235 $\mathrm{S1}^{-} \oplus \mathrm{S2}^{-} \oplus \mathrm{Z1}^{+}$	$\surd$	1	0	$\times$	-	-
N47.9.1236 $\mathrm{S1}^{-} \oplus \mathrm{S3}^{+} \oplus \mathrm{X1}^{+}$	$\surd$	1	1	$\times$	-	-
N47.9.1237 $\mathrm{S1}^{-} \oplus \mathrm{S3}^{+} \oplus \mathrm{Y1}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N47.9.1238 $\mathrm{S1}^{-} \oplus \mathrm{S3}^{+} \oplus \mathrm{Y4}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N47.9.1239 $\mathrm{S1}^{-} \oplus \mathrm{S3}^{+} \oplus \mathrm{Z1}^{+}$	$\surd$	1	1	$\times$	-	-
N47.9.1240 $\mathrm{S1}^{-} \oplus \mathrm{T1}^{-} \oplus \mathrm{X1}^{+}$	$\times$	-	-	-	-	-
N47.9.1241 $\mathrm{S1}^{-} \oplus \mathrm{T1}^{-} \oplus \mathrm{X3}^{-}$	$\times$	-	-	-	-	-
N47.9.1242 $\mathrm{S1}^{-} \oplus \mathrm{T1}^{-} \oplus \mathrm{Y1}^{+}$	$\times$	-	-	-	-	-
N47.9.1243 $\mathrm{S1}^{-} \oplus \mathrm{T1}^{-} \oplus \mathrm{Y4}^{-}$	$\times$	-	-	-	-	-
N47.9.1244 $\mathrm{S1}^{-} \oplus \mathrm{T3}^{-} \oplus \mathrm{X1}^{+}$	$\times$	-	-	-	-	-
N47.9.1245 $\mathrm{S1}^{-} \oplus \mathrm{T3}^{-} \oplus \mathrm{X3}^{-}$	$\times$	-	-	-	-	-
N47.9.1246 $\mathrm{S1}^{-} \oplus \mathrm{T3}^{-} \oplus \mathrm{Y1}^{+}$	$\times$	-	-	-	-	-
N47.9.1247 $\mathrm{S1}^{-} \oplus \mathrm{S1}^{-} \oplus \mathrm{X1}^{-}$	$\surd$	1	0	$\times$	-	-
N47.9.1248 $\mathrm{S1}^{-} \oplus \mathrm{S1}^{-} \oplus \mathrm{X3}^{+}$	$\surd$	1	0	$\times$	-	-
N47.9.1249 $\mathrm{S1}^{-} \oplus \mathrm{S1}^{-} \oplus \mathrm{Z1}^{-}$	$\surd$	1	0	$\times$	-	-
N47.9.1250 $\mathrm{S1}^{-} \oplus \mathrm{S2}^{-} \oplus \mathrm{X1}^{-}$	$\surd$	1	0	$\times$	-	-
N47.9.1251 $\mathrm{S1}^{-} \oplus \mathrm{S2}^{-} \oplus \mathrm{Z1}^{-}$	$\surd$	1	0	$\times$	-	-
N47.9.1252 $\mathrm{S1}^{-} \oplus \mathrm{S3}^{+} \oplus \mathrm{X1}^{-}$	$\surd$	1	1	$\times$	-	-
N47.9.1253 $\mathrm{S1}^{-} \oplus \mathrm{S3}^{+} \oplus \mathrm{Y1}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N47.9.1254 $\mathrm{S1}^{-} \oplus \mathrm{S3}^{+} \oplus \mathrm{Y4}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N47.9.1255 $\mathrm{S1}^{-} \oplus \mathrm{S3}^{+} \oplus \mathrm{Z1}^{-}$	$\surd$	1	1	$\times$	-	-
N47.9.1256 $\mathrm{S1}^{-} \oplus \mathrm{T1}^{-} \oplus \mathrm{X1}^{-}$	$\times$	-	-	-	-	-
N47.9.1257 $\mathrm{S1}^{-} \oplus \mathrm{T1}^{-} \oplus \mathrm{X3}^{+}$	$\times$	-	-	-	-	-
N47.9.1258 $\mathrm{S1}^{-} \oplus \mathrm{T1}^{-} \oplus \mathrm{Y1}^{-}$	$\times$	-	-	-	-	-
N47.9.1259 $\mathrm{S1}^{-} \oplus \mathrm{T1}^{-} \oplus \mathrm{Y4}^{+}$	$\times$	-	-	-	-	-
N47.9.1260 $\mathrm{S1}^{-} \oplus \mathrm{T3}^{-} \oplus \mathrm{X1}^{-}$	$\times$	-	-	-	-	-
N47.9.1261 $\mathrm{S1}^{-} \oplus \mathrm{T3}^{-} \oplus \mathrm{X3}^{+}$	$\times$	-	-	-	-	-
N47.9.1262 $\mathrm{S1}^{-} \oplus \mathrm{T3}^{-} \oplus \mathrm{Y1}^{-}$	$\times$	-	-	-	-	-
N47.9.1263 $\mathrm{S1}^{-} \oplus \mathrm{S1}^{-} \oplus \mathrm{X2}^{+}$	$\surd$	1	0	$\times$	-	-
N47.9.1264 $\mathrm{S1}^{-} \oplus \mathrm{S1}^{-} \oplus \mathrm{X2}^{-}$	$\surd$	1	0	$\times$	-	-
N47.9.1265 $\mathrm{S1}^{-} \oplus \mathrm{S1}^{-} \oplus \mathrm{X4}^{+}$	$\surd$	1	0	$\times$	-	-
N47.9.1266 $\mathrm{S1}^{-} \oplus \mathrm{S1}^{-} \oplus \mathrm{X4}^{-}$	$\surd$	1	0	$\times$	-	-
N47.9.1267 $\mathrm{S1}^{-} \oplus \mathrm{S1}^{-} \oplus \mathrm{Z3}^{+}$	$\surd$	1	0	$\times$	-	-
N47.9.1268 $\mathrm{S1}^{-} \oplus \mathrm{S2}^{-} \oplus \mathrm{X2}^{+}$	$\surd$	1	0	$\times$	-	-
N47.9.1269 $\mathrm{S1}^{-} \oplus \mathrm{S2}^{-} \oplus \mathrm{X2}^{-}$	$\surd$	1	0	$\times$	-	-
N47.9.1270 $\mathrm{S1}^{-} \oplus \mathrm{S2}^{-} \oplus \mathrm{Z3}^{+}$	$\surd$	1	0	$\times$	-	-
N47.9.1271 $\mathrm{S1}^{-} \oplus \mathrm{S3}^{+} \oplus \mathrm{X2}^{+}$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $Pmmm$ (No. 47) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N47.9.1272 $\mathrm{S1}^{-}\oplus\mathrm{S3}^{+}\oplus\mathrm{X2}^{-}$	$\surd$	1	1	$\times$	-	-
N47.9.1273 $\mathrm{S1}^{-}\oplus\mathrm{S3}^{+}\oplus\mathrm{Y2}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N47.9.1274 $\mathrm{S1}^{-}\oplus\mathrm{S3}^{+}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N47.9.1275 $\mathrm{S1}^{-}\oplus\mathrm{S3}^{+}\oplus\mathrm{Y3}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N47.9.1276 $\mathrm{S1}^{-}\oplus\mathrm{S3}^{+}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N47.9.1277 $\mathrm{S1}^{-}\oplus\mathrm{S3}^{+}\oplus\mathrm{Z3}^{+}$	$\surd$	1	1	$\times$	-	-
N47.9.1278 $\mathrm{S1}^{-}\oplus\mathrm{S3}^{+}\oplus\mathrm{Z3}^{-}$	$\surd$	1	1	$\times$	-	-
N47.9.1279 $\mathrm{S1}^{-}\oplus\mathrm{T1}^{-}\oplus\mathrm{X2}^{+}$	$\times$	-	-	-	-	-
N47.9.1280 $\mathrm{S1}^{-}\oplus\mathrm{T1}^{-}\oplus\mathrm{X2}^{-}$	$\times$	-	-	-	-	-
N47.9.1281 $\mathrm{S1}^{-}\oplus\mathrm{T1}^{-}\oplus\mathrm{X4}^{+}$	$\times$	-	-	-	-	-
N47.9.1282 $\mathrm{S1}^{-}\oplus\mathrm{T1}^{-}\oplus\mathrm{X4}^{-}$	$\times$	-	-	-	-	-
N47.9.1283 $\mathrm{S1}^{-}\oplus\mathrm{T1}^{-}\oplus\mathrm{Y2}^{+}$	$\times$	-	-	-	-	-
N47.9.1284 $\mathrm{S1}^{-}\oplus\mathrm{T1}^{-}\oplus\mathrm{Y2}^{-}$	$\times$	-	-	-	-	-
N47.9.1285 $\mathrm{S1}^{-}\oplus\mathrm{T3}^{-}\oplus\mathrm{X2}^{+}$	$\times$	-	-	-	-	-
N47.9.1286 $\mathrm{S1}^{-}\oplus\mathrm{T3}^{-}\oplus\mathrm{X2}^{-}$	$\times$	-	-	-	-	-
N47.9.1287 $\mathrm{S1}^{-}\oplus\mathrm{T3}^{-}\oplus\mathrm{X4}^{+}$	$\times$	-	-	-	-	-
N47.9.1288 $\mathrm{S1}^{-}\oplus\mathrm{T3}^{-}\oplus\mathrm{X4}^{-}$	$\times$	-	-	-	-	-
N47.9.1289 $\mathrm{S1}^{-}\oplus\mathrm{T3}^{-}\oplus\mathrm{Y2}^{+}$	$\times$	-	-	-	-	-
N47.9.1290 $\mathrm{S1}^{-}\oplus\mathrm{T3}^{-}\oplus\mathrm{Y3}^{+}$	$\times$	-	-	-	-	-
N47.9.1291 $\mathrm{S1}^{-}\oplus\mathrm{X1}^{+}\oplus\mathrm{X1}^{+}$	$\surd$	1	0	$\times$	-	-
N47.9.1292 $\mathrm{S1}^{-}\oplus\mathrm{X1}^{+}\oplus\mathrm{X3}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N47.9.1293 $\mathrm{S1}^{-}\oplus\mathrm{X1}^{+}\oplus\mathrm{Y1}^{+}$	$\times$	-	-	-	-	-
N47.9.1294 $\mathrm{S1}^{-}\oplus\mathrm{X1}^{+}\oplus\mathrm{Y4}^{-}$	$\times$	-	-	-	-	-
N47.9.1295 $\mathrm{S1}^{-}\oplus\mathrm{X1}^{+}\oplus\mathrm{Z1}^{+}$	$\times$	-	-	-	-	-
N47.9.1296 $\mathrm{S1}^{-}\oplus\mathrm{X3}^{-}\oplus\mathrm{X3}^{-}$	$\surd$	1	0	$\times$	-	-
N47.9.1297 $\mathrm{S1}^{-}\oplus\mathrm{X3}^{-}\oplus\mathrm{Y4}^{-}$	$\times$	-	-	-	-	-
N47.9.1298 $\mathrm{S1}^{-}\oplus\mathrm{X3}^{-}\oplus\mathrm{Z1}^{+}$	$\times$	-	-	-	-	-
N47.9.1299 $\mathrm{S1}^{-}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z1}^{+}$	$\surd$	1	0	$\times$	-	-
N47.9.1300 $\mathrm{S1}^{-}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z2}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N47.9.1301 $\mathrm{S1}^{-}\oplus\mathrm{X1}^{+}\oplus\mathrm{X1}^{-}$	$\surd$	1	1	$\times$	-	-
N47.9.1302 $\mathrm{S1}^{-}\oplus\mathrm{X1}^{+}\oplus\mathrm{X3}^{+}$	$\surd$	1	0	$\times$	-	-
N47.9.1303 $\mathrm{S1}^{-}\oplus\mathrm{X1}^{+}\oplus\mathrm{Y1}^{-}$	$\times$	-	-	-	-	-
N47.9.1304 $\mathrm{S1}^{-}\oplus\mathrm{X1}^{+}\oplus\mathrm{Y4}^{+}$	$\times$	-	-	-	-	-
N47.9.1305 $\mathrm{S1}^{-}\oplus\mathrm{X1}^{+}\oplus\mathrm{Z1}^{-}$	$\times$	-	-	-	-	-
N47.9.1306 $\mathrm{S1}^{-}\oplus\mathrm{X3}^{-}\oplus\mathrm{X1}^{-}$	$\surd$	1	0	$\times$	-	-
N47.9.1307 $\mathrm{S1}^{-}\oplus\mathrm{X3}^{-}\oplus\mathrm{X3}^{+}$	$\surd$	1	1	$\times$	-	-
N47.9.1308 $\mathrm{S1}^{-}\oplus\mathrm{X3}^{-}\oplus\mathrm{Y1}^{-}$	$\times$	-	-	-	-	-
N47.9.1309 $\mathrm{S1}^{-}\oplus\mathrm{X3}^{-}\oplus\mathrm{Y4}^{+}$	$\times$	-	-	-	-	-
N47.9.1310 $\mathrm{S1}^{-}\oplus\mathrm{X3}^{-}\oplus\mathrm{Z1}^{-}$	$\times$	-	-	-	-	-
N47.9.1311 $\mathrm{S1}^{-}\oplus\mathrm{Z1}^{+}\oplus\mathrm{X1}^{-}$	$\times$	-	-	-	-	-
N47.9.1312 $\mathrm{S1}^{-}\oplus\mathrm{Z1}^{+}\oplus\mathrm{X3}^{+}$	$\times$	-	-	-	-	-
N47.9.1313 $\mathrm{S1}^{-}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z1}^{-}$	$\surd$	1	1	$\times$	-	-
N47.9.1314 $\mathrm{S1}^{-}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z2}^{+}$	$\surd$	1	0	$\times$	-	-
N47.9.1315 $\mathrm{S1}^{-}\oplus\mathrm{X1}^{+}\oplus\mathrm{X2}^{+}$	$\surd$	1	0	$\times$	-	-
N47.9.1316 $\mathrm{S1}^{-}\oplus\mathrm{X1}^{+}\oplus\mathrm{X2}^{-}$	$\surd$	1	1	$\times$	-	-
N47.9.1317 $\mathrm{S1}^{-}\oplus\mathrm{X1}^{+}\oplus\mathrm{X4}^{+}$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $Pmmm$ (No. 47) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N47.9.1318 $\mathrm{S1}^{-}\oplus\mathrm{X1}^{+}\oplus\mathrm{X4}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N47.9.1319 $\mathrm{S1}^{-}\oplus\mathrm{X1}^{+}\oplus\mathrm{Y2}^{+}$	$\times$	-	-	-	-	-
N47.9.1320 $\mathrm{S1}^{-}\oplus\mathrm{X1}^{+}\oplus\mathrm{Y2}^{-}$	$\times$	-	-	-	-	-
N47.9.1321 $\mathrm{S1}^{-}\oplus\mathrm{X1}^{+}\oplus\mathrm{Y3}^{+}$	$\times$	-	-	-	-	-
N47.9.1322 $\mathrm{S1}^{-}\oplus\mathrm{X1}^{+}\oplus\mathrm{Y3}^{-}$	$\times$	-	-	-	-	-
N47.9.1323 $\mathrm{S1}^{-}\oplus\mathrm{X1}^{+}\oplus\mathrm{Z3}^{+}$	$\times$	-	-	-	-	-
N47.9.1324 $\mathrm{S1}^{-}\oplus\mathrm{X1}^{+}\oplus\mathrm{Z3}^{-}$	$\times$	-	-	-	-	-
N47.9.1325 $\mathrm{S1}^{-}\oplus\mathrm{X3}^{-}\oplus\mathrm{X2}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N47.9.1326 $\mathrm{S1}^{-}\oplus\mathrm{X3}^{-}\oplus\mathrm{X2}^{-}$	$\surd$	1	0	$\times$	-	-
N47.9.1327 $\mathrm{S1}^{-}\oplus\mathrm{X3}^{-}\oplus\mathrm{X4}^{+}$	$\surd$	1	1	$\times$	-	-
N47.9.1328 $\mathrm{S1}^{-}\oplus\mathrm{X3}^{-}\oplus\mathrm{X4}^{-}$	$\surd$	1	0	$\times$	-	-
N47.9.1329 $\mathrm{S1}^{-}\oplus\mathrm{X3}^{-}\oplus\mathrm{Y2}^{+}$	$\times$	-	-	-	-	-
N47.9.1330 $\mathrm{S1}^{-}\oplus\mathrm{X3}^{-}\oplus\mathrm{Y2}^{-}$	$\times$	-	-	-	-	-
N47.9.1331 $\mathrm{S1}^{-}\oplus\mathrm{X3}^{-}\oplus\mathrm{Y3}^{+}$	$\times$	-	-	-	-	-
N47.9.1332 $\mathrm{S1}^{-}\oplus\mathrm{X3}^{-}\oplus\mathrm{Y3}^{-}$	$\times$	-	-	-	-	-
N47.9.1333 $\mathrm{S1}^{-}\oplus\mathrm{X3}^{-}\oplus\mathrm{Z3}^{+}$	$\times$	-	-	-	-	-
N47.9.1334 $\mathrm{S1}^{-}\oplus\mathrm{X3}^{-}\oplus\mathrm{Z3}^{-}$	$\times$	-	-	-	-	-
N47.9.1335 $\mathrm{S1}^{-}\oplus\mathrm{Z1}^{+}\oplus\mathrm{X2}^{+}$	$\times$	-	-	-	-	-
N47.9.1336 $\mathrm{S1}^{-}\oplus\mathrm{Z1}^{+}\oplus\mathrm{X2}^{-}$	$\times$	-	-	-	-	-
N47.9.1337 $\mathrm{S1}^{-}\oplus\mathrm{Z1}^{+}\oplus\mathrm{X4}^{+}$	$\times$	-	-	-	-	-
N47.9.1338 $\mathrm{S1}^{-}\oplus\mathrm{Z1}^{+}\oplus\mathrm{X4}^{-}$	$\times$	-	-	-	-	-
N47.9.1339 $\mathrm{S1}^{-}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z3}^{+}$	$\surd$	1	0	$\times$	-	-
N47.9.1340 $\mathrm{S1}^{-}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z3}^{-}$	$\surd$	1	1	$\times$	-	-
N47.9.1341 $\mathrm{S1}^{-}\oplus\mathrm{X1}^{-}\oplus\mathrm{X1}^{-}$	$\surd$	1	0	$\times$	-	-
N47.9.1342 $\mathrm{S1}^{-}\oplus\mathrm{X1}^{-}\oplus\mathrm{X3}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N47.9.1343 $\mathrm{S1}^{-}\oplus\mathrm{X1}^{-}\oplus\mathrm{Y1}^{-}$	$\times$	-	-	-	-	-
N47.9.1344 $\mathrm{S1}^{-}\oplus\mathrm{X1}^{-}\oplus\mathrm{Y4}^{+}$	$\times$	-	-	-	-	-
N47.9.1345 $\mathrm{S1}^{-}\oplus\mathrm{X1}^{-}\oplus\mathrm{Z1}^{-}$	$\times$	-	-	-	-	-
N47.9.1346 $\mathrm{S1}^{-}\oplus\mathrm{X3}^{+}\oplus\mathrm{X3}^{+}$	$\surd$	1	0	$\times$	-	-
N47.9.1347 $\mathrm{S1}^{-}\oplus\mathrm{X3}^{+}\oplus\mathrm{Y4}^{+}$	$\times$	-	-	-	-	-
N47.9.1348 $\mathrm{S1}^{-}\oplus\mathrm{X3}^{+}\oplus\mathrm{Z1}^{-}$	$\times$	-	-	-	-	-
N47.9.1349 $\mathrm{S1}^{-}\oplus\mathrm{Z1}^{-}\oplus\mathrm{Z1}^{-}$	$\surd$	1	0	$\times$	-	-
N47.9.1350 $\mathrm{S1}^{-}\oplus\mathrm{Z1}^{-}\oplus\mathrm{Z2}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N47.9.1351 $\mathrm{S1}^{-}\oplus\mathrm{X1}^{-}\oplus\mathrm{X2}^{+}$	$\surd$	1	1	$\times$	-	-
N47.9.1352 $\mathrm{S1}^{-}\oplus\mathrm{X1}^{-}\oplus\mathrm{X2}^{-}$	$\surd$	1	0	$\times$	-	-
N47.9.1353 $\mathrm{S1}^{-}\oplus\mathrm{X1}^{-}\oplus\mathrm{X4}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N47.9.1354 $\mathrm{S1}^{-}\oplus\mathrm{X1}^{-}\oplus\mathrm{X4}^{-}$	$\surd$	1	0	$\times$	-	-
N47.9.1355 $\mathrm{S1}^{-}\oplus\mathrm{X1}^{-}\oplus\mathrm{Y2}^{+}$	$\times$	-	-	-	-	-
N47.9.1356 $\mathrm{S1}^{-}\oplus\mathrm{X1}^{-}\oplus\mathrm{Y2}^{-}$	$\times$	-	-	-	-	-
N47.9.1357 $\mathrm{S1}^{-}\oplus\mathrm{X1}^{-}\oplus\mathrm{Y3}^{+}$	$\times$	-	-	-	-	-
N47.9.1358 $\mathrm{S1}^{-}\oplus\mathrm{X1}^{-}\oplus\mathrm{Y3}^{-}$	$\times$	-	-	-	-	-
N47.9.1359 $\mathrm{S1}^{-}\oplus\mathrm{X1}^{-}\oplus\mathrm{Z3}^{+}$	$\times$	-	-	-	-	-
N47.9.1360 $\mathrm{S1}^{-}\oplus\mathrm{X1}^{-}\oplus\mathrm{Z3}^{-}$	$\times$	-	-	-	-	-
N47.9.1361 $\mathrm{S1}^{-}\oplus\mathrm{X3}^{+}\oplus\mathrm{X2}^{+}$	$\surd$	1	0	$\times$	-	-
N47.9.1362 $\mathrm{S1}^{-}\oplus\mathrm{X3}^{+}\oplus\mathrm{X2}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N47.9.1363 $\mathrm{S1}^{-}\oplus\mathrm{X3}^{+}\oplus\mathrm{X4}^{+}$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $Pmmm$ (No. 47) (continued).

SSG		Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N47.9.1364	$\mathrm{S1}^- \oplus \mathrm{X3}^+ \oplus \mathrm{X4}^-$	$\surd$	1	1	$\times$	-	-
N47.9.1365	$\mathrm{S1}^- \oplus \mathrm{X3}^+ \oplus \mathrm{Y2}^+$	$\times$	-	-	-	-	-
N47.9.1366	$\mathrm{S1}^- \oplus \mathrm{X3}^+ \oplus \mathrm{Y2}^-$	$\times$	-	-	-	-	-
N47.9.1367	$\mathrm{S1}^- \oplus \mathrm{X3}^+ \oplus \mathrm{Y3}^+$	$\times$	-	-	-	-	-
N47.9.1368	$\mathrm{S1}^- \oplus \mathrm{X3}^+ \oplus \mathrm{Y3}^-$	$\times$	-	-	-	-	-
N47.9.1369	$\mathrm{S1}^- \oplus \mathrm{X3}^+ \oplus \mathrm{Z3}^+$	$\times$	-	-	-	-	-
N47.9.1370	$\mathrm{S1}^- \oplus \mathrm{X3}^+ \oplus \mathrm{Z3}^-$	$\times$	-	-	-	-	-
N47.9.1371	$\mathrm{S1}^- \oplus \mathrm{Z1}^- \oplus \mathrm{X2}^+$	$\times$	-	-	-	-	-
N47.9.1372	$\mathrm{S1}^- \oplus \mathrm{Z1}^- \oplus \mathrm{X2}^-$	$\times$	-	-	-	-	-
N47.9.1373	$\mathrm{S1}^- \oplus \mathrm{Z1}^- \oplus \mathrm{X4}^+$	$\times$	-	-	-	-	-
N47.9.1374	$\mathrm{S1}^- \oplus \mathrm{Z1}^- \oplus \mathrm{X4}^-$	$\times$	-	-	-	-	-
N47.9.1375	$\mathrm{S1}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
N47.9.1376	$\mathrm{S1}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N47.9.1377	$\mathrm{S1}^- \oplus \mathrm{X2}^+ \oplus \mathrm{X2}^+$	$\surd$	1	0	$\times$	-	-
N47.9.1378	$\mathrm{S1}^- \oplus \mathrm{X2}^+ \oplus \mathrm{X2}^-$	$\surd$	1	1	$\times$	-	-
N47.9.1379	$\mathrm{S1}^- \oplus \mathrm{X2}^+ \oplus \mathrm{X4}^+$	$\surd$	1	0	$\times$	-	-
N47.9.1380	$\mathrm{S1}^- \oplus \mathrm{X2}^+ \oplus \mathrm{X4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N47.9.1381	$\mathrm{S1}^- \oplus \mathrm{X2}^+ \oplus \mathrm{Y2}^+$	$\times$	-	-	-	-	-
N47.9.1382	$\mathrm{S1}^- \oplus \mathrm{X2}^+ \oplus \mathrm{Y2}^-$	$\times$	-	-	-	-	-
N47.9.1383	$\mathrm{S1}^- \oplus \mathrm{X2}^+ \oplus \mathrm{Y3}^+$	$\times$	-	-	-	-	-
N47.9.1384	$\mathrm{S1}^- \oplus \mathrm{X2}^+ \oplus \mathrm{Y3}^-$	$\times$	-	-	-	-	-
N47.9.1385	$\mathrm{S1}^- \oplus \mathrm{X2}^+ \oplus \mathrm{Z3}^+$	$\times$	-	-	-	-	-
N47.9.1386	$\mathrm{S1}^- \oplus \mathrm{X2}^+ \oplus \mathrm{Z3}^-$	$\times$	-	-	-	-	-
N47.9.1387	$\mathrm{S1}^- \oplus \mathrm{X2}^- \oplus \mathrm{X2}^-$	$\surd$	1	0	$\times$	-	-
N47.9.1388	$\mathrm{S1}^- \oplus \mathrm{X2}^- \oplus \mathrm{X4}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N47.9.1389	$\mathrm{S1}^- \oplus \mathrm{X2}^- \oplus \mathrm{X4}^-$	$\surd$	1	0	$\times$	-	-
N47.9.1390	$\mathrm{S1}^- \oplus \mathrm{X2}^- \oplus \mathrm{Y2}^-$	$\times$	-	-	-	-	-
N47.9.1391	$\mathrm{S1}^- \oplus \mathrm{X2}^- \oplus \mathrm{Y3}^+$	$\times$	-	-	-	-	-
N47.9.1392	$\mathrm{S1}^- \oplus \mathrm{X2}^- \oplus \mathrm{Y3}^-$	$\times$	-	-	-	-	-
N47.9.1393	$\mathrm{S1}^- \oplus \mathrm{X2}^- \oplus \mathrm{Z3}^+$	$\times$	-	-	-	-	-
N47.9.1394	$\mathrm{S1}^- \oplus \mathrm{X2}^- \oplus \mathrm{Z3}^-$	$\times$	-	-	-	-	-
N47.9.1395	$\mathrm{S1}^- \oplus \mathrm{X4}^+ \oplus \mathrm{X4}^+$	$\surd$	1	0	$\times$	-	-
N47.9.1396	$\mathrm{S1}^- \oplus \mathrm{X4}^+ \oplus \mathrm{X4}^-$	$\surd$	1	1	$\times$	-	-
N47.9.1397	$\mathrm{S1}^- \oplus \mathrm{X4}^+ \oplus \mathrm{Y3}^+$	$\times$	-	-	-	-	-
N47.9.1398	$\mathrm{S1}^- \oplus \mathrm{X4}^+ \oplus \mathrm{Y3}^-$	$\times$	-	-	-	-	-
N47.9.1399	$\mathrm{S1}^- \oplus \mathrm{X4}^+ \oplus \mathrm{Z3}^+$	$\times$	-	-	-	-	-
N47.9.1400	$\mathrm{S1}^- \oplus \mathrm{X4}^+ \oplus \mathrm{Z3}^-$	$\times$	-	-	-	-	-
N47.9.1401	$\mathrm{S1}^- \oplus \mathrm{X4}^- \oplus \mathrm{X4}^-$	$\surd$	1	0	$\times$	-	-
N47.9.1402	$\mathrm{S1}^- \oplus \mathrm{X4}^- \oplus \mathrm{Y3}^-$	$\times$	-	-	-	-	-
N47.9.1403	$\mathrm{S1}^- \oplus \mathrm{X4}^- \oplus \mathrm{Z3}^+$	$\times$	-	-	-	-	-
N47.9.1404	$\mathrm{S1}^- \oplus \mathrm{X4}^- \oplus \mathrm{Z3}^-$	$\times$	-	-	-	-	-
N47.9.1405	$\mathrm{S1}^- \oplus \mathrm{Z3}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N47.9.1406	$\mathrm{S1}^- \oplus \mathrm{Z3}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N47.9.1407	$\mathrm{S1}^- \oplus \mathrm{Z3}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N47.9.1408	$\mathrm{S1}^- \oplus \mathrm{Z3}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N47.9.1409	$\mathrm{X1}^+ \oplus \mathrm{X1}^+ \oplus \mathrm{X1}^+$	$\surd$	0	0	$\surd$	-	-

Non-coplanar SSGs with parent space group $Pmmm$ (No. 47) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N47.9.1410 $\mathrm{X1^+}\oplus\mathrm{X1^+}\oplus\mathrm{X3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u}\oplus\mathrm{B3_u}$
N47.9.1411 $\mathrm{X1^+}\oplus\mathrm{X1^+}\oplus\mathrm{Y1^+}$	$\surd$	1	0	$\times$	-	-
N47.9.1412 $\mathrm{X1^+}\oplus\mathrm{X3^-}\oplus\mathrm{Y1^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N47.9.1413 $\mathrm{X1^+}\oplus\mathrm{Y1^+}\oplus\mathrm{Z1^+}$	$\times$	-	-	-	-	-
N47.9.1414 $\mathrm{X1^+}\oplus\mathrm{X1^+}\oplus\mathrm{X1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{A_u}$
N47.9.1415 $\mathrm{X1^+}\oplus\mathrm{X1^+}\oplus\mathrm{X3^+}$	$\surd$	0	0	$\surd$	-	-
N47.9.1416 $\mathrm{X1^+}\oplus\mathrm{X1^+}\oplus\mathrm{Y1^-}$	$\surd$	1	0	$\times$	-	-
N47.9.1417 $\mathrm{X1^+}\oplus\mathrm{X3^-}\oplus\mathrm{X1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B3_u}$
N47.9.1418 $\mathrm{X1^+}\oplus\mathrm{X3^-}\oplus\mathrm{Y1^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N47.9.1419 $\mathrm{X1^+}\oplus\mathrm{Y1^+}\oplus\mathrm{X1^-}$	$\surd$	1	1	$\times$	-	-
N47.9.1420 $\mathrm{X1^+}\oplus\mathrm{Y1^+}\oplus\mathrm{X3^+}$	$\surd$	1	0	$\times$	-	-
N47.9.1421 $\mathrm{X1^+}\oplus\mathrm{Y1^+}\oplus\mathrm{Z1^-}$	$\times$	-	-	-	-	-
N47.9.1422 $\mathrm{X1^+}\oplus\mathrm{X1^+}\oplus\mathrm{X2^+}$	$\surd$	0	0	$\surd$	-	-
N47.9.1423 $\mathrm{X1^+}\oplus\mathrm{X1^+}\oplus\mathrm{X2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B1_u}$
N47.9.1424 $\mathrm{X1^+}\oplus\mathrm{X1^+}\oplus\mathrm{Y2^+}$	$\surd$	1	0	$\times$	-	-
N47.9.1425 $\mathrm{X1^+}\oplus\mathrm{X1^+}\oplus\mathrm{Y2^-}$	$\surd$	1	0	$\times$	-	-
N47.9.1426 $\mathrm{X1^+}\oplus\mathrm{X3^-}\oplus\mathrm{X2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u}\oplus\mathrm{B2_u}$
N47.9.1427 $\mathrm{X1^+}\oplus\mathrm{X3^-}\oplus\mathrm{Y2^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N47.9.1428 $\mathrm{X1^+}\oplus\mathrm{X3^-}\oplus\mathrm{Y2^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N47.9.1429 $\mathrm{X1^+}\oplus\mathrm{Y1^+}\oplus\mathrm{X2^+}$	$\surd$	1	0	$\times$	-	-
N47.9.1430 $\mathrm{X1^+}\oplus\mathrm{Y1^+}\oplus\mathrm{X2^-}$	$\surd$	1	1	$\times$	-	-
N47.9.1431 $\mathrm{X1^+}\oplus\mathrm{Y1^+}\oplus\mathrm{X4^+}$	$\surd$	1	0	$\times$	-	-
N47.9.1432 $\mathrm{X1^+}\oplus\mathrm{Y1^+}\oplus\mathrm{X4^-}$	$\surd$	1	1	$\times$	-	-
N47.9.1433 $\mathrm{X1^+}\oplus\mathrm{Y1^+}\oplus\mathrm{Z3^+}$	$\times$	-	-	-	-	-
N47.9.1434 $\mathrm{X1^+}\oplus\mathrm{X1^-}\oplus\mathrm{X1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{A_u}$
N47.9.1435 $\mathrm{X1^+}\oplus\mathrm{X1^-}\oplus\mathrm{X3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B3_u}$
N47.9.1436 $\mathrm{X1^+}\oplus\mathrm{X1^-}\oplus\mathrm{Y1^-}$	$\surd$	1	1	$\times$	-	-
N47.9.1437 $\mathrm{X1^+}\oplus\mathrm{X3^+}\oplus\mathrm{X3^+}$	$\surd$	0	0	$\surd$	-	-
N47.9.1438 $\mathrm{X1^+}\oplus\mathrm{X3^+}\oplus\mathrm{Y1^-}$	$\surd$	1	0	$\times$	-	-
N47.9.1439 $\mathrm{X1^+}\oplus\mathrm{Y1^-}\oplus\mathrm{Y1^-}$	$\surd$	1	0	$\times$	-	-
N47.9.1440 $\mathrm{X1^+}\oplus\mathrm{Y1^-}\oplus\mathrm{Y4^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N47.9.1441 $\mathrm{X1^+}\oplus\mathrm{Y1^-}\oplus\mathrm{Z1^-}$	$\times$	-	-	-	-	-
N47.9.1442 $\mathrm{X1^+}\oplus\mathrm{X1^-}\oplus\mathrm{X2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B1_u}$
N47.9.1443 $\mathrm{X1^+}\oplus\mathrm{X1^-}\oplus\mathrm{X2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B1_u}$
N47.9.1444 $\mathrm{X1^+}\oplus\mathrm{X1^-}\oplus\mathrm{Y2^+}$	$\surd$	1	1	$\times$	-	-
N47.9.1445 $\mathrm{X1^+}\oplus\mathrm{X1^-}\oplus\mathrm{Y2^-}$	$\surd$	1	1	$\times$	-	-
N47.9.1446 $\mathrm{X1^+}\oplus\mathrm{X3^+}\oplus\mathrm{X2^+}$	$\surd$	0	0	$\surd$	-	-
N47.9.1447 $\mathrm{X1^+}\oplus\mathrm{X3^+}\oplus\mathrm{X2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B2_u}$
N47.9.1448 $\mathrm{X1^+}\oplus\mathrm{X3^+}\oplus\mathrm{Y2^+}$	$\surd$	1	0	$\times$	-	-
N47.9.1449 $\mathrm{X1^+}\oplus\mathrm{X3^+}\oplus\mathrm{Y2^-}$	$\surd$	1	0	$\times$	-	-
N47.9.1450 $\mathrm{X1^+}\oplus\mathrm{Y1^-}\oplus\mathrm{X2^+}$	$\surd$	1	0	$\times$	-	-
N47.9.1451 $\mathrm{X1^+}\oplus\mathrm{Y1^-}\oplus\mathrm{X2^-}$	$\surd$	1	1	$\times$	-	-
N47.9.1452 $\mathrm{X1^+}\oplus\mathrm{Y1^-}\oplus\mathrm{X4^+}$	$\surd$	1	0	$\times$	-	-
N47.9.1453 $\mathrm{X1^+}\oplus\mathrm{Y1^-}\oplus\mathrm{X4^-}$	$\surd$	1	1	$\times$	-	-
N47.9.1454 $\mathrm{X1^+}\oplus\mathrm{Y1^-}\oplus\mathrm{Y2^+}$	$\surd$	1	1	$\times$	-	-
N47.9.1455 $\mathrm{X1^+}\oplus\mathrm{Y1^-}\oplus\mathrm{Y2^-}$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $Pmmm$ (No. 47) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N47.9.1456 $\mathrm{X1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\times$	-	-
N47.9.1457 $\mathrm{X1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N47.9.1458 $\mathrm{X1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Z3}^+$	$\times$	-	-	-	-	-
N47.9.1459 $\mathrm{X1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Z3}^-$	$\times$	-	-	-	-	-
N47.9.1460 $\mathrm{X1}^+ \oplus \mathrm{X2}^+ \oplus \mathrm{X2}^+$	$\surd$	0	0	$\surd$	-	-
N47.9.1461 $\mathrm{X1}^+ \oplus \mathrm{X2}^+ \oplus \mathrm{X2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u}$
N47.9.1462 $\mathrm{X1}^+ \oplus \mathrm{X2}^+ \oplus \mathrm{X4}^+$	$\surd$	0	0	$\surd$	-	-
N47.9.1463 $\mathrm{X1}^+ \oplus \mathrm{X2}^+ \oplus \mathrm{X4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_u}$
N47.9.1464 $\mathrm{X1}^+ \oplus \mathrm{X2}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N47.9.1465 $\mathrm{X1}^+ \oplus \mathrm{X2}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N47.9.1466 $\mathrm{X1}^+ \oplus \mathrm{X2}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N47.9.1467 $\mathrm{X1}^+ \oplus \mathrm{X2}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N47.9.1468 $\mathrm{X1}^+ \oplus \mathrm{X2}^- \oplus \mathrm{X2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N47.9.1469 $\mathrm{X1}^+ \oplus \mathrm{X2}^- \oplus \mathrm{X4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N47.9.1470 $\mathrm{X1}^+ \oplus \mathrm{X2}^- \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\times$	-	-
N47.9.1471 $\mathrm{X1}^+ \oplus \mathrm{X2}^- \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\times$	-	-
N47.9.1472 $\mathrm{X1}^+ \oplus \mathrm{X2}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
N47.9.1473 $\mathrm{X1}^+ \oplus \mathrm{X2}^- \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N47.9.1474 $\mathrm{X1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N47.9.1475 $\mathrm{X1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\times$	-	-
N47.9.1476 $\mathrm{X1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N47.9.1477 $\mathrm{X1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N47.9.1478 $\mathrm{X1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Z3}^+$	$\times$	-	-	-	-	-
N47.9.1479 $\mathrm{X1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Z3}^-$	$\times$	-	-	-	-	-
N47.9.1480 $\mathrm{X1}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N47.9.1481 $\mathrm{X1}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N47.9.1482 $\mathrm{X1}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Z3}^+$	$\times$	-	-	-	-	-
N47.9.1483 $\mathrm{X1}^- \oplus \mathrm{X1}^- \oplus \mathrm{X1}^-$	$\surd$	0	0	$\surd$	-	-
N47.9.1484 $\mathrm{X1}^- \oplus \mathrm{X1}^- \oplus \mathrm{X3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B3_u}$
N47.9.1485 $\mathrm{X1}^- \oplus \mathrm{X1}^- \oplus \mathrm{Y1}^-$	$\surd$	1	0	$\times$	-	-
N47.9.1486 $\mathrm{X1}^- \oplus \mathrm{X3}^+ \oplus \mathrm{Y1}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N47.9.1487 $\mathrm{X1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Z1}^-$	$\times$	-	-	-	-	-
N47.9.1488 $\mathrm{X1}^- \oplus \mathrm{X1}^- \oplus \mathrm{X2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N47.9.1489 $\mathrm{X1}^- \oplus \mathrm{X1}^- \oplus \mathrm{X2}^-$	$\surd$	0	0	$\surd$	-	-
N47.9.1490 $\mathrm{X1}^- \oplus \mathrm{X1}^- \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N47.9.1491 $\mathrm{X1}^- \oplus \mathrm{X1}^- \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N47.9.1492 $\mathrm{X1}^- \oplus \mathrm{X3}^+ \oplus \mathrm{X2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u}$
N47.9.1493 $\mathrm{X1}^- \oplus \mathrm{X3}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N47.9.1494 $\mathrm{X1}^- \oplus \mathrm{X3}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N47.9.1495 $\mathrm{X1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{X2}^+$	$\surd$	1	1	$\times$	-	-
N47.9.1496 $\mathrm{X1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{X2}^-$	$\surd$	1	0	$\times$	-	-
N47.9.1497 $\mathrm{X1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{X4}^+$	$\surd$	1	1	$\times$	-	-
N47.9.1498 $\mathrm{X1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{X4}^-$	$\surd$	1	0	$\times$	-	-
N47.9.1499 $\mathrm{X1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Z3}^+$	$\times$	-	-	-	-	-
N47.9.1500 $\mathrm{X1}^- \oplus \mathrm{X2}^+ \oplus \mathrm{X2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N47.9.1501 $\mathrm{X1}^- \oplus \mathrm{X2}^+ \oplus \mathrm{X2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u}$

Non-coplanar SSGs with parent space group $Pmmm$ (No. 47) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N47.9.1502 $\mathrm{X1}^- \oplus \mathrm{X2}^+ \oplus \mathrm{X4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N47.9.1503 $\mathrm{X1}^- \oplus \mathrm{X2}^+ \oplus \mathrm{X4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u}$
N47.9.1504 $\mathrm{X1}^- \oplus \mathrm{X2}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\times$	-	-
N47.9.1505 $\mathrm{X1}^- \oplus \mathrm{X2}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\times$	-	-
N47.9.1506 $\mathrm{X1}^- \oplus \mathrm{X2}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
N47.9.1507 $\mathrm{X1}^- \oplus \mathrm{X2}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N47.9.1508 $\mathrm{X1}^- \oplus \mathrm{X2}^- \oplus \mathrm{X2}^-$	$\surd$	0	0	$\surd$	-	-
N47.9.1509 $\mathrm{X1}^- \oplus \mathrm{X2}^- \oplus \mathrm{X4}^-$	$\surd$	0	0	$\surd$	-	-
N47.9.1510 $\mathrm{X1}^- \oplus \mathrm{X2}^- \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N47.9.1511 $\mathrm{X1}^- \oplus \mathrm{X2}^- \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N47.9.1512 $\mathrm{X1}^- \oplus \mathrm{X2}^- \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N47.9.1513 $\mathrm{X1}^- \oplus \mathrm{X2}^- \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N47.9.1514 $\mathrm{X1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N47.9.1515 $\mathrm{X1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\times$	-	-
N47.9.1516 $\mathrm{X1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N47.9.1517 $\mathrm{X1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N47.9.1518 $\mathrm{X1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Z3}^+$	$\times$	-	-	-	-	-
N47.9.1519 $\mathrm{X1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Z3}^-$	$\times$	-	-	-	-	-
N47.9.1520 $\mathrm{X1}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N47.9.1521 $\mathrm{X1}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N47.9.1522 $\mathrm{X1}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Z3}^+$	$\times$	-	-	-	-	-
N47.9.1523 $\mathrm{X2}^+ \oplus \mathrm{X2}^+ \oplus \mathrm{X2}^+$	$\surd$	0	0	$\surd$	-	-
N47.9.1524 $\mathrm{X2}^+ \oplus \mathrm{X2}^+ \oplus \mathrm{X2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u}$
N47.9.1525 $\mathrm{X2}^+ \oplus \mathrm{X2}^+ \oplus \mathrm{X4}^+$	$\surd$	0	0	$\surd$	-	-
N47.9.1526 $\mathrm{X2}^+ \oplus \mathrm{X2}^+ \oplus \mathrm{X4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B3_u}$
N47.9.1527 $\mathrm{X2}^+ \oplus \mathrm{X2}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N47.9.1528 $\mathrm{X2}^+ \oplus \mathrm{X2}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N47.9.1529 $\mathrm{X2}^+ \oplus \mathrm{X2}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N47.9.1530 $\mathrm{X2}^+ \oplus \mathrm{X2}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N47.9.1531 $\mathrm{X2}^+ \oplus \mathrm{X2}^- \oplus \mathrm{X4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u}$
N47.9.1532 $\mathrm{X2}^+ \oplus \mathrm{X2}^- \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\times$	-	-
N47.9.1533 $\mathrm{X2}^+ \oplus \mathrm{X2}^- \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\times$	-	-
N47.9.1534 $\mathrm{X2}^+ \oplus \mathrm{X4}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N47.9.1535 $\mathrm{X2}^+ \oplus \mathrm{X4}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N47.9.1536 $\mathrm{X2}^+ \oplus \mathrm{X4}^- \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N47.9.1537 $\mathrm{X2}^+ \oplus \mathrm{X4}^- \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N47.9.1538 $\mathrm{X2}^+ \oplus \mathrm{X4}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N47.9.1539 $\mathrm{X2}^+ \oplus \mathrm{X4}^- \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N47.9.1540 $\mathrm{X2}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Z3}^+$	$\times$	-	-	-	-	-
N47.9.1541 $\mathrm{X2}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Z3}^-$	$\times$	-	-	-	-	-
N47.14.1 $\mathrm{GM1}^- \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N47.14.2 $\mathrm{GM1}^- \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N47.14.3 $\mathrm{GM1}^- \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N47.14.4 $\mathrm{GM1}^- \oplus \mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N47.14.5 $\mathrm{GM1}^- \oplus \mathrm{A2}$	$\surd$	1	1	$\times$	-	-
N47.14.6 $\mathrm{GM1}^- \oplus \mathrm{E1}$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $Pmmm$ (No. 47) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N47.14.7 $\mathrm{GM2}^{+} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	$mm2$	$\mathrm{B2}$
N47.14.8 $\mathrm{GM2}^{+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	222	$\mathrm{B1}$
N47.14.9 $\mathrm{GM2}^{+} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	$mm2$	$\mathrm{B2}$
N47.14.10 $\mathrm{GM2}^{+} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	222	$\mathrm{B1}$
N47.14.11 $\mathrm{GM2}^{+} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	$mm2$	$\mathrm{B2}$
N47.14.12 $\mathrm{GM2}^{+} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	$mm2$	$\mathrm{B2}$
N47.14.13 $\mathrm{GM2}^{+} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	222	$\mathrm{B1}$
N47.14.14 $\mathrm{GM2}^{+} \oplus \mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N47.14.15 $\mathrm{GM2}^{+} \oplus \mathrm{C1}$	$\surd$	1	1	$\times$	-	-
N47.14.16 $\mathrm{GM2}^{+} \oplus \mathrm{G1}$	$\surd$	1	1	$\times$	-	-
N47.14.17 $\mathrm{GM2}^{+} \oplus \mathrm{A2}$	$\surd$	1	1	$\times$	-	-
N47.14.18 $\mathrm{GM2}^{+} \oplus \mathrm{C2}$	$\surd$	1	1	$\times$	-	-
N47.14.19 $\mathrm{GM2}^{+} \oplus \mathrm{G2}$	$\surd$	1	1	$\times$	-	-
N47.14.20 $\mathrm{GM2}^{+} \oplus \mathrm{E1}$	$\surd$	1	1	$\times$	-	-
N47.14.21 $\mathrm{GM2}^{+} \oplus \mathrm{Q1}$	$\surd$	1	1	$\times$	-	-
N47.14.22 $\mathrm{GM2}^{-} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N47.14.23 $\mathrm{GM2}^{-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N47.14.24 $\mathrm{GM2}^{-} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N47.14.25 $\mathrm{GM2}^{-} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N47.14.26 $\mathrm{GM2}^{-} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N47.14.27 $\mathrm{GM2}^{-} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N47.14.28 $\mathrm{GM2}^{-} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N47.14.29 $\mathrm{GM2}^{-} \oplus \mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N47.14.30 $\mathrm{GM2}^{-} \oplus \mathrm{C1}$	$\surd$	1	1	$\times$	-	-
N47.14.31 $\mathrm{GM2}^{-} \oplus \mathrm{G1}$	$\surd$	1	1	$\times$	-	-
N47.14.32 $\mathrm{GM2}^{-} \oplus \mathrm{A2}$	$\surd$	1	1	$\times$	-	-
N47.14.33 $\mathrm{GM2}^{-} \oplus \mathrm{C2}$	$\surd$	1	1	$\times$	-	-
N47.14.34 $\mathrm{GM2}^{-} \oplus \mathrm{G2}$	$\surd$	1	1	$\times$	-	-
N47.14.35 $\mathrm{GM2}^{-} \oplus \mathrm{E1}$	$\surd$	1	1	$\times$	-	-
N47.14.36 $\mathrm{GM2}^{-} \oplus \mathrm{Q1}$	$\surd$	1	1	$\times$	-	-
N47.14.37 $\mathrm{R1}^{+} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N47.14.38 $\mathrm{R1}^{+} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N47.14.39 $\mathrm{R1}^{+} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N47.14.40 $\mathrm{R1}^{+} \oplus \mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N47.14.41 $\mathrm{R1}^{+} \oplus \mathrm{A3}$	$\surd$	1	1	$\times$	-	-
N47.14.42 $\mathrm{R1}^{+} \oplus \mathrm{A2}$	$\surd$	1	1	$\times$	-	-
N47.14.43 $\mathrm{R1}^{+} \oplus \mathrm{A4}$	$\surd$	1	1	$\times$	-	-
N47.14.44 $\mathrm{R1}^{+} \oplus \mathrm{E1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N47.14.45 $\mathrm{R1}^{+} \oplus \mathrm{E2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N47.14.46 $\mathrm{R1}^{+} \oplus \mathrm{E3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N47.14.47 $\mathrm{S1}^{+} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N47.14.48 $\mathrm{S1}^{+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N47.14.49 $\mathrm{S1}^{+} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N47.14.50 $\mathrm{S1}^{+} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N47.14.51 $\mathrm{S1}^{+} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N47.14.52 $\mathrm{S1}^{+} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$

Non-coplanar SSGs with parent space group $Pmmm$ (No. 47) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N47.14.53 $\mathrm{S1}^{+} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N47.14.54 $\mathrm{S1}^{+} \oplus \mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N47.14.55 $\mathrm{S1}^{+} \oplus \mathrm{C1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N47.14.56 $\mathrm{S1}^{+} \oplus \mathrm{C4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N47.14.57 $\mathrm{S1}^{+} \oplus \mathrm{G1}$	$\surd$	1	1	$\times$	-	-
N47.14.58 $\mathrm{S1}^{+} \oplus \mathrm{G4}$	$\surd$	1	1	$\times$	-	-
N47.14.59 $\mathrm{S1}^{+} \oplus \mathrm{A2}$	$\surd$	1	1	$\times$	-	-
N47.14.60 $\mathrm{S1}^{+} \oplus \mathrm{C2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N47.14.61 $\mathrm{S1}^{+} \oplus \mathrm{C3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N47.14.62 $\mathrm{S1}^{+} \oplus \mathrm{G2}$	$\surd$	1	1	$\times$	-	-
N47.14.63 $\mathrm{S1}^{+} \oplus \mathrm{G3}$	$\surd$	1	1	$\times$	-	-
N47.14.64 $\mathrm{S1}^{+} \oplus \mathrm{E1}$	$\surd$	1	1	$\times$	-	-
N47.14.65 $\mathrm{S1}^{+} \oplus \mathrm{E2}$	$\surd$	1	1	$\times$	-	-
N47.14.66 $\mathrm{S1}^{+} \oplus \mathrm{Q1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N47.14.67 $\mathrm{S1}^{+} \oplus \mathrm{Q2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N47.14.68 $\mathrm{S1}^{+} \oplus \mathrm{Q3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N47.14.69 $\mathrm{S1}^{-} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N47.14.70 $\mathrm{S1}^{-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N47.14.71 $\mathrm{S1}^{-} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N47.14.72 $\mathrm{S1}^{-} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N47.14.73 $\mathrm{S1}^{-} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N47.14.74 $\mathrm{S1}^{-} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N47.14.75 $\mathrm{S1}^{-} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N47.14.76 $\mathrm{S1}^{-} \oplus \mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N47.14.77 $\mathrm{S1}^{-} \oplus \mathrm{C1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N47.14.78 $\mathrm{S1}^{-} \oplus \mathrm{C4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N47.14.79 $\mathrm{S1}^{-} \oplus \mathrm{G1}$	$\surd$	1	1	$\times$	-	-
N47.14.80 $\mathrm{S1}^{-} \oplus \mathrm{G4}$	$\surd$	1	1	$\times$	-	-
N47.14.81 $\mathrm{S1}^{-} \oplus \mathrm{A2}$	$\surd$	1	1	$\times$	-	-
N47.14.82 $\mathrm{S1}^{-} \oplus \mathrm{C2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N47.14.83 $\mathrm{S1}^{-} \oplus \mathrm{C3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N47.14.84 $\mathrm{S1}^{-} \oplus \mathrm{G2}$	$\surd$	1	1	$\times$	-	-
N47.14.85 $\mathrm{S1}^{-} \oplus \mathrm{G3}$	$\surd$	1	1	$\times$	-	-
N47.14.86 $\mathrm{S1}^{-} \oplus \mathrm{E1}$	$\surd$	1	1	$\times$	-	-
N47.14.87 $\mathrm{S1}^{-} \oplus \mathrm{E2}$	$\surd$	1	1	$\times$	-	-
N47.14.88 $\mathrm{S1}^{-} \oplus \mathrm{Q1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N47.14.89 $\mathrm{S1}^{-} \oplus \mathrm{Q2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N47.14.90 $\mathrm{S1}^{-} \oplus \mathrm{Q3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N47.14.91 $\mathrm{X1}^{+} \oplus \mathrm{SM1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N47.14.92 $\mathrm{X1}^{+} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N47.14.93 $\mathrm{X1}^{+} \oplus \mathrm{SM2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N47.14.94 $\mathrm{X1}^{+} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N47.14.95 $\mathrm{X1}^{+} \oplus \mathrm{SM3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N47.14.96 $\mathrm{X1}^{+} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N47.14.97 $\mathrm{X1}^{+} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N47.14.98 $\mathrm{X1}^{+} \oplus \mathrm{A1}$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $Pmmm$ (No. 47) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N47.14.99 $\mathrm{X1}^{+} \oplus \mathrm{B1}$	$\surd$	1	1	$\times$	-	-
N47.14.100 $\mathrm{X1}^{+} \oplus \mathrm{D1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N47.14.101 $\mathrm{X1}^{+} \oplus \mathrm{D4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N47.14.102 $\mathrm{X1}^{+} \oplus \mathrm{A2}$	$\surd$	1	1	$\times$	-	-
N47.14.103 $\mathrm{X1}^{+} \oplus \mathrm{B2}$	$\surd$	1	1	$\times$	-	-
N47.14.104 $\mathrm{X1}^{+} \oplus \mathrm{D2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N47.14.105 $\mathrm{X1}^{+} \oplus \mathrm{D3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N47.14.106 $\mathrm{X1}^{+} \oplus \mathrm{E1}$	$\surd$	1	1	$\times$	-	-
N47.14.107 $\mathrm{X1}^{+} \oplus \mathrm{P1}$	$\surd$	1	1	$\times$	-	-
N47.14.108 $\mathrm{X1}^{+} \oplus \mathrm{P2}$	$\surd$	1	1	$\times$	-	-
N47.14.109 $\mathrm{X1}^{-} \oplus \mathrm{SM1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N47.14.110 $\mathrm{X1}^{-} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N47.14.111 $\mathrm{X1}^{-} \oplus \mathrm{SM2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N47.14.112 $\mathrm{X1}^{-} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N47.14.113 $\mathrm{X1}^{-} \oplus \mathrm{SM3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N47.14.114 $\mathrm{X1}^{-} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N47.14.115 $\mathrm{X1}^{-} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N47.14.116 $\mathrm{X1}^{-} \oplus \mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N47.14.117 $\mathrm{X1}^{-} \oplus \mathrm{B1}$	$\surd$	1	1	$\times$	-	-
N47.14.118 $\mathrm{X1}^{-} \oplus \mathrm{D1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N47.14.119 $\mathrm{X1}^{-} \oplus \mathrm{D4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N47.14.120 $\mathrm{X1}^{-} \oplus \mathrm{A2}$	$\surd$	1	1	$\times$	-	-
N47.14.121 $\mathrm{X1}^{-} \oplus \mathrm{B2}$	$\surd$	1	1	$\times$	-	-
N47.14.122 $\mathrm{X1}^{-} \oplus \mathrm{D2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N47.14.123 $\mathrm{X1}^{-} \oplus \mathrm{D3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N47.14.124 $\mathrm{X1}^{-} \oplus \mathrm{E1}$	$\surd$	1	1	$\times$	-	-
N47.14.125 $\mathrm{X1}^{-} \oplus \mathrm{P1}$	$\surd$	1	1	$\times$	-	-
N47.14.126 $\mathrm{X1}^{-} \oplus \mathrm{P2}$	$\surd$	1	1	$\times$	-	-
N47.14.127 $\mathrm{X2}^{+} \oplus \mathrm{SM1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N47.14.128 $\mathrm{X2}^{+} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N47.14.129 $\mathrm{X2}^{+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N47.14.130 $\mathrm{X2}^{+} \oplus \mathrm{SM2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N47.14.131 $\mathrm{X2}^{+} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N47.14.132 $\mathrm{X2}^{+} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N47.14.133 $\mathrm{X2}^{+} \oplus \mathrm{SM3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N47.14.134 $\mathrm{X2}^{+} \oplus \mathrm{SM4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N47.14.135 $\mathrm{X2}^{+} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N47.14.136 $\mathrm{X2}^{+} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N47.14.137 $\mathrm{X2}^{+} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N47.14.138 $\mathrm{X2}^{+} \oplus \mathrm{LD4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N47.14.139 $\mathrm{X2}^{+} \oplus \mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N47.14.140 $\mathrm{X2}^{+} \oplus \mathrm{C1}$	$\surd$	1	1	$\times$	-	-
N47.14.141 $\mathrm{X2}^{+} \oplus \mathrm{B1}$	$\surd$	1	1	$\times$	-	-
N47.14.142 $\mathrm{X2}^{+} \oplus \mathrm{D1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N47.14.143 $\mathrm{X2}^{+} \oplus \mathrm{D4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N47.14.144 $\mathrm{X2}^{+} \oplus \mathrm{H1}$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $Pmmm$ (No. 47) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N47.14.145 $\mathrm{X2^+} \oplus \mathrm{G1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N47.14.146 $\mathrm{X2^+} \oplus \mathrm{G4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N47.14.147 $\mathrm{X2^+} \oplus \mathrm{A2}$	$\surd$	1	1	$\times$	-	-
N47.14.148 $\mathrm{X2^+} \oplus \mathrm{C2}$	$\surd$	1	1	$\times$	-	-
N47.14.149 $\mathrm{X2^+} \oplus \mathrm{B2}$	$\surd$	1	1	$\times$	-	-
N47.14.150 $\mathrm{X2^+} \oplus \mathrm{D2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N47.14.151 $\mathrm{X2^+} \oplus \mathrm{D3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N47.14.152 $\mathrm{X2^+} \oplus \mathrm{H2}$	$\surd$	1	1	$\times$	-	-
N47.14.153 $\mathrm{X2^+} \oplus \mathrm{G2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N47.14.154 $\mathrm{X2^+} \oplus \mathrm{G3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N47.14.155 $\mathrm{X2^+} \oplus \mathrm{E1}$	$\surd$	1	1	$\times$	-	-
N47.14.156 $\mathrm{X2^+} \oplus \mathrm{P1}$	$\surd$	1	1	$\times$	-	-
N47.14.157 $\mathrm{X2^+} \oplus \mathrm{P2}$	$\surd$	1	1	$\times$	-	-
N47.14.158 $\mathrm{X2^+} \oplus \mathrm{Q1}$	$\surd$	1	1	$\times$	-	-
N47.14.159 $\mathrm{X2^+} \oplus \mathrm{Q2}$	$\surd$	1	1	$\times$	-	-

TABLE S142: Collinear SSGs with parent space group $Pnnn$ (No. 48).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L48.1.1 $\mathrm{GM1^+}$	1	mmm	$\mathrm{A_g}$
L48.2.1 $\mathrm{GM1^-}$	0	-	-
L48.2.2 $\mathrm{GM2^+}$	1	mmm	$\mathrm{B1_g}$
L48.2.3 $\mathrm{GM2^-}$	0	-	-
L48.2.4 $\mathrm{R1^+}$	0	-	-

TABLE S143: Coplanar SSGs with parent space group $Pnnn$ (No. 48).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P48.1.1 $\mathrm{GM1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
P48.2.1 $\mathrm{GM1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
P48.2.2 $\mathrm{GM2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
P48.2.3 $\mathrm{GM2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
P48.2.4 $\mathrm{R1^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P48.3.1 $\mathrm{GM1^-} \oplus \mathrm{GM1^-}$	$\surd$	0	0	$\surd$	-	-
P48.3.2 $\mathrm{GM1^-} \oplus \mathrm{GM2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
P48.3.3 $\mathrm{GM1^-} \oplus \mathrm{GM2^-}$	$\surd$	0	0	$\surd$	-	-
P48.3.4 $\mathrm{GM1^-} \oplus \mathrm{R1^+}$	$\surd$	1	1	$\times$	-	-
P48.3.5 $\mathrm{GM2^+} \oplus \mathrm{GM2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
P48.3.6 $\mathrm{GM2^+} \oplus \mathrm{GM3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
P48.3.7 $\mathrm{GM2^+} \oplus \mathrm{GM2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
P48.3.8 $\mathrm{GM2^+} \oplus \mathrm{GM3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
P48.3.9 $\mathrm{GM2^+} \oplus \mathrm{R1^+}$	$\surd$	1	0	$\times$	-	-
P48.3.10 $\mathrm{GM2^-} \oplus \mathrm{GM2^-}$	$\surd$	0	0	$\surd$	-	-
P48.3.11 $\mathrm{GM2^-} \oplus \mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
P48.3.12 $\mathrm{GM2^-} \oplus \mathrm{R1^+}$	$\surd$	1	1	$\times$	-	-

Coplanar SSGs with parent space group $Pnnn$ (No. 48) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P48.3.13 $\mathrm{R1}^+ \oplus \mathrm{R1}^+$	$\surd$	1	0	$\times$	-	-
P48.3.14 $\mathrm{R1}^+ \oplus \mathrm{R1}^-$	$\surd$	1	1	$\times$	-	-
P48.3.15 $\mathrm{R1}^+ \oplus \mathrm{R2}^+$	$\surd$	1	0	$\times$	-	-
P48.3.16 $\mathrm{R1}^+ \oplus \mathrm{R2}^-$	$\surd$	1	1	$\times$	-	-
P48.6.1 S1	$\surd$	1	1	$\times$	-	-
P48.6.2 X1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P48.6.3 X2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P48.8.1 DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P48.8.2 DT3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P48.8.3 E1	$\surd$	1	1	$\times$	-	-

TABLE S144: Non-coplanar SSGs with parent space group $Pnnn$ (No. 48).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N48.1.1 $\mathrm{GM1}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{A_g}$
N48.2.1 $\mathrm{GM1}^-$	$\surd$	2	2	$\surd$	222	$\mathrm{A1} \oplus \mathrm{A1}$
N48.2.2 $\mathrm{GM2}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B1_g}$
N48.2.3 $\mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{A1}$
N48.2.4 $\mathrm{R1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
N48.3.1 $\mathrm{GM1}^- \oplus \mathrm{GM1}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{A_u}$
N48.3.2 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{A2}$
N48.3.3 $\mathrm{GM1}^- \oplus \mathrm{GM2}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N48.3.4 $\mathrm{GM1}^- \oplus \mathrm{R1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
N48.3.5 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N48.3.6 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g} \oplus \mathrm{B3_g}$
N48.3.7 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	2	2	$\surd$	222	$\mathrm{A1} \oplus \mathrm{B1}$
N48.3.8 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{B1}$
N48.3.9 $\mathrm{GM2}^+ \oplus \mathrm{R1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
N48.3.10 $\mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N48.3.11 $\mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u} \oplus \mathrm{B3_u}$
N48.3.12 $\mathrm{GM2}^- \oplus \mathrm{R1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
N48.3.13 $\mathrm{R1}^+ \oplus \mathrm{R1}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N48.3.14 $\mathrm{R1}^+ \oplus \mathrm{R1}^-$	$\surd$	1	1	$\surd$	222	A1
N48.3.15 $\mathrm{R1}^+ \oplus \mathrm{R2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N48.3.16 $\mathrm{R1}^+ \oplus \mathrm{R2}^-$	$\surd$	1	1	$\surd$	$mm2$	A1
N48.6.1 S1	$\surd$	1	1	$\surd$	$mm2$	A1
N48.6.2 X1	$\surd$	1	1	$\surd$	$mm2$	A1
N48.6.3 X2	$\surd$	1	1	$\surd$	$mm2$	A1
N48.8.1 DT1	$\surd$	1	1	$\surd$	$mm2$	A1
N48.8.2 DT3	$\surd$	1	1	$\surd$	$mm2$	A1
N48.8.3 E1	$\surd$	1	1	$\surd$	$mm2$	A1
N48.9.1 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{GM1}^-$	$\surd$	0	0	$\surd$	-	-
N48.9.2 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{GM2}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N48.9.3 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
N48.9.4 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{R1}^+$	$\surd$	0	0	$\surd$	-	-
N48.9.5 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	2	2	$\surd$	222	$\mathrm{B1} \oplus \mathrm{B1}$

Non-coplanar SSGs with parent space group $Pnnn$ (No. 48) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N48.9.6 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2} \oplus \mathrm{B1}$
N48.9.7 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N48.9.8 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_u}$
N48.9.9 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{R1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N48.9.10 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
N48.9.11 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N48.9.12 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{R1}^+$	$\surd$	0	0	$\surd$	-	-
N48.9.13 $\mathrm{GM1}^- \oplus \mathrm{R1}^+ \oplus \mathrm{R1}^+$	$\surd$	1	0	$\times$	-	-
N48.9.14 $\mathrm{GM1}^- \oplus \mathrm{R1}^+ \oplus \mathrm{R1}^-$	$\surd$	1	1	$\times$	-	-
N48.9.15 $\mathrm{GM1}^- \oplus \mathrm{R1}^+ \oplus \mathrm{R2}^+$	$\surd$	1	0	$\times$	-	-
N48.9.16 $\mathrm{GM1}^- \oplus \mathrm{R1}^+ \oplus \mathrm{R2}^-$	$\surd$	1	1	$\times$	-	-
N48.9.17 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N48.9.18 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B3_g}$
N48.9.19 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N48.9.20 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{A2}$
N48.9.21 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2} \oplus \mathrm{B2}$
N48.9.22 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{B2}$
N48.9.23 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	222	$\mathrm{B1} \oplus \mathrm{B3}$
N48.9.24 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{R1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N48.9.25 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{R1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N48.9.26 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$
N48.9.27 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g} \oplus \mathrm{B2_u}$
N48.9.28 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N48.9.29 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N48.9.30 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{R1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
N48.9.31 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{R1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N48.9.32 $\mathrm{GM2}^+ \oplus \mathrm{R1}^+ \oplus \mathrm{R1}^+$	$\surd$	1	1	$\times$	-	-
N48.9.33 $\mathrm{GM2}^+ \oplus \mathrm{R1}^+ \oplus \mathrm{R1}^-$	$\surd$	1	1	$\times$	-	-
N48.9.34 $\mathrm{GM2}^+ \oplus \mathrm{R1}^+ \oplus \mathrm{R2}^+$	$\surd$	1	1	$\times$	-	-
N48.9.35 $\mathrm{GM2}^+ \oplus \mathrm{R1}^+ \oplus \mathrm{R2}^-$	$\surd$	1	1	$\times$	-	-
N48.9.36 $\mathrm{GM2}^+ \oplus \mathrm{R1}^+ \oplus \mathrm{R3}^+$	$\surd$	1	1	$\times$	-	-
N48.9.37 $\mathrm{GM2}^+ \oplus \mathrm{R1}^+ \oplus \mathrm{R3}^-$	$\surd$	1	1	$\times$	-	-
N48.9.38 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
N48.9.39 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N48.9.40 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N48.9.41 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{R1}^+$	$\surd$	0	0	$\surd$	-	-
N48.9.42 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{R1}^+$	$\surd$	0	0	$\surd$	-	-
N48.9.43 $\mathrm{GM2}^- \oplus \mathrm{R1}^+ \oplus \mathrm{R1}^+$	$\surd$	1	0	$\times$	-	-
N48.9.44 $\mathrm{GM2}^- \oplus \mathrm{R1}^+ \oplus \mathrm{R1}^-$	$\surd$	1	1	$\times$	-	-
N48.9.45 $\mathrm{GM2}^- \oplus \mathrm{R1}^+ \oplus \mathrm{R2}^+$	$\surd$	1	0	$\times$	-	-
N48.9.46 $\mathrm{GM2}^- \oplus \mathrm{R1}^+ \oplus \mathrm{R2}^-$	$\surd$	1	1	$\times$	-	-
N48.9.47 $\mathrm{GM2}^- \oplus \mathrm{R1}^+ \oplus \mathrm{R3}^+$	$\surd$	1	0	$\times$	-	-
N48.9.48 $\mathrm{GM2}^- \oplus \mathrm{R1}^+ \oplus \mathrm{R3}^-$	$\surd$	1	1	$\times$	-	-
N48.9.49 $\mathrm{R1}^+ \oplus \mathrm{R1}^+ \oplus \mathrm{R1}^+$	$\surd$	0	0	$\surd$	-	-
N48.9.50 $\mathrm{R1}^+ \oplus \mathrm{R1}^+ \oplus \mathrm{R1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u}$
N48.9.51 $\mathrm{R1}^+ \oplus \mathrm{R1}^+ \oplus \mathrm{R2}^+$	$\surd$	0	0	$\surd$	-	-

Non-coplanar SSGs with parent space group $Pnnn$ (No. 48) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N48.9.52 $\mathrm{R1}^+ \oplus \mathrm{R1}^+ \oplus \mathrm{R2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N48.9.53 $\mathrm{R1}^+ \oplus \mathrm{R1}^- \oplus \mathrm{R2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u}$
N48.9.54 $\mathrm{R1}^+ \oplus \mathrm{R2}^+ \oplus \mathrm{R3}^+$	$\surd$	0	0	$\surd$	-	-
N48.9.55 $\mathrm{R1}^+ \oplus \mathrm{R2}^+ \oplus \mathrm{R3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_u}$
N48.12.1 $\mathrm{GM1}^- \oplus \mathrm{S1}$	$\surd$	1	1	$\times$	-	-
N48.12.2 $\mathrm{GM1}^- \oplus \mathrm{X1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N48.12.3 $\mathrm{GM1}^- \oplus \mathrm{X2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N48.12.4 $\mathrm{GM2}^+ \oplus \mathrm{S1}$	$\surd$	1	1	$\times$	-	-
N48.12.5 $\mathrm{GM2}^+ \oplus \mathrm{T1}$	$\surd$	1	1	$\times$	-	-
N48.12.6 $\mathrm{GM2}^+ \oplus \mathrm{X1}$	$\surd$	1	1	$\surd$	$mm2$	B1
N48.12.7 $\mathrm{GM2}^+ \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	222	B1
N48.12.8 $\mathrm{GM2}^+ \oplus \mathrm{X2}$	$\surd$	1	1	$\surd$	$mm2$	B1
N48.12.9 $\mathrm{GM2}^+ \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	222	B1
N48.12.10 $\mathrm{GM2}^- \oplus \mathrm{S1}$	$\surd$	1	1	$\times$	-	-
N48.12.11 $\mathrm{GM2}^- \oplus \mathrm{T1}$	$\surd$	1	1	$\times$	-	-
N48.12.12 $\mathrm{GM2}^- \oplus \mathrm{X1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N48.12.13 $\mathrm{GM2}^- \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N48.12.14 $\mathrm{GM2}^- \oplus \mathrm{X2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N48.12.15 $\mathrm{GM2}^- \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N48.12.16 $\mathrm{R1}^+ \oplus \mathrm{S1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N48.12.17 $\mathrm{R1}^+ \oplus \mathrm{S2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N48.12.18 $\mathrm{R1}^+ \oplus \mathrm{X1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N48.12.19 $\mathrm{R1}^+ \oplus \mathrm{X2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N48.14.1 $\mathrm{GM1}^- \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N48.14.2 $\mathrm{GM1}^- \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N48.14.3 $\mathrm{GM1}^- \oplus \mathrm{E1}$	$\surd$	1	1	$\times$	-	-
N48.14.4 $\mathrm{GM2}^+ \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	$mm2$	B2
N48.14.5 $\mathrm{GM2}^+ \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	222	B1
N48.14.6 $\mathrm{GM2}^+ \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	$mm2$	B2
N48.14.7 $\mathrm{GM2}^+ \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	222	B1
N48.14.8 $\mathrm{GM2}^+ \oplus \mathrm{E1}$	$\surd$	1	1	$\times$	-	-
N48.14.9 $\mathrm{GM2}^+ \oplus \mathrm{Q1}$	$\surd$	1	1	$\times$	-	-
N48.14.10 $\mathrm{GM2}^- \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N48.14.11 $\mathrm{GM2}^- \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N48.14.12 $\mathrm{GM2}^- \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N48.14.13 $\mathrm{GM2}^- \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N48.14.14 $\mathrm{GM2}^- \oplus \mathrm{E1}$	$\surd$	1	1	$\times$	-	-
N48.14.15 $\mathrm{GM2}^- \oplus \mathrm{Q1}$	$\surd$	1	1	$\times$	-	-
N48.14.16 $\mathrm{R1}^+ \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N48.14.17 $\mathrm{R1}^+ \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N48.14.18 $\mathrm{R1}^+ \oplus \mathrm{E1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N48.14.19 $\mathrm{R1}^+ \oplus \mathrm{E3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$

TABLE S145: Collinear SSGs with parent space group $Pccm$ (No. 49).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L49.1.1 $\mathrm{GM1}^{+}$	1	mmm	$\mathrm{A_g}$
L49.2.1 $\mathrm{GM1}^{-}$	0	-	-
L49.2.2 $\mathrm{GM2}^{+}$	1	mmm	$\mathrm{B1_g}$
L49.2.3 $\mathrm{GM2}^{-}$	0	-	-
L49.2.4 $\mathrm{GM3}^{+}$	1	mmm	$\mathrm{B3_g}$
L49.2.5 $\mathrm{GM3}^{-}$	0	-	-
L49.2.6 $\mathrm{S1}^{+}$	0	-	-
L49.2.7 $\mathrm{S1}^{-}$	0	-	-
L49.2.8 $\mathrm{X1}^{+}$	0	-	-
L49.2.9 $\mathrm{X1}^{-}$	0	-	-
L49.2.10 $\mathrm{X2}^{+}$	0	-	-
L49.2.11 $\mathrm{X2}^{-}$	0	-	-

TABLE S146: Coplanar SSGs with parent space group $Pccm$ (No. 49).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P49.1.1 $\mathrm{GM1}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_g}$
P49.2.1 $\mathrm{GM1}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_u}$
P49.2.2 $\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B1_g}$
P49.2.3 $\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B1_u}$
P49.2.4 $\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}$
P49.2.5 $\mathrm{GM3}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}$
P49.2.6 $\mathrm{S1}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P49.2.7 $\mathrm{S1}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P49.2.8 $\mathrm{X1}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P49.2.9 $\mathrm{X1}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P49.2.10 $\mathrm{X2}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P49.2.11 $\mathrm{X2}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P49.3.1 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}$	$\surd$	0	0	$\surd$	-	-
P49.3.2 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_u}$
P49.3.3 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
P49.3.4 $\mathrm{GM1}^{-}\oplus\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_u}$
P49.3.5 $\mathrm{GM1}^{-}\oplus\mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
P49.3.6 $\mathrm{GM1}^{-}\oplus\mathrm{S1}^{+}$	$\surd$	1	1	$\times$	-	-
P49.3.7 $\mathrm{GM1}^{-}\oplus\mathrm{S1}^{-}$	$\surd$	1	1	$\times$	-	-
P49.3.8 $\mathrm{GM1}^{-}\oplus\mathrm{X1}^{+}$	$\surd$	1	1	$\times$	-	-
P49.3.9 $\mathrm{GM1}^{-}\oplus\mathrm{X1}^{-}$	$\surd$	1	1	$\times$	-	-
P49.3.10 $\mathrm{GM1}^{-}\oplus\mathrm{X2}^{+}$	$\surd$	1	1	$\times$	-	-
P49.3.11 $\mathrm{GM1}^{-}\oplus\mathrm{X2}^{-}$	$\surd$	1	1	$\times$	-	-
P49.3.12 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_g}$
P49.3.13 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B1_g}$
P49.3.14 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B3_g}$
P49.3.15 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B2_u}$
P49.3.16 $\mathrm{GM2}^{+}\oplus\mathrm{S1}^{+}$	$\surd$	1	0	$\times$	-	-
P49.3.17 $\mathrm{GM2}^{+}\oplus\mathrm{S1}^{-}$	$\surd$	1	0	$\times$	-	-
P49.3.18 $\mathrm{GM2}^{+}\oplus\mathrm{X1}^{+}$	$\surd$	1	0	$\times$	-	-

Coplanar SSGs with parent space group $Pccm$ (No. 49) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P49.3.19 $\mathrm{GM2^+} \oplus \mathrm{X1^-}$	$\surd$	1	0	$\times$	-	-
P49.3.20 $\mathrm{GM2^+} \oplus \mathrm{X2^+}$	$\surd$	1	0	$\times$	-	-
P49.3.21 $\mathrm{GM2^+} \oplus \mathrm{X2^-}$	$\surd$	1	0	$\times$	-	-
P49.3.22 $\mathrm{GM2^-} \oplus \mathrm{GM2^-}$	$\surd$	0	0	$\surd$	-	-
P49.3.23 $\mathrm{GM2^-} \oplus \mathrm{GM3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
P49.3.24 $\mathrm{GM2^-} \oplus \mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
P49.3.25 $\mathrm{GM2^-} \oplus \mathrm{S1^+}$	$\surd$	1	1	$\times$	-	-
P49.3.26 $\mathrm{GM2^-} \oplus \mathrm{S1^-}$	$\surd$	1	1	$\times$	-	-
P49.3.27 $\mathrm{GM2^-} \oplus \mathrm{X1^+}$	$\surd$	1	1	$\times$	-	-
P49.3.28 $\mathrm{GM2^-} \oplus \mathrm{X1^-}$	$\surd$	1	1	$\times$	-	-
P49.3.29 $\mathrm{GM2^-} \oplus \mathrm{X2^+}$	$\surd$	1	1	$\times$	-	-
P49.3.30 $\mathrm{GM2^-} \oplus \mathrm{X2^-}$	$\surd$	1	1	$\times$	-	-
P49.3.31 $\mathrm{GM3^+} \oplus \mathrm{GM3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
P49.3.32 $\mathrm{GM3^+} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g}$
P49.3.33 $\mathrm{GM3^+} \oplus \mathrm{GM3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
P49.3.34 $\mathrm{GM3^+} \oplus \mathrm{GM4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
P49.3.35 $\mathrm{GM3^+} \oplus \mathrm{S1^+}$	$\surd$	1	0	$\times$	-	-
P49.3.36 $\mathrm{GM3^+} \oplus \mathrm{S1^-}$	$\surd$	1	0	$\times$	-	-
P49.3.37 $\mathrm{GM3^+} \oplus \mathrm{X1^+}$	$\surd$	1	0	$\times$	-	-
P49.3.38 $\mathrm{GM3^+} \oplus \mathrm{Y1^+}$	$\surd$	1	0	$\times$	-	-
P49.3.39 $\mathrm{GM3^+} \oplus \mathrm{X1^-}$	$\surd$	1	0	$\times$	-	-
P49.3.40 $\mathrm{GM3^+} \oplus \mathrm{Y1^-}$	$\surd$	1	0	$\times$	-	-
P49.3.41 $\mathrm{GM3^+} \oplus \mathrm{X2^+}$	$\surd$	1	0	$\times$	-	-
P49.3.42 $\mathrm{GM3^+} \oplus \mathrm{Y2^+}$	$\surd$	1	0	$\times$	-	-
P49.3.43 $\mathrm{GM3^+} \oplus \mathrm{X2^-}$	$\surd$	1	0	$\times$	-	-
P49.3.44 $\mathrm{GM3^+} \oplus \mathrm{Y2^-}$	$\surd$	1	0	$\times$	-	-
P49.3.45 $\mathrm{GM3^-} \oplus \mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
P49.3.46 $\mathrm{GM3^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
P49.3.47 $\mathrm{GM3^-} \oplus \mathrm{S1^+}$	$\surd$	1	1	$\times$	-	-
P49.3.48 $\mathrm{GM3^-} \oplus \mathrm{S1^-}$	$\surd$	1	1	$\times$	-	-
P49.3.49 $\mathrm{GM3^-} \oplus \mathrm{X1^+}$	$\surd$	1	1	$\times$	-	-
P49.3.50 $\mathrm{GM3^-} \oplus \mathrm{Y1^+}$	$\surd$	1	1	$\times$	-	-
P49.3.51 $\mathrm{GM3^-} \oplus \mathrm{X1^-}$	$\surd$	1	1	$\times$	-	-
P49.3.52 $\mathrm{GM3^-} \oplus \mathrm{Y1^-}$	$\surd$	1	1	$\times$	-	-
P49.3.53 $\mathrm{GM3^-} \oplus \mathrm{X2^+}$	$\surd$	1	1	$\times$	-	-
P49.3.54 $\mathrm{GM3^-} \oplus \mathrm{Y2^+}$	$\surd$	1	1	$\times$	-	-
P49.3.55 $\mathrm{GM3^-} \oplus \mathrm{X2^-}$	$\surd$	1	1	$\times$	-	-
P49.3.56 $\mathrm{GM3^-} \oplus \mathrm{Y2^-}$	$\surd$	1	1	$\times$	-	-
P49.3.57 $\mathrm{S1^+} \oplus \mathrm{S1^+}$	$\surd$	1	0	$\times$	-	-
P49.3.58 $\mathrm{S1^+} \oplus \mathrm{S2^+}$	$\surd$	1	0	$\times$	-	-
P49.3.59 $\mathrm{S1^+} \oplus \mathrm{S3^-}$	$\surd$	1	1	$\times$	-	-
P49.3.60 $\mathrm{S1^+} \oplus \mathrm{S1^-}$	$\surd$	1	1	$\times$	-	-
P49.3.61 $\mathrm{S1^+} \oplus \mathrm{S2^-}$	$\surd$	1	1	$\times$	-	-
P49.3.62 $\mathrm{S1^+} \oplus \mathrm{S3^+}$	$\surd$	1	0	$\times$	-	-
P49.3.63 $\mathrm{S1^+} \oplus \mathrm{X1^+}$	$\times$	-	-	-	-	-
P49.3.64 $\mathrm{S1^+} \oplus \mathrm{X3^-}$	$\times$	-	-	-	-	-

Coplanar SSGs with parent space group $Pccm$ (No. 49) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P49.3.65 $\mathrm{S1}^{+} \oplus \mathrm{X1}^{-}$	$\times$	-	-	-	-	-
P49.3.66 $\mathrm{S1}^{+} \oplus \mathrm{X3}^{+}$	$\times$	-	-	-	-	-
P49.3.67 $\mathrm{S1}^{+} \oplus \mathrm{X2}^{+}$	$\times$	-	-	-	-	-
P49.3.68 $\mathrm{S1}^{+} \oplus \mathrm{X4}^{-}$	$\times$	-	-	-	-	-
P49.3.69 $\mathrm{S1}^{+} \oplus \mathrm{X2}^{-}$	$\times$	-	-	-	-	-
P49.3.70 $\mathrm{S1}^{+} \oplus \mathrm{X4}^{+}$	$\times$	-	-	-	-	-
P49.3.71 $\mathrm{S1}^{-} \oplus \mathrm{S1}^{-}$	$\surd$	1	0	$\times$	-	-
P49.3.72 $\mathrm{S1}^{-} \oplus \mathrm{S2}^{-}$	$\surd$	1	0	$\times$	-	-
P49.3.73 $\mathrm{S1}^{-} \oplus \mathrm{S3}^{+}$	$\surd$	1	1	$\times$	-	-
P49.3.74 $\mathrm{S1}^{-} \oplus \mathrm{X1}^{+}$	$\times$	-	-	-	-	-
P49.3.75 $\mathrm{S1}^{-} \oplus \mathrm{X3}^{-}$	$\times$	-	-	-	-	-
P49.3.76 $\mathrm{S1}^{-} \oplus \mathrm{X1}^{-}$	$\times$	-	-	-	-	-
P49.3.77 $\mathrm{S1}^{-} \oplus \mathrm{X3}^{+}$	$\times$	-	-	-	-	-
P49.3.78 $\mathrm{S1}^{-} \oplus \mathrm{X2}^{+}$	$\times$	-	-	-	-	-
P49.3.79 $\mathrm{S1}^{-} \oplus \mathrm{X4}^{-}$	$\times$	-	-	-	-	-
P49.3.80 $\mathrm{S1}^{-} \oplus \mathrm{X2}^{-}$	$\times$	-	-	-	-	-
P49.3.81 $\mathrm{S1}^{-} \oplus \mathrm{X4}^{+}$	$\times$	-	-	-	-	-
P49.3.82 $\mathrm{X1}^{+} \oplus \mathrm{X1}^{+}$	$\surd$	1	0	$\times$	-	-
P49.3.83 $\mathrm{X1}^{+} \oplus \mathrm{X3}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P49.3.84 $\mathrm{X1}^{+} \oplus \mathrm{Y1}^{+}$	$\times$	-	-	-	-	-
P49.3.85 $\mathrm{X1}^{+} \oplus \mathrm{X1}^{-}$	$\surd$	1	1	$\times$	-	-
P49.3.86 $\mathrm{X1}^{+} \oplus \mathrm{X3}^{+}$	$\surd$	1	0	$\times$	-	-
P49.3.87 $\mathrm{X1}^{+} \oplus \mathrm{Y1}^{-}$	$\times$	-	-	-	-	-
P49.3.88 $\mathrm{X1}^{+} \oplus \mathrm{X2}^{+}$	$\surd$	1	0	$\times$	-	-
P49.3.89 $\mathrm{X1}^{+} \oplus \mathrm{X4}^{-}$	$\surd$	1	1	$\times$	-	-
P49.3.90 $\mathrm{X1}^{+} \oplus \mathrm{Y2}^{+}$	$\times$	-	-	-	-	-
P49.3.91 $\mathrm{X1}^{+} \oplus \mathrm{X2}^{-}$	$\surd$	1	1	$\times$	-	-
P49.3.92 $\mathrm{X1}^{+} \oplus \mathrm{X4}^{+}$	$\surd$	1	0	$\times$	-	-
P49.3.93 $\mathrm{X1}^{+} \oplus \mathrm{Y2}^{-}$	$\times$	-	-	-	-	-
P49.3.94 $\mathrm{X1}^{-} \oplus \mathrm{X1}^{-}$	$\surd$	1	0	$\times$	-	-
P49.3.95 $\mathrm{X1}^{-} \oplus \mathrm{X3}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P49.3.96 $\mathrm{X1}^{-} \oplus \mathrm{Y1}^{-}$	$\times$	-	-	-	-	-
P49.3.97 $\mathrm{X1}^{-} \oplus \mathrm{X2}^{+}$	$\surd$	1	1	$\times$	-	-
P49.3.98 $\mathrm{X1}^{-} \oplus \mathrm{X4}^{-}$	$\surd$	1	0	$\times$	-	-
P49.3.99 $\mathrm{X1}^{-} \oplus \mathrm{Y2}^{+}$	$\times$	-	-	-	-	-
P49.3.100 $\mathrm{X1}^{-} \oplus \mathrm{X2}^{-}$	$\surd$	1	0	$\times$	-	-
P49.3.101 $\mathrm{X1}^{-} \oplus \mathrm{X4}^{+}$	$\surd$	1	1	$\times$	-	-
P49.3.102 $\mathrm{X1}^{-} \oplus \mathrm{Y2}^{-}$	$\times$	-	-	-	-	-
P49.3.103 $\mathrm{X2}^{+} \oplus \mathrm{X2}^{+}$	$\surd$	1	0	$\times$	-	-
P49.3.104 $\mathrm{X2}^{+} \oplus \mathrm{X4}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P49.3.105 $\mathrm{X2}^{+} \oplus \mathrm{Y2}^{+}$	$\times$	-	-	-	-	-
P49.3.106 $\mathrm{X2}^{+} \oplus \mathrm{X2}^{-}$	$\surd$	1	1	$\times$	-	-
P49.3.107 $\mathrm{X2}^{+} \oplus \mathrm{X4}^{+}$	$\surd$	1	0	$\times$	-	-
P49.3.108 $\mathrm{X2}^{+} \oplus \mathrm{Y2}^{-}$	$\times$	-	-	-	-	-
P49.3.109 $\mathrm{X2}^{-} \oplus \mathrm{X2}^{-}$	$\surd$	1	0	$\times$	-	-
P49.3.110 $\mathrm{X2}^{-} \oplus \mathrm{X4}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$

Coplanar SSGs with parent space group $Pccm$ (No. 49) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P49.3.111 $\mathrm{X2^-} \oplus \mathrm{Y2^-}$	$\times$	-	-	-	-	-
P49.6.1 R1	$\surd$	1	1	$\times$	-	-
P49.6.2 T1	$\surd$	1	1	$\times$	-	-
P49.6.3 Z1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P49.6.4 Z2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P49.8.1 DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P49.8.2 DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P49.8.3 DT3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P49.8.4 DT4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P49.8.5 C1	$\surd$	1	1	$\times$	-	-
P49.8.6 C2	$\surd$	1	1	$\times$	-	-
P49.8.7 LD1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P49.8.8 LD3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P49.8.9 G1	$\surd$	1	1	$\times$	-	-
P49.8.10 Q1	$\surd$	1	1	$\times$	-	-

TABLE S147: Non-coplanar SSGs with parent space group $Pccm$ (No. 49).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N49.1.1 $\mathrm{GM1^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{A_g}$
N49.2.1 $\mathrm{GM1^-}$	$\surd$	2	2	$\surd$	222	$\mathrm{A1} \oplus \mathrm{A1}$
N49.2.2 $\mathrm{GM2^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B1_g}$
N49.2.3 $\mathrm{GM2^-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{A1}$
N49.2.4 $\mathrm{GM3^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B3_g}$
N49.2.5 $\mathrm{GM3^-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{A1}$
N49.2.6 $\mathrm{S1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
N49.2.7 $\mathrm{S1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
N49.2.8 $\mathrm{X1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
N49.2.9 $\mathrm{X1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
N49.2.10 $\mathrm{X2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
N49.2.11 $\mathrm{X2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
N49.3.1 $\mathrm{GM1^-} \oplus \mathrm{GM1^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{A_u}$
N49.3.2 $\mathrm{GM1^-} \oplus \mathrm{GM2^+}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{A2}$
N49.3.3 $\mathrm{GM1^-} \oplus \mathrm{GM2^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N49.3.4 $\mathrm{GM1^-} \oplus \mathrm{GM3^+}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{A2}$
N49.3.5 $\mathrm{GM1^-} \oplus \mathrm{GM3^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B3_u}$
N49.3.6 $\mathrm{GM1^-} \oplus \mathrm{S1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
N49.3.7 $\mathrm{GM1^-} \oplus \mathrm{S1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
N49.3.8 $\mathrm{GM1^-} \oplus \mathrm{X1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
N49.3.9 $\mathrm{GM1^-} \oplus \mathrm{X1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
N49.3.10 $\mathrm{GM1^-} \oplus \mathrm{X2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
N49.3.11 $\mathrm{GM1^-} \oplus \mathrm{X2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
N49.3.12 $\mathrm{GM2^+} \oplus \mathrm{GM2^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N49.3.13 $\mathrm{GM2^+} \oplus \mathrm{GM2^-}$	$\surd$	2	2	$\surd$	222	$\mathrm{A1} \oplus \mathrm{B1}$
N49.3.14 $\mathrm{GM2^+} \oplus \mathrm{GM3^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g} \oplus \mathrm{B3_g}$
N49.3.15 $\mathrm{GM2^+} \oplus \mathrm{GM3^-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{B1}$

Non-coplanar SSGs with parent space group $Pccm$ (No. 49) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N49.3.16 $\mathrm{GM2}^{+} \oplus \mathrm{S1}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
N49.3.17 $\mathrm{GM2}^{+} \oplus \mathrm{S1}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
N49.3.18 $\mathrm{GM2}^{+} \oplus \mathrm{X1}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
N49.3.19 $\mathrm{GM2}^{+} \oplus \mathrm{X1}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
N49.3.20 $\mathrm{GM2}^{+} \oplus \mathrm{X2}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
N49.3.21 $\mathrm{GM2}^{+} \oplus \mathrm{X2}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
N49.3.22 $\mathrm{GM2}^{-} \oplus \mathrm{GM2}^{-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N49.3.23 $\mathrm{GM2}^{-} \oplus \mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{B2}$
N49.3.24 $\mathrm{GM2}^{-} \oplus \mathrm{GM3}^{-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u} \oplus \mathrm{B3_u}$
N49.3.25 $\mathrm{GM2}^{-} \oplus \mathrm{S1}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
N49.3.26 $\mathrm{GM2}^{-} \oplus \mathrm{S1}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
N49.3.27 $\mathrm{GM2}^{-} \oplus \mathrm{X1}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
N49.3.28 $\mathrm{GM2}^{-} \oplus \mathrm{X1}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
N49.3.29 $\mathrm{GM2}^{-} \oplus \mathrm{X2}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
N49.3.30 $\mathrm{GM2}^{-} \oplus \mathrm{X2}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
N49.3.31 $\mathrm{GM3}^{+} \oplus \mathrm{GM3}^{+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N49.3.32 $\mathrm{GM3}^{+} \oplus \mathrm{GM4}^{+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N49.3.33 $\mathrm{GM3}^{+} \oplus \mathrm{GM3}^{-}$	$\surd$	2	2	$\surd$	222	$\mathrm{A1} \oplus \mathrm{B3}$
N49.3.34 $\mathrm{GM3}^{+} \oplus \mathrm{GM4}^{-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{B2}$
N49.3.35 $\mathrm{GM3}^{+} \oplus \mathrm{S1}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g}$
N49.3.36 $\mathrm{GM3}^{+} \oplus \mathrm{S1}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g}$
N49.3.37 $\mathrm{GM3}^{+} \oplus \mathrm{X1}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g}$
N49.3.38 $\mathrm{GM3}^{+} \oplus \mathrm{Y1}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g}$
N49.3.39 $\mathrm{GM3}^{+} \oplus \mathrm{X1}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g}$
N49.3.40 $\mathrm{GM3}^{+} \oplus \mathrm{Y1}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g}$
N49.3.41 $\mathrm{GM3}^{+} \oplus \mathrm{X2}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g}$
N49.3.42 $\mathrm{GM3}^{+} \oplus \mathrm{Y2}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g}$
N49.3.43 $\mathrm{GM3}^{+} \oplus \mathrm{X2}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g}$
N49.3.44 $\mathrm{GM3}^{+} \oplus \mathrm{Y2}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g}$
N49.3.45 $\mathrm{GM3}^{-} \oplus \mathrm{GM3}^{-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N49.3.46 $\mathrm{GM3}^{-} \oplus \mathrm{GM4}^{-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N49.3.47 $\mathrm{GM3}^{-} \oplus \mathrm{S1}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u}$
N49.3.48 $\mathrm{GM3}^{-} \oplus \mathrm{S1}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u}$
N49.3.49 $\mathrm{GM3}^{-} \oplus \mathrm{X1}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u}$
N49.3.50 $\mathrm{GM3}^{-} \oplus \mathrm{Y1}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u}$
N49.3.51 $\mathrm{GM3}^{-} \oplus \mathrm{X1}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u}$
N49.3.52 $\mathrm{GM3}^{-} \oplus \mathrm{Y1}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u}$
N49.3.53 $\mathrm{GM3}^{-} \oplus \mathrm{X2}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u}$
N49.3.54 $\mathrm{GM3}^{-} \oplus \mathrm{Y2}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u}$
N49.3.55 $\mathrm{GM3}^{-} \oplus \mathrm{X2}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u}$
N49.3.56 $\mathrm{GM3}^{-} \oplus \mathrm{Y2}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u}$
N49.3.57 $\mathrm{S1}^{+} \oplus \mathrm{S1}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N49.3.58 $\mathrm{S1}^{+} \oplus \mathrm{S2}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N49.3.59 $\mathrm{S1}^{+} \oplus \mathrm{S3}^{-}$	$\surd$	1	1	$\surd$	$mm2$	A1
N49.3.60 $\mathrm{S1}^{+} \oplus \mathrm{S1}^{-}$	$\surd$	1	1	$\surd$	222	A1
N49.3.61 $\mathrm{S1}^{+} \oplus \mathrm{S2}^{-}$	$\surd$	1	1	$\surd$	$mm2$	A1

Non-coplanar SSGs with parent space group $Pccm$ (No. 49) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N49.3.62 $\mathrm{S1}^{+}\oplus\mathrm{S3}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N49.3.63 $\mathrm{S1}^{+}\oplus\mathrm{X1}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N49.3.64 $\mathrm{S1}^{+}\oplus\mathrm{X3}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N49.3.65 $\mathrm{S1}^{+}\oplus\mathrm{X1}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N49.3.66 $\mathrm{S1}^{+}\oplus\mathrm{X3}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N49.3.67 $\mathrm{S1}^{+}\oplus\mathrm{X2}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N49.3.68 $\mathrm{S1}^{+}\oplus\mathrm{X4}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N49.3.69 $\mathrm{S1}^{+}\oplus\mathrm{X2}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N49.3.70 $\mathrm{S1}^{+}\oplus\mathrm{X4}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N49.3.71 $\mathrm{S1}^{-}\oplus\mathrm{S1}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N49.3.72 $\mathrm{S1}^{-}\oplus\mathrm{S2}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N49.3.73 $\mathrm{S1}^{-}\oplus\mathrm{S3}^{+}$	√	1	1	√	$mm2$	A1
N49.3.74 $\mathrm{S1}^{-}\oplus\mathrm{X1}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N49.3.75 $\mathrm{S1}^{-}\oplus\mathrm{X3}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N49.3.76 $\mathrm{S1}^{-}\oplus\mathrm{X1}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N49.3.77 $\mathrm{S1}^{-}\oplus\mathrm{X3}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N49.3.78 $\mathrm{S1}^{-}\oplus\mathrm{X2}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N49.3.79 $\mathrm{S1}^{-}\oplus\mathrm{X4}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N49.3.80 $\mathrm{S1}^{-}\oplus\mathrm{X2}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N49.3.81 $\mathrm{S1}^{-}\oplus\mathrm{X4}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N49.3.82 $\mathrm{X1}^{+}\oplus\mathrm{X1}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N49.3.83 $\mathrm{X1}^{+}\oplus\mathrm{X3}^{-}$	√	1	1	√	$mm2$	A1
N49.3.84 $\mathrm{X1}^{+}\oplus\mathrm{Y1}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N49.3.85 $\mathrm{X1}^{+}\oplus\mathrm{X1}^{-}$	√	1	1	√	222	A1
N49.3.86 $\mathrm{X1}^{+}\oplus\mathrm{X3}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N49.3.87 $\mathrm{X1}^{+}\oplus\mathrm{Y1}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N49.3.88 $\mathrm{X1}^{+}\oplus\mathrm{X2}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N49.3.89 $\mathrm{X1}^{+}\oplus\mathrm{X4}^{-}$	√	1	1	√	$mm2$	A1
N49.3.90 $\mathrm{X1}^{+}\oplus\mathrm{Y2}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N49.3.91 $\mathrm{X1}^{+}\oplus\mathrm{X2}^{-}$	√	1	1	√	$mm2$	A1
N49.3.92 $\mathrm{X1}^{+}\oplus\mathrm{X4}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N49.3.93 $\mathrm{X1}^{+}\oplus\mathrm{Y2}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N49.3.94 $\mathrm{X1}^{-}\oplus\mathrm{X1}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N49.3.95 $\mathrm{X1}^{-}\oplus\mathrm{X3}^{+}$	√	1	1	√	$mm2$	A1
N49.3.96 $\mathrm{X1}^{-}\oplus\mathrm{Y1}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N49.3.97 $\mathrm{X1}^{-}\oplus\mathrm{X2}^{+}$	√	1	1	√	$mm2$	A1
N49.3.98 $\mathrm{X1}^{-}\oplus\mathrm{X4}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N49.3.99 $\mathrm{X1}^{-}\oplus\mathrm{Y2}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N49.3.100 $\mathrm{X1}^{-}\oplus\mathrm{X2}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N49.3.101 $\mathrm{X1}^{-}\oplus\mathrm{X4}^{+}$	√	1	1	√	$mm2$	A1
N49.3.102 $\mathrm{X1}^{-}\oplus\mathrm{Y2}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N49.3.103 $\mathrm{X2}^{+}\oplus\mathrm{X2}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N49.3.104 $\mathrm{X2}^{+}\oplus\mathrm{X4}^{-}$	√	1	1	√	$mm2$	A1
N49.3.105 $\mathrm{X2}^{+}\oplus\mathrm{Y2}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N49.3.106 $\mathrm{X2}^{+}\oplus\mathrm{X2}^{-}$	√	1	1	√	222	A1
N49.3.107 $\mathrm{X2}^{+}\oplus\mathrm{X4}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$

Non-coplanar SSGs with parent space group $Pccm$ (No. 49) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N49.3.108 $\mathrm{X2^+ \oplus Y2^-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N49.3.109 $\mathrm{X2^- \oplus X2^-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N49.3.110 $\mathrm{X2^- \oplus X4^+}$	√	1	1	√	$mm2$	A1
N49.3.111 $\mathrm{X2^- \oplus Y2^-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N49.6.1 R1	√	1	1	√	$mm2$	A1
N49.6.2 T1	√	1	1	√	$mm2$	A1
N49.6.3 Z1	√	1	1	√	$mm2$	A1
N49.6.4 Z2	√	1	1	√	$mm2$	A1
N49.8.1 DT1	√	1	1	√	$mm2$	A1
N49.8.2 DT2	√	1	1	√	$mm2$	A1
N49.8.3 DT3	√	1	1	√	$mm2$	A1
N49.8.4 DT4	√	1	1	√	$mm2$	A1
N49.8.5 C1	√	1	1	√	$mm2$	A1
N49.8.6 C2	√	1	1	√	$mm2$	A1
N49.8.7 LD1	√	1	1	√	$mm2$	A1
N49.8.8 LD3	√	1	1	√	$mm2$	A1
N49.8.9 G1	√	1	1	√	$mm2$	A1
N49.8.10 Q1	√	1	1	√	$mm2$	A1
N49.9.1 $\mathrm{GM1^- \oplus GM1^- \oplus GM1^-}$	√	0	0	√	-	-
N49.9.2 $\mathrm{GM1^- \oplus GM1^- \oplus GM2^+}$	√	3	3	√	mmm	$\mathrm{B1_g \oplus B1_u \oplus B1_u}$
N49.9.3 $\mathrm{GM1^- \oplus GM1^- \oplus GM2^-}$	√	0	0	√	-	-
N49.9.4 $\mathrm{GM1^- \oplus GM1^- \oplus GM3^+}$	√	3	3	√	mmm	$\mathrm{B3_g \oplus B3_u \oplus B3_u}$
N49.9.5 $\mathrm{GM1^- \oplus GM1^- \oplus GM3^-}$	√	0	0	√	-	-
N49.9.6 $\mathrm{GM1^- \oplus GM1^- \oplus S1^+}$	√	0	0	√	-	-
N49.9.7 $\mathrm{GM1^- \oplus GM1^- \oplus S1^-}$	√	0	0	√	-	-
N49.9.8 $\mathrm{GM1^- \oplus GM1^- \oplus X1^+}$	√	0	0	√	-	-
N49.9.9 $\mathrm{GM1^- \oplus GM1^- \oplus X1^-}$	√	0	0	√	-	-
N49.9.10 $\mathrm{GM1^- \oplus GM1^- \oplus X2^+}$	√	0	0	√	-	-
N49.9.11 $\mathrm{GM1^- \oplus GM1^- \oplus X2^-}$	√	0	0	√	-	-
N49.9.12 $\mathrm{GM1^- \oplus GM2^+ \oplus GM2^+}$	√	2	2	√	222	$\mathrm{B1 \oplus B1}$
N49.9.13 $\mathrm{GM1^- \oplus GM2^+ \oplus GM2^-}$	√	3	3	√	mmm	$\mathrm{A_u \oplus B1_g \oplus B1_u}$
N49.9.14 $\mathrm{GM1^- \oplus GM2^+ \oplus GM3^+}$	√	2	2	√	$mm2$	$\mathrm{B2 \oplus B1}$
N49.9.15 $\mathrm{GM1^- \oplus GM2^+ \oplus GM3^-}$	√	3	3	√	mmm	$\mathrm{B1_g \oplus B1_u \oplus B2_u}$
N49.9.16 $\mathrm{GM1^- \oplus GM2^+ \oplus S1^+}$	√	2	2	√	mmm	$\mathrm{B1_g \oplus B1_u}$
N49.9.17 $\mathrm{GM1^- \oplus GM2^+ \oplus S1^-}$	√	2	2	√	mmm	$\mathrm{B1_g \oplus B1_u}$
N49.9.18 $\mathrm{GM1^- \oplus GM2^+ \oplus X1^+}$	√	2	2	√	mmm	$\mathrm{B1_g \oplus B1_u}$
N49.9.19 $\mathrm{GM1^- \oplus GM2^+ \oplus X1^-}$	√	2	2	√	mmm	$\mathrm{B1_g \oplus B1_u}$
N49.9.20 $\mathrm{GM1^- \oplus GM2^+ \oplus X2^+}$	√	2	2	√	mmm	$\mathrm{B1_g \oplus B1_u}$
N49.9.21 $\mathrm{GM1^- \oplus GM2^+ \oplus X2^-}$	√	2	2	√	mmm	$\mathrm{B1_g \oplus B1_u}$
N49.9.22 $\mathrm{GM1^- \oplus GM2^- \oplus GM2^-}$	√	0	0	√	-	-
N49.9.23 $\mathrm{GM1^- \oplus GM2^- \oplus GM3^+}$	√	3	3	√	mmm	$\mathrm{B3_g \oplus B3_u \oplus B2_u}$
N49.9.24 $\mathrm{GM1^- \oplus GM2^- \oplus GM3^-}$	√	0	0	√	-	-
N49.9.25 $\mathrm{GM1^- \oplus GM2^- \oplus S1^+}$	√	0	0	√	-	-
N49.9.26 $\mathrm{GM1^- \oplus GM2^- \oplus S1^-}$	√	0	0	√	-	-
N49.9.27 $\mathrm{GM1^- \oplus GM2^- \oplus X1^+}$	√	0	0	√	-	-
N49.9.28 $\mathrm{GM1^- \oplus GM2^- \oplus X1^-}$	√	0	0	√	-	-

Non-coplanar SSGs with parent space group $Pccm$ (No. 49) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N49.9.29 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{X2}^+$	$\surd$	0	0	$\surd$	-	-
N49.9.30 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{X2}^-$	$\surd$	0	0	$\surd$	-	-
N49.9.31 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	222	$\mathrm{B3} \oplus \mathrm{B3}$
N49.9.32 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2} \oplus \mathrm{B1}$
N49.9.33 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N49.9.34 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N49.9.35 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{S1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u}$
N49.9.36 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{S1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u}$
N49.9.37 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{X1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u}$
N49.9.38 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u}$
N49.9.39 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{X1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u}$
N49.9.40 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u}$
N49.9.41 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{X2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u}$
N49.9.42 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u}$
N49.9.43 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{X2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u}$
N49.9.44 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u}$
N49.9.45 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N49.9.46 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N49.9.47 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{S1}^+$	$\surd$	0	0	$\surd$	-	-
N49.9.48 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{S1}^-$	$\surd$	0	0	$\surd$	-	-
N49.9.49 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{X1}^+$	$\surd$	0	0	$\surd$	-	-
N49.9.50 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y1}^+$	$\surd$	0	0	$\surd$	-	-
N49.9.51 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{X1}^-$	$\surd$	0	0	$\surd$	-	-
N49.9.52 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y1}^-$	$\surd$	0	0	$\surd$	-	-
N49.9.53 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{X2}^+$	$\surd$	0	0	$\surd$	-	-
N49.9.54 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y2}^+$	$\surd$	0	0	$\surd$	-	-
N49.9.55 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{X2}^-$	$\surd$	0	0	$\surd$	-	-
N49.9.56 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y2}^-$	$\surd$	0	0	$\surd$	-	-
N49.9.57 $\mathrm{GM1}^- \oplus \mathrm{S1}^+ \oplus \mathrm{S1}^+$	$\surd$	1	0	$\times$	-	-
N49.9.58 $\mathrm{GM1}^- \oplus \mathrm{S1}^+ \oplus \mathrm{S2}^+$	$\surd$	1	0	$\times$	-	-
N49.9.59 $\mathrm{GM1}^- \oplus \mathrm{S1}^+ \oplus \mathrm{S3}^-$	$\surd$	1	1	$\times$	-	-
N49.9.60 $\mathrm{GM1}^- \oplus \mathrm{S1}^+ \oplus \mathrm{S1}^-$	$\surd$	1	1	$\times$	-	-
N49.9.61 $\mathrm{GM1}^- \oplus \mathrm{S1}^+ \oplus \mathrm{S2}^-$	$\surd$	1	1	$\times$	-	-
N49.9.62 $\mathrm{GM1}^- \oplus \mathrm{S1}^+ \oplus \mathrm{S3}^+$	$\surd$	1	0	$\times$	-	-
N49.9.63 $\mathrm{GM1}^- \oplus \mathrm{S1}^+ \oplus \mathrm{X1}^+$	$\surd$	1	0	$\times$	-	-
N49.9.64 $\mathrm{GM1}^- \oplus \mathrm{S1}^+ \oplus \mathrm{X3}^-$	$\surd$	1	0	$\times$	-	-
N49.9.65 $\mathrm{GM1}^- \oplus \mathrm{S1}^+ \oplus \mathrm{X1}^-$	$\surd$	1	0	$\times$	-	-
N49.9.66 $\mathrm{GM1}^- \oplus \mathrm{S1}^+ \oplus \mathrm{X3}^+$	$\surd$	1	0	$\times$	-	-
N49.9.67 $\mathrm{GM1}^- \oplus \mathrm{S1}^+ \oplus \mathrm{X2}^+$	$\surd$	1	0	$\times$	-	-
N49.9.68 $\mathrm{GM1}^- \oplus \mathrm{S1}^+ \oplus \mathrm{X4}^-$	$\surd$	1	0	$\times$	-	-
N49.9.69 $\mathrm{GM1}^- \oplus \mathrm{S1}^+ \oplus \mathrm{X2}^-$	$\surd$	1	0	$\times$	-	-
N49.9.70 $\mathrm{GM1}^- \oplus \mathrm{S1}^+ \oplus \mathrm{X4}^+$	$\surd$	1	0	$\times$	-	-
N49.9.71 $\mathrm{GM1}^- \oplus \mathrm{S1}^- \oplus \mathrm{S1}^-$	$\surd$	1	0	$\times$	-	-
N49.9.72 $\mathrm{GM1}^- \oplus \mathrm{S1}^- \oplus \mathrm{S2}^-$	$\surd$	1	0	$\times$	-	-
N49.9.73 $\mathrm{GM1}^- \oplus \mathrm{S1}^- \oplus \mathrm{S3}^+$	$\surd$	1	1	$\times$	-	-
N49.9.74 $\mathrm{GM1}^- \oplus \mathrm{S1}^- \oplus \mathrm{X1}^+$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $Pccm$ (No. 49) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N49.9.75 $\mathrm{GM1}^- \oplus \mathrm{S1}^- \oplus \mathrm{X3}^-$	$\surd$	1	0	$\times$	-	-
N49.9.76 $\mathrm{GM1}^- \oplus \mathrm{S1}^- \oplus \mathrm{X1}^-$	$\surd$	1	0	$\times$	-	-
N49.9.77 $\mathrm{GM1}^- \oplus \mathrm{S1}^- \oplus \mathrm{X3}^+$	$\surd$	1	0	$\times$	-	-
N49.9.78 $\mathrm{GM1}^- \oplus \mathrm{S1}^- \oplus \mathrm{X2}^+$	$\surd$	1	0	$\times$	-	-
N49.9.79 $\mathrm{GM1}^- \oplus \mathrm{S1}^- \oplus \mathrm{X4}^-$	$\surd$	1	0	$\times$	-	-
N49.9.80 $\mathrm{GM1}^- \oplus \mathrm{S1}^- \oplus \mathrm{X2}^-$	$\surd$	1	0	$\times$	-	-
N49.9.81 $\mathrm{GM1}^- \oplus \mathrm{S1}^- \oplus \mathrm{X4}^+$	$\surd$	1	0	$\times$	-	-
N49.9.82 $\mathrm{GM1}^- \oplus \mathrm{X1}^+ \oplus \mathrm{X1}^+$	$\surd$	1	0	$\times$	-	-
N49.9.83 $\mathrm{GM1}^- \oplus \mathrm{X1}^+ \oplus \mathrm{X3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N49.9.84 $\mathrm{GM1}^- \oplus \mathrm{X1}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	0	$\times$	-	-
N49.9.85 $\mathrm{GM1}^- \oplus \mathrm{X1}^+ \oplus \mathrm{X1}^-$	$\surd$	1	1	$\times$	-	-
N49.9.86 $\mathrm{GM1}^- \oplus \mathrm{X1}^+ \oplus \mathrm{X3}^+$	$\surd$	1	0	$\times$	-	-
N49.9.87 $\mathrm{GM1}^- \oplus \mathrm{X1}^+ \oplus \mathrm{Y1}^-$	$\surd$	1	0	$\times$	-	-
N49.9.88 $\mathrm{GM1}^- \oplus \mathrm{X1}^+ \oplus \mathrm{X2}^+$	$\surd$	1	0	$\times$	-	-
N49.9.89 $\mathrm{GM1}^- \oplus \mathrm{X1}^+ \oplus \mathrm{X4}^-$	$\surd$	1	1	$\times$	-	-
N49.9.90 $\mathrm{GM1}^- \oplus \mathrm{X1}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N49.9.91 $\mathrm{GM1}^- \oplus \mathrm{X1}^+ \oplus \mathrm{X2}^-$	$\surd$	1	1	$\times$	-	-
N49.9.92 $\mathrm{GM1}^- \oplus \mathrm{X1}^+ \oplus \mathrm{X4}^+$	$\surd$	1	0	$\times$	-	-
N49.9.93 $\mathrm{GM1}^- \oplus \mathrm{X1}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N49.9.94 $\mathrm{GM1}^- \oplus \mathrm{X1}^- \oplus \mathrm{X1}^-$	$\surd$	1	0	$\times$	-	-
N49.9.95 $\mathrm{GM1}^- \oplus \mathrm{X1}^- \oplus \mathrm{X3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N49.9.96 $\mathrm{GM1}^- \oplus \mathrm{X1}^- \oplus \mathrm{Y1}^-$	$\surd$	1	0	$\times$	-	-
N49.9.97 $\mathrm{GM1}^- \oplus \mathrm{X1}^- \oplus \mathrm{X2}^+$	$\surd$	1	1	$\times$	-	-
N49.9.98 $\mathrm{GM1}^- \oplus \mathrm{X1}^- \oplus \mathrm{X4}^-$	$\surd$	1	0	$\times$	-	-
N49.9.99 $\mathrm{GM1}^- \oplus \mathrm{X1}^- \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N49.9.100 $\mathrm{GM1}^- \oplus \mathrm{X1}^- \oplus \mathrm{X2}^-$	$\surd$	1	0	$\times$	-	-
N49.9.101 $\mathrm{GM1}^- \oplus \mathrm{X1}^- \oplus \mathrm{X4}^+$	$\surd$	1	1	$\times$	-	-
N49.9.102 $\mathrm{GM1}^- \oplus \mathrm{X1}^- \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N49.9.103 $\mathrm{GM1}^- \oplus \mathrm{X2}^+ \oplus \mathrm{X2}^+$	$\surd$	1	0	$\times$	-	-
N49.9.104 $\mathrm{GM1}^- \oplus \mathrm{X2}^+ \oplus \mathrm{X4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N49.9.105 $\mathrm{GM1}^- \oplus \mathrm{X2}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N49.9.106 $\mathrm{GM1}^- \oplus \mathrm{X2}^+ \oplus \mathrm{X2}^-$	$\surd$	1	1	$\times$	-	-
N49.9.107 $\mathrm{GM1}^- \oplus \mathrm{X2}^+ \oplus \mathrm{X4}^+$	$\surd$	1	0	$\times$	-	-
N49.9.108 $\mathrm{GM1}^- \oplus \mathrm{X2}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N49.9.109 $\mathrm{GM1}^- \oplus \mathrm{X2}^- \oplus \mathrm{X2}^-$	$\surd$	1	0	$\times$	-	-
N49.9.110 $\mathrm{GM1}^- \oplus \mathrm{X2}^- \oplus \mathrm{X4}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N49.9.111 $\mathrm{GM1}^- \oplus \mathrm{X2}^- \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N49.9.112 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N49.9.113 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{A2}$
N49.9.114 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B3_g}$
N49.9.115 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2} \oplus \mathrm{B2}$
N49.9.116 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{S1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N49.9.117 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{S1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N49.9.118 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{X1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N49.9.119 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{X1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N49.9.120 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{X2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$

Non-coplanar SSGs with parent space group $Pccm$ (No. 49) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N49.9.121 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{X2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N49.9.122 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$
N49.9.123 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{B2}$
N49.9.124 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g} \oplus \mathrm{B2_u}$
N49.9.125 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{S1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
N49.9.126 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{S1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
N49.9.127 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{X1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
N49.9.128 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{X1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
N49.9.129 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{X2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
N49.9.130 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{X2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
N49.9.131 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N49.9.132 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N49.9.133 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{B2}$
N49.9.134 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	222	$\mathrm{B1} \oplus \mathrm{B3}$
N49.9.135 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{S1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N49.9.136 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{S1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N49.9.137 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{X1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N49.9.138 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N49.9.139 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{X1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N49.9.140 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N49.9.141 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{X2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N49.9.142 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N49.9.143 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{X2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N49.9.144 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N49.9.145 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N49.9.146 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N49.9.147 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{S1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N49.9.148 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{S1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N49.9.149 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{X1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N49.9.150 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N49.9.151 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{X1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N49.9.152 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N49.9.153 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{X2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N49.9.154 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N49.9.155 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{X2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N49.9.156 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N49.9.157 $\mathrm{GM2}^+ \oplus \mathrm{S1}^+ \oplus \mathrm{S1}^+$	$\surd$	1	1	$\times$	-	-
N49.9.158 $\mathrm{GM2}^+ \oplus \mathrm{S1}^+ \oplus \mathrm{S2}^+$	$\surd$	1	1	$\times$	-	-
N49.9.159 $\mathrm{GM2}^+ \oplus \mathrm{S1}^+ \oplus \mathrm{S3}^-$	$\surd$	1	1	$\times$	-	-
N49.9.160 $\mathrm{GM2}^+ \oplus \mathrm{S1}^+ \oplus \mathrm{S1}^-$	$\surd$	1	1	$\times$	-	-
N49.9.161 $\mathrm{GM2}^+ \oplus \mathrm{S1}^+ \oplus \mathrm{S2}^-$	$\surd$	1	1	$\times$	-	-
N49.9.162 $\mathrm{GM2}^+ \oplus \mathrm{S1}^+ \oplus \mathrm{S3}^+$	$\surd$	1	1	$\times$	-	-
N49.9.163 $\mathrm{GM2}^+ \oplus \mathrm{S1}^+ \oplus \mathrm{X1}^+$	$\surd$	1	1	$\times$	-	-
N49.9.164 $\mathrm{GM2}^+ \oplus \mathrm{S1}^+ \oplus \mathrm{X3}^-$	$\surd$	1	1	$\times$	-	-
N49.9.165 $\mathrm{GM2}^+ \oplus \mathrm{S1}^+ \oplus \mathrm{X1}^-$	$\surd$	1	1	$\times$	-	-
N49.9.166 $\mathrm{GM2}^+ \oplus \mathrm{S1}^+ \oplus \mathrm{X3}^+$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $Pccm$ (No. 49) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N49.9.167 $\mathrm{GM2}^{+}\oplus\mathrm{S1}^{+}\oplus\mathrm{X2}^{+}$	$\surd$	1	1	$\times$	-	-
N49.9.168 $\mathrm{GM2}^{+}\oplus\mathrm{S1}^{+}\oplus\mathrm{X4}^{-}$	$\surd$	1	1	$\times$	-	-
N49.9.169 $\mathrm{GM2}^{+}\oplus\mathrm{S1}^{+}\oplus\mathrm{X2}^{-}$	$\surd$	1	1	$\times$	-	-
N49.9.170 $\mathrm{GM2}^{+}\oplus\mathrm{S1}^{+}\oplus\mathrm{X4}^{+}$	$\surd$	1	1	$\times$	-	-
N49.9.171 $\mathrm{GM2}^{+}\oplus\mathrm{S1}^{-}\oplus\mathrm{S1}^{-}$	$\surd$	1	1	$\times$	-	-
N49.9.172 $\mathrm{GM2}^{+}\oplus\mathrm{S1}^{-}\oplus\mathrm{S2}^{-}$	$\surd$	1	1	$\times$	-	-
N49.9.173 $\mathrm{GM2}^{+}\oplus\mathrm{S1}^{-}\oplus\mathrm{S3}^{+}$	$\surd$	1	1	$\times$	-	-
N49.9.174 $\mathrm{GM2}^{+}\oplus\mathrm{S1}^{-}\oplus\mathrm{X1}^{+}$	$\surd$	1	1	$\times$	-	-
N49.9.175 $\mathrm{GM2}^{+}\oplus\mathrm{S1}^{-}\oplus\mathrm{X3}^{-}$	$\surd$	1	1	$\times$	-	-
N49.9.176 $\mathrm{GM2}^{+}\oplus\mathrm{S1}^{-}\oplus\mathrm{X1}^{-}$	$\surd$	1	1	$\times$	-	-
N49.9.177 $\mathrm{GM2}^{+}\oplus\mathrm{S1}^{-}\oplus\mathrm{X3}^{+}$	$\surd$	1	1	$\times$	-	-
N49.9.178 $\mathrm{GM2}^{+}\oplus\mathrm{S1}^{-}\oplus\mathrm{X2}^{+}$	$\surd$	1	1	$\times$	-	-
N49.9.179 $\mathrm{GM2}^{+}\oplus\mathrm{S1}^{-}\oplus\mathrm{X4}^{-}$	$\surd$	1	1	$\times$	-	-
N49.9.180 $\mathrm{GM2}^{+}\oplus\mathrm{S1}^{-}\oplus\mathrm{X2}^{-}$	$\surd$	1	1	$\times$	-	-
N49.9.181 $\mathrm{GM2}^{+}\oplus\mathrm{S1}^{-}\oplus\mathrm{X4}^{+}$	$\surd$	1	1	$\times$	-	-
N49.9.182 $\mathrm{GM2}^{+}\oplus\mathrm{X1}^{+}\oplus\mathrm{X1}^{+}$	$\surd$	1	1	$\times$	-	-
N49.9.183 $\mathrm{GM2}^{+}\oplus\mathrm{X1}^{+}\oplus\mathrm{X3}^{-}$	$\surd$	1	1	$\surd$	$mm2$	B1
N49.9.184 $\mathrm{GM2}^{+}\oplus\mathrm{X1}^{+}\oplus\mathrm{Y1}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N49.9.185 $\mathrm{GM2}^{+}\oplus\mathrm{X1}^{+}\oplus\mathrm{X1}^{-}$	$\surd$	1	1	$\times$	-	-
N49.9.186 $\mathrm{GM2}^{+}\oplus\mathrm{X1}^{+}\oplus\mathrm{X3}^{+}$	$\surd$	1	1	$\times$	-	-
N49.9.187 $\mathrm{GM2}^{+}\oplus\mathrm{X1}^{+}\oplus\mathrm{Y1}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N49.9.188 $\mathrm{GM2}^{+}\oplus\mathrm{X1}^{+}\oplus\mathrm{X2}^{+}$	$\surd$	1	1	$\times$	-	-
N49.9.189 $\mathrm{GM2}^{+}\oplus\mathrm{X1}^{+}\oplus\mathrm{X4}^{-}$	$\surd$	1	1	$\times$	-	-
N49.9.190 $\mathrm{GM2}^{+}\oplus\mathrm{X1}^{+}\oplus\mathrm{Y2}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N49.9.191 $\mathrm{GM2}^{+}\oplus\mathrm{X1}^{+}\oplus\mathrm{X2}^{-}$	$\surd$	1	1	$\times$	-	-
N49.9.192 $\mathrm{GM2}^{+}\oplus\mathrm{X1}^{+}\oplus\mathrm{X4}^{+}$	$\surd$	1	1	$\times$	-	-
N49.9.193 $\mathrm{GM2}^{+}\oplus\mathrm{X1}^{+}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N49.9.194 $\mathrm{GM2}^{+}\oplus\mathrm{X1}^{-}\oplus\mathrm{X1}^{-}$	$\surd$	1	1	$\times$	-	-
N49.9.195 $\mathrm{GM2}^{+}\oplus\mathrm{X1}^{-}\oplus\mathrm{X3}^{+}$	$\surd$	1	1	$\surd$	$mm2$	B1
N49.9.196 $\mathrm{GM2}^{+}\oplus\mathrm{X1}^{-}\oplus\mathrm{Y1}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N49.9.197 $\mathrm{GM2}^{+}\oplus\mathrm{X1}^{-}\oplus\mathrm{X2}^{+}$	$\surd$	1	1	$\times$	-	-
N49.9.198 $\mathrm{GM2}^{+}\oplus\mathrm{X1}^{-}\oplus\mathrm{X4}^{-}$	$\surd$	1	1	$\times$	-	-
N49.9.199 $\mathrm{GM2}^{+}\oplus\mathrm{X1}^{-}\oplus\mathrm{Y2}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N49.9.200 $\mathrm{GM2}^{+}\oplus\mathrm{X1}^{-}\oplus\mathrm{X2}^{-}$	$\surd$	1	1	$\times$	-	-
N49.9.201 $\mathrm{GM2}^{+}\oplus\mathrm{X1}^{-}\oplus\mathrm{X4}^{+}$	$\surd$	1	1	$\times$	-	-
N49.9.202 $\mathrm{GM2}^{+}\oplus\mathrm{X1}^{-}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N49.9.203 $\mathrm{GM2}^{+}\oplus\mathrm{X2}^{+}\oplus\mathrm{X2}^{+}$	$\surd$	1	1	$\times$	-	-
N49.9.204 $\mathrm{GM2}^{+}\oplus\mathrm{X2}^{+}\oplus\mathrm{X4}^{-}$	$\surd$	1	1	$\surd$	$mm2$	B1
N49.9.205 $\mathrm{GM2}^{+}\oplus\mathrm{X2}^{+}\oplus\mathrm{Y2}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N49.9.206 $\mathrm{GM2}^{+}\oplus\mathrm{X2}^{+}\oplus\mathrm{X2}^{-}$	$\surd$	1	1	$\times$	-	-
N49.9.207 $\mathrm{GM2}^{+}\oplus\mathrm{X2}^{+}\oplus\mathrm{X4}^{+}$	$\surd$	1	1	$\times$	-	-
N49.9.208 $\mathrm{GM2}^{+}\oplus\mathrm{X2}^{+}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N49.9.209 $\mathrm{GM2}^{+}\oplus\mathrm{X2}^{-}\oplus\mathrm{X2}^{-}$	$\surd$	1	1	$\times$	-	-
N49.9.210 $\mathrm{GM2}^{+}\oplus\mathrm{X2}^{-}\oplus\mathrm{X4}^{+}$	$\surd$	1	1	$\surd$	$mm2$	B1
N49.9.211 $\mathrm{GM2}^{+}\oplus\mathrm{X2}^{-}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N49.9.212 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-

Non-coplanar SSGs with parent space group $Pccm$ (No. 49) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N49.9.213 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N49.9.214 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N49.9.215 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{S1}^+$	$\surd$	0	0	$\surd$	-	-
N49.9.216 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{S1}^-$	$\surd$	0	0	$\surd$	-	-
N49.9.217 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{X1}^+$	$\surd$	0	0	$\surd$	-	-
N49.9.218 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{X1}^-$	$\surd$	0	0	$\surd$	-	-
N49.9.219 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{X2}^+$	$\surd$	0	0	$\surd$	-	-
N49.9.220 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{X2}^-$	$\surd$	0	0	$\surd$	-	-
N49.9.221 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2} \oplus \mathrm{B2}$
N49.9.222 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	222	$\mathrm{B3} \oplus \mathrm{B2}$
N49.9.223 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N49.9.224 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N49.9.225 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{S1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N49.9.226 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{S1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N49.9.227 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{X1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N49.9.228 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N49.9.229 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{X1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N49.9.230 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N49.9.231 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{X2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N49.9.232 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N49.9.233 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{X2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N49.9.234 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N49.9.235 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N49.9.236 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N49.9.237 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{S1}^+$	$\surd$	0	0	$\surd$	-	-
N49.9.238 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{S1}^-$	$\surd$	0	0	$\surd$	-	-
N49.9.239 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{X1}^+$	$\surd$	0	0	$\surd$	-	-
N49.9.240 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y1}^+$	$\surd$	0	0	$\surd$	-	-
N49.9.241 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{X1}^-$	$\surd$	0	0	$\surd$	-	-
N49.9.242 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y1}^-$	$\surd$	0	0	$\surd$	-	-
N49.9.243 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{X2}^+$	$\surd$	0	0	$\surd$	-	-
N49.9.244 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y2}^+$	$\surd$	0	0	$\surd$	-	-
N49.9.245 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{X2}^-$	$\surd$	0	0	$\surd$	-	-
N49.9.246 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y2}^-$	$\surd$	0	0	$\surd$	-	-
N49.9.247 $\mathrm{GM2}^- \oplus \mathrm{S1}^+ \oplus \mathrm{S1}^+$	$\surd$	1	0	$\times$	-	-
N49.9.248 $\mathrm{GM2}^- \oplus \mathrm{S1}^+ \oplus \mathrm{S2}^+$	$\surd$	1	0	$\times$	-	-
N49.9.249 $\mathrm{GM2}^- \oplus \mathrm{S1}^+ \oplus \mathrm{S3}^-$	$\surd$	1	1	$\times$	-	-
N49.9.250 $\mathrm{GM2}^- \oplus \mathrm{S1}^+ \oplus \mathrm{S1}^-$	$\surd$	1	1	$\times$	-	-
N49.9.251 $\mathrm{GM2}^- \oplus \mathrm{S1}^+ \oplus \mathrm{S2}^-$	$\surd$	1	1	$\times$	-	-
N49.9.252 $\mathrm{GM2}^- \oplus \mathrm{S1}^+ \oplus \mathrm{S3}^+$	$\surd$	1	0	$\times$	-	-
N49.9.253 $\mathrm{GM2}^- \oplus \mathrm{S1}^+ \oplus \mathrm{X1}^+$	$\surd$	1	0	$\times$	-	-
N49.9.254 $\mathrm{GM2}^- \oplus \mathrm{S1}^+ \oplus \mathrm{X3}^-$	$\surd$	1	0	$\times$	-	-
N49.9.255 $\mathrm{GM2}^- \oplus \mathrm{S1}^+ \oplus \mathrm{X1}^-$	$\surd$	1	0	$\times$	-	-
N49.9.256 $\mathrm{GM2}^- \oplus \mathrm{S1}^+ \oplus \mathrm{X3}^+$	$\surd$	1	0	$\times$	-	-
N49.9.257 $\mathrm{GM2}^- \oplus \mathrm{S1}^+ \oplus \mathrm{X2}^+$	$\surd$	1	0	$\times$	-	-
N49.9.258 $\mathrm{GM2}^- \oplus \mathrm{S1}^+ \oplus \mathrm{X4}^-$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $Pccm$ (No. 49) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N49.9.259 $\mathrm{GM2}^- \oplus \mathrm{S1}^+ \oplus \mathrm{X2}^-$	$\surd$	1	0	$\times$	-	-
N49.9.260 $\mathrm{GM2}^- \oplus \mathrm{S1}^+ \oplus \mathrm{X4}^+$	$\surd$	1	0	$\times$	-	-
N49.9.261 $\mathrm{GM2}^- \oplus \mathrm{S1}^- \oplus \mathrm{S1}^-$	$\surd$	1	0	$\times$	-	-
N49.9.262 $\mathrm{GM2}^- \oplus \mathrm{S1}^- \oplus \mathrm{S2}^-$	$\surd$	1	0	$\times$	-	-
N49.9.263 $\mathrm{GM2}^- \oplus \mathrm{S1}^- \oplus \mathrm{S3}^+$	$\surd$	1	1	$\times$	-	-
N49.9.264 $\mathrm{GM2}^- \oplus \mathrm{S1}^- \oplus \mathrm{X1}^+$	$\surd$	1	0	$\times$	-	-
N49.9.265 $\mathrm{GM2}^- \oplus \mathrm{S1}^- \oplus \mathrm{X3}^-$	$\surd$	1	0	$\times$	-	-
N49.9.266 $\mathrm{GM2}^- \oplus \mathrm{S1}^- \oplus \mathrm{X1}^-$	$\surd$	1	0	$\times$	-	-
N49.9.267 $\mathrm{GM2}^- \oplus \mathrm{S1}^- \oplus \mathrm{X3}^+$	$\surd$	1	0	$\times$	-	-
N49.9.268 $\mathrm{GM2}^- \oplus \mathrm{S1}^- \oplus \mathrm{X2}^+$	$\surd$	1	0	$\times$	-	-
N49.9.269 $\mathrm{GM2}^- \oplus \mathrm{S1}^- \oplus \mathrm{X4}^-$	$\surd$	1	0	$\times$	-	-
N49.9.270 $\mathrm{GM2}^- \oplus \mathrm{S1}^- \oplus \mathrm{X2}^-$	$\surd$	1	0	$\times$	-	-
N49.9.271 $\mathrm{GM2}^- \oplus \mathrm{S1}^- \oplus \mathrm{X4}^+$	$\surd$	1	0	$\times$	-	-
N49.9.272 $\mathrm{GM2}^- \oplus \mathrm{X1}^+ \oplus \mathrm{X1}^+$	$\surd$	1	0	$\times$	-	-
N49.9.273 $\mathrm{GM2}^- \oplus \mathrm{X1}^+ \oplus \mathrm{X3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N49.9.274 $\mathrm{GM2}^- \oplus \mathrm{X1}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	0	$\times$	-	-
N49.9.275 $\mathrm{GM2}^- \oplus \mathrm{X1}^+ \oplus \mathrm{X1}^-$	$\surd$	1	1	$\times$	-	-
N49.9.276 $\mathrm{GM2}^- \oplus \mathrm{X1}^+ \oplus \mathrm{X3}^+$	$\surd$	1	0	$\times$	-	-
N49.9.277 $\mathrm{GM2}^- \oplus \mathrm{X1}^+ \oplus \mathrm{Y1}^-$	$\surd$	1	0	$\times$	-	-
N49.9.278 $\mathrm{GM2}^- \oplus \mathrm{X1}^+ \oplus \mathrm{X2}^+$	$\surd$	1	0	$\times$	-	-
N49.9.279 $\mathrm{GM2}^- \oplus \mathrm{X1}^+ \oplus \mathrm{X4}^-$	$\surd$	1	1	$\times$	-	-
N49.9.280 $\mathrm{GM2}^- \oplus \mathrm{X1}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N49.9.281 $\mathrm{GM2}^- \oplus \mathrm{X1}^+ \oplus \mathrm{X2}^-$	$\surd$	1	1	$\times$	-	-
N49.9.282 $\mathrm{GM2}^- \oplus \mathrm{X1}^+ \oplus \mathrm{X4}^+$	$\surd$	1	0	$\times$	-	-
N49.9.283 $\mathrm{GM2}^- \oplus \mathrm{X1}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N49.9.284 $\mathrm{GM2}^- \oplus \mathrm{X1}^- \oplus \mathrm{X1}^-$	$\surd$	1	0	$\times$	-	-
N49.9.285 $\mathrm{GM2}^- \oplus \mathrm{X1}^- \oplus \mathrm{X3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N49.9.286 $\mathrm{GM2}^- \oplus \mathrm{X1}^- \oplus \mathrm{Y1}^-$	$\surd$	1	0	$\times$	-	-
N49.9.287 $\mathrm{GM2}^- \oplus \mathrm{X1}^- \oplus \mathrm{X2}^+$	$\surd$	1	1	$\times$	-	-
N49.9.288 $\mathrm{GM2}^- \oplus \mathrm{X1}^- \oplus \mathrm{X4}^-$	$\surd$	1	0	$\times$	-	-
N49.9.289 $\mathrm{GM2}^- \oplus \mathrm{X1}^- \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N49.9.290 $\mathrm{GM2}^- \oplus \mathrm{X1}^- \oplus \mathrm{X2}^-$	$\surd$	1	0	$\times$	-	-
N49.9.291 $\mathrm{GM2}^- \oplus \mathrm{X1}^- \oplus \mathrm{X4}^+$	$\surd$	1	1	$\times$	-	-
N49.9.292 $\mathrm{GM2}^- \oplus \mathrm{X1}^- \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N49.9.293 $\mathrm{GM2}^- \oplus \mathrm{X2}^+ \oplus \mathrm{X2}^+$	$\surd$	1	0	$\times$	-	-
N49.9.294 $\mathrm{GM2}^- \oplus \mathrm{X2}^+ \oplus \mathrm{X4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N49.9.295 $\mathrm{GM2}^- \oplus \mathrm{X2}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N49.9.296 $\mathrm{GM2}^- \oplus \mathrm{X2}^+ \oplus \mathrm{X2}^-$	$\surd$	1	1	$\times$	-	-
N49.9.297 $\mathrm{GM2}^- \oplus \mathrm{X2}^+ \oplus \mathrm{X4}^+$	$\surd$	1	0	$\times$	-	-
N49.9.298 $\mathrm{GM2}^- \oplus \mathrm{X2}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N49.9.299 $\mathrm{GM2}^- \oplus \mathrm{X2}^- \oplus \mathrm{X2}^-$	$\surd$	1	0	$\times$	-	-
N49.9.300 $\mathrm{GM2}^- \oplus \mathrm{X2}^- \oplus \mathrm{X4}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N49.9.301 $\mathrm{GM2}^- \oplus \mathrm{X2}^- \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N49.9.302 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N49.9.303 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N49.9.304 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{A2}$

Non-coplanar SSGs with parent space group $Pccm$ (No. 49) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N49.9.305 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2} \oplus \mathrm{B2}$
N49.9.306 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{GM3^-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{B2}$
N49.9.307 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{S1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
N49.9.308 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{S1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g}$
N49.9.309 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{S1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
N49.9.310 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{S1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g}$
N49.9.311 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{X1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
N49.9.312 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{Y1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
N49.9.313 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{X1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g}$
N49.9.314 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{X1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
N49.9.315 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{Y1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
N49.9.316 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{X1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g}$
N49.9.317 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{X2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
N49.9.318 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{Y2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
N49.9.319 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{X2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g}$
N49.9.320 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{X2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
N49.9.321 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{Y2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
N49.9.322 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{X2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g}$
N49.9.323 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{GM3^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B3_g}$
N49.9.324 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u} \oplus \mathrm{B3_g}$
N49.9.325 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B3_g}$
N49.9.326 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{S1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N49.9.327 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{S1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N49.9.328 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{S1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N49.9.329 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{S1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N49.9.330 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{X1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N49.9.331 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{Y1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N49.9.332 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{X1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N49.9.333 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Y1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N49.9.334 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{X1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N49.9.335 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{Y1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N49.9.336 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{X1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N49.9.337 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Y1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N49.9.338 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{X2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N49.9.339 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{Y2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N49.9.340 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{X2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N49.9.341 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Y2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N49.9.342 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{X2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N49.9.343 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{Y2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N49.9.344 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{X2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N49.9.345 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Y2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N49.9.346 $\mathrm{GM3^+} \oplus \mathrm{S1^+} \oplus \mathrm{S1^+}$	$\surd$	1	1	$\times$	-	-
N49.9.347 $\mathrm{GM3^+} \oplus \mathrm{S1^+} \oplus \mathrm{S2^+}$	$\surd$	1	1	$\times$	-	-
N49.9.348 $\mathrm{GM3^+} \oplus \mathrm{S1^+} \oplus \mathrm{S3^-}$	$\surd$	1	1	$\times$	-	-
N49.9.349 $\mathrm{GM3^+} \oplus \mathrm{S1^+} \oplus \mathrm{S4^-}$	$\surd$	1	1	$\times$	-	-
N49.9.350 $\mathrm{GM3^+} \oplus \mathrm{S1^+} \oplus \mathrm{S1^-}$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $Pccm$ (No. 49) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N49.9.351 $\mathrm{GM3}^+ \oplus \mathrm{S1}^+ \oplus \mathrm{S2}^-$	$\surd$	1	1	$\times$	-	-
N49.9.352 $\mathrm{GM3}^+ \oplus \mathrm{S1}^+ \oplus \mathrm{S3}^+$	$\surd$	1	1	$\times$	-	-
N49.9.353 $\mathrm{GM3}^+ \oplus \mathrm{S1}^+ \oplus \mathrm{S4}^+$	$\surd$	1	1	$\times$	-	-
N49.9.354 $\mathrm{GM3}^+ \oplus \mathrm{S1}^+ \oplus \mathrm{X1}^+$	$\surd$	1	1	$\times$	-	-
N49.9.355 $\mathrm{GM3}^+ \oplus \mathrm{S1}^+ \oplus \mathrm{X3}^-$	$\surd$	1	1	$\times$	-	-
N49.9.356 $\mathrm{GM3}^+ \oplus \mathrm{S1}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	1	$\times$	-	-
N49.9.357 $\mathrm{GM3}^+ \oplus \mathrm{S1}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\times$	-	-
N49.9.358 $\mathrm{GM3}^+ \oplus \mathrm{S1}^+ \oplus \mathrm{X1}^-$	$\surd$	1	1	$\times$	-	-
N49.9.359 $\mathrm{GM3}^+ \oplus \mathrm{S1}^+ \oplus \mathrm{X3}^+$	$\surd$	1	1	$\times$	-	-
N49.9.360 $\mathrm{GM3}^+ \oplus \mathrm{S1}^+ \oplus \mathrm{Y1}^-$	$\surd$	1	1	$\times$	-	-
N49.9.361 $\mathrm{GM3}^+ \oplus \mathrm{S1}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\times$	-	-
N49.9.362 $\mathrm{GM3}^+ \oplus \mathrm{S1}^+ \oplus \mathrm{X2}^+$	$\surd$	1	1	$\times$	-	-
N49.9.363 $\mathrm{GM3}^+ \oplus \mathrm{S1}^+ \oplus \mathrm{X4}^-$	$\surd$	1	1	$\times$	-	-
N49.9.364 $\mathrm{GM3}^+ \oplus \mathrm{S1}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\times$	-	-
N49.9.365 $\mathrm{GM3}^+ \oplus \mathrm{S1}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\times$	-	-
N49.9.366 $\mathrm{GM3}^+ \oplus \mathrm{S1}^+ \oplus \mathrm{X2}^-$	$\surd$	1	1	$\times$	-	-
N49.9.367 $\mathrm{GM3}^+ \oplus \mathrm{S1}^+ \oplus \mathrm{X4}^+$	$\surd$	1	1	$\times$	-	-
N49.9.368 $\mathrm{GM3}^+ \oplus \mathrm{S1}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\times$	-	-
N49.9.369 $\mathrm{GM3}^+ \oplus \mathrm{S1}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\times$	-	-
N49.9.370 $\mathrm{GM3}^+ \oplus \mathrm{S1}^- \oplus \mathrm{S1}^-$	$\surd$	1	1	$\times$	-	-
N49.9.371 $\mathrm{GM3}^+ \oplus \mathrm{S1}^- \oplus \mathrm{S2}^-$	$\surd$	1	1	$\times$	-	-
N49.9.372 $\mathrm{GM3}^+ \oplus \mathrm{S1}^- \oplus \mathrm{S3}^+$	$\surd$	1	1	$\times$	-	-
N49.9.373 $\mathrm{GM3}^+ \oplus \mathrm{S1}^- \oplus \mathrm{S4}^+$	$\surd$	1	1	$\times$	-	-
N49.9.374 $\mathrm{GM3}^+ \oplus \mathrm{S1}^- \oplus \mathrm{X1}^+$	$\surd$	1	1	$\times$	-	-
N49.9.375 $\mathrm{GM3}^+ \oplus \mathrm{S1}^- \oplus \mathrm{X3}^-$	$\surd$	1	1	$\times$	-	-
N49.9.376 $\mathrm{GM3}^+ \oplus \mathrm{S1}^- \oplus \mathrm{Y1}^+$	$\surd$	1	1	$\times$	-	-
N49.9.377 $\mathrm{GM3}^+ \oplus \mathrm{S1}^- \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\times$	-	-
N49.9.378 $\mathrm{GM3}^+ \oplus \mathrm{S1}^- \oplus \mathrm{X1}^-$	$\surd$	1	1	$\times$	-	-
N49.9.379 $\mathrm{GM3}^+ \oplus \mathrm{S1}^- \oplus \mathrm{X3}^+$	$\surd$	1	1	$\times$	-	-
N49.9.380 $\mathrm{GM3}^+ \oplus \mathrm{S1}^- \oplus \mathrm{Y1}^-$	$\surd$	1	1	$\times$	-	-
N49.9.381 $\mathrm{GM3}^+ \oplus \mathrm{S1}^- \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\times$	-	-
N49.9.382 $\mathrm{GM3}^+ \oplus \mathrm{S1}^- \oplus \mathrm{X2}^+$	$\surd$	1	1	$\times$	-	-
N49.9.383 $\mathrm{GM3}^+ \oplus \mathrm{S1}^- \oplus \mathrm{X4}^-$	$\surd$	1	1	$\times$	-	-
N49.9.384 $\mathrm{GM3}^+ \oplus \mathrm{S1}^- \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\times$	-	-
N49.9.385 $\mathrm{GM3}^+ \oplus \mathrm{S1}^- \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\times$	-	-
N49.9.386 $\mathrm{GM3}^+ \oplus \mathrm{S1}^- \oplus \mathrm{X2}^-$	$\surd$	1	1	$\times$	-	-
N49.9.387 $\mathrm{GM3}^+ \oplus \mathrm{S1}^- \oplus \mathrm{X4}^+$	$\surd$	1	1	$\times$	-	-
N49.9.388 $\mathrm{GM3}^+ \oplus \mathrm{S1}^- \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\times$	-	-
N49.9.389 $\mathrm{GM3}^+ \oplus \mathrm{S1}^- \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\times$	-	-
N49.9.390 $\mathrm{GM3}^+ \oplus \mathrm{X1}^+ \oplus \mathrm{X1}^+$	$\surd$	1	1	$\times$	-	-
N49.9.391 $\mathrm{GM3}^+ \oplus \mathrm{X1}^+ \oplus \mathrm{X3}^-$	$\surd$	1	1	$\surd$	222	B3
N49.9.392 $\mathrm{GM3}^+ \oplus \mathrm{X1}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	1	$\times$	-	-
N49.9.393 $\mathrm{GM3}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	1	$\times$	-	-
N49.9.394 $\mathrm{GM3}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\surd$	$mm2$	B2
N49.9.395 $\mathrm{GM3}^+ \oplus \mathrm{X1}^+ \oplus \mathrm{X1}^-$	$\surd$	1	1	$\times$	-	-
N49.9.396 $\mathrm{GM3}^+ \oplus \mathrm{X1}^+ \oplus \mathrm{X3}^+$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $Pccm$ (No. 49) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N49.9.397 $\mathrm{GM3}^{+}\oplus\mathrm{X1}^{+}\oplus\mathrm{Y1}^{-}$	$\surd$	1	1	$\times$	-	-
N49.9.398 $\mathrm{GM3}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{X1}^{-}$	$\surd$	1	1	$\times$	-	-
N49.9.399 $\mathrm{GM3}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y1}^{-}$	$\surd$	1	1	$\times$	-	-
N49.9.400 $\mathrm{GM3}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y4}^{+}$	$\surd$	1	1	$\times$	-	-
N49.9.401 $\mathrm{GM3}^{+}\oplus\mathrm{X1}^{+}\oplus\mathrm{X2}^{+}$	$\surd$	1	1	$\times$	-	-
N49.9.402 $\mathrm{GM3}^{+}\oplus\mathrm{X1}^{+}\oplus\mathrm{X4}^{-}$	$\surd$	1	1	$\times$	-	-
N49.9.403 $\mathrm{GM3}^{+}\oplus\mathrm{X1}^{+}\oplus\mathrm{Y2}^{+}$	$\surd$	1	1	$\times$	-	-
N49.9.404 $\mathrm{GM3}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{X2}^{+}$	$\surd$	1	1	$\times$	-	-
N49.9.405 $\mathrm{GM3}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y2}^{+}$	$\surd$	1	1	$\times$	-	-
N49.9.406 $\mathrm{GM3}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\times$	-	-
N49.9.407 $\mathrm{GM3}^{+}\oplus\mathrm{X1}^{+}\oplus\mathrm{X2}^{-}$	$\surd$	1	1	$\times$	-	-
N49.9.408 $\mathrm{GM3}^{+}\oplus\mathrm{X1}^{+}\oplus\mathrm{X4}^{+}$	$\surd$	1	1	$\times$	-	-
N49.9.409 $\mathrm{GM3}^{+}\oplus\mathrm{X1}^{+}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\times$	-	-
N49.9.410 $\mathrm{GM3}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{X2}^{-}$	$\surd$	1	1	$\times$	-	-
N49.9.411 $\mathrm{GM3}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\times$	-	-
N49.9.412 $\mathrm{GM3}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y3}^{+}$	$\surd$	1	1	$\times$	-	-
N49.9.413 $\mathrm{GM3}^{+}\oplus\mathrm{X1}^{-}\oplus\mathrm{X1}^{-}$	$\surd$	1	1	$\times$	-	-
N49.9.414 $\mathrm{GM3}^{+}\oplus\mathrm{X1}^{-}\oplus\mathrm{X3}^{+}$	$\surd$	1	1	$\surd$	222	B3
N49.9.415 $\mathrm{GM3}^{+}\oplus\mathrm{X1}^{-}\oplus\mathrm{Y1}^{-}$	$\surd$	1	1	$\times$	-	-
N49.9.416 $\mathrm{GM3}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y1}^{-}$	$\surd$	1	1	$\times$	-	-
N49.9.417 $\mathrm{GM3}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y4}^{+}$	$\surd$	1	1	$\surd$	$mm2$	B2
N49.9.418 $\mathrm{GM3}^{+}\oplus\mathrm{X1}^{-}\oplus\mathrm{X2}^{+}$	$\surd$	1	1	$\times$	-	-
N49.9.419 $\mathrm{GM3}^{+}\oplus\mathrm{X1}^{-}\oplus\mathrm{X4}^{-}$	$\surd$	1	1	$\times$	-	-
N49.9.420 $\mathrm{GM3}^{+}\oplus\mathrm{X1}^{-}\oplus\mathrm{Y2}^{+}$	$\surd$	1	1	$\times$	-	-
N49.9.421 $\mathrm{GM3}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{X2}^{+}$	$\surd$	1	1	$\times$	-	-
N49.9.422 $\mathrm{GM3}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y2}^{+}$	$\surd$	1	1	$\times$	-	-
N49.9.423 $\mathrm{GM3}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\times$	-	-
N49.9.424 $\mathrm{GM3}^{+}\oplus\mathrm{X1}^{-}\oplus\mathrm{X2}^{-}$	$\surd$	1	1	$\times$	-	-
N49.9.425 $\mathrm{GM3}^{+}\oplus\mathrm{X1}^{-}\oplus\mathrm{X4}^{+}$	$\surd$	1	1	$\times$	-	-
N49.9.426 $\mathrm{GM3}^{+}\oplus\mathrm{X1}^{-}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\times$	-	-
N49.9.427 $\mathrm{GM3}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{X2}^{-}$	$\surd$	1	1	$\times$	-	-
N49.9.428 $\mathrm{GM3}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\times$	-	-
N49.9.429 $\mathrm{GM3}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y3}^{+}$	$\surd$	1	1	$\times$	-	-
N49.9.430 $\mathrm{GM3}^{+}\oplus\mathrm{X2}^{+}\oplus\mathrm{X2}^{+}$	$\surd$	1	1	$\times$	-	-
N49.9.431 $\mathrm{GM3}^{+}\oplus\mathrm{X2}^{+}\oplus\mathrm{X4}^{-}$	$\surd$	1	1	$\surd$	222	B3
N49.9.432 $\mathrm{GM3}^{+}\oplus\mathrm{X2}^{+}\oplus\mathrm{Y2}^{+}$	$\surd$	1	1	$\times$	-	-
N49.9.433 $\mathrm{GM3}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Y2}^{+}$	$\surd$	1	1	$\times$	-	-
N49.9.434 $\mathrm{GM3}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\surd$	$mm2$	B2
N49.9.435 $\mathrm{GM3}^{+}\oplus\mathrm{X2}^{+}\oplus\mathrm{X2}^{-}$	$\surd$	1	1	$\times$	-	-
N49.9.436 $\mathrm{GM3}^{+}\oplus\mathrm{X2}^{+}\oplus\mathrm{X4}^{+}$	$\surd$	1	1	$\times$	-	-
N49.9.437 $\mathrm{GM3}^{+}\oplus\mathrm{X2}^{+}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\times$	-	-
N49.9.438 $\mathrm{GM3}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{X2}^{-}$	$\surd$	1	1	$\times$	-	-
N49.9.439 $\mathrm{GM3}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\times$	-	-
N49.9.440 $\mathrm{GM3}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Y3}^{+}$	$\surd$	1	1	$\times$	-	-
N49.9.441 $\mathrm{GM3}^{+}\oplus\mathrm{X2}^{-}\oplus\mathrm{X2}^{-}$	$\surd$	1	1	$\times$	-	-
N49.9.442 $\mathrm{GM3}^{+}\oplus\mathrm{X2}^{-}\oplus\mathrm{X4}^{+}$	$\surd$	1	1	$\surd$	222	B3

Non-coplanar SSGs with parent space group $Pccm$ (No. 49) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N49.9.443 $\mathrm{GM3}^{+}\oplus\mathrm{X2}^{-}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\times$	-	-
N49.9.444 $\mathrm{GM3}^{+}\oplus\mathrm{Y2}^{-}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\times$	-	-
N49.9.445 $\mathrm{GM3}^{+}\oplus\mathrm{Y2}^{-}\oplus\mathrm{Y3}^{+}$	$\surd$	1	1	$\surd$	$mm2$	B2
N49.9.446 $\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
N49.9.447 $\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
N49.9.448 $\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{S1}^{+}$	$\surd$	0	0	$\surd$	-	-
N49.9.449 $\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{-}\oplus\mathrm{S1}^{+}$	$\surd$	0	0	$\surd$	-	-
N49.9.450 $\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{S1}^{-}$	$\surd$	0	0	$\surd$	-	-
N49.9.451 $\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{-}\oplus\mathrm{S1}^{-}$	$\surd$	0	0	$\surd$	-	-
N49.9.452 $\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{X1}^{+}$	$\surd$	0	0	$\surd$	-	-
N49.9.453 $\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{Y1}^{+}$	$\surd$	0	0	$\surd$	-	-
N49.9.454 $\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{-}\oplus\mathrm{X1}^{+}$	$\surd$	0	0	$\surd$	-	-
N49.9.455 $\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{X1}^{-}$	$\surd$	0	0	$\surd$	-	-
N49.9.456 $\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{Y1}^{-}$	$\surd$	0	0	$\surd$	-	-
N49.9.457 $\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{-}\oplus\mathrm{X1}^{-}$	$\surd$	0	0	$\surd$	-	-
N49.9.458 $\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{X2}^{+}$	$\surd$	0	0	$\surd$	-	-
N49.9.459 $\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{Y2}^{+}$	$\surd$	0	0	$\surd$	-	-
N49.9.460 $\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{-}\oplus\mathrm{X2}^{+}$	$\surd$	0	0	$\surd$	-	-
N49.9.461 $\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{X2}^{-}$	$\surd$	0	0	$\surd$	-	-
N49.9.462 $\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{Y2}^{-}$	$\surd$	0	0	$\surd$	-	-
N49.9.463 $\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{-}\oplus\mathrm{X2}^{-}$	$\surd$	0	0	$\surd$	-	-
N49.9.464 $\mathrm{GM3}^{-}\oplus\mathrm{S1}^{+}\oplus\mathrm{S1}^{+}$	$\surd$	1	0	$\times$	-	-
N49.9.465 $\mathrm{GM3}^{-}\oplus\mathrm{S1}^{+}\oplus\mathrm{S2}^{+}$	$\surd$	1	0	$\times$	-	-
N49.9.466 $\mathrm{GM3}^{-}\oplus\mathrm{S1}^{+}\oplus\mathrm{S3}^{-}$	$\surd$	1	1	$\times$	-	-
N49.9.467 $\mathrm{GM3}^{-}\oplus\mathrm{S1}^{+}\oplus\mathrm{S4}^{-}$	$\surd$	1	1	$\times$	-	-
N49.9.468 $\mathrm{GM3}^{-}\oplus\mathrm{S1}^{+}\oplus\mathrm{S1}^{-}$	$\surd$	1	1	$\times$	-	-
N49.9.469 $\mathrm{GM3}^{-}\oplus\mathrm{S1}^{+}\oplus\mathrm{S2}^{-}$	$\surd$	1	1	$\times$	-	-
N49.9.470 $\mathrm{GM3}^{-}\oplus\mathrm{S1}^{+}\oplus\mathrm{S3}^{+}$	$\surd$	1	0	$\times$	-	-
N49.9.471 $\mathrm{GM3}^{-}\oplus\mathrm{S1}^{+}\oplus\mathrm{S4}^{+}$	$\surd$	1	0	$\times$	-	-
N49.9.472 $\mathrm{GM3}^{-}\oplus\mathrm{S1}^{+}\oplus\mathrm{X1}^{+}$	$\surd$	1	0	$\times$	-	-
N49.9.473 $\mathrm{GM3}^{-}\oplus\mathrm{S1}^{+}\oplus\mathrm{X3}^{-}$	$\surd$	1	0	$\times$	-	-
N49.9.474 $\mathrm{GM3}^{-}\oplus\mathrm{S1}^{+}\oplus\mathrm{Y1}^{+}$	$\surd$	1	0	$\times$	-	-
N49.9.475 $\mathrm{GM3}^{-}\oplus\mathrm{S1}^{+}\oplus\mathrm{Y4}^{-}$	$\surd$	1	0	$\times$	-	-
N49.9.476 $\mathrm{GM3}^{-}\oplus\mathrm{S1}^{+}\oplus\mathrm{X1}^{-}$	$\surd$	1	0	$\times$	-	-
N49.9.477 $\mathrm{GM3}^{-}\oplus\mathrm{S1}^{+}\oplus\mathrm{X3}^{+}$	$\surd$	1	0	$\times$	-	-
N49.9.478 $\mathrm{GM3}^{-}\oplus\mathrm{S1}^{+}\oplus\mathrm{Y1}^{-}$	$\surd$	1	0	$\times$	-	-
N49.9.479 $\mathrm{GM3}^{-}\oplus\mathrm{S1}^{+}\oplus\mathrm{Y4}^{+}$	$\surd$	1	0	$\times$	-	-
N49.9.480 $\mathrm{GM3}^{-}\oplus\mathrm{S1}^{+}\oplus\mathrm{X2}^{+}$	$\surd$	1	0	$\times$	-	-
N49.9.481 $\mathrm{GM3}^{-}\oplus\mathrm{S1}^{+}\oplus\mathrm{X4}^{-}$	$\surd$	1	0	$\times$	-	-
N49.9.482 $\mathrm{GM3}^{-}\oplus\mathrm{S1}^{+}\oplus\mathrm{Y2}^{+}$	$\surd$	1	0	$\times$	-	-
N49.9.483 $\mathrm{GM3}^{-}\oplus\mathrm{S1}^{+}\oplus\mathrm{Y3}^{-}$	$\surd$	1	0	$\times$	-	-
N49.9.484 $\mathrm{GM3}^{-}\oplus\mathrm{S1}^{+}\oplus\mathrm{X2}^{-}$	$\surd$	1	0	$\times$	-	-
N49.9.485 $\mathrm{GM3}^{-}\oplus\mathrm{S1}^{+}\oplus\mathrm{X4}^{+}$	$\surd$	1	0	$\times$	-	-
N49.9.486 $\mathrm{GM3}^{-}\oplus\mathrm{S1}^{+}\oplus\mathrm{Y2}^{-}$	$\surd$	1	0	$\times$	-	-
N49.9.487 $\mathrm{GM3}^{-}\oplus\mathrm{S1}^{+}\oplus\mathrm{Y3}^{+}$	$\surd$	1	0	$\times$	-	-
N49.9.488 $\mathrm{GM3}^{-}\oplus\mathrm{S1}^{-}\oplus\mathrm{S1}^{-}$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $Pccm$ (No. 49) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N49.9.489 $\mathrm{GM3}^{-} \oplus \mathrm{S1}^{-} \oplus \mathrm{S2}^{-}$	$\surd$	1	0	$\times$	-	-
N49.9.490 $\mathrm{GM3}^{-} \oplus \mathrm{S1}^{-} \oplus \mathrm{S3}^{+}$	$\surd$	1	1	$\times$	-	-
N49.9.491 $\mathrm{GM3}^{-} \oplus \mathrm{S1}^{-} \oplus \mathrm{S4}^{+}$	$\surd$	1	1	$\times$	-	-
N49.9.492 $\mathrm{GM3}^{-} \oplus \mathrm{S1}^{-} \oplus \mathrm{X1}^{+}$	$\surd$	1	0	$\times$	-	-
N49.9.493 $\mathrm{GM3}^{-} \oplus \mathrm{S1}^{-} \oplus \mathrm{X3}^{-}$	$\surd$	1	0	$\times$	-	-
N49.9.494 $\mathrm{GM3}^{-} \oplus \mathrm{S1}^{-} \oplus \mathrm{Y1}^{+}$	$\surd$	1	0	$\times$	-	-
N49.9.495 $\mathrm{GM3}^{-} \oplus \mathrm{S1}^{-} \oplus \mathrm{Y4}^{-}$	$\surd$	1	0	$\times$	-	-
N49.9.496 $\mathrm{GM3}^{-} \oplus \mathrm{S1}^{-} \oplus \mathrm{X1}^{-}$	$\surd$	1	0	$\times$	-	-
N49.9.497 $\mathrm{GM3}^{-} \oplus \mathrm{S1}^{-} \oplus \mathrm{X3}^{+}$	$\surd$	1	0	$\times$	-	-
N49.9.498 $\mathrm{GM3}^{-} \oplus \mathrm{S1}^{-} \oplus \mathrm{Y1}^{-}$	$\surd$	1	0	$\times$	-	-
N49.9.499 $\mathrm{GM3}^{-} \oplus \mathrm{S1}^{-} \oplus \mathrm{Y4}^{+}$	$\surd$	1	0	$\times$	-	-
N49.9.500 $\mathrm{GM3}^{-} \oplus \mathrm{S1}^{-} \oplus \mathrm{X2}^{+}$	$\surd$	1	0	$\times$	-	-
N49.9.501 $\mathrm{GM3}^{-} \oplus \mathrm{S1}^{-} \oplus \mathrm{X4}^{-}$	$\surd$	1	0	$\times$	-	-
N49.9.502 $\mathrm{GM3}^{-} \oplus \mathrm{S1}^{-} \oplus \mathrm{Y2}^{+}$	$\surd$	1	0	$\times$	-	-
N49.9.503 $\mathrm{GM3}^{-} \oplus \mathrm{S1}^{-} \oplus \mathrm{Y3}^{-}$	$\surd$	1	0	$\times$	-	-
N49.9.504 $\mathrm{GM3}^{-} \oplus \mathrm{S1}^{-} \oplus \mathrm{X2}^{-}$	$\surd$	1	0	$\times$	-	-
N49.9.505 $\mathrm{GM3}^{-} \oplus \mathrm{S1}^{-} \oplus \mathrm{X4}^{+}$	$\surd$	1	0	$\times$	-	-
N49.9.506 $\mathrm{GM3}^{-} \oplus \mathrm{S1}^{-} \oplus \mathrm{Y2}^{-}$	$\surd$	1	0	$\times$	-	-
N49.9.507 $\mathrm{GM3}^{-} \oplus \mathrm{S1}^{-} \oplus \mathrm{Y3}^{+}$	$\surd$	1	0	$\times$	-	-
N49.9.508 $\mathrm{GM3}^{-} \oplus \mathrm{X1}^{+} \oplus \mathrm{X1}^{+}$	$\surd$	1	0	$\times$	-	-
N49.9.509 $\mathrm{GM3}^{-} \oplus \mathrm{X1}^{+} \oplus \mathrm{X3}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N49.9.510 $\mathrm{GM3}^{-} \oplus \mathrm{X1}^{+} \oplus \mathrm{Y1}^{+}$	$\surd$	1	0	$\times$	-	-
N49.9.511 $\mathrm{GM3}^{-} \oplus \mathrm{Y1}^{+} \oplus \mathrm{Y1}^{+}$	$\surd$	1	0	$\times$	-	-
N49.9.512 $\mathrm{GM3}^{-} \oplus \mathrm{Y1}^{+} \oplus \mathrm{Y4}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N49.9.513 $\mathrm{GM3}^{-} \oplus \mathrm{X1}^{+} \oplus \mathrm{X1}^{-}$	$\surd$	1	1	$\times$	-	-
N49.9.514 $\mathrm{GM3}^{-} \oplus \mathrm{X1}^{+} \oplus \mathrm{X3}^{+}$	$\surd$	1	0	$\times$	-	-
N49.9.515 $\mathrm{GM3}^{-} \oplus \mathrm{X1}^{+} \oplus \mathrm{Y1}^{-}$	$\surd$	1	0	$\times$	-	-
N49.9.516 $\mathrm{GM3}^{-} \oplus \mathrm{Y1}^{+} \oplus \mathrm{X1}^{-}$	$\surd$	1	0	$\times$	-	-
N49.9.517 $\mathrm{GM3}^{-} \oplus \mathrm{Y1}^{+} \oplus \mathrm{Y1}^{-}$	$\surd$	1	1	$\times$	-	-
N49.9.518 $\mathrm{GM3}^{-} \oplus \mathrm{Y1}^{+} \oplus \mathrm{Y4}^{+}$	$\surd$	1	0	$\times$	-	-
N49.9.519 $\mathrm{GM3}^{-} \oplus \mathrm{X1}^{+} \oplus \mathrm{X2}^{+}$	$\surd$	1	0	$\times$	-	-
N49.9.520 $\mathrm{GM3}^{-} \oplus \mathrm{X1}^{+} \oplus \mathrm{X4}^{-}$	$\surd$	1	1	$\times$	-	-
N49.9.521 $\mathrm{GM3}^{-} \oplus \mathrm{X1}^{+} \oplus \mathrm{Y2}^{+}$	$\surd$	1	0	$\times$	-	-
N49.9.522 $\mathrm{GM3}^{-} \oplus \mathrm{Y1}^{+} \oplus \mathrm{X2}^{+}$	$\surd$	1	0	$\times$	-	-
N49.9.523 $\mathrm{GM3}^{-} \oplus \mathrm{Y1}^{+} \oplus \mathrm{Y2}^{+}$	$\surd$	1	0	$\times$	-	-
N49.9.524 $\mathrm{GM3}^{-} \oplus \mathrm{Y1}^{+} \oplus \mathrm{Y3}^{-}$	$\surd$	1	1	$\times$	-	-
N49.9.525 $\mathrm{GM3}^{-} \oplus \mathrm{X1}^{+} \oplus \mathrm{X2}^{-}$	$\surd$	1	1	$\times$	-	-
N49.9.526 $\mathrm{GM3}^{-} \oplus \mathrm{X1}^{+} \oplus \mathrm{X4}^{+}$	$\surd$	1	0	$\times$	-	-
N49.9.527 $\mathrm{GM3}^{-} \oplus \mathrm{X1}^{+} \oplus \mathrm{Y2}^{-}$	$\surd$	1	0	$\times$	-	-
N49.9.528 $\mathrm{GM3}^{-} \oplus \mathrm{Y1}^{+} \oplus \mathrm{X2}^{-}$	$\surd$	1	0	$\times$	-	-
N49.9.529 $\mathrm{GM3}^{-} \oplus \mathrm{Y1}^{+} \oplus \mathrm{Y2}^{-}$	$\surd$	1	1	$\times$	-	-
N49.9.530 $\mathrm{GM3}^{-} \oplus \mathrm{Y1}^{+} \oplus \mathrm{Y3}^{+}$	$\surd$	1	0	$\times$	-	-
N49.9.531 $\mathrm{GM3}^{-} \oplus \mathrm{X1}^{-} \oplus \mathrm{X1}^{-}$	$\surd$	1	0	$\times$	-	-
N49.9.532 $\mathrm{GM3}^{-} \oplus \mathrm{X1}^{-} \oplus \mathrm{X3}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N49.9.533 $\mathrm{GM3}^{-} \oplus \mathrm{X1}^{-} \oplus \mathrm{Y1}^{-}$	$\surd$	1	0	$\times$	-	-
N49.9.534 $\mathrm{GM3}^{-} \oplus \mathrm{Y1}^{-} \oplus \mathrm{Y1}^{-}$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $Pccm$ (No. 49) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N49.9.535 $\mathrm{GM3^-}\oplus\mathrm{Y1^-}\oplus\mathrm{Y4^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N49.9.536 $\mathrm{GM3^-}\oplus\mathrm{X1^-}\oplus\mathrm{X2^+}$	$\surd$	1	1	$\times$	-	-
N49.9.537 $\mathrm{GM3^-}\oplus\mathrm{X1^-}\oplus\mathrm{X4^-}$	$\surd$	1	0	$\times$	-	-
N49.9.538 $\mathrm{GM3^-}\oplus\mathrm{X1^-}\oplus\mathrm{Y2^+}$	$\surd$	1	0	$\times$	-	-
N49.9.539 $\mathrm{GM3^-}\oplus\mathrm{Y1^-}\oplus\mathrm{X2^+}$	$\surd$	1	0	$\times$	-	-
N49.9.540 $\mathrm{GM3^-}\oplus\mathrm{Y1^-}\oplus\mathrm{Y2^+}$	$\surd$	1	1	$\times$	-	-
N49.9.541 $\mathrm{GM3^-}\oplus\mathrm{Y1^-}\oplus\mathrm{Y3^-}$	$\surd$	1	0	$\times$	-	-
N49.9.542 $\mathrm{GM3^-}\oplus\mathrm{X1^-}\oplus\mathrm{X2^-}$	$\surd$	1	0	$\times$	-	-
N49.9.543 $\mathrm{GM3^-}\oplus\mathrm{X1^-}\oplus\mathrm{X4^+}$	$\surd$	1	1	$\times$	-	-
N49.9.544 $\mathrm{GM3^-}\oplus\mathrm{X1^-}\oplus\mathrm{Y2^-}$	$\surd$	1	0	$\times$	-	-
N49.9.545 $\mathrm{GM3^-}\oplus\mathrm{Y1^-}\oplus\mathrm{X2^-}$	$\surd$	1	0	$\times$	-	-
N49.9.546 $\mathrm{GM3^-}\oplus\mathrm{Y1^-}\oplus\mathrm{Y2^-}$	$\surd$	1	0	$\times$	-	-
N49.9.547 $\mathrm{GM3^-}\oplus\mathrm{Y1^-}\oplus\mathrm{Y3^+}$	$\surd$	1	1	$\times$	-	-
N49.9.548 $\mathrm{GM3^-}\oplus\mathrm{X2^+}\oplus\mathrm{X2^+}$	$\surd$	1	0	$\times$	-	-
N49.9.549 $\mathrm{GM3^-}\oplus\mathrm{X2^+}\oplus\mathrm{X4^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N49.9.550 $\mathrm{GM3^-}\oplus\mathrm{X2^+}\oplus\mathrm{Y2^+}$	$\surd$	1	0	$\times$	-	-
N49.9.551 $\mathrm{GM3^-}\oplus\mathrm{Y2^+}\oplus\mathrm{Y2^+}$	$\surd$	1	0	$\times$	-	-
N49.9.552 $\mathrm{GM3^-}\oplus\mathrm{Y2^+}\oplus\mathrm{Y3^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N49.9.553 $\mathrm{GM3^-}\oplus\mathrm{X2^+}\oplus\mathrm{X2^-}$	$\surd$	1	1	$\times$	-	-
N49.9.554 $\mathrm{GM3^-}\oplus\mathrm{X2^+}\oplus\mathrm{X4^+}$	$\surd$	1	0	$\times$	-	-
N49.9.555 $\mathrm{GM3^-}\oplus\mathrm{X2^+}\oplus\mathrm{Y2^-}$	$\surd$	1	0	$\times$	-	-
N49.9.556 $\mathrm{GM3^-}\oplus\mathrm{Y2^+}\oplus\mathrm{X2^-}$	$\surd$	1	0	$\times$	-	-
N49.9.557 $\mathrm{GM3^-}\oplus\mathrm{Y2^+}\oplus\mathrm{Y2^-}$	$\surd$	1	1	$\times$	-	-
N49.9.558 $\mathrm{GM3^-}\oplus\mathrm{Y2^+}\oplus\mathrm{Y3^+}$	$\surd$	1	0	$\times$	-	-
N49.9.559 $\mathrm{GM3^-}\oplus\mathrm{X2^-}\oplus\mathrm{X2^-}$	$\surd$	1	0	$\times$	-	-
N49.9.560 $\mathrm{GM3^-}\oplus\mathrm{X2^-}\oplus\mathrm{X4^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N49.9.561 $\mathrm{GM3^-}\oplus\mathrm{X2^-}\oplus\mathrm{Y2^-}$	$\surd$	1	0	$\times$	-	-
N49.9.562 $\mathrm{GM3^-}\oplus\mathrm{Y2^-}\oplus\mathrm{Y2^-}$	$\surd$	1	0	$\times$	-	-
N49.9.563 $\mathrm{GM3^-}\oplus\mathrm{Y2^-}\oplus\mathrm{Y3^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N49.9.564 $\mathrm{S1^+}\oplus\mathrm{S1^+}\oplus\mathrm{S1^+}$	$\surd$	0	0	$\surd$	-	-
N49.9.565 $\mathrm{S1^+}\oplus\mathrm{S1^+}\oplus\mathrm{S2^+}$	$\surd$	0	0	$\surd$	-	-
N49.9.566 $\mathrm{S1^+}\oplus\mathrm{S1^+}\oplus\mathrm{S3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u}\oplus\mathrm{B3_u}$
N49.9.567 $\mathrm{S1^+}\oplus\mathrm{S2^+}\oplus\mathrm{S3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u}\oplus\mathrm{B2_u}$
N49.9.568 $\mathrm{S1^+}\oplus\mathrm{S1^+}\oplus\mathrm{S1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{A_u}$
N49.9.569 $\mathrm{S1^+}\oplus\mathrm{S1^+}\oplus\mathrm{S2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B1_u}$
N49.9.570 $\mathrm{S1^+}\oplus\mathrm{S1^+}\oplus\mathrm{S3^+}$	$\surd$	0	0	$\surd$	-	-
N49.9.571 $\mathrm{S1^+}\oplus\mathrm{S2^+}\oplus\mathrm{S1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B1_u}$
N49.9.572 $\mathrm{S1^+}\oplus\mathrm{S2^+}\oplus\mathrm{S3^+}$	$\surd$	0	0	$\surd$	-	-
N49.9.573 $\mathrm{S1^+}\oplus\mathrm{S3^-}\oplus\mathrm{S1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B3_u}$
N49.9.574 $\mathrm{S1^+}\oplus\mathrm{S3^-}\oplus\mathrm{S2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B3_u}$
N49.9.575 $\mathrm{S1^+}\oplus\mathrm{S1^+}\oplus\mathrm{X1^+}$	$\surd$	1	0	$\times$	-	-
N49.9.576 $\mathrm{S1^+}\oplus\mathrm{S1^+}\oplus\mathrm{X3^-}$	$\surd$	1	0	$\times$	-	-
N49.9.577 $\mathrm{S1^+}\oplus\mathrm{S2^+}\oplus\mathrm{X1^+}$	$\surd$	1	0	$\times$	-	-
N49.9.578 $\mathrm{S1^+}\oplus\mathrm{S3^-}\oplus\mathrm{X1^+}$	$\surd$	1	1	$\times$	-	-
N49.9.579 $\mathrm{S1^+}\oplus\mathrm{S3^-}\oplus\mathrm{Y1^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N49.9.580 $\mathrm{S1^+}\oplus\mathrm{S3^-}\oplus\mathrm{Y4^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$

Non-coplanar SSGs with parent space group $Pccm$ (No. 49) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N49.9.581 $\mathrm{S1}^+ \oplus \mathrm{S1}^+ \oplus \mathrm{X1}^-$	$\surd$	1	0	$\times$	-	-
N49.9.582 $\mathrm{S1}^+ \oplus \mathrm{S1}^+ \oplus \mathrm{X3}^+$	$\surd$	1	0	$\times$	-	-
N49.9.583 $\mathrm{S1}^+ \oplus \mathrm{S2}^+ \oplus \mathrm{X1}^-$	$\surd$	1	0	$\times$	-	-
N49.9.584 $\mathrm{S1}^+ \oplus \mathrm{S3}^- \oplus \mathrm{X1}^-$	$\surd$	1	1	$\times$	-	-
N49.9.585 $\mathrm{S1}^+ \oplus \mathrm{S3}^- \oplus \mathrm{Y1}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N49.9.586 $\mathrm{S1}^+ \oplus \mathrm{S3}^- \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N49.9.587 $\mathrm{S1}^+ \oplus \mathrm{S1}^+ \oplus \mathrm{X2}^+$	$\surd$	1	0	$\times$	-	-
N49.9.588 $\mathrm{S1}^+ \oplus \mathrm{S1}^+ \oplus \mathrm{X4}^-$	$\surd$	1	0	$\times$	-	-
N49.9.589 $\mathrm{S1}^+ \oplus \mathrm{S2}^+ \oplus \mathrm{X2}^+$	$\surd$	1	0	$\times$	-	-
N49.9.590 $\mathrm{S1}^+ \oplus \mathrm{S3}^- \oplus \mathrm{X2}^+$	$\surd$	1	1	$\times$	-	-
N49.9.591 $\mathrm{S1}^+ \oplus \mathrm{S3}^- \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N49.9.592 $\mathrm{S1}^+ \oplus \mathrm{S3}^- \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N49.9.593 $\mathrm{S1}^+ \oplus \mathrm{S1}^+ \oplus \mathrm{X2}^-$	$\surd$	1	0	$\times$	-	-
N49.9.594 $\mathrm{S1}^+ \oplus \mathrm{S1}^+ \oplus \mathrm{X4}^+$	$\surd$	1	0	$\times$	-	-
N49.9.595 $\mathrm{S1}^+ \oplus \mathrm{S2}^+ \oplus \mathrm{X2}^-$	$\surd$	1	0	$\times$	-	-
N49.9.596 $\mathrm{S1}^+ \oplus \mathrm{S3}^- \oplus \mathrm{X2}^-$	$\surd$	1	1	$\times$	-	-
N49.9.597 $\mathrm{S1}^+ \oplus \mathrm{S3}^- \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N49.9.598 $\mathrm{S1}^+ \oplus \mathrm{S3}^- \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N49.9.599 $\mathrm{S1}^+ \oplus \mathrm{S1}^- \oplus \mathrm{S1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u}$
N49.9.600 $\mathrm{S1}^+ \oplus \mathrm{S1}^- \oplus \mathrm{S2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u}$
N49.9.601 $\mathrm{S1}^+ \oplus \mathrm{S1}^- \oplus \mathrm{S3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u}$
N49.9.602 $\mathrm{S1}^+ \oplus \mathrm{S2}^- \oplus \mathrm{S2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N49.9.603 $\mathrm{S1}^+ \oplus \mathrm{S2}^- \oplus \mathrm{S3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N49.9.604 $\mathrm{S1}^+ \oplus \mathrm{S3}^+ \oplus \mathrm{S3}^+$	$\surd$	0	0	$\surd$	-	-
N49.9.605 $\mathrm{S1}^+ \oplus \mathrm{S3}^+ \oplus \mathrm{S4}^+$	$\surd$	0	0	$\surd$	-	-
N49.9.606 $\mathrm{S1}^+ \oplus \mathrm{S1}^- \oplus \mathrm{X1}^+$	$\surd$	1	1	$\times$	-	-
N49.9.607 $\mathrm{S1}^+ \oplus \mathrm{S1}^- \oplus \mathrm{X3}^-$	$\surd$	1	1	$\times$	-	-
N49.9.608 $\mathrm{S1}^+ \oplus \mathrm{S2}^- \oplus \mathrm{X1}^+$	$\surd$	1	1	$\times$	-	-
N49.9.609 $\mathrm{S1}^+ \oplus \mathrm{S2}^- \oplus \mathrm{X3}^-$	$\surd$	1	1	$\times$	-	-
N49.9.610 $\mathrm{S1}^+ \oplus \mathrm{S3}^+ \oplus \mathrm{X1}^+$	$\surd$	1	0	$\times$	-	-
N49.9.611 $\mathrm{S1}^+ \oplus \mathrm{S3}^+ \oplus \mathrm{X3}^-$	$\surd$	1	0	$\times$	-	-
N49.9.612 $\mathrm{S1}^+ \oplus \mathrm{S3}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	0	$\times$	-	-
N49.9.613 $\mathrm{S1}^+ \oplus \mathrm{S3}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	0	$\times$	-	-
N49.9.614 $\mathrm{S1}^+ \oplus \mathrm{S1}^- \oplus \mathrm{X1}^-$	$\surd$	1	1	$\times$	-	-
N49.9.615 $\mathrm{S1}^+ \oplus \mathrm{S1}^- \oplus \mathrm{X3}^+$	$\surd$	1	1	$\times$	-	-
N49.9.616 $\mathrm{S1}^+ \oplus \mathrm{S2}^- \oplus \mathrm{X1}^-$	$\surd$	1	1	$\times$	-	-
N49.9.617 $\mathrm{S1}^+ \oplus \mathrm{S2}^- \oplus \mathrm{X3}^+$	$\surd$	1	1	$\times$	-	-
N49.9.618 $\mathrm{S1}^+ \oplus \mathrm{S3}^+ \oplus \mathrm{X1}^-$	$\surd$	1	0	$\times$	-	-
N49.9.619 $\mathrm{S1}^+ \oplus \mathrm{S3}^+ \oplus \mathrm{X3}^+$	$\surd$	1	0	$\times$	-	-
N49.9.620 $\mathrm{S1}^+ \oplus \mathrm{S3}^+ \oplus \mathrm{Y1}^-$	$\surd$	1	0	$\times$	-	-
N49.9.621 $\mathrm{S1}^+ \oplus \mathrm{S3}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
N49.9.622 $\mathrm{S1}^+ \oplus \mathrm{S1}^- \oplus \mathrm{X2}^+$	$\surd$	1	1	$\times$	-	-
N49.9.623 $\mathrm{S1}^+ \oplus \mathrm{S1}^- \oplus \mathrm{X4}^-$	$\surd$	1	1	$\times$	-	-
N49.9.624 $\mathrm{S1}^+ \oplus \mathrm{S2}^- \oplus \mathrm{X2}^+$	$\surd$	1	1	$\times$	-	-
N49.9.625 $\mathrm{S1}^+ \oplus \mathrm{S2}^- \oplus \mathrm{X4}^-$	$\surd$	1	1	$\times$	-	-
N49.9.626 $\mathrm{S1}^+ \oplus \mathrm{S3}^+ \oplus \mathrm{X2}^+$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $Pccm$ (No. 49) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N49.9.627 $\mathrm{S1}^{+}\oplus\mathrm{S3}^{+}\oplus\mathrm{X4}^{-}$	$\surd$	1	0	$\times$	-	-
N49.9.628 $\mathrm{S1}^{+}\oplus\mathrm{S3}^{+}\oplus\mathrm{Y2}^{+}$	$\surd$	1	0	$\times$	-	-
N49.9.629 $\mathrm{S1}^{+}\oplus\mathrm{S3}^{+}\oplus\mathrm{Y3}^{-}$	$\surd$	1	0	$\times$	-	-
N49.9.630 $\mathrm{S1}^{+}\oplus\mathrm{S1}^{-}\oplus\mathrm{X2}^{-}$	$\surd$	1	1	$\times$	-	-
N49.9.631 $\mathrm{S1}^{+}\oplus\mathrm{S1}^{-}\oplus\mathrm{X4}^{+}$	$\surd$	1	1	$\times$	-	-
N49.9.632 $\mathrm{S1}^{+}\oplus\mathrm{S2}^{-}\oplus\mathrm{X2}^{-}$	$\surd$	1	1	$\times$	-	-
N49.9.633 $\mathrm{S1}^{+}\oplus\mathrm{S2}^{-}\oplus\mathrm{X4}^{+}$	$\surd$	1	1	$\times$	-	-
N49.9.634 $\mathrm{S1}^{+}\oplus\mathrm{S3}^{+}\oplus\mathrm{X2}^{-}$	$\surd$	1	0	$\times$	-	-
N49.9.635 $\mathrm{S1}^{+}\oplus\mathrm{S3}^{+}\oplus\mathrm{X4}^{+}$	$\surd$	1	0	$\times$	-	-
N49.9.636 $\mathrm{S1}^{+}\oplus\mathrm{S3}^{+}\oplus\mathrm{Y2}^{-}$	$\surd$	1	0	$\times$	-	-
N49.9.637 $\mathrm{S1}^{+}\oplus\mathrm{S3}^{+}\oplus\mathrm{Y3}^{+}$	$\surd$	1	0	$\times$	-	-
N49.9.638 $\mathrm{S1}^{+}\oplus\mathrm{X1}^{+}\oplus\mathrm{X1}^{+}$	$\surd$	1	0	$\times$	-	-
N49.9.639 $\mathrm{S1}^{+}\oplus\mathrm{X1}^{+}\oplus\mathrm{X3}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N49.9.640 $\mathrm{S1}^{+}\oplus\mathrm{X1}^{+}\oplus\mathrm{Y1}^{+}$	$\times$	-	-	-	-	-
N49.9.641 $\mathrm{S1}^{+}\oplus\mathrm{X1}^{+}\oplus\mathrm{Y4}^{-}$	$\times$	-	-	-	-	-
N49.9.642 $\mathrm{S1}^{+}\oplus\mathrm{X3}^{-}\oplus\mathrm{X3}^{-}$	$\surd$	1	0	$\times$	-	-
N49.9.643 $\mathrm{S1}^{+}\oplus\mathrm{X3}^{-}\oplus\mathrm{Y4}^{-}$	$\times$	-	-	-	-	-
N49.9.644 $\mathrm{S1}^{+}\oplus\mathrm{X1}^{+}\oplus\mathrm{X1}^{-}$	$\surd$	1	1	$\times$	-	-
N49.9.645 $\mathrm{S1}^{+}\oplus\mathrm{X1}^{+}\oplus\mathrm{X3}^{+}$	$\surd$	1	0	$\times$	-	-
N49.9.646 $\mathrm{S1}^{+}\oplus\mathrm{X1}^{+}\oplus\mathrm{Y1}^{-}$	$\times$	-	-	-	-	-
N49.9.647 $\mathrm{S1}^{+}\oplus\mathrm{X1}^{+}\oplus\mathrm{Y4}^{+}$	$\times$	-	-	-	-	-
N49.9.648 $\mathrm{S1}^{+}\oplus\mathrm{X3}^{-}\oplus\mathrm{X1}^{-}$	$\surd$	1	0	$\times$	-	-
N49.9.649 $\mathrm{S1}^{+}\oplus\mathrm{X3}^{-}\oplus\mathrm{X3}^{+}$	$\surd$	1	1	$\times$	-	-
N49.9.650 $\mathrm{S1}^{+}\oplus\mathrm{X3}^{-}\oplus\mathrm{Y1}^{-}$	$\times$	-	-	-	-	-
N49.9.651 $\mathrm{S1}^{+}\oplus\mathrm{X3}^{-}\oplus\mathrm{Y4}^{+}$	$\times$	-	-	-	-	-
N49.9.652 $\mathrm{S1}^{+}\oplus\mathrm{X1}^{+}\oplus\mathrm{X2}^{+}$	$\surd$	1	0	$\times$	-	-
N49.9.653 $\mathrm{S1}^{+}\oplus\mathrm{X1}^{+}\oplus\mathrm{X4}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N49.9.654 $\mathrm{S1}^{+}\oplus\mathrm{X1}^{+}\oplus\mathrm{Y2}^{+}$	$\times$	-	-	-	-	-
N49.9.655 $\mathrm{S1}^{+}\oplus\mathrm{X1}^{+}\oplus\mathrm{Y3}^{-}$	$\times$	-	-	-	-	-
N49.9.656 $\mathrm{S1}^{+}\oplus\mathrm{X3}^{-}\oplus\mathrm{X2}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N49.9.657 $\mathrm{S1}^{+}\oplus\mathrm{X3}^{-}\oplus\mathrm{X4}^{-}$	$\surd$	1	0	$\times$	-	-
N49.9.658 $\mathrm{S1}^{+}\oplus\mathrm{X3}^{-}\oplus\mathrm{Y2}^{+}$	$\times$	-	-	-	-	-
N49.9.659 $\mathrm{S1}^{+}\oplus\mathrm{X3}^{-}\oplus\mathrm{Y3}^{-}$	$\times$	-	-	-	-	-
N49.9.660 $\mathrm{S1}^{+}\oplus\mathrm{X1}^{+}\oplus\mathrm{X2}^{-}$	$\surd$	1	1	$\times$	-	-
N49.9.661 $\mathrm{S1}^{+}\oplus\mathrm{X1}^{+}\oplus\mathrm{X4}^{+}$	$\surd$	1	0	$\times$	-	-
N49.9.662 $\mathrm{S1}^{+}\oplus\mathrm{X1}^{+}\oplus\mathrm{Y2}^{-}$	$\times$	-	-	-	-	-
N49.9.663 $\mathrm{S1}^{+}\oplus\mathrm{X1}^{+}\oplus\mathrm{Y3}^{+}$	$\times$	-	-	-	-	-
N49.9.664 $\mathrm{S1}^{+}\oplus\mathrm{X3}^{-}\oplus\mathrm{X2}^{-}$	$\surd$	1	0	$\times$	-	-
N49.9.665 $\mathrm{S1}^{+}\oplus\mathrm{X3}^{-}\oplus\mathrm{X4}^{+}$	$\surd$	1	1	$\times$	-	-
N49.9.666 $\mathrm{S1}^{+}\oplus\mathrm{X3}^{-}\oplus\mathrm{Y2}^{-}$	$\times$	-	-	-	-	-
N49.9.667 $\mathrm{S1}^{+}\oplus\mathrm{X3}^{-}\oplus\mathrm{Y3}^{+}$	$\times$	-	-	-	-	-
N49.9.668 $\mathrm{S1}^{+}\oplus\mathrm{X1}^{-}\oplus\mathrm{X1}^{-}$	$\surd$	1	0	$\times$	-	-
N49.9.669 $\mathrm{S1}^{+}\oplus\mathrm{X1}^{-}\oplus\mathrm{X3}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N49.9.670 $\mathrm{S1}^{+}\oplus\mathrm{X1}^{-}\oplus\mathrm{Y1}^{-}$	$\times$	-	-	-	-	-
N49.9.671 $\mathrm{S1}^{+}\oplus\mathrm{X1}^{-}\oplus\mathrm{Y4}^{+}$	$\times$	-	-	-	-	-
N49.9.672 $\mathrm{S1}^{+}\oplus\mathrm{X3}^{+}\oplus\mathrm{X3}^{+}$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $Pccm$ (No. 49) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N49.9.673 $\mathrm{S1}^{+}\oplus\mathrm{X3}^{+}\oplus\mathrm{Y4}^{+}$	$\times$	-	-	-	-	-
N49.9.674 $\mathrm{S1}^{+}\oplus\mathrm{X1}^{-}\oplus\mathrm{X2}^{+}$	$\surd$	1	1	$\times$	-	-
N49.9.675 $\mathrm{S1}^{+}\oplus\mathrm{X1}^{-}\oplus\mathrm{X4}^{-}$	$\surd$	1	0	$\times$	-	-
N49.9.676 $\mathrm{S1}^{+}\oplus\mathrm{X1}^{-}\oplus\mathrm{Y2}^{+}$	$\times$	-	-	-	-	-
N49.9.677 $\mathrm{S1}^{+}\oplus\mathrm{X1}^{-}\oplus\mathrm{Y3}^{-}$	$\times$	-	-	-	-	-
N49.9.678 $\mathrm{S1}^{+}\oplus\mathrm{X3}^{+}\oplus\mathrm{X2}^{+}$	$\surd$	1	0	$\times$	-	-
N49.9.679 $\mathrm{S1}^{+}\oplus\mathrm{X3}^{+}\oplus\mathrm{X4}^{-}$	$\surd$	1	1	$\times$	-	-
N49.9.680 $\mathrm{S1}^{+}\oplus\mathrm{X3}^{+}\oplus\mathrm{Y2}^{+}$	$\times$	-	-	-	-	-
N49.9.681 $\mathrm{S1}^{+}\oplus\mathrm{X3}^{+}\oplus\mathrm{Y3}^{-}$	$\times$	-	-	-	-	-
N49.9.682 $\mathrm{S1}^{+}\oplus\mathrm{X1}^{-}\oplus\mathrm{X2}^{-}$	$\surd$	1	0	$\times$	-	-
N49.9.683 $\mathrm{S1}^{+}\oplus\mathrm{X1}^{-}\oplus\mathrm{X4}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N49.9.684 $\mathrm{S1}^{+}\oplus\mathrm{X1}^{-}\oplus\mathrm{Y2}^{-}$	$\times$	-	-	-	-	-
N49.9.685 $\mathrm{S1}^{+}\oplus\mathrm{X1}^{-}\oplus\mathrm{Y3}^{+}$	$\times$	-	-	-	-	-
N49.9.686 $\mathrm{S1}^{+}\oplus\mathrm{X3}^{+}\oplus\mathrm{X2}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N49.9.687 $\mathrm{S1}^{+}\oplus\mathrm{X3}^{+}\oplus\mathrm{X4}^{+}$	$\surd$	1	0	$\times$	-	-
N49.9.688 $\mathrm{S1}^{+}\oplus\mathrm{X3}^{+}\oplus\mathrm{Y2}^{-}$	$\times$	-	-	-	-	-
N49.9.689 $\mathrm{S1}^{+}\oplus\mathrm{X3}^{+}\oplus\mathrm{Y3}^{+}$	$\times$	-	-	-	-	-
N49.9.690 $\mathrm{S1}^{+}\oplus\mathrm{X2}^{+}\oplus\mathrm{X2}^{+}$	$\surd$	1	0	$\times$	-	-
N49.9.691 $\mathrm{S1}^{+}\oplus\mathrm{X2}^{+}\oplus\mathrm{X4}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N49.9.692 $\mathrm{S1}^{+}\oplus\mathrm{X2}^{+}\oplus\mathrm{Y2}^{+}$	$\times$	-	-	-	-	-
N49.9.693 $\mathrm{S1}^{+}\oplus\mathrm{X2}^{+}\oplus\mathrm{Y3}^{-}$	$\times$	-	-	-	-	-
N49.9.694 $\mathrm{S1}^{+}\oplus\mathrm{X4}^{-}\oplus\mathrm{X4}^{-}$	$\surd$	1	0	$\times$	-	-
N49.9.695 $\mathrm{S1}^{+}\oplus\mathrm{X4}^{-}\oplus\mathrm{Y3}^{-}$	$\times$	-	-	-	-	-
N49.9.696 $\mathrm{S1}^{+}\oplus\mathrm{X2}^{+}\oplus\mathrm{X2}^{-}$	$\surd$	1	1	$\times$	-	-
N49.9.697 $\mathrm{S1}^{+}\oplus\mathrm{X2}^{+}\oplus\mathrm{X4}^{+}$	$\surd$	1	0	$\times$	-	-
N49.9.698 $\mathrm{S1}^{+}\oplus\mathrm{X2}^{+}\oplus\mathrm{Y2}^{-}$	$\times$	-	-	-	-	-
N49.9.699 $\mathrm{S1}^{+}\oplus\mathrm{X2}^{+}\oplus\mathrm{Y3}^{+}$	$\times$	-	-	-	-	-
N49.9.700 $\mathrm{S1}^{+}\oplus\mathrm{X4}^{-}\oplus\mathrm{X2}^{-}$	$\surd$	1	0	$\times$	-	-
N49.9.701 $\mathrm{S1}^{+}\oplus\mathrm{X4}^{-}\oplus\mathrm{X4}^{+}$	$\surd$	1	1	$\times$	-	-
N49.9.702 $\mathrm{S1}^{+}\oplus\mathrm{X4}^{-}\oplus\mathrm{Y2}^{-}$	$\times$	-	-	-	-	-
N49.9.703 $\mathrm{S1}^{+}\oplus\mathrm{X4}^{-}\oplus\mathrm{Y3}^{+}$	$\times$	-	-	-	-	-
N49.9.704 $\mathrm{S1}^{+}\oplus\mathrm{X2}^{-}\oplus\mathrm{X2}^{-}$	$\surd$	1	0	$\times$	-	-
N49.9.705 $\mathrm{S1}^{+}\oplus\mathrm{X2}^{-}\oplus\mathrm{X4}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N49.9.706 $\mathrm{S1}^{+}\oplus\mathrm{X2}^{-}\oplus\mathrm{Y2}^{-}$	$\times$	-	-	-	-	-
N49.9.707 $\mathrm{S1}^{+}\oplus\mathrm{X2}^{-}\oplus\mathrm{Y3}^{+}$	$\times$	-	-	-	-	-
N49.9.708 $\mathrm{S1}^{+}\oplus\mathrm{X4}^{+}\oplus\mathrm{X4}^{+}$	$\surd$	1	0	$\times$	-	-
N49.9.709 $\mathrm{S1}^{+}\oplus\mathrm{X4}^{+}\oplus\mathrm{Y3}^{+}$	$\times$	-	-	-	-	-
N49.9.710 $\mathrm{S1}^{-}\oplus\mathrm{S1}^{-}\oplus\mathrm{S1}^{-}$	$\surd$	0	0	$\surd$	-	-
N49.9.711 $\mathrm{S1}^{-}\oplus\mathrm{S1}^{-}\oplus\mathrm{S2}^{-}$	$\surd$	0	0	$\surd$	-	-
N49.9.712 $\mathrm{S1}^{-}\oplus\mathrm{S1}^{-}\oplus\mathrm{S3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u}\oplus\mathrm{B3_u}$
N49.9.713 $\mathrm{S1}^{-}\oplus\mathrm{S2}^{-}\oplus\mathrm{S3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u}\oplus\mathrm{B2_u}$
N49.9.714 $\mathrm{S1}^{-}\oplus\mathrm{S1}^{-}\oplus\mathrm{X1}^{+}$	$\surd$	1	0	$\times$	-	-
N49.9.715 $\mathrm{S1}^{-}\oplus\mathrm{S1}^{-}\oplus\mathrm{X3}^{-}$	$\surd$	1	0	$\times$	-	-
N49.9.716 $\mathrm{S1}^{-}\oplus\mathrm{S2}^{-}\oplus\mathrm{X1}^{+}$	$\surd$	1	0	$\times$	-	-
N49.9.717 $\mathrm{S1}^{-}\oplus\mathrm{S3}^{+}\oplus\mathrm{X1}^{+}$	$\surd$	1	1	$\times$	-	-
N49.9.718 $\mathrm{S1}^{-}\oplus\mathrm{S3}^{+}\oplus\mathrm{Y1}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$

Non-coplanar SSGs with parent space group $Pccm$ (No. 49) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N49.9.719 $\mathrm{S1}^{-}\oplus\mathrm{S3}^{+}\oplus\mathrm{Y4}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N49.9.720 $\mathrm{S1}^{-}\oplus\mathrm{S1}^{-}\oplus\mathrm{X1}^{-}$	$\surd$	1	0	$\times$	-	-
N49.9.721 $\mathrm{S1}^{-}\oplus\mathrm{S1}^{-}\oplus\mathrm{X3}^{+}$	$\surd$	1	0	$\times$	-	-
N49.9.722 $\mathrm{S1}^{-}\oplus\mathrm{S2}^{-}\oplus\mathrm{X1}^{-}$	$\surd$	1	0	$\times$	-	-
N49.9.723 $\mathrm{S1}^{-}\oplus\mathrm{S3}^{+}\oplus\mathrm{X1}^{-}$	$\surd$	1	1	$\times$	-	-
N49.9.724 $\mathrm{S1}^{-}\oplus\mathrm{S3}^{+}\oplus\mathrm{Y1}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N49.9.725 $\mathrm{S1}^{-}\oplus\mathrm{S3}^{+}\oplus\mathrm{Y4}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N49.9.726 $\mathrm{S1}^{-}\oplus\mathrm{S1}^{-}\oplus\mathrm{X2}^{+}$	$\surd$	1	0	$\times$	-	-
N49.9.727 $\mathrm{S1}^{-}\oplus\mathrm{S1}^{-}\oplus\mathrm{X4}^{-}$	$\surd$	1	0	$\times$	-	-
N49.9.728 $\mathrm{S1}^{-}\oplus\mathrm{S2}^{-}\oplus\mathrm{X2}^{+}$	$\surd$	1	0	$\times$	-	-
N49.9.729 $\mathrm{S1}^{-}\oplus\mathrm{S3}^{+}\oplus\mathrm{X2}^{+}$	$\surd$	1	1	$\times$	-	-
N49.9.730 $\mathrm{S1}^{-}\oplus\mathrm{S3}^{+}\oplus\mathrm{Y2}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N49.9.731 $\mathrm{S1}^{-}\oplus\mathrm{S3}^{+}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N49.9.732 $\mathrm{S1}^{-}\oplus\mathrm{S1}^{-}\oplus\mathrm{X2}^{-}$	$\surd$	1	0	$\times$	-	-
N49.9.733 $\mathrm{S1}^{-}\oplus\mathrm{S1}^{-}\oplus\mathrm{X4}^{+}$	$\surd$	1	0	$\times$	-	-
N49.9.734 $\mathrm{S1}^{-}\oplus\mathrm{S2}^{-}\oplus\mathrm{X2}^{-}$	$\surd$	1	0	$\times$	-	-
N49.9.735 $\mathrm{S1}^{-}\oplus\mathrm{S3}^{+}\oplus\mathrm{X2}^{-}$	$\surd$	1	1	$\times$	-	-
N49.9.736 $\mathrm{S1}^{-}\oplus\mathrm{S3}^{+}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N49.9.737 $\mathrm{S1}^{-}\oplus\mathrm{S3}^{+}\oplus\mathrm{Y3}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N49.9.738 $\mathrm{S1}^{-}\oplus\mathrm{X1}^{+}\oplus\mathrm{X1}^{+}$	$\surd$	1	0	$\times$	-	-
N49.9.739 $\mathrm{S1}^{-}\oplus\mathrm{X1}^{+}\oplus\mathrm{X3}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N49.9.740 $\mathrm{S1}^{-}\oplus\mathrm{X1}^{+}\oplus\mathrm{Y1}^{+}$	$\times$	-	-	-	-	-
N49.9.741 $\mathrm{S1}^{-}\oplus\mathrm{X1}^{+}\oplus\mathrm{Y4}^{-}$	$\times$	-	-	-	-	-
N49.9.742 $\mathrm{S1}^{-}\oplus\mathrm{X3}^{-}\oplus\mathrm{X3}^{-}$	$\surd$	1	0	$\times$	-	-
N49.9.743 $\mathrm{S1}^{-}\oplus\mathrm{X3}^{-}\oplus\mathrm{Y4}^{-}$	$\times$	-	-	-	-	-
N49.9.744 $\mathrm{S1}^{-}\oplus\mathrm{X1}^{+}\oplus\mathrm{X1}^{-}$	$\surd$	1	1	$\times$	-	-
N49.9.745 $\mathrm{S1}^{-}\oplus\mathrm{X1}^{+}\oplus\mathrm{X3}^{+}$	$\surd$	1	0	$\times$	-	-
N49.9.746 $\mathrm{S1}^{-}\oplus\mathrm{X1}^{+}\oplus\mathrm{Y1}^{-}$	$\times$	-	-	-	-	-
N49.9.747 $\mathrm{S1}^{-}\oplus\mathrm{X1}^{+}\oplus\mathrm{Y4}^{+}$	$\times$	-	-	-	-	-
N49.9.748 $\mathrm{S1}^{-}\oplus\mathrm{X3}^{-}\oplus\mathrm{X1}^{-}$	$\surd$	1	0	$\times$	-	-
N49.9.749 $\mathrm{S1}^{-}\oplus\mathrm{X3}^{-}\oplus\mathrm{X3}^{+}$	$\surd$	1	1	$\times$	-	-
N49.9.750 $\mathrm{S1}^{-}\oplus\mathrm{X3}^{-}\oplus\mathrm{Y1}^{-}$	$\times$	-	-	-	-	-
N49.9.751 $\mathrm{S1}^{-}\oplus\mathrm{X3}^{-}\oplus\mathrm{Y4}^{+}$	$\times$	-	-	-	-	-
N49.9.752 $\mathrm{S1}^{-}\oplus\mathrm{X1}^{+}\oplus\mathrm{X2}^{+}$	$\surd$	1	0	$\times$	-	-
N49.9.753 $\mathrm{S1}^{-}\oplus\mathrm{X1}^{+}\oplus\mathrm{X4}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N49.9.754 $\mathrm{S1}^{-}\oplus\mathrm{X1}^{+}\oplus\mathrm{Y2}^{+}$	$\times$	-	-	-	-	-
N49.9.755 $\mathrm{S1}^{-}\oplus\mathrm{X1}^{+}\oplus\mathrm{Y3}^{-}$	$\times$	-	-	-	-	-
N49.9.756 $\mathrm{S1}^{-}\oplus\mathrm{X3}^{-}\oplus\mathrm{X2}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N49.9.757 $\mathrm{S1}^{-}\oplus\mathrm{X3}^{-}\oplus\mathrm{X4}^{-}$	$\surd$	1	0	$\times$	-	-
N49.9.758 $\mathrm{S1}^{-}\oplus\mathrm{X3}^{-}\oplus\mathrm{Y2}^{+}$	$\times$	-	-	-	-	-
N49.9.759 $\mathrm{S1}^{-}\oplus\mathrm{X3}^{-}\oplus\mathrm{Y3}^{-}$	$\times$	-	-	-	-	-
N49.9.760 $\mathrm{S1}^{-}\oplus\mathrm{X1}^{+}\oplus\mathrm{X2}^{-}$	$\surd$	1	1	$\times$	-	-
N49.9.761 $\mathrm{S1}^{-}\oplus\mathrm{X1}^{+}\oplus\mathrm{X4}^{+}$	$\surd$	1	0	$\times$	-	-
N49.9.762 $\mathrm{S1}^{-}\oplus\mathrm{X1}^{+}\oplus\mathrm{Y2}^{-}$	$\times$	-	-	-	-	-
N49.9.763 $\mathrm{S1}^{-}\oplus\mathrm{X1}^{+}\oplus\mathrm{Y3}^{+}$	$\times$	-	-	-	-	-
N49.9.764 $\mathrm{S1}^{-}\oplus\mathrm{X3}^{-}\oplus\mathrm{X2}^{-}$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $Pccm$ (No. 49) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N49.9.765 $\mathrm{S1}^{-}\oplus\mathrm{X3}^{-}\oplus\mathrm{X4}^{+}$	$\surd$	1	1	$\times$	-	-
N49.9.766 $\mathrm{S1}^{-}\oplus\mathrm{X3}^{-}\oplus\mathrm{Y2}^{-}$	$\times$	-	-	-	-	-
N49.9.767 $\mathrm{S1}^{-}\oplus\mathrm{X3}^{-}\oplus\mathrm{Y3}^{+}$	$\times$	-	-	-	-	-
N49.9.768 $\mathrm{S1}^{-}\oplus\mathrm{X1}^{-}\oplus\mathrm{X1}^{-}$	$\surd$	1	0	$\times$	-	-
N49.9.769 $\mathrm{S1}^{-}\oplus\mathrm{X1}^{-}\oplus\mathrm{X3}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N49.9.770 $\mathrm{S1}^{-}\oplus\mathrm{X1}^{-}\oplus\mathrm{Y1}^{-}$	$\times$	-	-	-	-	-
N49.9.771 $\mathrm{S1}^{-}\oplus\mathrm{X1}^{-}\oplus\mathrm{Y4}^{+}$	$\times$	-	-	-	-	-
N49.9.772 $\mathrm{S1}^{-}\oplus\mathrm{X3}^{+}\oplus\mathrm{X3}^{+}$	$\surd$	1	0	$\times$	-	-
N49.9.773 $\mathrm{S1}^{-}\oplus\mathrm{X3}^{+}\oplus\mathrm{Y4}^{+}$	$\times$	-	-	-	-	-
N49.9.774 $\mathrm{S1}^{-}\oplus\mathrm{X1}^{-}\oplus\mathrm{X2}^{+}$	$\surd$	1	1	$\times$	-	-
N49.9.775 $\mathrm{S1}^{-}\oplus\mathrm{X1}^{-}\oplus\mathrm{X4}^{-}$	$\surd$	1	0	$\times$	-	-
N49.9.776 $\mathrm{S1}^{-}\oplus\mathrm{X1}^{-}\oplus\mathrm{Y2}^{+}$	$\times$	-	-	-	-	-
N49.9.777 $\mathrm{S1}^{-}\oplus\mathrm{X1}^{-}\oplus\mathrm{Y3}^{-}$	$\times$	-	-	-	-	-
N49.9.778 $\mathrm{S1}^{-}\oplus\mathrm{X3}^{+}\oplus\mathrm{X2}^{+}$	$\surd$	1	0	$\times$	-	-
N49.9.779 $\mathrm{S1}^{-}\oplus\mathrm{X3}^{+}\oplus\mathrm{X4}^{-}$	$\surd$	1	1	$\times$	-	-
N49.9.780 $\mathrm{S1}^{-}\oplus\mathrm{X3}^{+}\oplus\mathrm{Y2}^{+}$	$\times$	-	-	-	-	-
N49.9.781 $\mathrm{S1}^{-}\oplus\mathrm{X3}^{+}\oplus\mathrm{Y3}^{-}$	$\times$	-	-	-	-	-
N49.9.782 $\mathrm{S1}^{-}\oplus\mathrm{X1}^{-}\oplus\mathrm{X2}^{-}$	$\surd$	1	0	$\times$	-	-
N49.9.783 $\mathrm{S1}^{-}\oplus\mathrm{X1}^{-}\oplus\mathrm{X4}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N49.9.784 $\mathrm{S1}^{-}\oplus\mathrm{X1}^{-}\oplus\mathrm{Y2}^{-}$	$\times$	-	-	-	-	-
N49.9.785 $\mathrm{S1}^{-}\oplus\mathrm{X1}^{-}\oplus\mathrm{Y3}^{+}$	$\times$	-	-	-	-	-
N49.9.786 $\mathrm{S1}^{-}\oplus\mathrm{X3}^{+}\oplus\mathrm{X2}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N49.9.787 $\mathrm{S1}^{-}\oplus\mathrm{X3}^{+}\oplus\mathrm{X4}^{+}$	$\surd$	1	0	$\times$	-	-
N49.9.788 $\mathrm{S1}^{-}\oplus\mathrm{X3}^{+}\oplus\mathrm{Y2}^{-}$	$\times$	-	-	-	-	-
N49.9.789 $\mathrm{S1}^{-}\oplus\mathrm{X3}^{+}\oplus\mathrm{Y3}^{+}$	$\times$	-	-	-	-	-
N49.9.790 $\mathrm{S1}^{-}\oplus\mathrm{X2}^{+}\oplus\mathrm{X2}^{+}$	$\surd$	1	0	$\times$	-	-
N49.9.791 $\mathrm{S1}^{-}\oplus\mathrm{X2}^{+}\oplus\mathrm{X4}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N49.9.792 $\mathrm{S1}^{-}\oplus\mathrm{X2}^{+}\oplus\mathrm{Y2}^{+}$	$\times$	-	-	-	-	-
N49.9.793 $\mathrm{S1}^{-}\oplus\mathrm{X2}^{+}\oplus\mathrm{Y3}^{-}$	$\times$	-	-	-	-	-
N49.9.794 $\mathrm{S1}^{-}\oplus\mathrm{X4}^{-}\oplus\mathrm{X4}^{-}$	$\surd$	1	0	$\times$	-	-
N49.9.795 $\mathrm{S1}^{-}\oplus\mathrm{X4}^{-}\oplus\mathrm{Y3}^{-}$	$\times$	-	-	-	-	-
N49.9.796 $\mathrm{S1}^{-}\oplus\mathrm{X2}^{+}\oplus\mathrm{X2}^{-}$	$\surd$	1	1	$\times$	-	-
N49.9.797 $\mathrm{S1}^{-}\oplus\mathrm{X2}^{+}\oplus\mathrm{X4}^{+}$	$\surd$	1	0	$\times$	-	-
N49.9.798 $\mathrm{S1}^{-}\oplus\mathrm{X2}^{+}\oplus\mathrm{Y2}^{-}$	$\times$	-	-	-	-	-
N49.9.799 $\mathrm{S1}^{-}\oplus\mathrm{X2}^{+}\oplus\mathrm{Y3}^{+}$	$\times$	-	-	-	-	-
N49.9.800 $\mathrm{S1}^{-}\oplus\mathrm{X4}^{-}\oplus\mathrm{X2}^{-}$	$\surd$	1	0	$\times$	-	-
N49.9.801 $\mathrm{S1}^{-}\oplus\mathrm{X4}^{-}\oplus\mathrm{X4}^{+}$	$\surd$	1	1	$\times$	-	-
N49.9.802 $\mathrm{S1}^{-}\oplus\mathrm{X4}^{-}\oplus\mathrm{Y2}^{-}$	$\times$	-	-	-	-	-
N49.9.803 $\mathrm{S1}^{-}\oplus\mathrm{X4}^{-}\oplus\mathrm{Y3}^{+}$	$\times$	-	-	-	-	-
N49.9.804 $\mathrm{S1}^{-}\oplus\mathrm{X2}^{-}\oplus\mathrm{X2}^{-}$	$\surd$	1	0	$\times$	-	-
N49.9.805 $\mathrm{S1}^{-}\oplus\mathrm{X2}^{-}\oplus\mathrm{X4}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N49.9.806 $\mathrm{S1}^{-}\oplus\mathrm{X2}^{-}\oplus\mathrm{Y2}^{-}$	$\times$	-	-	-	-	-
N49.9.807 $\mathrm{S1}^{-}\oplus\mathrm{X2}^{-}\oplus\mathrm{Y3}^{+}$	$\times$	-	-	-	-	-
N49.9.808 $\mathrm{S1}^{-}\oplus\mathrm{X4}^{+}\oplus\mathrm{X4}^{+}$	$\surd$	1	0	$\times$	-	-
N49.9.809 $\mathrm{S1}^{-}\oplus\mathrm{X4}^{+}\oplus\mathrm{Y3}^{+}$	$\times$	-	-	-	-	-
N49.9.810 $\mathrm{X1}^{+}\oplus\mathrm{X1}^{+}\oplus\mathrm{X1}^{+}$	$\surd$	0	0	$\surd$	-	-

Non-coplanar SSGs with parent space group $Pccm$ (No. 49) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N49.9.811 $\mathrm{X1}^+ \oplus \mathrm{X1}^+ \oplus \mathrm{X3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B3_u}$
N49.9.812 $\mathrm{X1}^+ \oplus \mathrm{X1}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	0	$\times$	-	-
N49.9.813 $\mathrm{X1}^+ \oplus \mathrm{X3}^- \oplus \mathrm{Y1}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N49.9.814 $\mathrm{X1}^+ \oplus \mathrm{X1}^+ \oplus \mathrm{X1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u}$
N49.9.815 $\mathrm{X1}^+ \oplus \mathrm{X1}^+ \oplus \mathrm{X3}^+$	$\surd$	0	0	$\surd$	-	-
N49.9.816 $\mathrm{X1}^+ \oplus \mathrm{X1}^+ \oplus \mathrm{Y1}^-$	$\surd$	1	0	$\times$	-	-
N49.9.817 $\mathrm{X1}^+ \oplus \mathrm{X3}^- \oplus \mathrm{X1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u}$
N49.9.818 $\mathrm{X1}^+ \oplus \mathrm{X3}^- \oplus \mathrm{Y1}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N49.9.819 $\mathrm{X1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{X1}^-$	$\surd$	1	1	$\times$	-	-
N49.9.820 $\mathrm{X1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{X3}^+$	$\surd$	1	0	$\times$	-	-
N49.9.821 $\mathrm{X1}^+ \oplus \mathrm{X1}^+ \oplus \mathrm{X2}^+$	$\surd$	0	0	$\surd$	-	-
N49.9.822 $\mathrm{X1}^+ \oplus \mathrm{X1}^+ \oplus \mathrm{X4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_u} \oplus \mathrm{B2_u}$
N49.9.823 $\mathrm{X1}^+ \oplus \mathrm{X1}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N49.9.824 $\mathrm{X1}^+ \oplus \mathrm{X3}^- \oplus \mathrm{X2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_u}$
N49.9.825 $\mathrm{X1}^+ \oplus \mathrm{X3}^- \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N49.9.826 $\mathrm{X1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{X2}^+$	$\surd$	1	0	$\times$	-	-
N49.9.827 $\mathrm{X1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{X4}^-$	$\surd$	1	1	$\times$	-	-
N49.9.828 $\mathrm{X1}^+ \oplus \mathrm{X1}^+ \oplus \mathrm{X2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N49.9.829 $\mathrm{X1}^+ \oplus \mathrm{X1}^+ \oplus \mathrm{X4}^+$	$\surd$	0	0	$\surd$	-	-
N49.9.830 $\mathrm{X1}^+ \oplus \mathrm{X1}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N49.9.831 $\mathrm{X1}^+ \oplus \mathrm{X3}^- \oplus \mathrm{X2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u}$
N49.9.832 $\mathrm{X1}^+ \oplus \mathrm{X3}^- \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N49.9.833 $\mathrm{X1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{X2}^-$	$\surd$	1	1	$\times$	-	-
N49.9.834 $\mathrm{X1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{X4}^+$	$\surd$	1	0	$\times$	-	-
N49.9.835 $\mathrm{X1}^+ \oplus \mathrm{X1}^- \oplus \mathrm{X1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u}$
N49.9.836 $\mathrm{X1}^+ \oplus \mathrm{X1}^- \oplus \mathrm{X3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u}$
N49.9.837 $\mathrm{X1}^+ \oplus \mathrm{X1}^- \oplus \mathrm{Y1}^-$	$\surd$	1	1	$\times$	-	-
N49.9.838 $\mathrm{X1}^+ \oplus \mathrm{X3}^+ \oplus \mathrm{X3}^+$	$\surd$	0	0	$\surd$	-	-
N49.9.839 $\mathrm{X1}^+ \oplus \mathrm{X3}^+ \oplus \mathrm{Y1}^-$	$\surd$	1	0	$\times$	-	-
N49.9.840 $\mathrm{X1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y1}^-$	$\surd$	1	0	$\times$	-	-
N49.9.841 $\mathrm{X1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N49.9.842 $\mathrm{X1}^+ \oplus \mathrm{X1}^- \oplus \mathrm{X2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u}$
N49.9.843 $\mathrm{X1}^+ \oplus \mathrm{X1}^- \oplus \mathrm{X4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B2_u}$
N49.9.844 $\mathrm{X1}^+ \oplus \mathrm{X1}^- \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\times$	-	-
N49.9.845 $\mathrm{X1}^+ \oplus \mathrm{X3}^+ \oplus \mathrm{X2}^+$	$\surd$	0	0	$\surd$	-	-
N49.9.846 $\mathrm{X1}^+ \oplus \mathrm{X3}^+ \oplus \mathrm{X4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N49.9.847 $\mathrm{X1}^+ \oplus \mathrm{X3}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N49.9.848 $\mathrm{X1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{X2}^+$	$\surd$	1	0	$\times$	-	-
N49.9.849 $\mathrm{X1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{X4}^-$	$\surd$	1	1	$\times$	-	-
N49.9.850 $\mathrm{X1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\times$	-	-
N49.9.851 $\mathrm{X1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N49.9.852 $\mathrm{X1}^+ \oplus \mathrm{X1}^- \oplus \mathrm{X2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u}$
N49.9.853 $\mathrm{X1}^+ \oplus \mathrm{X1}^- \oplus \mathrm{X4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B2_u}$
N49.9.854 $\mathrm{X1}^+ \oplus \mathrm{X1}^- \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\times$	-	-
N49.9.855 $\mathrm{X1}^+ \oplus \mathrm{X3}^+ \oplus \mathrm{X2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N49.9.856 $\mathrm{X1}^+ \oplus \mathrm{X3}^+ \oplus \mathrm{X4}^+$	$\surd$	0	0	$\surd$	-	-

Non-coplanar SSGs with parent space group $Pccm$ (No. 49) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N49.9.857 $\mathrm{X1}^+ \oplus \mathrm{X3}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N49.9.858 $\mathrm{X1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{X2}^-$	$\surd$	1	1	$\times$	-	-
N49.9.859 $\mathrm{X1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{X4}^+$	$\surd$	1	0	$\times$	-	-
N49.9.860 $\mathrm{X1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N49.9.861 $\mathrm{X1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\times$	-	-
N49.9.862 $\mathrm{X1}^+ \oplus \mathrm{X2}^+ \oplus \mathrm{X2}^+$	$\surd$	0	0	$\surd$	-	-
N49.9.863 $\mathrm{X1}^+ \oplus \mathrm{X2}^+ \oplus \mathrm{X4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_u}$
N49.9.864 $\mathrm{X1}^+ \oplus \mathrm{X2}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N49.9.865 $\mathrm{X1}^+ \oplus \mathrm{X4}^- \oplus \mathrm{X4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_u} \oplus \mathrm{B2_u}$
N49.9.866 $\mathrm{X1}^+ \oplus \mathrm{X4}^- \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\times$	-	-
N49.9.867 $\mathrm{X1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N49.9.868 $\mathrm{X1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N49.9.869 $\mathrm{X1}^+ \oplus \mathrm{X2}^+ \oplus \mathrm{X2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u}$
N49.9.870 $\mathrm{X1}^+ \oplus \mathrm{X2}^+ \oplus \mathrm{X4}^+$	$\surd$	0	0	$\surd$	-	-
N49.9.871 $\mathrm{X1}^+ \oplus \mathrm{X2}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N49.9.872 $\mathrm{X1}^+ \oplus \mathrm{X4}^- \oplus \mathrm{X2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N49.9.873 $\mathrm{X1}^+ \oplus \mathrm{X4}^- \oplus \mathrm{X4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B2_u}$
N49.9.874 $\mathrm{X1}^+ \oplus \mathrm{X4}^- \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\times$	-	-
N49.9.875 $\mathrm{X1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{X2}^-$	$\surd$	1	1	$\times$	-	-
N49.9.876 $\mathrm{X1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{X4}^+$	$\surd$	1	0	$\times$	-	-
N49.9.877 $\mathrm{X1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\times$	-	-
N49.9.878 $\mathrm{X1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N49.9.879 $\mathrm{X1}^+ \oplus \mathrm{X2}^- \oplus \mathrm{X2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N49.9.880 $\mathrm{X1}^+ \oplus \mathrm{X2}^- \oplus \mathrm{X4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u}$
N49.9.881 $\mathrm{X1}^+ \oplus \mathrm{X2}^- \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\times$	-	-
N49.9.882 $\mathrm{X1}^+ \oplus \mathrm{X4}^+ \oplus \mathrm{X4}^+$	$\surd$	0	0	$\surd$	-	-
N49.9.883 $\mathrm{X1}^+ \oplus \mathrm{X4}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N49.9.884 $\mathrm{X1}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N49.9.885 $\mathrm{X1}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N49.9.886 $\mathrm{X1}^- \oplus \mathrm{X1}^- \oplus \mathrm{X1}^-$	$\surd$	0	0	$\surd$	-	-
N49.9.887 $\mathrm{X1}^- \oplus \mathrm{X1}^- \oplus \mathrm{X3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B3_u}$
N49.9.888 $\mathrm{X1}^- \oplus \mathrm{X1}^- \oplus \mathrm{Y1}^-$	$\surd$	1	0	$\times$	-	-
N49.9.889 $\mathrm{X1}^- \oplus \mathrm{X3}^+ \oplus \mathrm{Y1}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N49.9.890 $\mathrm{X1}^- \oplus \mathrm{X1}^- \oplus \mathrm{X2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N49.9.891 $\mathrm{X1}^- \oplus \mathrm{X1}^- \oplus \mathrm{X4}^-$	$\surd$	0	0	$\surd$	-	-
N49.9.892 $\mathrm{X1}^- \oplus \mathrm{X1}^- \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N49.9.893 $\mathrm{X1}^- \oplus \mathrm{X3}^+ \oplus \mathrm{X2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u}$
N49.9.894 $\mathrm{X1}^- \oplus \mathrm{X3}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N49.9.895 $\mathrm{X1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{X2}^+$	$\surd$	1	1	$\times$	-	-
N49.9.896 $\mathrm{X1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{X4}^-$	$\surd$	1	0	$\times$	-	-
N49.9.897 $\mathrm{X1}^- \oplus \mathrm{X1}^- \oplus \mathrm{X2}^-$	$\surd$	0	0	$\surd$	-	-
N49.9.898 $\mathrm{X1}^- \oplus \mathrm{X1}^- \oplus \mathrm{X4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_u} \oplus \mathrm{B2_u}$
N49.9.899 $\mathrm{X1}^- \oplus \mathrm{X1}^- \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N49.9.900 $\mathrm{X1}^- \oplus \mathrm{X3}^+ \oplus \mathrm{X2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_u}$
N49.9.901 $\mathrm{X1}^- \oplus \mathrm{X3}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N49.9.902 $\mathrm{X1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{X2}^-$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $Pccm$ (No. 49) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N49.9.903 $\mathrm{X1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{X4}^+$	$\surd$	1	1	$\times$	-	-
N49.9.904 $\mathrm{X1}^- \oplus \mathrm{X2}^+ \oplus \mathrm{X2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N49.9.905 $\mathrm{X1}^- \oplus \mathrm{X2}^+ \oplus \mathrm{X4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u}$
N49.9.906 $\mathrm{X1}^- \oplus \mathrm{X2}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\times$	-	-
N49.9.907 $\mathrm{X1}^- \oplus \mathrm{X4}^- \oplus \mathrm{X4}^-$	$\surd$	0	0	$\surd$	-	-
N49.9.908 $\mathrm{X1}^- \oplus \mathrm{X4}^- \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N49.9.909 $\mathrm{X1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N49.9.910 $\mathrm{X1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N49.9.911 $\mathrm{X1}^- \oplus \mathrm{X2}^+ \oplus \mathrm{X2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u}$
N49.9.912 $\mathrm{X1}^- \oplus \mathrm{X2}^+ \oplus \mathrm{X4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N49.9.913 $\mathrm{X1}^- \oplus \mathrm{X2}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\times$	-	-
N49.9.914 $\mathrm{X1}^- \oplus \mathrm{X4}^- \oplus \mathrm{X2}^-$	$\surd$	0	0	$\surd$	-	-
N49.9.915 $\mathrm{X1}^- \oplus \mathrm{X4}^- \oplus \mathrm{X4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B2_u}$
N49.9.916 $\mathrm{X1}^- \oplus \mathrm{X4}^- \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N49.9.917 $\mathrm{X1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{X2}^-$	$\surd$	1	0	$\times$	-	-
N49.9.918 $\mathrm{X1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{X4}^+$	$\surd$	1	1	$\times$	-	-
N49.9.919 $\mathrm{X1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\times$	-	-
N49.9.920 $\mathrm{X1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N49.9.921 $\mathrm{X1}^- \oplus \mathrm{X2}^- \oplus \mathrm{X2}^-$	$\surd$	0	0	$\surd$	-	-
N49.9.922 $\mathrm{X1}^- \oplus \mathrm{X2}^- \oplus \mathrm{X4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_u}$
N49.9.923 $\mathrm{X1}^- \oplus \mathrm{X2}^- \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N49.9.924 $\mathrm{X1}^- \oplus \mathrm{X4}^+ \oplus \mathrm{X4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_u} \oplus \mathrm{B2_u}$
N49.9.925 $\mathrm{X1}^- \oplus \mathrm{X4}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\times$	-	-
N49.9.926 $\mathrm{X1}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N49.9.927 $\mathrm{X1}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N49.9.928 $\mathrm{X2}^+ \oplus \mathrm{X2}^+ \oplus \mathrm{X2}^+$	$\surd$	0	0	$\surd$	-	-
N49.9.929 $\mathrm{X2}^+ \oplus \mathrm{X2}^+ \oplus \mathrm{X4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B3_u}$
N49.9.930 $\mathrm{X2}^+ \oplus \mathrm{X2}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N49.9.931 $\mathrm{X2}^+ \oplus \mathrm{X4}^- \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N49.9.932 $\mathrm{X2}^+ \oplus \mathrm{X2}^+ \oplus \mathrm{X2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u}$
N49.9.933 $\mathrm{X2}^+ \oplus \mathrm{X2}^+ \oplus \mathrm{X4}^+$	$\surd$	0	0	$\surd$	-	-
N49.9.934 $\mathrm{X2}^+ \oplus \mathrm{X2}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N49.9.935 $\mathrm{X2}^+ \oplus \mathrm{X4}^- \oplus \mathrm{X2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u}$
N49.9.936 $\mathrm{X2}^+ \oplus \mathrm{X4}^- \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N49.9.937 $\mathrm{X2}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{X2}^-$	$\surd$	1	1	$\times$	-	-
N49.9.938 $\mathrm{X2}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{X4}^+$	$\surd$	1	0	$\times$	-	-
N49.9.939 $\mathrm{X2}^+ \oplus \mathrm{X2}^- \oplus \mathrm{X2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u}$
N49.9.940 $\mathrm{X2}^+ \oplus \mathrm{X2}^- \oplus \mathrm{X4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u}$
N49.9.941 $\mathrm{X2}^+ \oplus \mathrm{X2}^- \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\times$	-	-
N49.9.942 $\mathrm{X2}^+ \oplus \mathrm{X4}^+ \oplus \mathrm{X4}^+$	$\surd$	0	0	$\surd$	-	-
N49.9.943 $\mathrm{X2}^+ \oplus \mathrm{X4}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N49.9.944 $\mathrm{X2}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N49.9.945 $\mathrm{X2}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N49.9.946 $\mathrm{X2}^- \oplus \mathrm{X2}^- \oplus \mathrm{X2}^-$	$\surd$	0	0	$\surd$	-	-
N49.9.947 $\mathrm{X2}^- \oplus \mathrm{X2}^- \oplus \mathrm{X4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B3_u}$
N49.9.948 $\mathrm{X2}^- \oplus \mathrm{X2}^- \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $Pccm$ (No. 49) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N49.9.949 $\mathrm{X2^-} \oplus \mathrm{X4^+} \oplus \mathrm{Y2^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N49.12.1 $\mathrm{GM1^-} \oplus \mathrm{R1}$	$\surd$	1	1	$\times$	-	-
N49.12.2 $\mathrm{GM1^-} \oplus \mathrm{T1}$	$\surd$	1	1	$\times$	-	-
N49.12.3 $\mathrm{GM1^-} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N49.12.4 $\mathrm{GM1^-} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N49.12.5 $\mathrm{GM2^+} \oplus \mathrm{R1}$	$\surd$	1	1	$\times$	-	-
N49.12.6 $\mathrm{GM2^+} \oplus \mathrm{T1}$	$\surd$	1	1	$\times$	-	-
N49.12.7 $\mathrm{GM2^+} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	222	B1
N49.12.8 $\mathrm{GM2^+} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	222	B1
N49.12.9 $\mathrm{GM2^-} \oplus \mathrm{R1}$	$\surd$	1	1	$\times$	-	-
N49.12.10 $\mathrm{GM2^-} \oplus \mathrm{T1}$	$\surd$	1	1	$\times$	-	-
N49.12.11 $\mathrm{GM2^-} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N49.12.12 $\mathrm{GM2^-} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N49.12.13 $\mathrm{GM3^+} \oplus \mathrm{R1}$	$\surd$	1	1	$\times$	-	-
N49.12.14 $\mathrm{GM3^+} \oplus \mathrm{T1}$	$\surd$	1	1	$\times$	-	-
N49.12.15 $\mathrm{GM3^+} \oplus \mathrm{U1}$	$\surd$	1	1	$\times$	-	-
N49.12.16 $\mathrm{GM3^+} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$mm2$	B2
N49.12.17 $\mathrm{GM3^+} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	$mm2$	B2
N49.12.18 $\mathrm{GM3^-} \oplus \mathrm{R1}$	$\surd$	1	1	$\times$	-	-
N49.12.19 $\mathrm{GM3^-} \oplus \mathrm{T1}$	$\surd$	1	1	$\times$	-	-
N49.12.20 $\mathrm{GM3^-} \oplus \mathrm{U1}$	$\surd$	1	1	$\times$	-	-
N49.12.21 $\mathrm{GM3^-} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N49.12.22 $\mathrm{GM3^-} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N49.12.23 $\mathrm{S1^+} \oplus \mathrm{R1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N49.12.24 $\mathrm{S1^+} \oplus \mathrm{R2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N49.12.25 $\mathrm{S1^+} \oplus \mathrm{T1}$	$\surd$	1	1	$\times$	-	-
N49.12.26 $\mathrm{S1^+} \oplus \mathrm{T2}$	$\surd$	1	1	$\times$	-	-
N49.12.27 $\mathrm{S1^+} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N49.12.28 $\mathrm{S1^+} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N49.12.29 $\mathrm{S1^-} \oplus \mathrm{R1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N49.12.30 $\mathrm{S1^-} \oplus \mathrm{R2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N49.12.31 $\mathrm{S1^-} \oplus \mathrm{T1}$	$\surd$	1	1	$\times$	-	-
N49.12.32 $\mathrm{S1^-} \oplus \mathrm{T2}$	$\surd$	1	1	$\times$	-	-
N49.12.33 $\mathrm{S1^-} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N49.12.34 $\mathrm{S1^-} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N49.12.35 $\mathrm{X1^+} \oplus \mathrm{R1}$	$\surd$	1	1	$\times$	-	-
N49.12.36 $\mathrm{X1^+} \oplus \mathrm{T1}$	$\surd$	1	1	$\times$	-	-
N49.12.37 $\mathrm{X1^+} \oplus \mathrm{U1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N49.12.38 $\mathrm{X1^+} \oplus \mathrm{U2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N49.12.39 $\mathrm{X1^+} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N49.12.40 $\mathrm{X1^+} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N49.12.41 $\mathrm{X1^-} \oplus \mathrm{R1}$	$\surd$	1	1	$\times$	-	-
N49.12.42 $\mathrm{X1^-} \oplus \mathrm{T1}$	$\surd$	1	1	$\times$	-	-
N49.12.43 $\mathrm{X1^-} \oplus \mathrm{U1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N49.12.44 $\mathrm{X1^-} \oplus \mathrm{U2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N49.12.45 $\mathrm{X1^-} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$

Non-coplanar SSGs with parent space group $Pccm$ (No. 49) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N49.12.46 $\mathrm{X1^-} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N49.12.47 $\mathrm{X2^+} \oplus \mathrm{R1}$	$\surd$	1	1	$\times$	-	-
N49.12.48 $\mathrm{X2^+} \oplus \mathrm{T1}$	$\surd$	1	1	$\times$	-	-
N49.12.49 $\mathrm{X2^+} \oplus \mathrm{U1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N49.12.50 $\mathrm{X2^+} \oplus \mathrm{U2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N49.12.51 $\mathrm{X2^+} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N49.12.52 $\mathrm{X2^+} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N49.12.53 $\mathrm{X2^-} \oplus \mathrm{R1}$	$\surd$	1	1	$\times$	-	-
N49.12.54 $\mathrm{X2^-} \oplus \mathrm{T1}$	$\surd$	1	1	$\times$	-	-
N49.12.55 $\mathrm{X2^-} \oplus \mathrm{U1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N49.12.56 $\mathrm{X2^-} \oplus \mathrm{U2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N49.12.57 $\mathrm{X2^-} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N49.12.58 $\mathrm{X2^-} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N49.14.1 $\mathrm{GM1^-} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N49.14.2 $\mathrm{GM1^-} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N49.14.3 $\mathrm{GM1^-} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N49.14.4 $\mathrm{GM1^-} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N49.14.5 $\mathrm{GM1^-} \oplus \mathrm{C1}$	$\surd$	1	1	$\times$	-	-
N49.14.6 $\mathrm{GM1^-} \oplus \mathrm{C2}$	$\surd$	1	1	$\times$	-	-
N49.14.7 $\mathrm{GM1^-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N49.14.8 $\mathrm{GM1^-} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N49.14.9 $\mathrm{GM1^-} \oplus \mathrm{G1}$	$\surd$	1	1	$\times$	-	-
N49.14.10 $\mathrm{GM1^-} \oplus \mathrm{Q1}$	$\surd$	1	1	$\times$	-	-
N49.14.11 $\mathrm{GM2^+} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	$mm2$	B2
N49.14.12 $\mathrm{GM2^+} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	$mm2$	B2
N49.14.13 $\mathrm{GM2^+} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	$mm2$	B2
N49.14.14 $\mathrm{GM2^+} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	$mm2$	B2
N49.14.15 $\mathrm{GM2^+} \oplus \mathrm{C1}$	$\surd$	1	1	$\times$	-	-
N49.14.16 $\mathrm{GM2^+} \oplus \mathrm{C2}$	$\surd$	1	1	$\times$	-	-
N49.14.17 $\mathrm{GM2^+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	222	B1
N49.14.18 $\mathrm{GM2^+} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	222	B1
N49.14.19 $\mathrm{GM2^+} \oplus \mathrm{G1}$	$\surd$	1	1	$\times$	-	-
N49.14.20 $\mathrm{GM2^+} \oplus \mathrm{Q1}$	$\surd$	1	1	$\times$	-	-
N49.14.21 $\mathrm{GM2^-} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N49.14.22 $\mathrm{GM2^-} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N49.14.23 $\mathrm{GM2^-} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N49.14.24 $\mathrm{GM2^-} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N49.14.25 $\mathrm{GM2^-} \oplus \mathrm{C1}$	$\surd$	1	1	$\times$	-	-
N49.14.26 $\mathrm{GM2^-} \oplus \mathrm{C2}$	$\surd$	1	1	$\times$	-	-
N49.14.27 $\mathrm{GM2^-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N49.14.28 $\mathrm{GM2^-} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N49.14.29 $\mathrm{GM2^-} \oplus \mathrm{G1}$	$\surd$	1	1	$\times$	-	-
N49.14.30 $\mathrm{GM2^-} \oplus \mathrm{Q1}$	$\surd$	1	1	$\times$	-	-
N49.14.31 $\mathrm{GM3^+} \oplus \mathrm{SM1}$	$\surd$	1	1	$\surd$	222	B3
N49.14.32 $\mathrm{GM3^+} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	$mm2$	B2
N49.14.33 $\mathrm{GM3^+} \oplus \mathrm{SM2}$	$\surd$	1	1	$\surd$	222	B3

Non-coplanar SSGs with parent space group $Pccm$ (No. 49) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N49.14.34 GM3$^+$ ⊕ DT2	√	1	1	√	$mm2$	B2
N49.14.35 GM3$^+$ ⊕ SM3	√	1	1	√	222	B3
N49.14.36 GM3$^+$ ⊕ DT3	√	1	1	√	$mm2$	B2
N49.14.37 GM3$^+$ ⊕ SM4	√	1	1	√	222	B3
N49.14.38 GM3$^+$ ⊕ DT4	√	1	1	√	$mm2$	B2
N49.14.39 GM3$^+$ ⊕ C1	√	1	1	×	-	-
N49.14.40 GM3$^+$ ⊕ D1	√	1	1	×	-	-
N49.14.41 GM3$^+$ ⊕ C2	√	1	1	×	-	-
N49.14.42 GM3$^+$ ⊕ D2	√	1	1	×	-	-
N49.14.43 GM3$^+$ ⊕ LD1	√	1	1	√	$mm2$	B2
N49.14.44 GM3$^+$ ⊕ LD3	√	1	1	√	$mm2$	B2
N49.14.45 GM3$^+$ ⊕ H1	√	1	1	×	-	-
N49.14.46 GM3$^+$ ⊕ G1	√	1	1	×	-	-
N49.14.47 GM3$^+$ ⊕ Q1	√	1	1	×	-	-
N49.14.48 GM3$^-$ ⊕ SM1	√	1	1	√	mmm	$\mathrm{B3_u}$
N49.14.49 GM3$^-$ ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N49.14.50 GM3$^-$ ⊕ SM2	√	1	1	√	mmm	$\mathrm{B3_u}$
N49.14.51 GM3$^-$ ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
N49.14.52 GM3$^-$ ⊕ SM3	√	1	1	√	mmm	$\mathrm{B3_u}$
N49.14.53 GM3$^-$ ⊕ DT3	√	1	1	√	mmm	$\mathrm{B2_u}$
N49.14.54 GM3$^-$ ⊕ SM4	√	1	1	√	mmm	$\mathrm{B3_u}$
N49.14.55 GM3$^-$ ⊕ DT4	√	1	1	√	mmm	$\mathrm{B2_u}$
N49.14.56 GM3$^-$ ⊕ C1	√	1	1	×	-	-
N49.14.57 GM3$^-$ ⊕ D1	√	1	1	×	-	-
N49.14.58 GM3$^-$ ⊕ C2	√	1	1	×	-	-
N49.14.59 GM3$^-$ ⊕ D2	√	1	1	×	-	-
N49.14.60 GM3$^-$ ⊕ LD1	√	1	1	√	mmm	$\mathrm{B1_u}$
N49.14.61 GM3$^-$ ⊕ LD3	√	1	1	√	mmm	$\mathrm{B1_u}$
N49.14.62 GM3$^-$ ⊕ H1	√	1	1	×	-	-
N49.14.63 GM3$^-$ ⊕ G1	√	1	1	×	-	-
N49.14.64 GM3$^-$ ⊕ Q1	√	1	1	×	-	-
N49.14.65 S1$^+$ ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N49.14.66 S1$^+$ ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
N49.14.67 S1$^+$ ⊕ DT3	√	1	1	√	mmm	$\mathrm{B2_u}$
N49.14.68 S1$^+$ ⊕ DT4	√	1	1	√	mmm	$\mathrm{B2_u}$
N49.14.69 S1$^+$ ⊕ C1	√	1	1	√	mmm	$\mathrm{B3_u}$
N49.14.70 S1$^+$ ⊕ C4	√	1	1	√	mmm	$\mathrm{B3_u}$
N49.14.71 S1$^+$ ⊕ C2	√	1	1	√	mmm	$\mathrm{B3_u}$
N49.14.72 S1$^+$ ⊕ C3	√	1	1	√	mmm	$\mathrm{B3_u}$
N49.14.73 S1$^+$ ⊕ LD1	√	1	1	√	mmm	$\mathrm{B1_u}$
N49.14.74 S1$^+$ ⊕ LD3	√	1	1	√	mmm	$\mathrm{B1_u}$
N49.14.75 S1$^+$ ⊕ G1	√	1	1	×	-	-
N49.14.76 S1$^+$ ⊕ G3	√	1	1	×	-	-
N49.14.77 S1$^+$ ⊕ Q1	√	1	1	√	mmm	$\mathrm{B1_u}$
N49.14.78 S1$^+$ ⊕ Q3	√	1	1	√	mmm	$\mathrm{B1_u}$
N49.14.79 S1$^-$ ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$

Non-coplanar SSGs with parent space group $Pccm$ (No. 49) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N49.14.80 $\mathrm{S1}^{-} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N49.14.81 $\mathrm{S1}^{-} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N49.14.82 $\mathrm{S1}^{-} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N49.14.83 $\mathrm{S1}^{-} \oplus \mathrm{C1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N49.14.84 $\mathrm{S1}^{-} \oplus \mathrm{C4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N49.14.85 $\mathrm{S1}^{-} \oplus \mathrm{C2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N49.14.86 $\mathrm{S1}^{-} \oplus \mathrm{C3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N49.14.87 $\mathrm{S1}^{-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N49.14.88 $\mathrm{S1}^{-} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N49.14.89 $\mathrm{S1}^{-} \oplus \mathrm{G1}$	$\surd$	1	1	$\times$	-	-
N49.14.90 $\mathrm{S1}^{-} \oplus \mathrm{G3}$	$\surd$	1	1	$\times$	-	-
N49.14.91 $\mathrm{S1}^{-} \oplus \mathrm{Q1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N49.14.92 $\mathrm{S1}^{-} \oplus \mathrm{Q3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N49.14.93 $\mathrm{X1}^{+} \oplus \mathrm{SM1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N49.14.94 $\mathrm{X1}^{+} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N49.14.95 $\mathrm{X1}^{+} \oplus \mathrm{SM2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N49.14.96 $\mathrm{X1}^{+} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N49.14.97 $\mathrm{X1}^{+} \oplus \mathrm{SM3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N49.14.98 $\mathrm{X1}^{+} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N49.14.99 $\mathrm{X1}^{+} \oplus \mathrm{SM4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N49.14.100 $\mathrm{X1}^{+} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N49.14.101 $\mathrm{X1}^{+} \oplus \mathrm{C1}$	$\surd$	1	1	$\times$	-	-
N49.14.102 $\mathrm{X1}^{+} \oplus \mathrm{D1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N49.14.103 $\mathrm{X1}^{+} \oplus \mathrm{D4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N49.14.104 $\mathrm{X1}^{+} \oplus \mathrm{C2}$	$\surd$	1	1	$\times$	-	-
N49.14.105 $\mathrm{X1}^{+} \oplus \mathrm{D2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N49.14.106 $\mathrm{X1}^{+} \oplus \mathrm{D3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N49.14.107 $\mathrm{X1}^{+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N49.14.108 $\mathrm{X1}^{+} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N49.14.109 $\mathrm{X1}^{+} \oplus \mathrm{H1}$	$\surd$	1	1	$\times$	-	-
N49.14.110 $\mathrm{X1}^{+} \oplus \mathrm{G1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N49.14.111 $\mathrm{X1}^{+} \oplus \mathrm{G3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N49.14.112 $\mathrm{X1}^{+} \oplus \mathrm{Q1}$	$\surd$	1	1	$\times$	-	-
N49.14.113 $\mathrm{X1}^{-} \oplus \mathrm{SM1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N49.14.114 $\mathrm{X1}^{-} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N49.14.115 $\mathrm{X1}^{-} \oplus \mathrm{SM2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N49.14.116 $\mathrm{X1}^{-} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N49.14.117 $\mathrm{X1}^{-} \oplus \mathrm{SM3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N49.14.118 $\mathrm{X1}^{-} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N49.14.119 $\mathrm{X1}^{-} \oplus \mathrm{SM4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N49.14.120 $\mathrm{X1}^{-} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N49.14.121 $\mathrm{X1}^{-} \oplus \mathrm{C1}$	$\surd$	1	1	$\times$	-	-
N49.14.122 $\mathrm{X1}^{-} \oplus \mathrm{D1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N49.14.123 $\mathrm{X1}^{-} \oplus \mathrm{D4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N49.14.124 $\mathrm{X1}^{-} \oplus \mathrm{C2}$	$\surd$	1	1	$\times$	-	-
N49.14.125 $\mathrm{X1}^{-} \oplus \mathrm{D2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$

Non-coplanar SSGs with parent space group $Pccm$ (No. 49) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N49.14.126 $\mathrm{X1}^{-} \oplus \mathrm{D3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N49.14.127 $\mathrm{X1}^{-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N49.14.128 $\mathrm{X1}^{-} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N49.14.129 $\mathrm{X1}^{-} \oplus \mathrm{H1}$	$\surd$	1	1	$\times$	-	-
N49.14.130 $\mathrm{X1}^{-} \oplus \mathrm{G1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N49.14.131 $\mathrm{X1}^{-} \oplus \mathrm{G3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N49.14.132 $\mathrm{X1}^{-} \oplus \mathrm{Q1}$	$\surd$	1	1	$\times$	-	-
N49.14.133 $\mathrm{X2}^{+} \oplus \mathrm{SM1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N49.14.134 $\mathrm{X2}^{+} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N49.14.135 $\mathrm{X2}^{+} \oplus \mathrm{SM2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N49.14.136 $\mathrm{X2}^{+} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N49.14.137 $\mathrm{X2}^{+} \oplus \mathrm{SM3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N49.14.138 $\mathrm{X2}^{+} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N49.14.139 $\mathrm{X2}^{+} \oplus \mathrm{SM4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N49.14.140 $\mathrm{X2}^{+} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N49.14.141 $\mathrm{X2}^{+} \oplus \mathrm{C1}$	$\surd$	1	1	$\times$	-	-
N49.14.142 $\mathrm{X2}^{+} \oplus \mathrm{D1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N49.14.143 $\mathrm{X2}^{+} \oplus \mathrm{D4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N49.14.144 $\mathrm{X2}^{+} \oplus \mathrm{C2}$	$\surd$	1	1	$\times$	-	-
N49.14.145 $\mathrm{X2}^{+} \oplus \mathrm{D2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N49.14.146 $\mathrm{X2}^{+} \oplus \mathrm{D3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N49.14.147 $\mathrm{X2}^{+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N49.14.148 $\mathrm{X2}^{+} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N49.14.149 $\mathrm{X2}^{+} \oplus \mathrm{H1}$	$\surd$	1	1	$\times$	-	-
N49.14.150 $\mathrm{X2}^{+} \oplus \mathrm{G1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N49.14.151 $\mathrm{X2}^{+} \oplus \mathrm{G3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N49.14.152 $\mathrm{X2}^{+} \oplus \mathrm{Q1}$	$\surd$	1	1	$\times$	-	-
N49.14.153 $\mathrm{X2}^{-} \oplus \mathrm{SM1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N49.14.154 $\mathrm{X2}^{-} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N49.14.155 $\mathrm{X2}^{-} \oplus \mathrm{SM2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N49.14.156 $\mathrm{X2}^{-} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N49.14.157 $\mathrm{X2}^{-} \oplus \mathrm{SM3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N49.14.158 $\mathrm{X2}^{-} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N49.14.159 $\mathrm{X2}^{-} \oplus \mathrm{SM4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N49.14.160 $\mathrm{X2}^{-} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N49.14.161 $\mathrm{X2}^{-} \oplus \mathrm{C1}$	$\surd$	1	1	$\times$	-	-
N49.14.162 $\mathrm{X2}^{-} \oplus \mathrm{D1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N49.14.163 $\mathrm{X2}^{-} \oplus \mathrm{D4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N49.14.164 $\mathrm{X2}^{-} \oplus \mathrm{C2}$	$\surd$	1	1	$\times$	-	-
N49.14.165 $\mathrm{X2}^{-} \oplus \mathrm{D2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N49.14.166 $\mathrm{X2}^{-} \oplus \mathrm{D3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N49.14.167 $\mathrm{X2}^{-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N49.14.168 $\mathrm{X2}^{-} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N49.14.169 $\mathrm{X2}^{-} \oplus \mathrm{H1}$	$\surd$	1	1	$\times$	-	-
N49.14.170 $\mathrm{X2}^{-} \oplus \mathrm{G1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N49.14.171 $\mathrm{X2}^{-} \oplus \mathrm{G3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$

Non-coplanar SSGs with parent space group $Pccm$ (No. 49) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N49.14.172 X2$^-$ $\oplus$ Q1	$\surd$	1	1	$\times$	-	-

TABLE S148: Collinear SSGs with parent space group $Pban$ (No. 50).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L50.1.1 GM1$^+$	1	mmm	$\mathrm{A_g}$
L50.2.1 GM1$^-$	0	-	-
L50.2.2 GM2$^+$	1	mmm	$\mathrm{B1_g}$
L50.2.3 GM2$^-$	0	-	-
L50.2.4 GM3$^+$	1	mmm	$\mathrm{B3_g}$
L50.2.5 GM3$^-$	0	-	-
L50.2.6 Z1$^+$	0	-	-
L50.2.7 Z1$^-$	0	-	-
L50.2.8 Z3$^+$	0	-	-

TABLE S149: Coplanar SSGs with parent space group $Pban$ (No. 50).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P50.1.1 GM1$^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
P50.2.1 GM1$^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
P50.2.2 GM2$^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
P50.2.3 GM2$^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
P50.2.4 GM3$^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g}$
P50.2.5 GM3$^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u}$
P50.2.6 Z1$^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P50.2.7 Z1$^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P50.2.8 Z3$^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P50.3.1 GM1$^-$ $\oplus$ GM1$^-$	$\surd$	0	0	$\surd$	-	-
P50.3.2 GM1$^-$ $\oplus$ GM2$^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
P50.3.3 GM1$^-$ $\oplus$ GM2$^-$	$\surd$	0	0	$\surd$	-	-
P50.3.4 GM1$^-$ $\oplus$ GM3$^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u}$
P50.3.5 GM1$^-$ $\oplus$ GM3$^-$	$\surd$	0	0	$\surd$	-	-
P50.3.6 GM1$^-$ $\oplus$ Z1$^+$	$\surd$	1	1	$\times$	-	-
P50.3.7 GM1$^-$ $\oplus$ Z1$^-$	$\surd$	1	1	$\times$	-	-
P50.3.8 GM1$^-$ $\oplus$ Z3$^+$	$\surd$	1	1	$\times$	-	-
P50.3.9 GM2$^+$ $\oplus$ GM2$^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
P50.3.10 GM2$^+$ $\oplus$ GM2$^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
P50.3.11 GM2$^+$ $\oplus$ GM3$^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
P50.3.12 GM2$^+$ $\oplus$ GM3$^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
P50.3.13 GM2$^+$ $\oplus$ Z1$^+$	$\surd$	1	0	$\times$	-	-
P50.3.14 GM2$^+$ $\oplus$ Z1$^-$	$\surd$	1	0	$\times$	-	-
P50.3.15 GM2$^+$ $\oplus$ Z3$^+$	$\surd$	1	0	$\times$	-	-
P50.3.16 GM2$^-$ $\oplus$ GM2$^-$	$\surd$	0	0	$\surd$	-	-
P50.3.17 GM2$^-$ $\oplus$ GM3$^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
P50.3.18 GM2$^-$ $\oplus$ GM3$^-$	$\surd$	0	0	$\surd$	-	-

Coplanar SSGs with parent space group $Pban$ (No. 50) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P50.3.19 $\mathrm{GM2}^- \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\times$	-	-
P50.3.20 $\mathrm{GM2}^- \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
P50.3.21 $\mathrm{GM2}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
P50.3.22 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
P50.3.23 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g}$
P50.3.24 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
P50.3.25 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
P50.3.26 $\mathrm{GM3}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
P50.3.27 $\mathrm{GM3}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
P50.3.28 $\mathrm{GM3}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
P50.3.29 $\mathrm{GM3}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
P50.3.30 $\mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
P50.3.31 $\mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
P50.3.32 $\mathrm{GM3}^- \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\times$	-	-
P50.3.33 $\mathrm{GM3}^- \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
P50.3.34 $\mathrm{GM3}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
P50.3.35 $\mathrm{GM3}^- \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
P50.3.36 $\mathrm{Z1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
P50.3.37 $\mathrm{Z1}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P50.3.38 $\mathrm{Z1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
P50.3.39 $\mathrm{Z1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
P50.3.40 $\mathrm{Z1}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
P50.3.41 $\mathrm{Z1}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
P50.3.42 $\mathrm{Z1}^- \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
P50.3.43 $\mathrm{Z1}^- \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P50.3.44 $\mathrm{Z1}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
P50.3.45 $\mathrm{Z1}^- \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
P50.3.46 $\mathrm{Z3}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
P50.3.47 $\mathrm{Z3}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
P50.3.48 $\mathrm{Z3}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
P50.3.49 $\mathrm{Z3}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P50.6.1 R1	$\surd$	1	1	$\times$	-	-
P50.6.2 S1	$\surd$	1	1	$\times$	-	-
P50.6.3 T1	$\surd$	1	1	$\times$	-	-
P50.6.4 X1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P50.6.5 X2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P50.8.1 DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P50.8.2 DT3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P50.8.3 A1	$\surd$	1	1	$\times$	-	-
P50.8.4 LD1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P50.8.5 LD2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P50.8.6 LD3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P50.8.7 Q1	$\surd$	1	1	$\times$	-	-

TABLE S150: Non-coplanar SSGs with parent space group $Pban$ (No. 50).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N50.1.1 $\mathrm{GM1}^{+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{A_g}$
N50.2.1 $\mathrm{GM1}^{-}$	$\surd$	2	2	$\surd$	222	$\mathrm{A1}\oplus\mathrm{A1}$
N50.2.2 $\mathrm{GM2}^{+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{B1_g}$
N50.2.3 $\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1}\oplus\mathrm{A1}$
N50.2.4 $\mathrm{GM3}^{+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{B3_g}$
N50.2.5 $\mathrm{GM3}^{-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1}\oplus\mathrm{A1}$
N50.2.6 $\mathrm{Z1}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_g}$
N50.2.7 $\mathrm{Z1}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_g}$
N50.2.8 $\mathrm{Z3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_g}$
N50.3.1 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_u}\oplus\mathrm{A_u}$
N50.3.2 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1}\oplus\mathrm{A2}$
N50.3.3 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_u}\oplus\mathrm{B1_u}$
N50.3.4 $\mathrm{GM1}^{-}\oplus\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1}\oplus\mathrm{A2}$
N50.3.5 $\mathrm{GM1}^{-}\oplus\mathrm{GM3}^{-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_u}\oplus\mathrm{B3_u}$
N50.3.6 $\mathrm{GM1}^{-}\oplus\mathrm{Z1}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_u}$
N50.3.7 $\mathrm{GM1}^{-}\oplus\mathrm{Z1}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_u}$
N50.3.8 $\mathrm{GM1}^{-}\oplus\mathrm{Z3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_u}$
N50.3.9 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B1_g}\oplus\mathrm{B1_g}$
N50.3.10 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	222	$\mathrm{A1}\oplus\mathrm{B1}$
N50.3.11 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B1_g}\oplus\mathrm{B3_g}$
N50.3.12 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1}\oplus\mathrm{B1}$
N50.3.13 $\mathrm{GM2}^{+}\oplus\mathrm{Z1}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B1_g}$
N50.3.14 $\mathrm{GM2}^{+}\oplus\mathrm{Z1}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B1_g}$
N50.3.15 $\mathrm{GM2}^{+}\oplus\mathrm{Z3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B1_g}$
N50.3.16 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B1_u}\oplus\mathrm{B1_u}$
N50.3.17 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1}\oplus\mathrm{B2}$
N50.3.18 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B1_u}\oplus\mathrm{B3_u}$
N50.3.19 $\mathrm{GM2}^{-}\oplus\mathrm{Z1}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B1_u}$
N50.3.20 $\mathrm{GM2}^{-}\oplus\mathrm{Z1}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B1_u}$
N50.3.21 $\mathrm{GM2}^{-}\oplus\mathrm{Z3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B1_u}$
N50.3.22 $\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}\oplus\mathrm{B3_g}$
N50.3.23 $\mathrm{GM3}^{+}\oplus\mathrm{GM4}^{+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}\oplus\mathrm{B2_g}$
N50.3.24 $\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{-}$	$\surd$	2	2	$\surd$	222	$\mathrm{A1}\oplus\mathrm{B3}$
N50.3.25 $\mathrm{GM3}^{+}\oplus\mathrm{GM4}^{-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1}\oplus\mathrm{B2}$
N50.3.26 $\mathrm{GM3}^{+}\oplus\mathrm{Z1}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}$
N50.3.27 $\mathrm{GM3}^{+}\oplus\mathrm{Z1}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}$
N50.3.28 $\mathrm{GM3}^{+}\oplus\mathrm{Z3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}$
N50.3.29 $\mathrm{GM3}^{+}\oplus\mathrm{Z3}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}$
N50.3.30 $\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}\oplus\mathrm{B3_u}$
N50.3.31 $\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}\oplus\mathrm{B2_u}$
N50.3.32 $\mathrm{GM3}^{-}\oplus\mathrm{Z1}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}$
N50.3.33 $\mathrm{GM3}^{-}\oplus\mathrm{Z1}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}$
N50.3.34 $\mathrm{GM3}^{-}\oplus\mathrm{Z3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}$
N50.3.35 $\mathrm{GM3}^{-}\oplus\mathrm{Z3}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}$
N50.3.36 $\mathrm{Z1}^{+}\oplus\mathrm{Z1}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N50.3.37 $\mathrm{Z1}^{+}\oplus\mathrm{Z2}^{-}$	$\surd$	1	1	$\surd$	$mm2$	A1

Non-coplanar SSGs with parent space group $Pban$ (No. 50) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N50.3.38 $\mathrm{Z1}^+ \oplus \mathrm{Z1}^-$	√	1	1	√	222	A1
N50.3.39 $\mathrm{Z1}^+ \oplus \mathrm{Z2}^+$	√	1	1	√	mmm	$\mathrm{A_g}$
N50.3.40 $\mathrm{Z1}^+ \oplus \mathrm{Z3}^+$	√	1	1	√	mmm	$\mathrm{A_g}$
N50.3.41 $\mathrm{Z1}^+ \oplus \mathrm{Z3}^-$	√	1	1	√	$mm2$	A1
N50.3.42 $\mathrm{Z1}^- \oplus \mathrm{Z1}^-$	√	1	1	√	mmm	$\mathrm{A_g}$
N50.3.43 $\mathrm{Z1}^- \oplus \mathrm{Z2}^+$	√	1	1	√	$mm2$	A1
N50.3.44 $\mathrm{Z1}^- \oplus \mathrm{Z3}^+$	√	1	1	√	$mm2$	A1
N50.3.45 $\mathrm{Z1}^- \oplus \mathrm{Z3}^-$	√	1	1	√	mmm	$\mathrm{A_g}$
N50.3.46 $\mathrm{Z3}^+ \oplus \mathrm{Z3}^+$	√	1	1	√	mmm	$\mathrm{A_g}$
N50.3.47 $\mathrm{Z3}^+ \oplus \mathrm{Z3}^-$	√	1	1	√	222	A1
N50.3.48 $\mathrm{Z3}^+ \oplus \mathrm{Z4}^+$	√	1	1	√	mmm	$\mathrm{A_g}$
N50.3.49 $\mathrm{Z3}^+ \oplus \mathrm{Z4}^-$	√	1	1	√	$mm2$	A1
N50.6.1 R1	√	1	1	√	$mm2$	A1
N50.6.2 S1	√	1	1	√	$mm2$	A1
N50.6.3 T1	√	1	1	√	$mm2$	A1
N50.6.4 X1	√	1	1	√	$mm2$	A1
N50.6.5 X2	√	1	1	√	$mm2$	A1
N50.8.1 DT1	√	1	1	√	$mm2$	A1
N50.8.2 DT3	√	1	1	√	$mm2$	A1
N50.8.3 A1	√	1	1	√	$mm2$	A1
N50.8.4 LD1	√	1	1	√	$mm2$	A1
N50.8.5 LD2	√	1	1	√	$mm2$	A1
N50.8.6 LD3	√	1	1	√	$mm2$	A1
N50.8.7 Q1	√	1	1	√	$mm2$	A1
N50.9.1 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{GM1}^-$	√	0	0	√	-	-
N50.9.2 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{GM2}^+$	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N50.9.3 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{GM2}^-$	√	0	0	√	-	-
N50.9.4 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{GM3}^+$	√	3	3	√	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N50.9.5 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{GM3}^-$	√	0	0	√	-	-
N50.9.6 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{Z1}^+$	√	0	0	√	-	-
N50.9.7 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{Z1}^-$	√	0	0	√	-	-
N50.9.8 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{Z3}^+$	√	0	0	√	-	-
N50.9.9 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	√	2	2	√	222	$\mathrm{B1} \oplus \mathrm{B1}$
N50.9.10 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N50.9.11 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM3}^+$	√	2	2	√	$mm2$	$\mathrm{B2} \oplus \mathrm{B1}$
N50.9.12 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM3}^-$	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_u}$
N50.9.13 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{Z1}^+$	√	2	2	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N50.9.14 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{Z1}^-$	√	2	2	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N50.9.15 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{Z3}^+$	√	2	2	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N50.9.16 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	√	0	0	√	-	-
N50.9.17 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^+$	√	3	3	√	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N50.9.18 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^-$	√	0	0	√	-	-
N50.9.19 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Z1}^+$	√	0	0	√	-	-
N50.9.20 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Z1}^-$	√	0	0	√	-	-
N50.9.21 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Z3}^+$	√	0	0	√	-	-
N50.9.22 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	√	2	2	√	222	$\mathrm{B3} \oplus \mathrm{B3}$

Non-coplanar SSGs with parent space group $Pban$ (No. 50) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N50.9.23 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2} \oplus \mathrm{B1}$
N50.9.24 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{GM3^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N50.9.25 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N50.9.26 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{Z1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u}$
N50.9.27 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{Z1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u}$
N50.9.28 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{Z3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u}$
N50.9.29 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{Z3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u}$
N50.9.30 $\mathrm{GM1^-} \oplus \mathrm{GM3^-} \oplus \mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
N50.9.31 $\mathrm{GM1^-} \oplus \mathrm{GM3^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N50.9.32 $\mathrm{GM1^-} \oplus \mathrm{GM3^-} \oplus \mathrm{Z1^+}$	$\surd$	0	0	$\surd$	-	-
N50.9.33 $\mathrm{GM1^-} \oplus \mathrm{GM3^-} \oplus \mathrm{Z1^-}$	$\surd$	0	0	$\surd$	-	-
N50.9.34 $\mathrm{GM1^-} \oplus \mathrm{GM3^-} \oplus \mathrm{Z3^+}$	$\surd$	0	0	$\surd$	-	-
N50.9.35 $\mathrm{GM1^-} \oplus \mathrm{GM3^-} \oplus \mathrm{Z3^-}$	$\surd$	0	0	$\surd$	-	-
N50.9.36 $\mathrm{GM1^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z1^+}$	$\surd$	1	0	$\times$	-	-
N50.9.37 $\mathrm{GM1^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N50.9.38 $\mathrm{GM1^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z1^-}$	$\surd$	1	1	$\times$	-	-
N50.9.39 $\mathrm{GM1^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z2^+}$	$\surd$	1	0	$\times$	-	-
N50.9.40 $\mathrm{GM1^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z3^+}$	$\surd$	1	0	$\times$	-	-
N50.9.41 $\mathrm{GM1^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z3^-}$	$\surd$	1	1	$\times$	-	-
N50.9.42 $\mathrm{GM1^-} \oplus \mathrm{Z1^-} \oplus \mathrm{Z1^-}$	$\surd$	1	0	$\times$	-	-
N50.9.43 $\mathrm{GM1^-} \oplus \mathrm{Z1^-} \oplus \mathrm{Z2^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N50.9.44 $\mathrm{GM1^-} \oplus \mathrm{Z1^-} \oplus \mathrm{Z3^+}$	$\surd$	1	1	$\times$	-	-
N50.9.45 $\mathrm{GM1^-} \oplus \mathrm{Z1^-} \oplus \mathrm{Z3^-}$	$\surd$	1	0	$\times$	-	-
N50.9.46 $\mathrm{GM1^-} \oplus \mathrm{Z3^+} \oplus \mathrm{Z3^+}$	$\surd$	1	0	$\times$	-	-
N50.9.47 $\mathrm{GM1^-} \oplus \mathrm{Z3^+} \oplus \mathrm{Z3^-}$	$\surd$	1	1	$\times$	-	-
N50.9.48 $\mathrm{GM1^-} \oplus \mathrm{Z3^+} \oplus \mathrm{Z4^+}$	$\surd$	1	0	$\times$	-	-
N50.9.49 $\mathrm{GM1^-} \oplus \mathrm{Z3^+} \oplus \mathrm{Z4^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N50.9.50 $\mathrm{GM2^+} \oplus \mathrm{GM2^+} \oplus \mathrm{GM2^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N50.9.51 $\mathrm{GM2^+} \oplus \mathrm{GM2^+} \oplus \mathrm{GM2^-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{A2}$
N50.9.52 $\mathrm{GM2^+} \oplus \mathrm{GM2^+} \oplus \mathrm{GM3^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B3_g}$
N50.9.53 $\mathrm{GM2^+} \oplus \mathrm{GM2^+} \oplus \mathrm{GM3^-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2} \oplus \mathrm{B2}$
N50.9.54 $\mathrm{GM2^+} \oplus \mathrm{GM2^+} \oplus \mathrm{Z1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N50.9.55 $\mathrm{GM2^+} \oplus \mathrm{GM2^+} \oplus \mathrm{Z1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N50.9.56 $\mathrm{GM2^+} \oplus \mathrm{GM2^+} \oplus \mathrm{Z3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N50.9.57 $\mathrm{GM2^+} \oplus \mathrm{GM2^-} \oplus \mathrm{GM2^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$
N50.9.58 $\mathrm{GM2^+} \oplus \mathrm{GM2^-} \oplus \mathrm{GM3^+}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{B2}$
N50.9.59 $\mathrm{GM2^+} \oplus \mathrm{GM2^-} \oplus \mathrm{GM3^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g} \oplus \mathrm{B2_u}$
N50.9.60 $\mathrm{GM2^+} \oplus \mathrm{GM2^-} \oplus \mathrm{Z1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
N50.9.61 $\mathrm{GM2^+} \oplus \mathrm{GM2^-} \oplus \mathrm{Z1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
N50.9.62 $\mathrm{GM2^+} \oplus \mathrm{GM2^-} \oplus \mathrm{Z3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
N50.9.63 $\mathrm{GM2^+} \oplus \mathrm{GM3^+} \oplus \mathrm{GM3^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N50.9.64 $\mathrm{GM2^+} \oplus \mathrm{GM3^+} \oplus \mathrm{GM4^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N50.9.65 $\mathrm{GM2^+} \oplus \mathrm{GM3^+} \oplus \mathrm{GM3^-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{B2}$
N50.9.66 $\mathrm{GM2^+} \oplus \mathrm{GM3^+} \oplus \mathrm{GM4^-}$	$\surd$	2	2	$\surd$	222	$\mathrm{B1} \oplus \mathrm{B3}$
N50.9.67 $\mathrm{GM2^+} \oplus \mathrm{GM3^+} \oplus \mathrm{Z1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N50.9.68 $\mathrm{GM2^+} \oplus \mathrm{GM3^+} \oplus \mathrm{Z1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$

Non-coplanar SSGs with parent space group $Pban$ (No. 50) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N50.9.69 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Z3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N50.9.70 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Z3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N50.9.71 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N50.9.72 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N50.9.73 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Z1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N50.9.74 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Z1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N50.9.75 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Z3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N50.9.76 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Z3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N50.9.77 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\times$	-	-
N50.9.78 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\surd$	222	B1
N50.9.79 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
N50.9.80 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\times$	-	-
N50.9.81 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
N50.9.82 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N50.9.83 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
N50.9.84 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\surd$	222	B1
N50.9.85 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
N50.9.86 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N50.9.87 $\mathrm{GM2}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
N50.9.88 $\mathrm{GM2}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N50.9.89 $\mathrm{GM2}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\times$	-	-
N50.9.90 $\mathrm{GM2}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\surd$	222	B1
N50.9.91 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
N50.9.92 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N50.9.93 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N50.9.94 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Z1}^+$	$\surd$	0	0	$\surd$	-	-
N50.9.95 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Z1}^-$	$\surd$	0	0	$\surd$	-	-
N50.9.96 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Z3}^+$	$\surd$	0	0	$\surd$	-	-
N50.9.97 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2} \oplus \mathrm{B2}$
N50.9.98 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	222	$\mathrm{B3} \oplus \mathrm{B2}$
N50.9.99 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N50.9.100 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N50.9.101 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Z1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N50.9.102 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Z1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N50.9.103 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Z3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N50.9.104 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Z3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N50.9.105 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N50.9.106 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N50.9.107 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Z1}^+$	$\surd$	0	0	$\surd$	-	-
N50.9.108 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Z1}^-$	$\surd$	0	0	$\surd$	-	-
N50.9.109 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Z3}^+$	$\surd$	0	0	$\surd$	-	-
N50.9.110 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Z3}^-$	$\surd$	0	0	$\surd$	-	-
N50.9.111 $\mathrm{GM2}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N50.9.112 $\mathrm{GM2}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N50.9.113 $\mathrm{GM2}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
N50.9.114 $\mathrm{GM2}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $Pban$ (No. 50) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N50.9.115 $\mathrm{GM2^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z3^+}$	$\surd$	1	0	$\times$	-	-
N50.9.116 $\mathrm{GM2^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z3^-}$	$\surd$	1	1	$\times$	-	-
N50.9.117 $\mathrm{GM2^-} \oplus \mathrm{Z1^-} \oplus \mathrm{Z1^-}$	$\surd$	1	0	$\times$	-	-
N50.9.118 $\mathrm{GM2^-} \oplus \mathrm{Z1^-} \oplus \mathrm{Z2^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N50.9.119 $\mathrm{GM2^-} \oplus \mathrm{Z1^-} \oplus \mathrm{Z3^+}$	$\surd$	1	1	$\times$	-	-
N50.9.120 $\mathrm{GM2^-} \oplus \mathrm{Z1^-} \oplus \mathrm{Z3^-}$	$\surd$	1	0	$\times$	-	-
N50.9.121 $\mathrm{GM2^-} \oplus \mathrm{Z3^+} \oplus \mathrm{Z3^+}$	$\surd$	1	0	$\times$	-	-
N50.9.122 $\mathrm{GM2^-} \oplus \mathrm{Z3^+} \oplus \mathrm{Z3^-}$	$\surd$	1	1	$\times$	-	-
N50.9.123 $\mathrm{GM2^-} \oplus \mathrm{Z3^+} \oplus \mathrm{Z4^+}$	$\surd$	1	0	$\times$	-	-
N50.9.124 $\mathrm{GM2^-} \oplus \mathrm{Z3^+} \oplus \mathrm{Z4^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N50.9.125 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{GM3^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N50.9.126 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{GM4^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N50.9.127 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{GM3^-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{A2}$
N50.9.128 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2} \oplus \mathrm{B2}$
N50.9.129 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{GM3^-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{B2}$
N50.9.130 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{Z1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
N50.9.131 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{Z1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g}$
N50.9.132 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{Z1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
N50.9.133 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{Z1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g}$
N50.9.134 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{Z3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
N50.9.135 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{Z3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
N50.9.136 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{Z3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g}$
N50.9.137 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{GM3^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B3_g}$
N50.9.138 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u} \oplus \mathrm{B3_g}$
N50.9.139 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B3_g}$
N50.9.140 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{Z1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N50.9.141 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Z1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N50.9.142 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{Z1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N50.9.143 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Z1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N50.9.144 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{Z3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N50.9.145 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{Z3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N50.9.146 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Z3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N50.9.147 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Z3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N50.9.148 $\mathrm{GM3^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z1^+}$	$\surd$	1	1	$\times$	-	-
N50.9.149 $\mathrm{GM3^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\surd$	$mm2$	$\mathrm{B2}$
N50.9.150 $\mathrm{GM3^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z1^-}$	$\surd$	1	1	$\times$	-	-
N50.9.151 $\mathrm{GM3^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z2^+}$	$\surd$	1	1	$\times$	-	-
N50.9.152 $\mathrm{GM3^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z3^+}$	$\surd$	1	1	$\times$	-	-
N50.9.153 $\mathrm{GM3^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z3^-}$	$\surd$	1	1	$\times$	-	-
N50.9.154 $\mathrm{GM3^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z4^+}$	$\surd$	1	1	$\times$	-	-
N50.9.155 $\mathrm{GM3^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z4^-}$	$\surd$	1	1	$\times$	-	-
N50.9.156 $\mathrm{GM3^+} \oplus \mathrm{Z1^-} \oplus \mathrm{Z1^-}$	$\surd$	1	1	$\times$	-	-
N50.9.157 $\mathrm{GM3^+} \oplus \mathrm{Z1^-} \oplus \mathrm{Z2^+}$	$\surd$	1	1	$\surd$	$mm2$	$\mathrm{B2}$
N50.9.158 $\mathrm{GM3^+} \oplus \mathrm{Z1^-} \oplus \mathrm{Z3^+}$	$\surd$	1	1	$\times$	-	-
N50.9.159 $\mathrm{GM3^+} \oplus \mathrm{Z1^-} \oplus \mathrm{Z3^-}$	$\surd$	1	1	$\times$	-	-
N50.9.160 $\mathrm{GM3^+} \oplus \mathrm{Z1^-} \oplus \mathrm{Z4^+}$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $Pban$ (No. 50) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N50.9.161 $\mathrm{GM3}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\times$	-	-
N50.9.162 $\mathrm{GM3}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
N50.9.163 $\mathrm{GM3}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N50.9.164 $\mathrm{GM3}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\times$	-	-
N50.9.165 $\mathrm{GM3}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\surd$	$mm2$	B2
N50.9.166 $\mathrm{GM3}^+ \oplus \mathrm{Z3}^- \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N50.9.167 $\mathrm{GM3}^+ \oplus \mathrm{Z3}^- \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\surd$	$mm2$	B2
N50.9.168 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N50.9.169 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N50.9.170 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Z1}^+$	$\surd$	0	0	$\surd$	-	-
N50.9.171 $\mathrm{GM3}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Z1}^+$	$\surd$	0	0	$\surd$	-	-
N50.9.172 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Z1}^-$	$\surd$	0	0	$\surd$	-	-
N50.9.173 $\mathrm{GM3}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Z1}^-$	$\surd$	0	0	$\surd$	-	-
N50.9.174 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Z3}^+$	$\surd$	0	0	$\surd$	-	-
N50.9.175 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Z3}^-$	$\surd$	0	0	$\surd$	-	-
N50.9.176 $\mathrm{GM3}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Z3}^+$	$\surd$	0	0	$\surd$	-	-
N50.9.177 $\mathrm{GM3}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N50.9.178 $\mathrm{GM3}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N50.9.179 $\mathrm{GM3}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
N50.9.180 $\mathrm{GM3}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N50.9.181 $\mathrm{GM3}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N50.9.182 $\mathrm{GM3}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N50.9.183 $\mathrm{GM3}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N50.9.184 $\mathrm{GM3}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\times$	-	-
N50.9.185 $\mathrm{GM3}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N50.9.186 $\mathrm{GM3}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N50.9.187 $\mathrm{GM3}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
N50.9.188 $\mathrm{GM3}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N50.9.189 $\mathrm{GM3}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\times$	-	-
N50.9.190 $\mathrm{GM3}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z4}^-$	$\surd$	1	0	$\times$	-	-
N50.9.191 $\mathrm{GM3}^- \oplus \mathrm{Z3}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N50.9.192 $\mathrm{GM3}^- \oplus \mathrm{Z3}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N50.9.193 $\mathrm{GM3}^- \oplus \mathrm{Z3}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N50.9.194 $\mathrm{GM3}^- \oplus \mathrm{Z3}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N50.9.195 $\mathrm{GM3}^- \oplus \mathrm{Z3}^- \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N50.9.196 $\mathrm{GM3}^- \oplus \mathrm{Z3}^- \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N50.9.197 $\mathrm{Z1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^+$	$\surd$	0	0	$\surd$	-	-
N50.9.198 $\mathrm{Z1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N50.9.199 $\mathrm{Z1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u}$
N50.9.200 $\mathrm{Z1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^+$	$\surd$	0	0	$\surd$	-	-
N50.9.201 $\mathrm{Z1}^+ \oplus \mathrm{Z2}^- \oplus \mathrm{Z1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u}$
N50.9.202 $\mathrm{Z1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^+$	$\surd$	0	0	$\surd$	-	-
N50.9.203 $\mathrm{Z1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B3_u}$
N50.9.204 $\mathrm{Z1}^+ \oplus \mathrm{Z2}^- \oplus \mathrm{Z3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N50.9.205 $\mathrm{Z1}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u}$
N50.9.206 $\mathrm{Z1}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u}$

Non-coplanar SSGs with parent space group $Pban$ (No. 50) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N50.9.207 $\mathrm{Z1^+} \oplus \mathrm{Z2^+} \oplus \mathrm{Z2^+}$	$\surd$	0	0	$\surd$	-	-
N50.9.208 $\mathrm{Z1^+} \oplus \mathrm{Z1^-} \oplus \mathrm{Z3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u}$
N50.9.209 $\mathrm{Z1^+} \oplus \mathrm{Z1^-} \oplus \mathrm{Z3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u}$
N50.9.210 $\mathrm{Z1^+} \oplus \mathrm{Z2^+} \oplus \mathrm{Z3^+}$	$\surd$	0	0	$\surd$	-	-
N50.9.211 $\mathrm{Z1^+} \oplus \mathrm{Z2^+} \oplus \mathrm{Z3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_u}$
N50.9.212 $\mathrm{Z1^+} \oplus \mathrm{Z3^+} \oplus \mathrm{Z3^+}$	$\surd$	0	0	$\surd$	-	-
N50.9.213 $\mathrm{Z1^+} \oplus \mathrm{Z3^+} \oplus \mathrm{Z3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u}$
N50.9.214 $\mathrm{Z1^+} \oplus \mathrm{Z3^+} \oplus \mathrm{Z4^+}$	$\surd$	0	0	$\surd$	-	-
N50.9.215 $\mathrm{Z1^+} \oplus \mathrm{Z3^+} \oplus \mathrm{Z4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N50.9.216 $\mathrm{Z1^+} \oplus \mathrm{Z3^-} \oplus \mathrm{Z3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B3_u}$
N50.9.217 $\mathrm{Z1^+} \oplus \mathrm{Z3^-} \oplus \mathrm{Z4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_u}$
N50.9.218 $\mathrm{Z1^-} \oplus \mathrm{Z1^-} \oplus \mathrm{Z1^-}$	$\surd$	0	0	$\surd$	-	-
N50.9.219 $\mathrm{Z1^-} \oplus \mathrm{Z1^-} \oplus \mathrm{Z2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N50.9.220 $\mathrm{Z1^-} \oplus \mathrm{Z1^-} \oplus \mathrm{Z3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B3_u}$
N50.9.221 $\mathrm{Z1^-} \oplus \mathrm{Z1^-} \oplus \mathrm{Z3^-}$	$\surd$	0	0	$\surd$	-	-
N50.9.222 $\mathrm{Z1^-} \oplus \mathrm{Z2^+} \oplus \mathrm{Z3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u}$
N50.9.223 $\mathrm{Z1^-} \oplus \mathrm{Z3^+} \oplus \mathrm{Z3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B3_u}$
N50.9.224 $\mathrm{Z1^-} \oplus \mathrm{Z3^+} \oplus \mathrm{Z3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u}$
N50.9.225 $\mathrm{Z1^-} \oplus \mathrm{Z3^+} \oplus \mathrm{Z4^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_u}$
N50.9.226 $\mathrm{Z1^-} \oplus \mathrm{Z3^+} \oplus \mathrm{Z4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u}$
N50.9.227 $\mathrm{Z1^-} \oplus \mathrm{Z3^-} \oplus \mathrm{Z3^-}$	$\surd$	0	0	$\surd$	-	-
N50.9.228 $\mathrm{Z1^-} \oplus \mathrm{Z3^-} \oplus \mathrm{Z4^-}$	$\surd$	0	0	$\surd$	-	-
N50.9.229 $\mathrm{Z3^+} \oplus \mathrm{Z3^+} \oplus \mathrm{Z3^+}$	$\surd$	0	0	$\surd$	-	-
N50.9.230 $\mathrm{Z3^+} \oplus \mathrm{Z3^+} \oplus \mathrm{Z3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u}$
N50.9.231 $\mathrm{Z3^+} \oplus \mathrm{Z3^+} \oplus \mathrm{Z4^+}$	$\surd$	0	0	$\surd$	-	-
N50.9.232 $\mathrm{Z3^+} \oplus \mathrm{Z3^+} \oplus \mathrm{Z4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N50.9.233 $\mathrm{Z3^+} \oplus \mathrm{Z3^-} \oplus \mathrm{Z4^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u}$
N50.12.1 $\mathrm{GM1^-} \oplus \mathrm{R1}$	$\surd$	1	1	$\times$	-	-
N50.12.2 $\mathrm{GM1^-} \oplus \mathrm{S1}$	$\surd$	1	1	$\times$	-	-
N50.12.3 $\mathrm{GM1^-} \oplus \mathrm{T1}$	$\surd$	1	1	$\times$	-	-
N50.12.4 $\mathrm{GM1^-} \oplus \mathrm{X1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N50.12.5 $\mathrm{GM1^-} \oplus \mathrm{X2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N50.12.6 $\mathrm{GM2^+} \oplus \mathrm{R1}$	$\surd$	1	1	$\times$	-	-
N50.12.7 $\mathrm{GM2^+} \oplus \mathrm{S1}$	$\surd$	1	1	$\times$	-	-
N50.12.8 $\mathrm{GM2^+} \oplus \mathrm{T1}$	$\surd$	1	1	$\times$	-	-
N50.12.9 $\mathrm{GM2^+} \oplus \mathrm{X1}$	$\surd$	1	1	$\surd$	$mm2$	B1
N50.12.10 $\mathrm{GM2^+} \oplus \mathrm{X2}$	$\surd$	1	1	$\surd$	$mm2$	B1
N50.12.11 $\mathrm{GM2^-} \oplus \mathrm{R1}$	$\surd$	1	1	$\times$	-	-
N50.12.12 $\mathrm{GM2^-} \oplus \mathrm{S1}$	$\surd$	1	1	$\times$	-	-
N50.12.13 $\mathrm{GM2^-} \oplus \mathrm{T1}$	$\surd$	1	1	$\times$	-	-
N50.12.14 $\mathrm{GM2^-} \oplus \mathrm{X1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N50.12.15 $\mathrm{GM2^-} \oplus \mathrm{X2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N50.12.16 $\mathrm{GM3^+} \oplus \mathrm{R1}$	$\surd$	1	1	$\times$	-	-
N50.12.17 $\mathrm{GM3^+} \oplus \mathrm{S1}$	$\surd$	1	1	$\times$	-	-
N50.12.18 $\mathrm{GM3^+} \oplus \mathrm{T1}$	$\surd$	1	1	$\times$	-	-
N50.12.19 $\mathrm{GM3^+} \oplus \mathrm{U1}$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $Pban$ (No. 50) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N50.12.20 GM3$^+$ ⊕ X1	√	1	1	√	222	B3
N50.12.21 GM3$^+$ ⊕ Y1	√	1	1	√	$mm2$	B2
N50.12.22 GM3$^+$ ⊕ X2	√	1	1	√	222	B3
N50.12.23 GM3$^+$ ⊕ Y2	√	1	1	√	$mm2$	B2
N50.12.24 GM3$^-$ ⊕ R1	√	1	1	×	-	-
N50.12.25 GM3$^-$ ⊕ S1	√	1	1	×	-	-
N50.12.26 GM3$^-$ ⊕ T1	√	1	1	×	-	-
N50.12.27 GM3$^-$ ⊕ U1	√	1	1	×	-	-
N50.12.28 GM3$^-$ ⊕ X1	√	1	1	√	mmm	$\mathrm{B3_u}$
N50.12.29 GM3$^-$ ⊕ Y1	√	1	1	√	mmm	$\mathrm{B2_u}$
N50.12.30 GM3$^-$ ⊕ X2	√	1	1	√	mmm	$\mathrm{B3_u}$
N50.12.31 GM3$^-$ ⊕ Y2	√	1	1	√	mmm	$\mathrm{B2_u}$
N50.12.32 Z1$^+$ ⊕ R1	√	1	1	×	-	-
N50.12.33 Z1$^+$ ⊕ S1	√	1	1	×	-	-
N50.12.34 Z1$^+$ ⊕ T1	√	1	1	√	mmm	$\mathrm{B2_u}$
N50.12.35 Z1$^+$ ⊕ T2	√	1	1	√	mmm	$\mathrm{B2_u}$
N50.12.36 Z1$^+$ ⊕ X1	√	1	1	√	mmm	$\mathrm{B3_u}$
N50.12.37 Z1$^+$ ⊕ X2	√	1	1	√	mmm	$\mathrm{B3_u}$
N50.12.38 Z1$^-$ ⊕ R1	√	1	1	×	-	-
N50.12.39 Z1$^-$ ⊕ S1	√	1	1	×	-	-
N50.12.40 Z1$^-$ ⊕ T1	√	1	1	√	mmm	$\mathrm{B2_u}$
N50.12.41 Z1$^-$ ⊕ T2	√	1	1	√	mmm	$\mathrm{B2_u}$
N50.12.42 Z1$^-$ ⊕ X1	√	1	1	√	mmm	$\mathrm{B3_u}$
N50.12.43 Z1$^-$ ⊕ X2	√	1	1	√	mmm	$\mathrm{B3_u}$
N50.12.44 Z3$^+$ ⊕ R1	√	1	1	×	-	-
N50.12.45 Z3$^+$ ⊕ S1	√	1	1	×	-	-
N50.12.46 Z3$^+$ ⊕ T1	√	1	1	√	mmm	$\mathrm{B2_u}$
N50.12.47 Z3$^+$ ⊕ T2	√	1	1	√	mmm	$\mathrm{B2_u}$
N50.12.48 Z3$^+$ ⊕ U1	√	1	1	√	mmm	$\mathrm{B3_u}$
N50.12.49 Z3$^+$ ⊕ U2	√	1	1	√	mmm	$\mathrm{B3_u}$
N50.12.50 Z3$^+$ ⊕ X1	√	1	1	√	mmm	$\mathrm{B3_u}$
N50.12.51 Z3$^+$ ⊕ Y1	√	1	1	√	mmm	$\mathrm{B2_u}$
N50.12.52 Z3$^+$ ⊕ X2	√	1	1	√	mmm	$\mathrm{B3_u}$
N50.12.53 Z3$^+$ ⊕ Y2	√	1	1	√	mmm	$\mathrm{B2_u}$
N50.14.1 GM1$^-$ ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N50.14.2 GM1$^-$ ⊕ DT3	√	1	1	√	mmm	$\mathrm{B2_u}$
N50.14.3 GM1$^-$ ⊕ A1	√	1	1	×	-	-
N50.14.4 GM1$^-$ ⊕ LD1	√	1	1	√	mmm	$\mathrm{B1_u}$
N50.14.5 GM1$^-$ ⊕ LD2	√	1	1	√	mmm	$\mathrm{B1_u}$
N50.14.6 GM1$^-$ ⊕ LD3	√	1	1	√	mmm	$\mathrm{B1_u}$
N50.14.7 GM1$^-$ ⊕ Q1	√	1	1	×	-	-
N50.14.8 GM2$^+$ ⊕ DT1	√	1	1	√	$mm2$	B2
N50.14.9 GM2$^+$ ⊕ DT3	√	1	1	√	$mm2$	B2
N50.14.10 GM2$^+$ ⊕ A1	√	1	1	×	-	-
N50.14.11 GM2$^+$ ⊕ LD1	√	1	1	√	222	B1
N50.14.12 GM2$^+$ ⊕ LD2	√	1	1	√	222	B1

Non-coplanar SSGs with parent space group $Pban$ (No. 50) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N50.14.13 GM2$^+$ ⊕ LD3	√	1	1	√	222	B1
N50.14.14 GM2$^+$ ⊕ Q1	√	1	1	×	-	-
N50.14.15 GM2$^-$ ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N50.14.16 GM2$^-$ ⊕ DT3	√	1	1	√	mmm	$\mathrm{B2_u}$
N50.14.17 GM2$^-$ ⊕ A1	√	1	1	×	-	-
N50.14.18 GM2$^-$ ⊕ LD1	√	1	1	√	mmm	$\mathrm{B1_u}$
N50.14.19 GM2$^-$ ⊕ LD2	√	1	1	√	mmm	$\mathrm{B1_u}$
N50.14.20 GM2$^-$ ⊕ LD3	√	1	1	√	mmm	$\mathrm{B1_u}$
N50.14.21 GM2$^-$ ⊕ Q1	√	1	1	×	-	-
N50.14.22 GM3$^+$ ⊕ SM1	√	1	1	√	222	B3
N50.14.23 GM3$^+$ ⊕ DT1	√	1	1	√	$mm2$	B2
N50.14.24 GM3$^+$ ⊕ SM3	√	1	1	√	222	B3
N50.14.25 GM3$^+$ ⊕ DT3	√	1	1	√	$mm2$	B2
N50.14.26 GM3$^+$ ⊕ A1	√	1	1	×	-	-
N50.14.27 GM3$^+$ ⊕ B1	√	1	1	×	-	-
N50.14.28 GM3$^+$ ⊕ LD1	√	1	1	√	$mm2$	B2
N50.14.29 GM3$^+$ ⊕ LD2	√	1	1	√	$mm2$	B2
N50.14.30 GM3$^+$ ⊕ LD3	√	1	1	√	$mm2$	B2
N50.14.31 GM3$^+$ ⊕ LD4	√	1	1	√	$mm2$	B2
N50.14.32 GM3$^+$ ⊕ Q1	√	1	1	×	-	-
N50.14.33 GM3$^-$ ⊕ SM1	√	1	1	√	mmm	$\mathrm{B3_u}$
N50.14.34 GM3$^-$ ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N50.14.35 GM3$^-$ ⊕ SM3	√	1	1	√	mmm	$\mathrm{B3_u}$
N50.14.36 GM3$^-$ ⊕ DT3	√	1	1	√	mmm	$\mathrm{B2_u}$
N50.14.37 GM3$^-$ ⊕ A1	√	1	1	×	-	-
N50.14.38 GM3$^-$ ⊕ B1	√	1	1	×	-	-
N50.14.39 GM3$^-$ ⊕ LD1	√	1	1	√	mmm	$\mathrm{B1_u}$
N50.14.40 GM3$^-$ ⊕ LD2	√	1	1	√	mmm	$\mathrm{B1_u}$
N50.14.41 GM3$^-$ ⊕ LD3	√	1	1	√	mmm	$\mathrm{B1_u}$
N50.14.42 GM3$^-$ ⊕ LD4	√	1	1	√	mmm	$\mathrm{B1_u}$
N50.14.43 GM3$^-$ ⊕ Q1	√	1	1	×	-	-
N50.14.44 Z1$^+$ ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N50.14.45 Z1$^+$ ⊕ DT3	√	1	1	√	mmm	$\mathrm{B2_u}$
N50.14.46 Z1$^+$ ⊕ A1	√	1	1	√	mmm	$\mathrm{B3_u}$
N50.14.47 Z1$^+$ ⊕ A3	√	1	1	√	mmm	$\mathrm{B3_u}$
N50.14.48 Z1$^+$ ⊕ LD1	√	1	1	√	mmm	$\mathrm{B1_u}$
N50.14.49 Z1$^+$ ⊕ LD2	√	1	1	√	mmm	$\mathrm{B1_u}$
N50.14.50 Z1$^+$ ⊕ LD3	√	1	1	√	mmm	$\mathrm{B1_u}$
N50.14.51 Z1$^+$ ⊕ Q1	√	1	1	×	-	-
N50.14.52 Z1$^-$ ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N50.14.53 Z1$^-$ ⊕ DT3	√	1	1	√	mmm	$\mathrm{B2_u}$
N50.14.54 Z1$^-$ ⊕ A1	√	1	1	√	mmm	$\mathrm{B3_u}$
N50.14.55 Z1$^-$ ⊕ A3	√	1	1	√	mmm	$\mathrm{B3_u}$
N50.14.56 Z1$^-$ ⊕ LD1	√	1	1	√	mmm	$\mathrm{B1_u}$
N50.14.57 Z1$^-$ ⊕ LD2	√	1	1	√	mmm	$\mathrm{B1_u}$
N50.14.58 Z1$^-$ ⊕ LD3	√	1	1	√	mmm	$\mathrm{B1_u}$

Non-coplanar SSGs with parent space group $Pban$ (No. 50) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N50.14.59 Z1$^-$ ⊕ Q1	√	1	1	×	-	-
N50.14.60 Z3$^+$ ⊕ SM1	√	1	1	√	mmm	$\mathrm{B3_u}$
N50.14.61 Z3$^+$ ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N50.14.62 Z3$^+$ ⊕ SM3	√	1	1	√	mmm	$\mathrm{B3_u}$
N50.14.63 Z3$^+$ ⊕ DT3	√	1	1	√	mmm	$\mathrm{B2_u}$
N50.14.64 Z3$^+$ ⊕ A1	√	1	1	√	mmm	$\mathrm{B3_u}$
N50.14.65 Z3$^+$ ⊕ A3	√	1	1	√	mmm	$\mathrm{B3_u}$
N50.14.66 Z3$^+$ ⊕ B1	√	1	1	√	mmm	$\mathrm{B2_u}$
N50.14.67 Z3$^+$ ⊕ B3	√	1	1	√	mmm	$\mathrm{B2_u}$
N50.14.68 Z3$^+$ ⊕ LD1	√	1	1	√	mmm	$\mathrm{B1_u}$
N50.14.69 Z3$^+$ ⊕ LD2	√	1	1	√	mmm	$\mathrm{B1_u}$
N50.14.70 Z3$^+$ ⊕ LD3	√	1	1	√	mmm	$\mathrm{B1_u}$
N50.14.71 Z3$^+$ ⊕ LD4	√	1	1	√	mmm	$\mathrm{B1_u}$
N50.14.72 Z3$^+$ ⊕ Q1	√	1	1	×	-	-

TABLE S151: Collinear SSGs with parent space group $Pmma$ (No. 51).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L51.1.1 GM1$^+$	1	mmm	$\mathrm{A_g}$
L51.2.1 GM1$^-$	0	-	-
L51.2.2 GM2$^+$	1	mmm	$\mathrm{B1_g}$
L51.2.3 GM2$^-$	0	-	-
L51.2.4 GM3$^+$	1	mmm	$\mathrm{B3_g}$
L51.2.5 GM3$^-$	0	-	-
L51.2.6 GM4$^+$	1	mmm	$\mathrm{B2_g}$
L51.2.7 GM4$^-$	0	-	-
L51.2.8 T1$^+$	0	-	-
L51.2.9 T1$^-$	0	-	-
L51.2.10 Y1$^+$	0	-	-
L51.2.11 Y1$^-$	0	-	-
L51.2.12 Y2$^+$	0	-	-
L51.2.13 Y2$^-$	0	-	-
L51.2.14 Z1$^+$	0	-	-
L51.2.15 Z1$^-$	0	-	-
L51.2.16 Z3$^+$	0	-	-
L51.2.17 Z3$^-$	0	-	-

TABLE S152: Coplanar SSGs with parent space group $Pmma$ (No. 51).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P51.1.1 GM1$^+$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
P51.2.1 GM1$^-$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
P51.2.2 GM2$^+$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
P51.2.3 GM2$^-$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
P51.2.4 GM3$^+$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g}$
P51.2.5 GM3$^-$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u}$

Coplanar SSGs with parent space group $Pmma$ (No. 51) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P51.2.6 $\mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B2_g}$
P51.2.7 $\mathrm{GM4}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B2_u}$
P51.2.8 $\mathrm{T1}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P51.2.9 $\mathrm{T1}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P51.2.10 $\mathrm{Y1}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P51.2.11 $\mathrm{Y1}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P51.2.12 $\mathrm{Y2}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P51.2.13 $\mathrm{Y2}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P51.2.14 $\mathrm{Z1}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P51.2.15 $\mathrm{Z1}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P51.2.16 $\mathrm{Z3}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P51.2.17 $\mathrm{Z3}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P51.3.1 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-}$	$\surd$	0	0	$\surd$	-	-
P51.3.2 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
P51.3.3 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
P51.3.4 $\mathrm{GM1}^{-} \oplus \mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u}$
P51.3.5 $\mathrm{GM1}^{-} \oplus \mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
P51.3.6 $\mathrm{GM1}^{-} \oplus \mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_g} \oplus \mathrm{B2_u}$
P51.3.7 $\mathrm{GM1}^{-} \oplus \mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
P51.3.8 $\mathrm{GM1}^{-} \oplus \mathrm{T1}^{+}$	$\surd$	1	1	$\times$	-	-
P51.3.9 $\mathrm{GM1}^{-} \oplus \mathrm{T1}^{-}$	$\surd$	1	1	$\times$	-	-
P51.3.10 $\mathrm{GM1}^{-} \oplus \mathrm{Y1}^{+}$	$\surd$	1	1	$\times$	-	-
P51.3.11 $\mathrm{GM1}^{-} \oplus \mathrm{Y1}^{-}$	$\surd$	1	1	$\times$	-	-
P51.3.12 $\mathrm{GM1}^{-} \oplus \mathrm{Y2}^{+}$	$\surd$	1	1	$\times$	-	-
P51.3.13 $\mathrm{GM1}^{-} \oplus \mathrm{Y2}^{-}$	$\surd$	1	1	$\times$	-	-
P51.3.14 $\mathrm{GM1}^{-} \oplus \mathrm{Z1}^{+}$	$\surd$	1	1	$\times$	-	-
P51.3.15 $\mathrm{GM1}^{-} \oplus \mathrm{Z1}^{-}$	$\surd$	1	1	$\times$	-	-
P51.3.16 $\mathrm{GM1}^{-} \oplus \mathrm{Z3}^{+}$	$\surd$	1	1	$\times$	-	-
P51.3.17 $\mathrm{GM1}^{-} \oplus \mathrm{Z3}^{-}$	$\surd$	1	1	$\times$	-	-
P51.3.18 $\mathrm{GM2}^{+} \oplus \mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
P51.3.19 $\mathrm{GM2}^{+} \oplus \mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
P51.3.20 $\mathrm{GM2}^{+} \oplus \mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
P51.3.21 $\mathrm{GM2}^{+} \oplus \mathrm{GM3}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
P51.3.22 $\mathrm{GM2}^{+} \oplus \mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
P51.3.23 $\mathrm{GM2}^{+} \oplus \mathrm{GM4}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_u}$
P51.3.24 $\mathrm{GM2}^{+} \oplus \mathrm{T1}^{+}$	$\surd$	1	0	$\times$	-	-
P51.3.25 $\mathrm{GM2}^{+} \oplus \mathrm{T1}^{-}$	$\surd$	1	0	$\times$	-	-
P51.3.26 $\mathrm{GM2}^{+} \oplus \mathrm{Y1}^{+}$	$\surd$	1	0	$\times$	-	-
P51.3.27 $\mathrm{GM2}^{+} \oplus \mathrm{Y1}^{-}$	$\surd$	1	0	$\times$	-	-
P51.3.28 $\mathrm{GM2}^{+} \oplus \mathrm{Y2}^{+}$	$\surd$	1	0	$\times$	-	-
P51.3.29 $\mathrm{GM2}^{+} \oplus \mathrm{Y2}^{-}$	$\surd$	1	0	$\times$	-	-
P51.3.30 $\mathrm{GM2}^{+} \oplus \mathrm{Z1}^{+}$	$\surd$	1	0	$\times$	-	-
P51.3.31 $\mathrm{GM2}^{+} \oplus \mathrm{Z1}^{-}$	$\surd$	1	0	$\times$	-	-
P51.3.32 $\mathrm{GM2}^{+} \oplus \mathrm{Z3}^{+}$	$\surd$	1	0	$\times$	-	-
P51.3.33 $\mathrm{GM2}^{+} \oplus \mathrm{Z3}^{-}$	$\surd$	1	0	$\times$	-	-
P51.3.34 $\mathrm{GM2}^{-} \oplus \mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-

Coplanar SSGs with parent space group $Pmma$ (No. 51) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P51.3.35 $\mathrm{GM2}^{-} \oplus \mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
P51.3.36 $\mathrm{GM2}^{-} \oplus \mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
P51.3.37 $\mathrm{GM2}^{-} \oplus \mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_g}$
P51.3.38 $\mathrm{GM2}^{-} \oplus \mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
P51.3.39 $\mathrm{GM2}^{-} \oplus \mathrm{T1}^{+}$	$\surd$	1	1	$\times$	-	-
P51.3.40 $\mathrm{GM2}^{-} \oplus \mathrm{T1}^{-}$	$\surd$	1	1	$\times$	-	-
P51.3.41 $\mathrm{GM2}^{-} \oplus \mathrm{Y1}^{+}$	$\surd$	1	1	$\times$	-	-
P51.3.42 $\mathrm{GM2}^{-} \oplus \mathrm{Y1}^{-}$	$\surd$	1	1	$\times$	-	-
P51.3.43 $\mathrm{GM2}^{-} \oplus \mathrm{Y2}^{+}$	$\surd$	1	1	$\times$	-	-
P51.3.44 $\mathrm{GM2}^{-} \oplus \mathrm{Y2}^{-}$	$\surd$	1	1	$\times$	-	-
P51.3.45 $\mathrm{GM2}^{-} \oplus \mathrm{Z1}^{+}$	$\surd$	1	1	$\times$	-	-
P51.3.46 $\mathrm{GM2}^{-} \oplus \mathrm{Z1}^{-}$	$\surd$	1	1	$\times$	-	-
P51.3.47 $\mathrm{GM2}^{-} \oplus \mathrm{Z3}^{+}$	$\surd$	1	1	$\times$	-	-
P51.3.48 $\mathrm{GM2}^{-} \oplus \mathrm{Z3}^{-}$	$\surd$	1	1	$\times$	-	-
P51.3.49 $\mathrm{GM3}^{+} \oplus \mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
P51.3.50 $\mathrm{GM3}^{+} \oplus \mathrm{GM3}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
P51.3.51 $\mathrm{GM3}^{+} \oplus \mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g}$
P51.3.52 $\mathrm{GM3}^{+} \oplus \mathrm{GM4}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
P51.3.53 $\mathrm{GM3}^{+} \oplus \mathrm{T1}^{+}$	$\surd$	1	0	$\times$	-	-
P51.3.54 $\mathrm{GM3}^{+} \oplus \mathrm{T1}^{-}$	$\surd$	1	0	$\times$	-	-
P51.3.55 $\mathrm{GM3}^{+} \oplus \mathrm{Y1}^{+}$	$\surd$	1	0	$\times$	-	-
P51.3.56 $\mathrm{GM3}^{+} \oplus \mathrm{Y1}^{-}$	$\surd$	1	0	$\times$	-	-
P51.3.57 $\mathrm{GM3}^{+} \oplus \mathrm{Y2}^{+}$	$\surd$	1	0	$\times$	-	-
P51.3.58 $\mathrm{GM3}^{+} \oplus \mathrm{Y2}^{-}$	$\surd$	1	0	$\times$	-	-
P51.3.59 $\mathrm{GM3}^{+} \oplus \mathrm{Z1}^{+}$	$\surd$	1	0	$\times$	-	-
P51.3.60 $\mathrm{GM3}^{+} \oplus \mathrm{Z1}^{-}$	$\surd$	1	0	$\times$	-	-
P51.3.61 $\mathrm{GM3}^{+} \oplus \mathrm{Z3}^{+}$	$\surd$	1	0	$\times$	-	-
P51.3.62 $\mathrm{GM3}^{+} \oplus \mathrm{Z3}^{-}$	$\surd$	1	0	$\times$	-	-
P51.3.63 $\mathrm{GM3}^{-} \oplus \mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
P51.3.64 $\mathrm{GM3}^{-} \oplus \mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g}$
P51.3.65 $\mathrm{GM3}^{-} \oplus \mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
P51.3.66 $\mathrm{GM3}^{-} \oplus \mathrm{T1}^{+}$	$\surd$	1	1	$\times$	-	-
P51.3.67 $\mathrm{GM3}^{-} \oplus \mathrm{T1}^{-}$	$\surd$	1	1	$\times$	-	-
P51.3.68 $\mathrm{GM3}^{-} \oplus \mathrm{Y1}^{+}$	$\surd$	1	1	$\times$	-	-
P51.3.69 $\mathrm{GM3}^{-} \oplus \mathrm{Y1}^{-}$	$\surd$	1	1	$\times$	-	-
P51.3.70 $\mathrm{GM3}^{-} \oplus \mathrm{Y2}^{+}$	$\surd$	1	1	$\times$	-	-
P51.3.71 $\mathrm{GM3}^{-} \oplus \mathrm{Y2}^{-}$	$\surd$	1	1	$\times$	-	-
P51.3.72 $\mathrm{GM3}^{-} \oplus \mathrm{Z1}^{+}$	$\surd$	1	1	$\times$	-	-
P51.3.73 $\mathrm{GM3}^{-} \oplus \mathrm{Z1}^{-}$	$\surd$	1	1	$\times$	-	-
P51.3.74 $\mathrm{GM3}^{-} \oplus \mathrm{Z3}^{+}$	$\surd$	1	1	$\times$	-	-
P51.3.75 $\mathrm{GM3}^{-} \oplus \mathrm{Z3}^{-}$	$\surd$	1	1	$\times$	-	-
P51.3.76 $\mathrm{GM4}^{+} \oplus \mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_g} \oplus \mathrm{B2_g}$
P51.3.77 $\mathrm{GM4}^{+} \oplus \mathrm{GM4}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B2_g}$
P51.3.78 $\mathrm{GM4}^{+} \oplus \mathrm{T1}^{+}$	$\surd$	1	0	$\times$	-	-
P51.3.79 $\mathrm{GM4}^{+} \oplus \mathrm{T1}^{-}$	$\surd$	1	0	$\times$	-	-
P51.3.80 $\mathrm{GM4}^{+} \oplus \mathrm{Y1}^{+}$	$\surd$	1	0	$\times$	-	-

Coplanar SSGs with parent space group $Pmma$ (No. 51) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P51.3.81 $\mathrm{GM4}^{+} \oplus \mathrm{Y1}^{-}$	$\surd$	1	0	$\times$	-	-
P51.3.82 $\mathrm{GM4}^{+} \oplus \mathrm{Y2}^{+}$	$\surd$	1	0	$\times$	-	-
P51.3.83 $\mathrm{GM4}^{+} \oplus \mathrm{Y2}^{-}$	$\surd$	1	0	$\times$	-	-
P51.3.84 $\mathrm{GM4}^{+} \oplus \mathrm{Z1}^{+}$	$\surd$	1	0	$\times$	-	-
P51.3.85 $\mathrm{GM4}^{+} \oplus \mathrm{Z1}^{-}$	$\surd$	1	0	$\times$	-	-
P51.3.86 $\mathrm{GM4}^{+} \oplus \mathrm{Z3}^{+}$	$\surd$	1	0	$\times$	-	-
P51.3.87 $\mathrm{GM4}^{+} \oplus \mathrm{Z3}^{-}$	$\surd$	1	0	$\times$	-	-
P51.3.88 $\mathrm{GM4}^{-} \oplus \mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
P51.3.89 $\mathrm{GM4}^{-} \oplus \mathrm{T1}^{+}$	$\surd$	1	1	$\times$	-	-
P51.3.90 $\mathrm{GM4}^{-} \oplus \mathrm{T1}^{-}$	$\surd$	1	1	$\times$	-	-
P51.3.91 $\mathrm{GM4}^{-} \oplus \mathrm{Y1}^{+}$	$\surd$	1	1	$\times$	-	-
P51.3.92 $\mathrm{GM4}^{-} \oplus \mathrm{Y1}^{-}$	$\surd$	1	1	$\times$	-	-
P51.3.93 $\mathrm{GM4}^{-} \oplus \mathrm{Y2}^{+}$	$\surd$	1	1	$\times$	-	-
P51.3.94 $\mathrm{GM4}^{-} \oplus \mathrm{Y2}^{-}$	$\surd$	1	1	$\times$	-	-
P51.3.95 $\mathrm{GM4}^{-} \oplus \mathrm{Z1}^{+}$	$\surd$	1	1	$\times$	-	-
P51.3.96 $\mathrm{GM4}^{-} \oplus \mathrm{Z1}^{-}$	$\surd$	1	1	$\times$	-	-
P51.3.97 $\mathrm{GM4}^{-} \oplus \mathrm{Z3}^{+}$	$\surd$	1	1	$\times$	-	-
P51.3.98 $\mathrm{GM4}^{-} \oplus \mathrm{Z3}^{-}$	$\surd$	1	1	$\times$	-	-
P51.3.99 $\mathrm{T1}^{+} \oplus \mathrm{T1}^{+}$	$\surd$	1	0	$\times$	-	-
P51.3.100 $\mathrm{T1}^{+} \oplus \mathrm{T2}^{-}$	$\surd$	1	1	$\times$	-	-
P51.3.101 $\mathrm{T1}^{+} \oplus \mathrm{T3}^{+}$	$\surd$	1	0	$\times$	-	-
P51.3.102 $\mathrm{T1}^{+} \oplus \mathrm{T4}^{-}$	$\surd$	1	1	$\times$	-	-
P51.3.103 $\mathrm{T1}^{+} \oplus \mathrm{T1}^{-}$	$\surd$	1	1	$\times$	-	-
P51.3.104 $\mathrm{T1}^{+} \oplus \mathrm{T2}^{+}$	$\surd$	1	0	$\times$	-	-
P51.3.105 $\mathrm{T1}^{+} \oplus \mathrm{T3}^{-}$	$\surd$	1	1	$\times$	-	-
P51.3.106 $\mathrm{T1}^{+} \oplus \mathrm{T4}^{+}$	$\surd$	1	0	$\times$	-	-
P51.3.107 $\mathrm{T1}^{+} \oplus \mathrm{Y1}^{+}$	$\times$	-	-	-	-	-
P51.3.108 $\mathrm{T1}^{+} \oplus \mathrm{Y4}^{-}$	$\times$	-	-	-	-	-
P51.3.109 $\mathrm{T1}^{+} \oplus \mathrm{Y1}^{-}$	$\times$	-	-	-	-	-
P51.3.110 $\mathrm{T1}^{+} \oplus \mathrm{Y4}^{+}$	$\times$	-	-	-	-	-
P51.3.111 $\mathrm{T1}^{+} \oplus \mathrm{Y2}^{+}$	$\times$	-	-	-	-	-
P51.3.112 $\mathrm{T1}^{+} \oplus \mathrm{Y3}^{-}$	$\times$	-	-	-	-	-
P51.3.113 $\mathrm{T1}^{+} \oplus \mathrm{Y2}^{-}$	$\times$	-	-	-	-	-
P51.3.114 $\mathrm{T1}^{+} \oplus \mathrm{Y3}^{+}$	$\times$	-	-	-	-	-
P51.3.115 $\mathrm{T1}^{+} \oplus \mathrm{Z1}^{+}$	$\times$	-	-	-	-	-
P51.3.116 $\mathrm{T1}^{+} \oplus \mathrm{Z2}^{-}$	$\times$	-	-	-	-	-
P51.3.117 $\mathrm{T1}^{+} \oplus \mathrm{Z1}^{-}$	$\times$	-	-	-	-	-
P51.3.118 $\mathrm{T1}^{+} \oplus \mathrm{Z2}^{+}$	$\times$	-	-	-	-	-
P51.3.119 $\mathrm{T1}^{+} \oplus \mathrm{Z3}^{+}$	$\times$	-	-	-	-	-
P51.3.120 $\mathrm{T1}^{+} \oplus \mathrm{Z4}^{-}$	$\times$	-	-	-	-	-
P51.3.121 $\mathrm{T1}^{+} \oplus \mathrm{Z3}^{-}$	$\times$	-	-	-	-	-
P51.3.122 $\mathrm{T1}^{+} \oplus \mathrm{Z4}^{+}$	$\times$	-	-	-	-	-
P51.3.123 $\mathrm{T1}^{-} \oplus \mathrm{T1}^{-}$	$\surd$	1	0	$\times$	-	-
P51.3.124 $\mathrm{T1}^{-} \oplus \mathrm{T2}^{+}$	$\surd$	1	1	$\times$	-	-
P51.3.125 $\mathrm{T1}^{-} \oplus \mathrm{T3}^{-}$	$\surd$	1	0	$\times$	-	-
P51.3.126 $\mathrm{T1}^{-} \oplus \mathrm{T4}^{+}$	$\surd$	1	1	$\times$	-	-

Coplanar SSGs with parent space group $Pmma$ (No. 51) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P51.3.127 $\mathrm{T1}^{-} \oplus \mathrm{Y1}^{+}$	$\times$	-	-	-	-	-
P51.3.128 $\mathrm{T1}^{-} \oplus \mathrm{Y4}^{-}$	$\times$	-	-	-	-	-
P51.3.129 $\mathrm{T1}^{-} \oplus \mathrm{Y1}^{-}$	$\times$	-	-	-	-	-
P51.3.130 $\mathrm{T1}^{-} \oplus \mathrm{Y4}^{+}$	$\times$	-	-	-	-	-
P51.3.131 $\mathrm{T1}^{-} \oplus \mathrm{Y2}^{+}$	$\times$	-	-	-	-	-
P51.3.132 $\mathrm{T1}^{-} \oplus \mathrm{Y3}^{-}$	$\times$	-	-	-	-	-
P51.3.133 $\mathrm{T1}^{-} \oplus \mathrm{Y2}^{-}$	$\times$	-	-	-	-	-
P51.3.134 $\mathrm{T1}^{-} \oplus \mathrm{Y3}^{+}$	$\times$	-	-	-	-	-
P51.3.135 $\mathrm{T1}^{-} \oplus \mathrm{Z1}^{+}$	$\times$	-	-	-	-	-
P51.3.136 $\mathrm{T1}^{-} \oplus \mathrm{Z2}^{-}$	$\times$	-	-	-	-	-
P51.3.137 $\mathrm{T1}^{-} \oplus \mathrm{Z1}^{-}$	$\times$	-	-	-	-	-
P51.3.138 $\mathrm{T1}^{-} \oplus \mathrm{Z2}^{+}$	$\times$	-	-	-	-	-
P51.3.139 $\mathrm{T1}^{-} \oplus \mathrm{Z3}^{+}$	$\times$	-	-	-	-	-
P51.3.140 $\mathrm{T1}^{-} \oplus \mathrm{Z4}^{-}$	$\times$	-	-	-	-	-
P51.3.141 $\mathrm{T1}^{-} \oplus \mathrm{Z3}^{-}$	$\times$	-	-	-	-	-
P51.3.142 $\mathrm{T1}^{-} \oplus \mathrm{Z4}^{+}$	$\times$	-	-	-	-	-
P51.3.143 $\mathrm{Y1}^{+} \oplus \mathrm{Y1}^{+}$	$\surd$	1	0	$\times$	-	-
P51.3.144 $\mathrm{Y1}^{+} \oplus \mathrm{Y4}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P51.3.145 $\mathrm{Y1}^{+} \oplus \mathrm{Y1}^{-}$	$\surd$	1	1	$\times$	-	-
P51.3.146 $\mathrm{Y1}^{+} \oplus \mathrm{Y4}^{+}$	$\surd$	1	0	$\times$	-	-
P51.3.147 $\mathrm{Y1}^{+} \oplus \mathrm{Y2}^{+}$	$\surd$	1	0	$\times$	-	-
P51.3.148 $\mathrm{Y1}^{+} \oplus \mathrm{Y3}^{-}$	$\surd$	1	1	$\times$	-	-
P51.3.149 $\mathrm{Y1}^{+} \oplus \mathrm{Y2}^{-}$	$\surd$	1	1	$\times$	-	-
P51.3.150 $\mathrm{Y1}^{+} \oplus \mathrm{Y3}^{+}$	$\surd$	1	0	$\times$	-	-
P51.3.151 $\mathrm{Y1}^{+} \oplus \mathrm{Z1}^{+}$	$\times$	-	-	-	-	-
P51.3.152 $\mathrm{Y1}^{+} \oplus \mathrm{Z1}^{-}$	$\times$	-	-	-	-	-
P51.3.153 $\mathrm{Y1}^{+} \oplus \mathrm{Z3}^{+}$	$\times$	-	-	-	-	-
P51.3.154 $\mathrm{Y1}^{+} \oplus \mathrm{Z3}^{-}$	$\times$	-	-	-	-	-
P51.3.155 $\mathrm{Y1}^{-} \oplus \mathrm{Y1}^{-}$	$\surd$	1	0	$\times$	-	-
P51.3.156 $\mathrm{Y1}^{-} \oplus \mathrm{Y4}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P51.3.157 $\mathrm{Y1}^{-} \oplus \mathrm{Y2}^{+}$	$\surd$	1	1	$\times$	-	-
P51.3.158 $\mathrm{Y1}^{-} \oplus \mathrm{Y3}^{-}$	$\surd$	1	0	$\times$	-	-
P51.3.159 $\mathrm{Y1}^{-} \oplus \mathrm{Y2}^{-}$	$\surd$	1	0	$\times$	-	-
P51.3.160 $\mathrm{Y1}^{-} \oplus \mathrm{Y3}^{+}$	$\surd$	1	1	$\times$	-	-
P51.3.161 $\mathrm{Y1}^{-} \oplus \mathrm{Z1}^{+}$	$\times$	-	-	-	-	-
P51.3.162 $\mathrm{Y1}^{-} \oplus \mathrm{Z1}^{-}$	$\times$	-	-	-	-	-
P51.3.163 $\mathrm{Y1}^{-} \oplus \mathrm{Z3}^{+}$	$\times$	-	-	-	-	-
P51.3.164 $\mathrm{Y1}^{-} \oplus \mathrm{Z3}^{-}$	$\times$	-	-	-	-	-
P51.3.165 $\mathrm{Y2}^{+} \oplus \mathrm{Y2}^{+}$	$\surd$	1	0	$\times$	-	-
P51.3.166 $\mathrm{Y2}^{+} \oplus \mathrm{Y3}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P51.3.167 $\mathrm{Y2}^{+} \oplus \mathrm{Y2}^{-}$	$\surd$	1	1	$\times$	-	-
P51.3.168 $\mathrm{Y2}^{+} \oplus \mathrm{Y3}^{+}$	$\surd$	1	0	$\times$	-	-
P51.3.169 $\mathrm{Y2}^{+} \oplus \mathrm{Z1}^{+}$	$\times$	-	-	-	-	-
P51.3.170 $\mathrm{Y2}^{+} \oplus \mathrm{Z1}^{-}$	$\times$	-	-	-	-	-
P51.3.171 $\mathrm{Y2}^{+} \oplus \mathrm{Z3}^{+}$	$\times$	-	-	-	-	-
P51.3.172 $\mathrm{Y2}^{+} \oplus \mathrm{Z3}^{-}$	$\times$	-	-	-	-	-

Coplanar SSGs with parent space group $Pmma$ (No. 51) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P51.3.173 $\mathrm{Y2}^{-} \oplus \mathrm{Y2}^{-}$	$\surd$	1	0	$\times$	-	-
P51.3.174 $\mathrm{Y2}^{-} \oplus \mathrm{Y3}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P51.3.175 $\mathrm{Y2}^{-} \oplus \mathrm{Z1}^{+}$	$\times$	-	-	-	-	-
P51.3.176 $\mathrm{Y2}^{-} \oplus \mathrm{Z1}^{-}$	$\times$	-	-	-	-	-
P51.3.177 $\mathrm{Y2}^{-} \oplus \mathrm{Z3}^{+}$	$\times$	-	-	-	-	-
P51.3.178 $\mathrm{Y2}^{-} \oplus \mathrm{Z3}^{-}$	$\times$	-	-	-	-	-
P51.3.179 $\mathrm{Z1}^{+} \oplus \mathrm{Z1}^{+}$	$\surd$	1	0	$\times$	-	-
P51.3.180 $\mathrm{Z1}^{+} \oplus \mathrm{Z2}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P51.3.181 $\mathrm{Z1}^{+} \oplus \mathrm{Z1}^{-}$	$\surd$	1	1	$\times$	-	-
P51.3.182 $\mathrm{Z1}^{+} \oplus \mathrm{Z2}^{+}$	$\surd$	1	0	$\times$	-	-
P51.3.183 $\mathrm{Z1}^{+} \oplus \mathrm{Z3}^{+}$	$\surd$	1	0	$\times$	-	-
P51.3.184 $\mathrm{Z1}^{+} \oplus \mathrm{Z4}^{-}$	$\surd$	1	1	$\times$	-	-
P51.3.185 $\mathrm{Z1}^{+} \oplus \mathrm{Z3}^{-}$	$\surd$	1	1	$\times$	-	-
P51.3.186 $\mathrm{Z1}^{+} \oplus \mathrm{Z4}^{+}$	$\surd$	1	0	$\times$	-	-
P51.3.187 $\mathrm{Z1}^{-} \oplus \mathrm{Z1}^{-}$	$\surd$	1	0	$\times$	-	-
P51.3.188 $\mathrm{Z1}^{-} \oplus \mathrm{Z2}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P51.3.189 $\mathrm{Z1}^{-} \oplus \mathrm{Z3}^{+}$	$\surd$	1	1	$\times$	-	-
P51.3.190 $\mathrm{Z1}^{-} \oplus \mathrm{Z4}^{-}$	$\surd$	1	0	$\times$	-	-
P51.3.191 $\mathrm{Z1}^{-} \oplus \mathrm{Z3}^{-}$	$\surd$	1	0	$\times$	-	-
P51.3.192 $\mathrm{Z1}^{-} \oplus \mathrm{Z4}^{+}$	$\surd$	1	1	$\times$	-	-
P51.3.193 $\mathrm{Z3}^{+} \oplus \mathrm{Z3}^{+}$	$\surd$	1	0	$\times$	-	-
P51.3.194 $\mathrm{Z3}^{+} \oplus \mathrm{Z4}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P51.3.195 $\mathrm{Z3}^{+} \oplus \mathrm{Z3}^{-}$	$\surd$	1	1	$\times$	-	-
P51.3.196 $\mathrm{Z3}^{+} \oplus \mathrm{Z4}^{+}$	$\surd$	1	0	$\times$	-	-
P51.3.197 $\mathrm{Z3}^{-} \oplus \mathrm{Z3}^{-}$	$\surd$	1	0	$\times$	-	-
P51.3.198 $\mathrm{Z3}^{-} \oplus \mathrm{Z4}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P51.6.1 R1	$\surd$	1	1	$\times$	-	-
P51.6.2 S1	$\surd$	1	1	$\times$	-	-
P51.6.3 U1	$\surd$	1	1	$\times$	-	-
P51.6.4 U2	$\surd$	1	1	$\times$	-	-
P51.6.5 X1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P51.6.6 X2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P51.8.1 SM1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P51.8.2 SM2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P51.8.3 A1	$\surd$	1	1	$\times$	-	-
P51.8.4 A2	$\surd$	1	1	$\times$	-	-
P51.8.5 C1	$\surd$	1	1	$\times$	-	-
P51.8.6 E1	$\surd$	1	1	$\times$	-	-
P51.8.7 DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P51.8.8 DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P51.8.9 DT3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P51.8.10 DT4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P51.8.11 B1	$\surd$	1	1	$\times$	-	-
P51.8.12 B2	$\surd$	1	1	$\times$	-	-
P51.8.13 LD1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P51.8.14 LD2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$

Coplanar SSGs with parent space group $Pmma$ (No. 51) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P51.8.15 LD3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P51.8.16 LD4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P51.8.17 H1	$\surd$	1	1	$\times$	-	-
P51.8.18 H2	$\surd$	1	1	$\times$	-	-

TABLE S153: Non-coplanar SSGs with parent space group $Pmma$ (No. 51).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N51.1.1 $\mathrm{GM1^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g\oplus A_g\oplus A_g}$
N51.2.1 $\mathrm{GM1^-}$	$\surd$	2	2	$\surd$	222	$\mathrm{A1\oplus A1}$
N51.2.2 $\mathrm{GM2^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g\oplus A_g\oplus B1_g}$
N51.2.3 $\mathrm{GM2^-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1\oplus A1}$
N51.2.4 $\mathrm{GM3^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g\oplus A_g\oplus B3_g}$
N51.2.5 $\mathrm{GM3^-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1\oplus A1}$
N51.2.6 $\mathrm{GM4^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g\oplus A_g\oplus B2_g}$
N51.2.7 $\mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1\oplus A1}$
N51.2.8 $\mathrm{T1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g\oplus A_g}$
N51.2.9 $\mathrm{T1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g\oplus A_g}$
N51.2.10 $\mathrm{Y1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g\oplus A_g}$
N51.2.11 $\mathrm{Y1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g\oplus A_g}$
N51.2.12 $\mathrm{Y2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g\oplus A_g}$
N51.2.13 $\mathrm{Y2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g\oplus A_g}$
N51.2.14 $\mathrm{Z1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g\oplus A_g}$
N51.2.15 $\mathrm{Z1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g\oplus A_g}$
N51.2.16 $\mathrm{Z3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g\oplus A_g}$
N51.2.17 $\mathrm{Z3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g\oplus A_g}$
N51.3.1 $\mathrm{GM1^-\oplus GM1^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g\oplus A_u\oplus A_u}$
N51.3.2 $\mathrm{GM1^-\oplus GM2^+}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1\oplus A2}$
N51.3.3 $\mathrm{GM1^-\oplus GM2^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g\oplus A_u\oplus B1_u}$
N51.3.4 $\mathrm{GM1^-\oplus GM3^+}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1\oplus A2}$
N51.3.5 $\mathrm{GM1^-\oplus GM3^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g\oplus A_u\oplus B3_u}$
N51.3.6 $\mathrm{GM1^-\oplus GM4^+}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1\oplus A2}$
N51.3.7 $\mathrm{GM1^-\oplus GM4^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g\oplus A_u\oplus B2_u}$
N51.3.8 $\mathrm{GM1^-\oplus T1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g\oplus A_u}$
N51.3.9 $\mathrm{GM1^-\oplus T1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g\oplus A_u}$
N51.3.10 $\mathrm{GM1^-\oplus Y1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g\oplus A_u}$
N51.3.11 $\mathrm{GM1^-\oplus Y1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g\oplus A_u}$
N51.3.12 $\mathrm{GM1^-\oplus Y2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g\oplus A_u}$
N51.3.13 $\mathrm{GM1^-\oplus Y2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g\oplus A_u}$
N51.3.14 $\mathrm{GM1^-\oplus Z1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g\oplus A_u}$
N51.3.15 $\mathrm{GM1^-\oplus Z1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g\oplus A_u}$
N51.3.16 $\mathrm{GM1^-\oplus Z3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g\oplus A_u}$
N51.3.17 $\mathrm{GM1^-\oplus Z3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g\oplus A_u}$
N51.3.18 $\mathrm{GM2^+\oplus GM2^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g\oplus B1_g\oplus B1_g}$
N51.3.19 $\mathrm{GM2^+\oplus GM2^-}$	$\surd$	2	2	$\surd$	222	$\mathrm{A1\oplus B1}$
N51.3.20 $\mathrm{GM2^+\oplus GM3^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g\oplus B1_g\oplus B3_g}$

Non-coplanar SSGs with parent space group $Pmma$ (No. 51) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N51.3.21 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{-}$	√	2	2	√	$mm2$	$\mathrm{A1}\oplus\mathrm{B1}$
N51.3.22 $\mathrm{GM2}^{+}\oplus\mathrm{GM4}^{+}$	√	3	3	√	mmm	$\mathrm{A_g}\oplus\mathrm{B1_g}\oplus\mathrm{B2_g}$
N51.3.23 $\mathrm{GM2}^{+}\oplus\mathrm{GM4}^{-}$	√	2	2	√	$mm2$	$\mathrm{A1}\oplus\mathrm{B2}$
N51.3.24 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{+}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B1_g}$
N51.3.25 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{-}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B1_g}$
N51.3.26 $\mathrm{GM2}^{+}\oplus\mathrm{Y1}^{+}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B1_g}$
N51.3.27 $\mathrm{GM2}^{+}\oplus\mathrm{Y1}^{-}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B1_g}$
N51.3.28 $\mathrm{GM2}^{+}\oplus\mathrm{Y2}^{+}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B1_g}$
N51.3.29 $\mathrm{GM2}^{+}\oplus\mathrm{Y2}^{-}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B1_g}$
N51.3.30 $\mathrm{GM2}^{+}\oplus\mathrm{Z1}^{+}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B1_g}$
N51.3.31 $\mathrm{GM2}^{+}\oplus\mathrm{Z1}^{-}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B1_g}$
N51.3.32 $\mathrm{GM2}^{+}\oplus\mathrm{Z3}^{+}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B1_g}$
N51.3.33 $\mathrm{GM2}^{+}\oplus\mathrm{Z3}^{-}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B1_g}$
N51.3.34 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}$	√	3	3	√	mmm	$\mathrm{A_g}\oplus\mathrm{B1_u}\oplus\mathrm{B1_u}$
N51.3.35 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{+}$	√	2	2	√	$mm2$	$\mathrm{A1}\oplus\mathrm{B2}$
N51.3.36 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}$	√	3	3	√	mmm	$\mathrm{A_g}\oplus\mathrm{B1_u}\oplus\mathrm{B3_u}$
N51.3.37 $\mathrm{GM2}^{-}\oplus\mathrm{GM4}^{+}$	√	2	2	√	$mm2$	$\mathrm{A1}\oplus\mathrm{B1}$
N51.3.38 $\mathrm{GM2}^{-}\oplus\mathrm{GM4}^{-}$	√	3	3	√	mmm	$\mathrm{A_g}\oplus\mathrm{B1_u}\oplus\mathrm{B2_u}$
N51.3.39 $\mathrm{GM2}^{-}\oplus\mathrm{T1}^{+}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B1_u}$
N51.3.40 $\mathrm{GM2}^{-}\oplus\mathrm{T1}^{-}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B1_u}$
N51.3.41 $\mathrm{GM2}^{-}\oplus\mathrm{Y1}^{+}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B1_u}$
N51.3.42 $\mathrm{GM2}^{-}\oplus\mathrm{Y1}^{-}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B1_u}$
N51.3.43 $\mathrm{GM2}^{-}\oplus\mathrm{Y2}^{+}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B1_u}$
N51.3.44 $\mathrm{GM2}^{-}\oplus\mathrm{Y2}^{-}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B1_u}$
N51.3.45 $\mathrm{GM2}^{-}\oplus\mathrm{Z1}^{+}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B1_u}$
N51.3.46 $\mathrm{GM2}^{-}\oplus\mathrm{Z1}^{-}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B1_u}$
N51.3.47 $\mathrm{GM2}^{-}\oplus\mathrm{Z3}^{+}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B1_u}$
N51.3.48 $\mathrm{GM2}^{-}\oplus\mathrm{Z3}^{-}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B1_u}$
N51.3.49 $\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{+}$	√	3	3	√	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}\oplus\mathrm{B3_g}$
N51.3.50 $\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{-}$	√	2	2	√	222	$\mathrm{A1}\oplus\mathrm{B3}$
N51.3.51 $\mathrm{GM3}^{+}\oplus\mathrm{GM4}^{+}$	√	3	3	√	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}\oplus\mathrm{B2_g}$
N51.3.52 $\mathrm{GM3}^{+}\oplus\mathrm{GM4}^{-}$	√	2	2	√	$mm2$	$\mathrm{A1}\oplus\mathrm{B2}$
N51.3.53 $\mathrm{GM3}^{+}\oplus\mathrm{T1}^{+}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}$
N51.3.54 $\mathrm{GM3}^{+}\oplus\mathrm{T1}^{-}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}$
N51.3.55 $\mathrm{GM3}^{+}\oplus\mathrm{Y1}^{+}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}$
N51.3.56 $\mathrm{GM3}^{+}\oplus\mathrm{Y1}^{-}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}$
N51.3.57 $\mathrm{GM3}^{+}\oplus\mathrm{Y2}^{+}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}$
N51.3.58 $\mathrm{GM3}^{+}\oplus\mathrm{Y2}^{-}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}$
N51.3.59 $\mathrm{GM3}^{+}\oplus\mathrm{Z1}^{+}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}$
N51.3.60 $\mathrm{GM3}^{+}\oplus\mathrm{Z1}^{-}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}$
N51.3.61 $\mathrm{GM3}^{+}\oplus\mathrm{Z3}^{+}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}$
N51.3.62 $\mathrm{GM3}^{+}\oplus\mathrm{Z3}^{-}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}$
N51.3.63 $\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}$	√	3	3	√	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}\oplus\mathrm{B3_u}$
N51.3.64 $\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{+}$	√	2	2	√	$mm2$	$\mathrm{A1}\oplus\mathrm{B1}$
N51.3.65 $\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{-}$	√	3	3	√	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}\oplus\mathrm{B2_u}$
N51.3.66 $\mathrm{GM3}^{-}\oplus\mathrm{T1}^{+}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}$

Non-coplanar SSGs with parent space group $Pmma$ (No. 51) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N51.3.67 $\mathrm{GM3^-} \oplus \mathrm{T1^-}$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u}$
N51.3.68 $\mathrm{GM3^-} \oplus \mathrm{Y1^+}$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u}$
N51.3.69 $\mathrm{GM3^-} \oplus \mathrm{Y1^-}$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u}$
N51.3.70 $\mathrm{GM3^-} \oplus \mathrm{Y2^+}$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u}$
N51.3.71 $\mathrm{GM3^-} \oplus \mathrm{Y2^-}$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u}$
N51.3.72 $\mathrm{GM3^-} \oplus \mathrm{Z1^+}$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u}$
N51.3.73 $\mathrm{GM3^-} \oplus \mathrm{Z1^-}$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u}$
N51.3.74 $\mathrm{GM3^-} \oplus \mathrm{Z3^+}$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u}$
N51.3.75 $\mathrm{GM3^-} \oplus \mathrm{Z3^-}$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u}$
N51.3.76 $\mathrm{GM4^+} \oplus \mathrm{GM4^+}$	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N51.3.77 $\mathrm{GM4^+} \oplus \mathrm{GM4^-}$	√	2	2	√	222	$\mathrm{A1} \oplus \mathrm{B2}$
N51.3.78 $\mathrm{GM4^+} \oplus \mathrm{T1^+}$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B2_g}$
N51.3.79 $\mathrm{GM4^+} \oplus \mathrm{T1^-}$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B2_g}$
N51.3.80 $\mathrm{GM4^+} \oplus \mathrm{Y1^+}$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B2_g}$
N51.3.81 $\mathrm{GM4^+} \oplus \mathrm{Y1^-}$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B2_g}$
N51.3.82 $\mathrm{GM4^+} \oplus \mathrm{Y2^+}$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B2_g}$
N51.3.83 $\mathrm{GM4^+} \oplus \mathrm{Y2^-}$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B2_g}$
N51.3.84 $\mathrm{GM4^+} \oplus \mathrm{Z1^+}$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B2_g}$
N51.3.85 $\mathrm{GM4^+} \oplus \mathrm{Z1^-}$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B2_g}$
N51.3.86 $\mathrm{GM4^+} \oplus \mathrm{Z3^+}$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B2_g}$
N51.3.87 $\mathrm{GM4^+} \oplus \mathrm{Z3^-}$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B2_g}$
N51.3.88 $\mathrm{GM4^-} \oplus \mathrm{GM4^-}$	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N51.3.89 $\mathrm{GM4^-} \oplus \mathrm{T1^+}$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B2_u}$
N51.3.90 $\mathrm{GM4^-} \oplus \mathrm{T1^-}$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B2_u}$
N51.3.91 $\mathrm{GM4^-} \oplus \mathrm{Y1^+}$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B2_u}$
N51.3.92 $\mathrm{GM4^-} \oplus \mathrm{Y1^-}$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B2_u}$
N51.3.93 $\mathrm{GM4^-} \oplus \mathrm{Y2^+}$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B2_u}$
N51.3.94 $\mathrm{GM4^-} \oplus \mathrm{Y2^-}$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B2_u}$
N51.3.95 $\mathrm{GM4^-} \oplus \mathrm{Z1^+}$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B2_u}$
N51.3.96 $\mathrm{GM4^-} \oplus \mathrm{Z1^-}$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B2_u}$
N51.3.97 $\mathrm{GM4^-} \oplus \mathrm{Z3^+}$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B2_u}$
N51.3.98 $\mathrm{GM4^-} \oplus \mathrm{Z3^-}$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B2_u}$
N51.3.99 $\mathrm{T1^+} \oplus \mathrm{T1^+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N51.3.100 $\mathrm{T1^+} \oplus \mathrm{T2^-}$	√	1	1	√	$mm2$	A1
N51.3.101 $\mathrm{T1^+} \oplus \mathrm{T3^+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N51.3.102 $\mathrm{T1^+} \oplus \mathrm{T4^-}$	√	1	1	√	$mm2$	A1
N51.3.103 $\mathrm{T1^+} \oplus \mathrm{T1^-}$	√	1	1	√	222	A1
N51.3.104 $\mathrm{T1^+} \oplus \mathrm{T2^+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N51.3.105 $\mathrm{T1^+} \oplus \mathrm{T3^-}$	√	1	1	√	$mm2$	A1
N51.3.106 $\mathrm{T1^+} \oplus \mathrm{T4^+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N51.3.107 $\mathrm{T1^+} \oplus \mathrm{Y1^+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N51.3.108 $\mathrm{T1^+} \oplus \mathrm{Y4^-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N51.3.109 $\mathrm{T1^+} \oplus \mathrm{Y1^-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N51.3.110 $\mathrm{T1^+} \oplus \mathrm{Y4^+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N51.3.111 $\mathrm{T1^+} \oplus \mathrm{Y2^+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N51.3.112 $\mathrm{T1^+} \oplus \mathrm{Y3^-}$	√	1	1	√	mmm	$\mathrm{A_g}$

Non-coplanar SSGs with parent space group $Pmma$ (No. 51) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N51.3.113 $\mathrm{T1}^{+}\oplus\mathrm{Y2}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N51.3.114 $\mathrm{T1}^{+}\oplus\mathrm{Y3}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N51.3.115 $\mathrm{T1}^{+}\oplus\mathrm{Z1}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N51.3.116 $\mathrm{T1}^{+}\oplus\mathrm{Z2}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N51.3.117 $\mathrm{T1}^{+}\oplus\mathrm{Z1}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N51.3.118 $\mathrm{T1}^{+}\oplus\mathrm{Z2}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N51.3.119 $\mathrm{T1}^{+}\oplus\mathrm{Z3}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N51.3.120 $\mathrm{T1}^{+}\oplus\mathrm{Z4}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N51.3.121 $\mathrm{T1}^{+}\oplus\mathrm{Z3}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N51.3.122 $\mathrm{T1}^{+}\oplus\mathrm{Z4}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N51.3.123 $\mathrm{T1}^{-}\oplus\mathrm{T1}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N51.3.124 $\mathrm{T1}^{-}\oplus\mathrm{T2}^{+}$	√	1	1	√	$mm2$	A1
N51.3.125 $\mathrm{T1}^{-}\oplus\mathrm{T3}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N51.3.126 $\mathrm{T1}^{-}\oplus\mathrm{T4}^{+}$	√	1	1	√	$mm2$	A1
N51.3.127 $\mathrm{T1}^{-}\oplus\mathrm{Y1}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N51.3.128 $\mathrm{T1}^{-}\oplus\mathrm{Y4}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N51.3.129 $\mathrm{T1}^{-}\oplus\mathrm{Y1}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N51.3.130 $\mathrm{T1}^{-}\oplus\mathrm{Y4}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N51.3.131 $\mathrm{T1}^{-}\oplus\mathrm{Y2}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N51.3.132 $\mathrm{T1}^{-}\oplus\mathrm{Y3}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N51.3.133 $\mathrm{T1}^{-}\oplus\mathrm{Y2}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N51.3.134 $\mathrm{T1}^{-}\oplus\mathrm{Y3}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N51.3.135 $\mathrm{T1}^{-}\oplus\mathrm{Z1}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N51.3.136 $\mathrm{T1}^{-}\oplus\mathrm{Z2}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N51.3.137 $\mathrm{T1}^{-}\oplus\mathrm{Z1}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N51.3.138 $\mathrm{T1}^{-}\oplus\mathrm{Z2}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N51.3.139 $\mathrm{T1}^{-}\oplus\mathrm{Z3}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N51.3.140 $\mathrm{T1}^{-}\oplus\mathrm{Z4}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N51.3.141 $\mathrm{T1}^{-}\oplus\mathrm{Z3}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N51.3.142 $\mathrm{T1}^{-}\oplus\mathrm{Z4}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N51.3.143 $\mathrm{Y1}^{+}\oplus\mathrm{Y1}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N51.3.144 $\mathrm{Y1}^{+}\oplus\mathrm{Y4}^{-}$	√	1	1	√	$mm2$	A1
N51.3.145 $\mathrm{Y1}^{+}\oplus\mathrm{Y1}^{-}$	√	1	1	√	222	A1
N51.3.146 $\mathrm{Y1}^{+}\oplus\mathrm{Y4}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N51.3.147 $\mathrm{Y1}^{+}\oplus\mathrm{Y2}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N51.3.148 $\mathrm{Y1}^{+}\oplus\mathrm{Y3}^{-}$	√	1	1	√	$mm2$	A1
N51.3.149 $\mathrm{Y1}^{+}\oplus\mathrm{Y2}^{-}$	√	1	1	√	$mm2$	A1
N51.3.150 $\mathrm{Y1}^{+}\oplus\mathrm{Y3}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N51.3.151 $\mathrm{Y1}^{+}\oplus\mathrm{Z1}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N51.3.152 $\mathrm{Y1}^{+}\oplus\mathrm{Z1}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N51.3.153 $\mathrm{Y1}^{+}\oplus\mathrm{Z3}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N51.3.154 $\mathrm{Y1}^{+}\oplus\mathrm{Z3}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N51.3.155 $\mathrm{Y1}^{-}\oplus\mathrm{Y1}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N51.3.156 $\mathrm{Y1}^{-}\oplus\mathrm{Y4}^{+}$	√	1	1	√	$mm2$	A1
N51.3.157 $\mathrm{Y1}^{-}\oplus\mathrm{Y2}^{+}$	√	1	1	√	$mm2$	A1
N51.3.158 $\mathrm{Y1}^{-}\oplus\mathrm{Y3}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$

Non-coplanar SSGs with parent space group $Pmma$ (No. 51) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N51.3.159 $\mathrm{Y1}^{-} \oplus \mathrm{Y2}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N51.3.160 $\mathrm{Y1}^{-} \oplus \mathrm{Y3}^{+}$	$\surd$	1	1	$\surd$	$mm2$	A1
N51.3.161 $\mathrm{Y1}^{-} \oplus \mathrm{Z1}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N51.3.162 $\mathrm{Y1}^{-} \oplus \mathrm{Z1}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N51.3.163 $\mathrm{Y1}^{-} \oplus \mathrm{Z3}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N51.3.164 $\mathrm{Y1}^{-} \oplus \mathrm{Z3}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N51.3.165 $\mathrm{Y2}^{+} \oplus \mathrm{Y2}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N51.3.166 $\mathrm{Y2}^{+} \oplus \mathrm{Y3}^{-}$	$\surd$	1	1	$\surd$	$mm2$	A1
N51.3.167 $\mathrm{Y2}^{+} \oplus \mathrm{Y2}^{-}$	$\surd$	1	1	$\surd$	222	A1
N51.3.168 $\mathrm{Y2}^{+} \oplus \mathrm{Y3}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N51.3.169 $\mathrm{Y2}^{+} \oplus \mathrm{Z1}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N51.3.170 $\mathrm{Y2}^{+} \oplus \mathrm{Z1}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N51.3.171 $\mathrm{Y2}^{+} \oplus \mathrm{Z3}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N51.3.172 $\mathrm{Y2}^{+} \oplus \mathrm{Z3}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N51.3.173 $\mathrm{Y2}^{-} \oplus \mathrm{Y2}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N51.3.174 $\mathrm{Y2}^{-} \oplus \mathrm{Y3}^{+}$	$\surd$	1	1	$\surd$	$mm2$	A1
N51.3.175 $\mathrm{Y2}^{-} \oplus \mathrm{Z1}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N51.3.176 $\mathrm{Y2}^{-} \oplus \mathrm{Z1}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N51.3.177 $\mathrm{Y2}^{-} \oplus \mathrm{Z3}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N51.3.178 $\mathrm{Y2}^{-} \oplus \mathrm{Z3}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N51.3.179 $\mathrm{Z1}^{+} \oplus \mathrm{Z1}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N51.3.180 $\mathrm{Z1}^{+} \oplus \mathrm{Z2}^{-}$	$\surd$	1	1	$\surd$	$mm2$	A1
N51.3.181 $\mathrm{Z1}^{+} \oplus \mathrm{Z1}^{-}$	$\surd$	1	1	$\surd$	222	A1
N51.3.182 $\mathrm{Z1}^{+} \oplus \mathrm{Z2}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N51.3.183 $\mathrm{Z1}^{+} \oplus \mathrm{Z3}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N51.3.184 $\mathrm{Z1}^{+} \oplus \mathrm{Z4}^{-}$	$\surd$	1	1	$\surd$	$mm2$	A1
N51.3.185 $\mathrm{Z1}^{+} \oplus \mathrm{Z3}^{-}$	$\surd$	1	1	$\surd$	$mm2$	A1
N51.3.186 $\mathrm{Z1}^{+} \oplus \mathrm{Z4}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N51.3.187 $\mathrm{Z1}^{-} \oplus \mathrm{Z1}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N51.3.188 $\mathrm{Z1}^{-} \oplus \mathrm{Z2}^{+}$	$\surd$	1	1	$\surd$	$mm2$	A1
N51.3.189 $\mathrm{Z1}^{-} \oplus \mathrm{Z3}^{+}$	$\surd$	1	1	$\surd$	$mm2$	A1
N51.3.190 $\mathrm{Z1}^{-} \oplus \mathrm{Z4}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N51.3.191 $\mathrm{Z1}^{-} \oplus \mathrm{Z3}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N51.3.192 $\mathrm{Z1}^{-} \oplus \mathrm{Z4}^{+}$	$\surd$	1	1	$\surd$	$mm2$	A1
N51.3.193 $\mathrm{Z3}^{+} \oplus \mathrm{Z3}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N51.3.194 $\mathrm{Z3}^{+} \oplus \mathrm{Z4}^{-}$	$\surd$	1	1	$\surd$	$mm2$	A1
N51.3.195 $\mathrm{Z3}^{+} \oplus \mathrm{Z3}^{-}$	$\surd$	1	1	$\surd$	222	A1
N51.3.196 $\mathrm{Z3}^{+} \oplus \mathrm{Z4}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N51.3.197 $\mathrm{Z3}^{-} \oplus \mathrm{Z3}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N51.3.198 $\mathrm{Z3}^{-} \oplus \mathrm{Z4}^{+}$	$\surd$	1	1	$\surd$	$mm2$	A1
N51.6.1 R1	$\surd$	1	1	$\surd$	$mm2$	A1
N51.6.2 S1	$\surd$	1	1	$\surd$	$mm2$	A1
N51.6.3 U1	$\surd$	1	1	$\surd$	$mm2$	A1
N51.6.4 U2	$\surd$	1	1	$\surd$	$mm2$	A1
N51.6.5 X1	$\surd$	1	1	$\surd$	$mm2$	A1
N51.6.6 X2	$\surd$	1	1	$\surd$	$mm2$	A1

Non-coplanar SSGs with parent space group $Pmma$ (No. 51) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N51.8.1 SM1	√	1	1	√	$mm2$	A1
N51.8.2 SM2	√	1	1	√	$mm2$	A1
N51.8.3 A1	√	1	1	√	$mm2$	A1
N51.8.4 A2	√	1	1	√	$mm2$	A1
N51.8.5 C1	√	1	1	√	$mm2$	A1
N51.8.6 E1	√	1	1	√	$mm2$	A1
N51.8.7 DT1	√	1	1	√	$mm2$	A1
N51.8.8 DT2	√	1	1	√	$mm2$	A1
N51.8.9 DT3	√	1	1	√	$mm2$	A1
N51.8.10 DT4	√	1	1	√	$mm2$	A1
N51.8.11 B1	√	1	1	√	$mm2$	A1
N51.8.12 B2	√	1	1	√	$mm2$	A1
N51.8.13 LD1	√	1	1	√	$mm2$	A1
N51.8.14 LD2	√	1	1	√	$mm2$	A1
N51.8.15 LD3	√	1	1	√	$mm2$	A1
N51.8.16 LD4	√	1	1	√	$mm2$	A1
N51.8.17 H1	√	1	1	√	$mm2$	A1
N51.8.18 H2	√	1	1	√	$mm2$	A1
N51.9.1 $\mathrm{GM1^-}\oplus\mathrm{GM1^-}\oplus\mathrm{GM1^-}$	√	0	0	√	-	-
N51.9.2 $\mathrm{GM1^-}\oplus\mathrm{GM1^-}\oplus\mathrm{GM2^+}$	√	3	3	√	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_u}\oplus\mathrm{B1_u}$
N51.9.3 $\mathrm{GM1^-}\oplus\mathrm{GM1^-}\oplus\mathrm{GM2^-}$	√	0	0	√	-	-
N51.9.4 $\mathrm{GM1^-}\oplus\mathrm{GM1^-}\oplus\mathrm{GM3^+}$	√	3	3	√	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_u}\oplus\mathrm{B3_u}$
N51.9.5 $\mathrm{GM1^-}\oplus\mathrm{GM1^-}\oplus\mathrm{GM3^-}$	√	0	0	√	-	-
N51.9.6 $\mathrm{GM1^-}\oplus\mathrm{GM1^-}\oplus\mathrm{GM4^+}$	√	3	3	√	mmm	$\mathrm{B2_g}\oplus\mathrm{B2_u}\oplus\mathrm{B2_u}$
N51.9.7 $\mathrm{GM1^-}\oplus\mathrm{GM1^-}\oplus\mathrm{GM4^-}$	√	0	0	√	-	-
N51.9.8 $\mathrm{GM1^-}\oplus\mathrm{GM1^-}\oplus\mathrm{T1^+}$	√	0	0	√	-	-
N51.9.9 $\mathrm{GM1^-}\oplus\mathrm{GM1^-}\oplus\mathrm{T1^-}$	√	0	0	√	-	-
N51.9.10 $\mathrm{GM1^-}\oplus\mathrm{GM1^-}\oplus\mathrm{Y1^+}$	√	0	0	√	-	-
N51.9.11 $\mathrm{GM1^-}\oplus\mathrm{GM1^-}\oplus\mathrm{Y1^-}$	√	0	0	√	-	-
N51.9.12 $\mathrm{GM1^-}\oplus\mathrm{GM1^-}\oplus\mathrm{Y2^+}$	√	0	0	√	-	-
N51.9.13 $\mathrm{GM1^-}\oplus\mathrm{GM1^-}\oplus\mathrm{Y2^-}$	√	0	0	√	-	-
N51.9.14 $\mathrm{GM1^-}\oplus\mathrm{GM1^-}\oplus\mathrm{Z1^+}$	√	0	0	√	-	-
N51.9.15 $\mathrm{GM1^-}\oplus\mathrm{GM1^-}\oplus\mathrm{Z1^-}$	√	0	0	√	-	-
N51.9.16 $\mathrm{GM1^-}\oplus\mathrm{GM1^-}\oplus\mathrm{Z3^+}$	√	0	0	√	-	-
N51.9.17 $\mathrm{GM1^-}\oplus\mathrm{GM1^-}\oplus\mathrm{Z3^-}$	√	0	0	√	-	-
N51.9.18 $\mathrm{GM1^-}\oplus\mathrm{GM2^+}\oplus\mathrm{GM2^+}$	√	2	2	√	222	$\mathrm{B1}\oplus\mathrm{B1}$
N51.9.19 $\mathrm{GM1^-}\oplus\mathrm{GM2^+}\oplus\mathrm{GM2^-}$	√	3	3	√	mmm	$\mathrm{A_u}\oplus\mathrm{B1_g}\oplus\mathrm{B1_u}$
N51.9.20 $\mathrm{GM1^-}\oplus\mathrm{GM2^+}\oplus\mathrm{GM3^+}$	√	2	2	√	$mm2$	$\mathrm{B2}\oplus\mathrm{B1}$
N51.9.21 $\mathrm{GM1^-}\oplus\mathrm{GM2^+}\oplus\mathrm{GM3^-}$	√	3	3	√	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_u}\oplus\mathrm{B2_u}$
N51.9.22 $\mathrm{GM1^-}\oplus\mathrm{GM2^+}\oplus\mathrm{GM4^+}$	√	2	2	√	$mm2$	$\mathrm{B2}\oplus\mathrm{B1}$
N51.9.23 $\mathrm{GM1^-}\oplus\mathrm{GM2^+}\oplus\mathrm{GM4^-}$	√	3	3	√	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_u}\oplus\mathrm{B3_u}$
N51.9.24 $\mathrm{GM1^-}\oplus\mathrm{GM2^+}\oplus\mathrm{T1^+}$	√	2	2	√	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_u}$
N51.9.25 $\mathrm{GM1^-}\oplus\mathrm{GM2^+}\oplus\mathrm{T1^-}$	√	2	2	√	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_u}$
N51.9.26 $\mathrm{GM1^-}\oplus\mathrm{GM2^+}\oplus\mathrm{Y1^+}$	√	2	2	√	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_u}$
N51.9.27 $\mathrm{GM1^-}\oplus\mathrm{GM2^+}\oplus\mathrm{Y1^-}$	√	2	2	√	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_u}$
N51.9.28 $\mathrm{GM1^-}\oplus\mathrm{GM2^+}\oplus\mathrm{Y2^+}$	√	2	2	√	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_u}$

Non-coplanar SSGs with parent space group $Pmma$ (No. 51) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N51.9.29 $\mathrm{GM1^-}\oplus\mathrm{GM2^+}\oplus\mathrm{Y2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_u}$
N51.9.30 $\mathrm{GM1^-}\oplus\mathrm{GM2^+}\oplus\mathrm{Z1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_u}$
N51.9.31 $\mathrm{GM1^-}\oplus\mathrm{GM2^+}\oplus\mathrm{Z1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_u}$
N51.9.32 $\mathrm{GM1^-}\oplus\mathrm{GM2^+}\oplus\mathrm{Z3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_u}$
N51.9.33 $\mathrm{GM1^-}\oplus\mathrm{GM2^+}\oplus\mathrm{Z3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_u}$
N51.9.34 $\mathrm{GM1^-}\oplus\mathrm{GM2^-}\oplus\mathrm{GM2^-}$	$\surd$	0	0	$\surd$	-	-
N51.9.35 $\mathrm{GM1^-}\oplus\mathrm{GM2^-}\oplus\mathrm{GM3^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_u}\oplus\mathrm{B2_u}$
N51.9.36 $\mathrm{GM1^-}\oplus\mathrm{GM2^-}\oplus\mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
N51.9.37 $\mathrm{GM1^-}\oplus\mathrm{GM2^-}\oplus\mathrm{GM4^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_u}\oplus\mathrm{B2_g}\oplus\mathrm{B2_u}$
N51.9.38 $\mathrm{GM1^-}\oplus\mathrm{GM2^-}\oplus\mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N51.9.39 $\mathrm{GM1^-}\oplus\mathrm{GM2^-}\oplus\mathrm{T1^+}$	$\surd$	0	0	$\surd$	-	-
N51.9.40 $\mathrm{GM1^-}\oplus\mathrm{GM2^-}\oplus\mathrm{T1^-}$	$\surd$	0	0	$\surd$	-	-
N51.9.41 $\mathrm{GM1^-}\oplus\mathrm{GM2^-}\oplus\mathrm{Y1^+}$	$\surd$	0	0	$\surd$	-	-
N51.9.42 $\mathrm{GM1^-}\oplus\mathrm{GM2^-}\oplus\mathrm{Y1^-}$	$\surd$	0	0	$\surd$	-	-
N51.9.43 $\mathrm{GM1^-}\oplus\mathrm{GM2^-}\oplus\mathrm{Y2^+}$	$\surd$	0	0	$\surd$	-	-
N51.9.44 $\mathrm{GM1^-}\oplus\mathrm{GM2^-}\oplus\mathrm{Y2^-}$	$\surd$	0	0	$\surd$	-	-
N51.9.45 $\mathrm{GM1^-}\oplus\mathrm{GM2^-}\oplus\mathrm{Z1^+}$	$\surd$	0	0	$\surd$	-	-
N51.9.46 $\mathrm{GM1^-}\oplus\mathrm{GM2^-}\oplus\mathrm{Z1^-}$	$\surd$	0	0	$\surd$	-	-
N51.9.47 $\mathrm{GM1^-}\oplus\mathrm{GM2^-}\oplus\mathrm{Z3^+}$	$\surd$	0	0	$\surd$	-	-
N51.9.48 $\mathrm{GM1^-}\oplus\mathrm{GM2^-}\oplus\mathrm{Z3^-}$	$\surd$	0	0	$\surd$	-	-
N51.9.49 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{GM3^+}$	$\surd$	2	2	$\surd$	222	$\mathrm{B3}\oplus\mathrm{B3}$
N51.9.50 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{GM3^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B3_g}\oplus\mathrm{B3_u}$
N51.9.51 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2}\oplus\mathrm{B1}$
N51.9.52 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{GM4^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B3_g}\oplus\mathrm{B3_u}$
N51.9.53 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{T1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_u}$
N51.9.54 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{T1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_u}$
N51.9.55 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{Y1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_u}$
N51.9.56 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{Y1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_u}$
N51.9.57 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{Y2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_u}$
N51.9.58 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{Y2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_u}$
N51.9.59 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{Z1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_u}$
N51.9.60 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{Z1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_u}$
N51.9.61 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{Z3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_u}$
N51.9.62 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{Z3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_u}$
N51.9.63 $\mathrm{GM1^-}\oplus\mathrm{GM3^-}\oplus\mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
N51.9.64 $\mathrm{GM1^-}\oplus\mathrm{GM3^-}\oplus\mathrm{GM4^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B2_g}\oplus\mathrm{B2_u}$
N51.9.65 $\mathrm{GM1^-}\oplus\mathrm{GM3^-}\oplus\mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N51.9.66 $\mathrm{GM1^-}\oplus\mathrm{GM3^-}\oplus\mathrm{T1^+}$	$\surd$	0	0	$\surd$	-	-
N51.9.67 $\mathrm{GM1^-}\oplus\mathrm{GM3^-}\oplus\mathrm{T1^-}$	$\surd$	0	0	$\surd$	-	-
N51.9.68 $\mathrm{GM1^-}\oplus\mathrm{GM3^-}\oplus\mathrm{Y1^+}$	$\surd$	0	0	$\surd$	-	-
N51.9.69 $\mathrm{GM1^-}\oplus\mathrm{GM3^-}\oplus\mathrm{Y1^-}$	$\surd$	0	0	$\surd$	-	-
N51.9.70 $\mathrm{GM1^-}\oplus\mathrm{GM3^-}\oplus\mathrm{Y2^+}$	$\surd$	0	0	$\surd$	-	-
N51.9.71 $\mathrm{GM1^-}\oplus\mathrm{GM3^-}\oplus\mathrm{Y2^-}$	$\surd$	0	0	$\surd$	-	-
N51.9.72 $\mathrm{GM1^-}\oplus\mathrm{GM3^-}\oplus\mathrm{Z1^+}$	$\surd$	0	0	$\surd$	-	-
N51.9.73 $\mathrm{GM1^-}\oplus\mathrm{GM3^-}\oplus\mathrm{Z1^-}$	$\surd$	0	0	$\surd$	-	-
N51.9.74 $\mathrm{GM1^-}\oplus\mathrm{GM3^-}\oplus\mathrm{Z3^+}$	$\surd$	0	0	$\surd$	-	-

Non-coplanar SSGs with parent space group $Pmma$ (No. 51) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N51.9.75 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Z3}^-$	$\surd$	0	0	$\surd$	-	-
N51.9.76 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	222	$\mathrm{B2} \oplus \mathrm{B2}$
N51.9.77 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N51.9.78 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{T1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_g} \oplus \mathrm{B2_u}$
N51.9.79 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{T1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_g} \oplus \mathrm{B2_u}$
N51.9.80 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_g} \oplus \mathrm{B2_u}$
N51.9.81 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_g} \oplus \mathrm{B2_u}$
N51.9.82 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_g} \oplus \mathrm{B2_u}$
N51.9.83 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_g} \oplus \mathrm{B2_u}$
N51.9.84 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{Z1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_g} \oplus \mathrm{B2_u}$
N51.9.85 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{Z1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_g} \oplus \mathrm{B2_u}$
N51.9.86 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{Z3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_g} \oplus \mathrm{B2_u}$
N51.9.87 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{Z3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_g} \oplus \mathrm{B2_u}$
N51.9.88 $\mathrm{GM1}^- \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N51.9.89 $\mathrm{GM1}^- \oplus \mathrm{GM4}^- \oplus \mathrm{T1}^+$	$\surd$	0	0	$\surd$	-	-
N51.9.90 $\mathrm{GM1}^- \oplus \mathrm{GM4}^- \oplus \mathrm{T1}^-$	$\surd$	0	0	$\surd$	-	-
N51.9.91 $\mathrm{GM1}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Y1}^+$	$\surd$	0	0	$\surd$	-	-
N51.9.92 $\mathrm{GM1}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Y1}^-$	$\surd$	0	0	$\surd$	-	-
N51.9.93 $\mathrm{GM1}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Y2}^+$	$\surd$	0	0	$\surd$	-	-
N51.9.94 $\mathrm{GM1}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Y2}^-$	$\surd$	0	0	$\surd$	-	-
N51.9.95 $\mathrm{GM1}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Z1}^+$	$\surd$	0	0	$\surd$	-	-
N51.9.96 $\mathrm{GM1}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Z1}^-$	$\surd$	0	0	$\surd$	-	-
N51.9.97 $\mathrm{GM1}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Z3}^+$	$\surd$	0	0	$\surd$	-	-
N51.9.98 $\mathrm{GM1}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Z3}^-$	$\surd$	0	0	$\surd$	-	-
N51.9.99 $\mathrm{GM1}^- \oplus \mathrm{T1}^+ \oplus \mathrm{T1}^+$	$\surd$	1	0	$\times$	-	-
N51.9.100 $\mathrm{GM1}^- \oplus \mathrm{T1}^+ \oplus \mathrm{T2}^-$	$\surd$	1	1	$\times$	-	-
N51.9.101 $\mathrm{GM1}^- \oplus \mathrm{T1}^+ \oplus \mathrm{T3}^+$	$\surd$	1	0	$\times$	-	-
N51.9.102 $\mathrm{GM1}^- \oplus \mathrm{T1}^+ \oplus \mathrm{T4}^-$	$\surd$	1	1	$\times$	-	-
N51.9.103 $\mathrm{GM1}^- \oplus \mathrm{T1}^+ \oplus \mathrm{T1}^-$	$\surd$	1	1	$\times$	-	-
N51.9.104 $\mathrm{GM1}^- \oplus \mathrm{T1}^+ \oplus \mathrm{T2}^+$	$\surd$	1	0	$\times$	-	-
N51.9.105 $\mathrm{GM1}^- \oplus \mathrm{T1}^+ \oplus \mathrm{T3}^-$	$\surd$	1	1	$\times$	-	-
N51.9.106 $\mathrm{GM1}^- \oplus \mathrm{T1}^+ \oplus \mathrm{T4}^+$	$\surd$	1	0	$\times$	-	-
N51.9.107 $\mathrm{GM1}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	0	$\times$	-	-
N51.9.108 $\mathrm{GM1}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	0	$\times$	-	-
N51.9.109 $\mathrm{GM1}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Y1}^-$	$\surd$	1	0	$\times$	-	-
N51.9.110 $\mathrm{GM1}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
N51.9.111 $\mathrm{GM1}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N51.9.112 $\mathrm{GM1}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N51.9.113 $\mathrm{GM1}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N51.9.114 $\mathrm{GM1}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N51.9.115 $\mathrm{GM1}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N51.9.116 $\mathrm{GM1}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-
N51.9.117 $\mathrm{GM1}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N51.9.118 $\mathrm{GM1}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N51.9.119 $\mathrm{GM1}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N51.9.120 $\mathrm{GM1}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $Pmma$ (No. 51) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N51.9.121 $\mathrm{GM1}^{-}\oplus\mathrm{T1}^{+}\oplus\mathrm{Z3}^{-}$	$\surd$	1	0	$\times$	-	-
N51.9.122 $\mathrm{GM1}^{-}\oplus\mathrm{T1}^{+}\oplus\mathrm{Z4}^{+}$	$\surd$	1	0	$\times$	-	-
N51.9.123 $\mathrm{GM1}^{-}\oplus\mathrm{T1}^{-}\oplus\mathrm{T1}^{-}$	$\surd$	1	0	$\times$	-	-
N51.9.124 $\mathrm{GM1}^{-}\oplus\mathrm{T1}^{-}\oplus\mathrm{T2}^{+}$	$\surd$	1	1	$\times$	-	-
N51.9.125 $\mathrm{GM1}^{-}\oplus\mathrm{T1}^{-}\oplus\mathrm{T3}^{-}$	$\surd$	1	0	$\times$	-	-
N51.9.126 $\mathrm{GM1}^{-}\oplus\mathrm{T1}^{-}\oplus\mathrm{T4}^{+}$	$\surd$	1	1	$\times$	-	-
N51.9.127 $\mathrm{GM1}^{-}\oplus\mathrm{T1}^{-}\oplus\mathrm{Y1}^{+}$	$\surd$	1	0	$\times$	-	-
N51.9.128 $\mathrm{GM1}^{-}\oplus\mathrm{T1}^{-}\oplus\mathrm{Y4}^{-}$	$\surd$	1	0	$\times$	-	-
N51.9.129 $\mathrm{GM1}^{-}\oplus\mathrm{T1}^{-}\oplus\mathrm{Y1}^{-}$	$\surd$	1	0	$\times$	-	-
N51.9.130 $\mathrm{GM1}^{-}\oplus\mathrm{T1}^{-}\oplus\mathrm{Y4}^{+}$	$\surd$	1	0	$\times$	-	-
N51.9.131 $\mathrm{GM1}^{-}\oplus\mathrm{T1}^{-}\oplus\mathrm{Y2}^{+}$	$\surd$	1	0	$\times$	-	-
N51.9.132 $\mathrm{GM1}^{-}\oplus\mathrm{T1}^{-}\oplus\mathrm{Y3}^{-}$	$\surd$	1	0	$\times$	-	-
N51.9.133 $\mathrm{GM1}^{-}\oplus\mathrm{T1}^{-}\oplus\mathrm{Y2}^{-}$	$\surd$	1	0	$\times$	-	-
N51.9.134 $\mathrm{GM1}^{-}\oplus\mathrm{T1}^{-}\oplus\mathrm{Y3}^{+}$	$\surd$	1	0	$\times$	-	-
N51.9.135 $\mathrm{GM1}^{-}\oplus\mathrm{T1}^{-}\oplus\mathrm{Z1}^{+}$	$\surd$	1	0	$\times$	-	-
N51.9.136 $\mathrm{GM1}^{-}\oplus\mathrm{T1}^{-}\oplus\mathrm{Z2}^{-}$	$\surd$	1	0	$\times$	-	-
N51.9.137 $\mathrm{GM1}^{-}\oplus\mathrm{T1}^{-}\oplus\mathrm{Z1}^{-}$	$\surd$	1	0	$\times$	-	-
N51.9.138 $\mathrm{GM1}^{-}\oplus\mathrm{T1}^{-}\oplus\mathrm{Z2}^{+}$	$\surd$	1	0	$\times$	-	-
N51.9.139 $\mathrm{GM1}^{-}\oplus\mathrm{T1}^{-}\oplus\mathrm{Z3}^{+}$	$\surd$	1	0	$\times$	-	-
N51.9.140 $\mathrm{GM1}^{-}\oplus\mathrm{T1}^{-}\oplus\mathrm{Z4}^{-}$	$\surd$	1	0	$\times$	-	-
N51.9.141 $\mathrm{GM1}^{-}\oplus\mathrm{T1}^{-}\oplus\mathrm{Z3}^{-}$	$\surd$	1	0	$\times$	-	-
N51.9.142 $\mathrm{GM1}^{-}\oplus\mathrm{T1}^{-}\oplus\mathrm{Z4}^{+}$	$\surd$	1	0	$\times$	-	-
N51.9.143 $\mathrm{GM1}^{-}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y1}^{+}$	$\surd$	1	0	$\times$	-	-
N51.9.144 $\mathrm{GM1}^{-}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y4}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N51.9.145 $\mathrm{GM1}^{-}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y1}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.146 $\mathrm{GM1}^{-}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y4}^{+}$	$\surd$	1	0	$\times$	-	-
N51.9.147 $\mathrm{GM1}^{-}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y2}^{+}$	$\surd$	1	0	$\times$	-	-
N51.9.148 $\mathrm{GM1}^{-}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.149 $\mathrm{GM1}^{-}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.150 $\mathrm{GM1}^{-}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y3}^{+}$	$\surd$	1	0	$\times$	-	-
N51.9.151 $\mathrm{GM1}^{-}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Z1}^{+}$	$\surd$	1	0	$\times$	-	-
N51.9.152 $\mathrm{GM1}^{-}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Z1}^{-}$	$\surd$	1	0	$\times$	-	-
N51.9.153 $\mathrm{GM1}^{-}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Z3}^{+}$	$\surd$	1	0	$\times$	-	-
N51.9.154 $\mathrm{GM1}^{-}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Z3}^{-}$	$\surd$	1	0	$\times$	-	-
N51.9.155 $\mathrm{GM1}^{-}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y1}^{-}$	$\surd$	1	0	$\times$	-	-
N51.9.156 $\mathrm{GM1}^{-}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y4}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N51.9.157 $\mathrm{GM1}^{-}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y2}^{+}$	$\surd$	1	1	$\times$	-	-
N51.9.158 $\mathrm{GM1}^{-}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y3}^{-}$	$\surd$	1	0	$\times$	-	-
N51.9.159 $\mathrm{GM1}^{-}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y2}^{-}$	$\surd$	1	0	$\times$	-	-
N51.9.160 $\mathrm{GM1}^{-}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y3}^{+}$	$\surd$	1	1	$\times$	-	-
N51.9.161 $\mathrm{GM1}^{-}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Z1}^{+}$	$\surd$	1	0	$\times$	-	-
N51.9.162 $\mathrm{GM1}^{-}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Z1}^{-}$	$\surd$	1	0	$\times$	-	-
N51.9.163 $\mathrm{GM1}^{-}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Z3}^{+}$	$\surd$	1	0	$\times$	-	-
N51.9.164 $\mathrm{GM1}^{-}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Z3}^{-}$	$\surd$	1	0	$\times$	-	-
N51.9.165 $\mathrm{GM1}^{-}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Y2}^{+}$	$\surd$	1	0	$\times$	-	-
N51.9.166 $\mathrm{GM1}^{-}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$

Non-coplanar SSGs with parent space group $Pmma$ (No. 51) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N51.9.167 $\mathrm{GM1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\times$	-	-
N51.9.168 $\mathrm{GM1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N51.9.169 $\mathrm{GM1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N51.9.170 $\mathrm{GM1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N51.9.171 $\mathrm{GM1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N51.9.172 $\mathrm{GM1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N51.9.173 $\mathrm{GM1}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N51.9.174 $\mathrm{GM1}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N51.9.175 $\mathrm{GM1}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N51.9.176 $\mathrm{GM1}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N51.9.177 $\mathrm{GM1}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N51.9.178 $\mathrm{GM1}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N51.9.179 $\mathrm{GM1}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N51.9.180 $\mathrm{GM1}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.9.181 $\mathrm{GM1}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
N51.9.182 $\mathrm{GM1}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N51.9.183 $\mathrm{GM1}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N51.9.184 $\mathrm{GM1}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\times$	-	-
N51.9.185 $\mathrm{GM1}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N51.9.186 $\mathrm{GM1}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N51.9.187 $\mathrm{GM1}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N51.9.188 $\mathrm{GM1}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.9.189 $\mathrm{GM1}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
N51.9.190 $\mathrm{GM1}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z4}^-$	$\surd$	1	0	$\times$	-	-
N51.9.191 $\mathrm{GM1}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N51.9.192 $\mathrm{GM1}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\times$	-	-
N51.9.193 $\mathrm{GM1}^- \oplus \mathrm{Z3}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N51.9.194 $\mathrm{GM1}^- \oplus \mathrm{Z3}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.9.195 $\mathrm{GM1}^- \oplus \mathrm{Z3}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N51.9.196 $\mathrm{GM1}^- \oplus \mathrm{Z3}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N51.9.197 $\mathrm{GM1}^- \oplus \mathrm{Z3}^- \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N51.9.198 $\mathrm{GM1}^- \oplus \mathrm{Z3}^- \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.9.199 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N51.9.200 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{A2}$
N51.9.201 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B3_g}$
N51.9.202 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2} \oplus \mathrm{B2}$
N51.9.203 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B2_g}$
N51.9.204 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B1} \oplus \mathrm{B1}$
N51.9.205 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{T1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N51.9.206 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{T1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N51.9.207 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N51.9.208 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N51.9.209 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N51.9.210 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N51.9.211 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{Z1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N51.9.212 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{Z1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$

Non-coplanar SSGs with parent space group $Pmma$ (No. 51) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N51.9.213 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{Z3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N51.9.214 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{Z3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N51.9.215 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$
N51.9.216 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{B2}$
N51.9.217 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g} \oplus \mathrm{B2_u}$
N51.9.218 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{B1}$
N51.9.219 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g} \oplus \mathrm{B3_u}$
N51.9.220 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{T1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
N51.9.221 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{T1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
N51.9.222 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
N51.9.223 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
N51.9.224 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
N51.9.225 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
N51.9.226 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{Z1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
N51.9.227 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{Z1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
N51.9.228 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{Z3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
N51.9.229 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{Z3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
N51.9.230 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N51.9.231 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{B2}$
N51.9.232 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N51.9.233 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	222	$\mathrm{B1} \oplus \mathrm{B3}$
N51.9.234 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{T1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N51.9.235 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{T1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N51.9.236 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N51.9.237 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N51.9.238 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N51.9.239 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N51.9.240 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Z1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N51.9.241 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Z1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N51.9.242 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Z3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N51.9.243 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Z3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N51.9.244 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N51.9.245 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	222	$\mathrm{B1} \oplus \mathrm{B2}$
N51.9.246 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N51.9.247 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{T1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N51.9.248 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{T1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N51.9.249 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N51.9.250 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N51.9.251 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N51.9.252 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N51.9.253 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Z1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N51.9.254 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Z1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N51.9.255 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Z3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N51.9.256 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Z3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N51.9.257 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N51.9.258 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{B1}$

Non-coplanar SSGs with parent space group $Pmma$ (No. 51) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N51.9.259 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{T1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
N51.9.260 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{T1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
N51.9.261 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
N51.9.262 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
N51.9.263 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
N51.9.264 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
N51.9.265 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{Z1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
N51.9.266 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{Z1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
N51.9.267 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{Z3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
N51.9.268 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{Z3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
N51.9.269 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N51.9.270 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{T1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_u}$
N51.9.271 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{T1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_u}$
N51.9.272 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_u}$
N51.9.273 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_u}$
N51.9.274 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_u}$
N51.9.275 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_u}$
N51.9.276 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{Z1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_u}$
N51.9.277 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{Z1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_u}$
N51.9.278 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{Z3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_u}$
N51.9.279 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{Z3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_u}$
N51.9.280 $\mathrm{GM2}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{T1}^+$	$\surd$	1	1	$\times$	-	-
N51.9.281 $\mathrm{GM2}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{T2}^-$	$\surd$	1	1	$\times$	-	-
N51.9.282 $\mathrm{GM2}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{T3}^+$	$\surd$	1	1	$\times$	-	-
N51.9.283 $\mathrm{GM2}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{T4}^-$	$\surd$	1	1	$\times$	-	-
N51.9.284 $\mathrm{GM2}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{T1}^-$	$\surd$	1	1	$\times$	-	-
N51.9.285 $\mathrm{GM2}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{T2}^+$	$\surd$	1	1	$\times$	-	-
N51.9.286 $\mathrm{GM2}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{T3}^-$	$\surd$	1	1	$\times$	-	-
N51.9.287 $\mathrm{GM2}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{T4}^+$	$\surd$	1	1	$\times$	-	-
N51.9.288 $\mathrm{GM2}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	1	$\times$	-	-
N51.9.289 $\mathrm{GM2}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\times$	-	-
N51.9.290 $\mathrm{GM2}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Y1}^-$	$\surd$	1	1	$\times$	-	-
N51.9.291 $\mathrm{GM2}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\times$	-	-
N51.9.292 $\mathrm{GM2}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\times$	-	-
N51.9.293 $\mathrm{GM2}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\times$	-	-
N51.9.294 $\mathrm{GM2}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\times$	-	-
N51.9.295 $\mathrm{GM2}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\times$	-	-
N51.9.296 $\mathrm{GM2}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\times$	-	-
N51.9.297 $\mathrm{GM2}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\times$	-	-
N51.9.298 $\mathrm{GM2}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
N51.9.299 $\mathrm{GM2}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\times$	-	-
N51.9.300 $\mathrm{GM2}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
N51.9.301 $\mathrm{GM2}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\times$	-	-
N51.9.302 $\mathrm{GM2}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N51.9.303 $\mathrm{GM2}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\times$	-	-
N51.9.304 $\mathrm{GM2}^+ \oplus \mathrm{T1}^- \oplus \mathrm{T1}^-$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $Pmma$ (No. 51) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N51.9.305 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{-}\oplus\mathrm{T2}^{+}$	$\surd$	1	1	$\times$	-	-
N51.9.306 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{-}\oplus\mathrm{T3}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.307 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{-}\oplus\mathrm{T4}^{+}$	$\surd$	1	1	$\times$	-	-
N51.9.308 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{-}\oplus\mathrm{Y1}^{+}$	$\surd$	1	1	$\times$	-	-
N51.9.309 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{-}\oplus\mathrm{Y4}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.310 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{-}\oplus\mathrm{Y1}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.311 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{-}\oplus\mathrm{Y4}^{+}$	$\surd$	1	1	$\times$	-	-
N51.9.312 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{-}\oplus\mathrm{Y2}^{+}$	$\surd$	1	1	$\times$	-	-
N51.9.313 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{-}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.314 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{-}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.315 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{-}\oplus\mathrm{Y3}^{+}$	$\surd$	1	1	$\times$	-	-
N51.9.316 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{-}\oplus\mathrm{Z1}^{+}$	$\surd$	1	1	$\times$	-	-
N51.9.317 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{-}\oplus\mathrm{Z2}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.318 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{-}\oplus\mathrm{Z1}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.319 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{-}\oplus\mathrm{Z2}^{+}$	$\surd$	1	1	$\times$	-	-
N51.9.320 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{-}\oplus\mathrm{Z3}^{+}$	$\surd$	1	1	$\times$	-	-
N51.9.321 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{-}\oplus\mathrm{Z4}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.322 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{-}\oplus\mathrm{Z3}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.323 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{-}\oplus\mathrm{Z4}^{+}$	$\surd$	1	1	$\times$	-	-
N51.9.324 $\mathrm{GM2}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y1}^{+}$	$\surd$	1	1	$\times$	-	-
N51.9.325 $\mathrm{GM2}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y4}^{-}$	$\surd$	1	1	$\surd$	$mm2$	B2
N51.9.326 $\mathrm{GM2}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y1}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.327 $\mathrm{GM2}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y4}^{+}$	$\surd$	1	1	$\times$	-	-
N51.9.328 $\mathrm{GM2}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y2}^{+}$	$\surd$	1	1	$\times$	-	-
N51.9.329 $\mathrm{GM2}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.330 $\mathrm{GM2}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.331 $\mathrm{GM2}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y3}^{+}$	$\surd$	1	1	$\times$	-	-
N51.9.332 $\mathrm{GM2}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Z1}^{+}$	$\surd$	1	1	$\times$	-	-
N51.9.333 $\mathrm{GM2}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Z1}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.334 $\mathrm{GM2}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Z3}^{+}$	$\surd$	1	1	$\times$	-	-
N51.9.335 $\mathrm{GM2}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Z3}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.336 $\mathrm{GM2}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y1}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.337 $\mathrm{GM2}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y4}^{+}$	$\surd$	1	1	$\surd$	$mm2$	B2
N51.9.338 $\mathrm{GM2}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y2}^{+}$	$\surd$	1	1	$\times$	-	-
N51.9.339 $\mathrm{GM2}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.340 $\mathrm{GM2}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.341 $\mathrm{GM2}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y3}^{+}$	$\surd$	1	1	$\times$	-	-
N51.9.342 $\mathrm{GM2}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Z1}^{+}$	$\surd$	1	1	$\times$	-	-
N51.9.343 $\mathrm{GM2}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Z1}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.344 $\mathrm{GM2}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Z3}^{+}$	$\surd$	1	1	$\times$	-	-
N51.9.345 $\mathrm{GM2}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Z3}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.346 $\mathrm{GM2}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Y2}^{+}$	$\surd$	1	1	$\times$	-	-
N51.9.347 $\mathrm{GM2}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\surd$	$mm2$	B2
N51.9.348 $\mathrm{GM2}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.349 $\mathrm{GM2}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Y3}^{+}$	$\surd$	1	1	$\times$	-	-
N51.9.350 $\mathrm{GM2}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Z1}^{+}$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $Pmma$ (No. 51) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N51.9.351 $\mathrm{GM2^+} \oplus \mathrm{Y2^+} \oplus \mathrm{Z1^-}$	$\surd$	1	1	$\times$	-	-
N51.9.352 $\mathrm{GM2^+} \oplus \mathrm{Y2^+} \oplus \mathrm{Z3^+}$	$\surd$	1	1	$\times$	-	-
N51.9.353 $\mathrm{GM2^+} \oplus \mathrm{Y2^+} \oplus \mathrm{Z3^-}$	$\surd$	1	1	$\times$	-	-
N51.9.354 $\mathrm{GM2^+} \oplus \mathrm{Y2^-} \oplus \mathrm{Y2^-}$	$\surd$	1	1	$\times$	-	-
N51.9.355 $\mathrm{GM2^+} \oplus \mathrm{Y2^-} \oplus \mathrm{Y3^+}$	$\surd$	1	1	$\surd$	$mm2$	B2
N51.9.356 $\mathrm{GM2^+} \oplus \mathrm{Y2^-} \oplus \mathrm{Z1^+}$	$\surd$	1	1	$\times$	-	-
N51.9.357 $\mathrm{GM2^+} \oplus \mathrm{Y2^-} \oplus \mathrm{Z1^-}$	$\surd$	1	1	$\times$	-	-
N51.9.358 $\mathrm{GM2^+} \oplus \mathrm{Y2^-} \oplus \mathrm{Z3^+}$	$\surd$	1	1	$\times$	-	-
N51.9.359 $\mathrm{GM2^+} \oplus \mathrm{Y2^-} \oplus \mathrm{Z3^-}$	$\surd$	1	1	$\times$	-	-
N51.9.360 $\mathrm{GM2^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z1^+}$	$\surd$	1	1	$\times$	-	-
N51.9.361 $\mathrm{GM2^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\surd$	222	B1
N51.9.362 $\mathrm{GM2^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z1^-}$	$\surd$	1	1	$\times$	-	-
N51.9.363 $\mathrm{GM2^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z2^+}$	$\surd$	1	1	$\times$	-	-
N51.9.364 $\mathrm{GM2^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z3^+}$	$\surd$	1	1	$\times$	-	-
N51.9.365 $\mathrm{GM2^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z4^-}$	$\surd$	1	1	$\times$	-	-
N51.9.366 $\mathrm{GM2^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z3^-}$	$\surd$	1	1	$\times$	-	-
N51.9.367 $\mathrm{GM2^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z4^+}$	$\surd$	1	1	$\times$	-	-
N51.9.368 $\mathrm{GM2^+} \oplus \mathrm{Z1^-} \oplus \mathrm{Z1^-}$	$\surd$	1	1	$\times$	-	-
N51.9.369 $\mathrm{GM2^+} \oplus \mathrm{Z1^-} \oplus \mathrm{Z2^+}$	$\surd$	1	1	$\surd$	222	B1
N51.9.370 $\mathrm{GM2^+} \oplus \mathrm{Z1^-} \oplus \mathrm{Z3^+}$	$\surd$	1	1	$\times$	-	-
N51.9.371 $\mathrm{GM2^+} \oplus \mathrm{Z1^-} \oplus \mathrm{Z4^-}$	$\surd$	1	1	$\times$	-	-
N51.9.372 $\mathrm{GM2^+} \oplus \mathrm{Z1^-} \oplus \mathrm{Z3^-}$	$\surd$	1	1	$\times$	-	-
N51.9.373 $\mathrm{GM2^+} \oplus \mathrm{Z1^-} \oplus \mathrm{Z4^+}$	$\surd$	1	1	$\times$	-	-
N51.9.374 $\mathrm{GM2^+} \oplus \mathrm{Z3^+} \oplus \mathrm{Z3^+}$	$\surd$	1	1	$\times$	-	-
N51.9.375 $\mathrm{GM2^+} \oplus \mathrm{Z3^+} \oplus \mathrm{Z4^-}$	$\surd$	1	1	$\surd$	222	B1
N51.9.376 $\mathrm{GM2^+} \oplus \mathrm{Z3^+} \oplus \mathrm{Z3^-}$	$\surd$	1	1	$\times$	-	-
N51.9.377 $\mathrm{GM2^+} \oplus \mathrm{Z3^+} \oplus \mathrm{Z4^+}$	$\surd$	1	1	$\times$	-	-
N51.9.378 $\mathrm{GM2^+} \oplus \mathrm{Z3^-} \oplus \mathrm{Z3^-}$	$\surd$	1	1	$\times$	-	-
N51.9.379 $\mathrm{GM2^+} \oplus \mathrm{Z3^-} \oplus \mathrm{Z4^+}$	$\surd$	1	1	$\surd$	222	B1
N51.9.380 $\mathrm{GM2^-} \oplus \mathrm{GM2^-} \oplus \mathrm{GM2^-}$	$\surd$	0	0	$\surd$	-	-
N51.9.381 $\mathrm{GM2^-} \oplus \mathrm{GM2^-} \oplus \mathrm{GM3^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N51.9.382 $\mathrm{GM2^-} \oplus \mathrm{GM2^-} \oplus \mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
N51.9.383 $\mathrm{GM2^-} \oplus \mathrm{GM2^-} \oplus \mathrm{GM4^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_g}$
N51.9.384 $\mathrm{GM2^-} \oplus \mathrm{GM2^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N51.9.385 $\mathrm{GM2^-} \oplus \mathrm{GM2^-} \oplus \mathrm{T1^+}$	$\surd$	0	0	$\surd$	-	-
N51.9.386 $\mathrm{GM2^-} \oplus \mathrm{GM2^-} \oplus \mathrm{T1^-}$	$\surd$	0	0	$\surd$	-	-
N51.9.387 $\mathrm{GM2^-} \oplus \mathrm{GM2^-} \oplus \mathrm{Y1^+}$	$\surd$	0	0	$\surd$	-	-
N51.9.388 $\mathrm{GM2^-} \oplus \mathrm{GM2^-} \oplus \mathrm{Y1^-}$	$\surd$	0	0	$\surd$	-	-
N51.9.389 $\mathrm{GM2^-} \oplus \mathrm{GM2^-} \oplus \mathrm{Y2^+}$	$\surd$	0	0	$\surd$	-	-
N51.9.390 $\mathrm{GM2^-} \oplus \mathrm{GM2^-} \oplus \mathrm{Y2^-}$	$\surd$	0	0	$\surd$	-	-
N51.9.391 $\mathrm{GM2^-} \oplus \mathrm{GM2^-} \oplus \mathrm{Z1^+}$	$\surd$	0	0	$\surd$	-	-
N51.9.392 $\mathrm{GM2^-} \oplus \mathrm{GM2^-} \oplus \mathrm{Z1^-}$	$\surd$	0	0	$\surd$	-	-
N51.9.393 $\mathrm{GM2^-} \oplus \mathrm{GM2^-} \oplus \mathrm{Z3^+}$	$\surd$	0	0	$\surd$	-	-
N51.9.394 $\mathrm{GM2^-} \oplus \mathrm{GM2^-} \oplus \mathrm{Z3^-}$	$\surd$	0	0	$\surd$	-	-
N51.9.395 $\mathrm{GM2^-} \oplus \mathrm{GM3^+} \oplus \mathrm{GM3^+}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2} \oplus \mathrm{B2}$
N51.9.396 $\mathrm{GM2^-} \oplus \mathrm{GM3^+} \oplus \mathrm{GM3^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$

Non-coplanar SSGs with parent space group $Pmma$ (No. 51) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N51.9.397 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	222	$\mathrm{B3} \oplus \mathrm{B2}$
N51.9.398 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N51.9.399 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{T1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N51.9.400 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{T1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N51.9.401 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N51.9.402 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N51.9.403 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N51.9.404 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N51.9.405 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Z1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N51.9.406 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Z1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N51.9.407 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Z3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N51.9.408 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Z3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N51.9.409 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N51.9.410 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_g}$
N51.9.411 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N51.9.412 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{T1}^+$	$\surd$	0	0	$\surd$	-	-
N51.9.413 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{T1}^-$	$\surd$	0	0	$\surd$	-	-
N51.9.414 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y1}^+$	$\surd$	0	0	$\surd$	-	-
N51.9.415 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y1}^-$	$\surd$	0	0	$\surd$	-	-
N51.9.416 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y2}^+$	$\surd$	0	0	$\surd$	-	-
N51.9.417 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y2}^-$	$\surd$	0	0	$\surd$	-	-
N51.9.418 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Z1}^+$	$\surd$	0	0	$\surd$	-	-
N51.9.419 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Z1}^-$	$\surd$	0	0	$\surd$	-	-
N51.9.420 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Z3}^+$	$\surd$	0	0	$\surd$	-	-
N51.9.421 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Z3}^-$	$\surd$	0	0	$\surd$	-	-
N51.9.422 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B1} \oplus \mathrm{B1}$
N51.9.423 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_g}$
N51.9.424 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{T1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_g}$
N51.9.425 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{T1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_g}$
N51.9.426 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_g}$
N51.9.427 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_g}$
N51.9.428 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_g}$
N51.9.429 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_g}$
N51.9.430 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{Z1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_g}$
N51.9.431 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{Z1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_g}$
N51.9.432 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{Z3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_g}$
N51.9.433 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{Z3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_g}$
N51.9.434 $\mathrm{GM2}^- \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N51.9.435 $\mathrm{GM2}^- \oplus \mathrm{GM4}^- \oplus \mathrm{T1}^+$	$\surd$	0	0	$\surd$	-	-
N51.9.436 $\mathrm{GM2}^- \oplus \mathrm{GM4}^- \oplus \mathrm{T1}^-$	$\surd$	0	0	$\surd$	-	-
N51.9.437 $\mathrm{GM2}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Y1}^+$	$\surd$	0	0	$\surd$	-	-
N51.9.438 $\mathrm{GM2}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Y1}^-$	$\surd$	0	0	$\surd$	-	-
N51.9.439 $\mathrm{GM2}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Y2}^+$	$\surd$	0	0	$\surd$	-	-
N51.9.440 $\mathrm{GM2}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Y2}^-$	$\surd$	0	0	$\surd$	-	-
N51.9.441 $\mathrm{GM2}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Z1}^+$	$\surd$	0	0	$\surd$	-	-
N51.9.442 $\mathrm{GM2}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Z1}^-$	$\surd$	0	0	$\surd$	-	-

Non-coplanar SSGs with parent space group $Pmma$ (No. 51) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N51.9.443 $\mathrm{GM2}^{-} \oplus \mathrm{GM4}^{-} \oplus \mathrm{Z3}^{+}$	$\surd$	0	0	$\surd$	-	-
N51.9.444 $\mathrm{GM2}^{-} \oplus \mathrm{GM4}^{-} \oplus \mathrm{Z3}^{-}$	$\surd$	0	0	$\surd$	-	-
N51.9.445 $\mathrm{GM2}^{-} \oplus \mathrm{T1}^{+} \oplus \mathrm{T1}^{+}$	$\surd$	1	0	$\times$	-	-
N51.9.446 $\mathrm{GM2}^{-} \oplus \mathrm{T1}^{+} \oplus \mathrm{T2}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.447 $\mathrm{GM2}^{-} \oplus \mathrm{T1}^{+} \oplus \mathrm{T3}^{+}$	$\surd$	1	0	$\times$	-	-
N51.9.448 $\mathrm{GM2}^{-} \oplus \mathrm{T1}^{+} \oplus \mathrm{T4}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.449 $\mathrm{GM2}^{-} \oplus \mathrm{T1}^{+} \oplus \mathrm{T1}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.450 $\mathrm{GM2}^{-} \oplus \mathrm{T1}^{+} \oplus \mathrm{T2}^{+}$	$\surd$	1	0	$\times$	-	-
N51.9.451 $\mathrm{GM2}^{-} \oplus \mathrm{T1}^{+} \oplus \mathrm{T3}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.452 $\mathrm{GM2}^{-} \oplus \mathrm{T1}^{+} \oplus \mathrm{T4}^{+}$	$\surd$	1	0	$\times$	-	-
N51.9.453 $\mathrm{GM2}^{-} \oplus \mathrm{T1}^{+} \oplus \mathrm{Y1}^{+}$	$\surd$	1	0	$\times$	-	-
N51.9.454 $\mathrm{GM2}^{-} \oplus \mathrm{T1}^{+} \oplus \mathrm{Y4}^{-}$	$\surd$	1	0	$\times$	-	-
N51.9.455 $\mathrm{GM2}^{-} \oplus \mathrm{T1}^{+} \oplus \mathrm{Y1}^{-}$	$\surd$	1	0	$\times$	-	-
N51.9.456 $\mathrm{GM2}^{-} \oplus \mathrm{T1}^{+} \oplus \mathrm{Y4}^{+}$	$\surd$	1	0	$\times$	-	-
N51.9.457 $\mathrm{GM2}^{-} \oplus \mathrm{T1}^{+} \oplus \mathrm{Y2}^{+}$	$\surd$	1	0	$\times$	-	-
N51.9.458 $\mathrm{GM2}^{-} \oplus \mathrm{T1}^{+} \oplus \mathrm{Y3}^{-}$	$\surd$	1	0	$\times$	-	-
N51.9.459 $\mathrm{GM2}^{-} \oplus \mathrm{T1}^{+} \oplus \mathrm{Y2}^{-}$	$\surd$	1	0	$\times$	-	-
N51.9.460 $\mathrm{GM2}^{-} \oplus \mathrm{T1}^{+} \oplus \mathrm{Y3}^{+}$	$\surd$	1	0	$\times$	-	-
N51.9.461 $\mathrm{GM2}^{-} \oplus \mathrm{T1}^{+} \oplus \mathrm{Z1}^{+}$	$\surd$	1	0	$\times$	-	-
N51.9.462 $\mathrm{GM2}^{-} \oplus \mathrm{T1}^{+} \oplus \mathrm{Z2}^{-}$	$\surd$	1	0	$\times$	-	-
N51.9.463 $\mathrm{GM2}^{-} \oplus \mathrm{T1}^{+} \oplus \mathrm{Z1}^{-}$	$\surd$	1	0	$\times$	-	-
N51.9.464 $\mathrm{GM2}^{-} \oplus \mathrm{T1}^{+} \oplus \mathrm{Z2}^{+}$	$\surd$	1	0	$\times$	-	-
N51.9.465 $\mathrm{GM2}^{-} \oplus \mathrm{T1}^{+} \oplus \mathrm{Z3}^{+}$	$\surd$	1	0	$\times$	-	-
N51.9.466 $\mathrm{GM2}^{-} \oplus \mathrm{T1}^{+} \oplus \mathrm{Z4}^{-}$	$\surd$	1	0	$\times$	-	-
N51.9.467 $\mathrm{GM2}^{-} \oplus \mathrm{T1}^{+} \oplus \mathrm{Z3}^{-}$	$\surd$	1	0	$\times$	-	-
N51.9.468 $\mathrm{GM2}^{-} \oplus \mathrm{T1}^{+} \oplus \mathrm{Z4}^{+}$	$\surd$	1	0	$\times$	-	-
N51.9.469 $\mathrm{GM2}^{-} \oplus \mathrm{T1}^{-} \oplus \mathrm{T1}^{-}$	$\surd$	1	0	$\times$	-	-
N51.9.470 $\mathrm{GM2}^{-} \oplus \mathrm{T1}^{-} \oplus \mathrm{T2}^{+}$	$\surd$	1	1	$\times$	-	-
N51.9.471 $\mathrm{GM2}^{-} \oplus \mathrm{T1}^{-} \oplus \mathrm{T3}^{-}$	$\surd$	1	0	$\times$	-	-
N51.9.472 $\mathrm{GM2}^{-} \oplus \mathrm{T1}^{-} \oplus \mathrm{T4}^{+}$	$\surd$	1	1	$\times$	-	-
N51.9.473 $\mathrm{GM2}^{-} \oplus \mathrm{T1}^{-} \oplus \mathrm{Y1}^{+}$	$\surd$	1	0	$\times$	-	-
N51.9.474 $\mathrm{GM2}^{-} \oplus \mathrm{T1}^{-} \oplus \mathrm{Y4}^{-}$	$\surd$	1	0	$\times$	-	-
N51.9.475 $\mathrm{GM2}^{-} \oplus \mathrm{T1}^{-} \oplus \mathrm{Y1}^{-}$	$\surd$	1	0	$\times$	-	-
N51.9.476 $\mathrm{GM2}^{-} \oplus \mathrm{T1}^{-} \oplus \mathrm{Y4}^{+}$	$\surd$	1	0	$\times$	-	-
N51.9.477 $\mathrm{GM2}^{-} \oplus \mathrm{T1}^{-} \oplus \mathrm{Y2}^{+}$	$\surd$	1	0	$\times$	-	-
N51.9.478 $\mathrm{GM2}^{-} \oplus \mathrm{T1}^{-} \oplus \mathrm{Y3}^{-}$	$\surd$	1	0	$\times$	-	-
N51.9.479 $\mathrm{GM2}^{-} \oplus \mathrm{T1}^{-} \oplus \mathrm{Y2}^{-}$	$\surd$	1	0	$\times$	-	-
N51.9.480 $\mathrm{GM2}^{-} \oplus \mathrm{T1}^{-} \oplus \mathrm{Y3}^{+}$	$\surd$	1	0	$\times$	-	-
N51.9.481 $\mathrm{GM2}^{-} \oplus \mathrm{T1}^{-} \oplus \mathrm{Z1}^{+}$	$\surd$	1	0	$\times$	-	-
N51.9.482 $\mathrm{GM2}^{-} \oplus \mathrm{T1}^{-} \oplus \mathrm{Z2}^{-}$	$\surd$	1	0	$\times$	-	-
N51.9.483 $\mathrm{GM2}^{-} \oplus \mathrm{T1}^{-} \oplus \mathrm{Z1}^{-}$	$\surd$	1	0	$\times$	-	-
N51.9.484 $\mathrm{GM2}^{-} \oplus \mathrm{T1}^{-} \oplus \mathrm{Z2}^{+}$	$\surd$	1	0	$\times$	-	-
N51.9.485 $\mathrm{GM2}^{-} \oplus \mathrm{T1}^{-} \oplus \mathrm{Z3}^{+}$	$\surd$	1	0	$\times$	-	-
N51.9.486 $\mathrm{GM2}^{-} \oplus \mathrm{T1}^{-} \oplus \mathrm{Z4}^{-}$	$\surd$	1	0	$\times$	-	-
N51.9.487 $\mathrm{GM2}^{-} \oplus \mathrm{T1}^{-} \oplus \mathrm{Z3}^{-}$	$\surd$	1	0	$\times$	-	-
N51.9.488 $\mathrm{GM2}^{-} \oplus \mathrm{T1}^{-} \oplus \mathrm{Z4}^{+}$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $Pmma$ (No. 51) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N51.9.489 $\mathrm{GM2}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	0	$\times$	-	-
N51.9.490 $\mathrm{GM2}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N51.9.491 $\mathrm{GM2}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^-$	$\surd$	1	1	$\times$	-	-
N51.9.492 $\mathrm{GM2}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
N51.9.493 $\mathrm{GM2}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N51.9.494 $\mathrm{GM2}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\times$	-	-
N51.9.495 $\mathrm{GM2}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\times$	-	-
N51.9.496 $\mathrm{GM2}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N51.9.497 $\mathrm{GM2}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N51.9.498 $\mathrm{GM2}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N51.9.499 $\mathrm{GM2}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N51.9.500 $\mathrm{GM2}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N51.9.501 $\mathrm{GM2}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y1}^-$	$\surd$	1	0	$\times$	-	-
N51.9.502 $\mathrm{GM2}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N51.9.503 $\mathrm{GM2}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\times$	-	-
N51.9.504 $\mathrm{GM2}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N51.9.505 $\mathrm{GM2}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N51.9.506 $\mathrm{GM2}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\times$	-	-
N51.9.507 $\mathrm{GM2}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N51.9.508 $\mathrm{GM2}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N51.9.509 $\mathrm{GM2}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N51.9.510 $\mathrm{GM2}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N51.9.511 $\mathrm{GM2}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N51.9.512 $\mathrm{GM2}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N51.9.513 $\mathrm{GM2}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\times$	-	-
N51.9.514 $\mathrm{GM2}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N51.9.515 $\mathrm{GM2}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N51.9.516 $\mathrm{GM2}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N51.9.517 $\mathrm{GM2}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N51.9.518 $\mathrm{GM2}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N51.9.519 $\mathrm{GM2}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N51.9.520 $\mathrm{GM2}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N51.9.521 $\mathrm{GM2}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N51.9.522 $\mathrm{GM2}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N51.9.523 $\mathrm{GM2}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N51.9.524 $\mathrm{GM2}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N51.9.525 $\mathrm{GM2}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N51.9.526 $\mathrm{GM2}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.9.527 $\mathrm{GM2}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
N51.9.528 $\mathrm{GM2}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N51.9.529 $\mathrm{GM2}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N51.9.530 $\mathrm{GM2}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\times$	-	-
N51.9.531 $\mathrm{GM2}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N51.9.532 $\mathrm{GM2}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N51.9.533 $\mathrm{GM2}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N51.9.534 $\mathrm{GM2}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$

Non-coplanar SSGs with parent space group $Pmma$ (No. 51) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N51.9.535 $\mathrm{GM2}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
N51.9.536 $\mathrm{GM2}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z4}^-$	$\surd$	1	0	$\times$	-	-
N51.9.537 $\mathrm{GM2}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N51.9.538 $\mathrm{GM2}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\times$	-	-
N51.9.539 $\mathrm{GM2}^- \oplus \mathrm{Z3}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N51.9.540 $\mathrm{GM2}^- \oplus \mathrm{Z3}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.9.541 $\mathrm{GM2}^- \oplus \mathrm{Z3}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N51.9.542 $\mathrm{GM2}^- \oplus \mathrm{Z3}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N51.9.543 $\mathrm{GM2}^- \oplus \mathrm{Z3}^- \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N51.9.544 $\mathrm{GM2}^- \oplus \mathrm{Z3}^- \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.9.545 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N51.9.546 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{A2}$
N51.9.547 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N51.9.548 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2} \oplus \mathrm{B2}$
N51.9.549 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{T1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
N51.9.550 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{T1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
N51.9.551 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
N51.9.552 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
N51.9.553 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
N51.9.554 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
N51.9.555 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Z1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
N51.9.556 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Z1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
N51.9.557 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Z3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
N51.9.558 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Z3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
N51.9.559 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B3_g}$
N51.9.560 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{B2}$
N51.9.561 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u} \oplus \mathrm{B3_g}$
N51.9.562 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{T1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N51.9.563 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{T1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N51.9.564 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N51.9.565 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N51.9.566 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N51.9.567 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N51.9.568 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Z1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N51.9.569 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Z1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N51.9.570 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Z3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N51.9.571 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Z3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N51.9.572 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N51.9.573 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{B1}$
N51.9.574 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{T1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g}$
N51.9.575 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{T1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g}$
N51.9.576 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g}$
N51.9.577 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g}$
N51.9.578 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g}$
N51.9.579 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g}$
N51.9.580 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{Z1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g}$

Non-coplanar SSGs with parent space group $Pmma$ (No. 51) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N51.9.581 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{Z1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g}$
N51.9.582 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{Z3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g}$
N51.9.583 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{Z3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g}$
N51.9.584 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B3_g}$
N51.9.585 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{T1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N51.9.586 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{T1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N51.9.587 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N51.9.588 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N51.9.589 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N51.9.590 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N51.9.591 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{Z1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N51.9.592 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{Z1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N51.9.593 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{Z3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N51.9.594 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{Z3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N51.9.595 $\mathrm{GM3}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{T1}^+$	$\surd$	1	1	$\times$	-	-
N51.9.596 $\mathrm{GM3}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{T2}^-$	$\surd$	1	1	$\times$	-	-
N51.9.597 $\mathrm{GM3}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{T3}^+$	$\surd$	1	1	$\times$	-	-
N51.9.598 $\mathrm{GM3}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{T4}^-$	$\surd$	1	1	$\times$	-	-
N51.9.599 $\mathrm{GM3}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{T1}^-$	$\surd$	1	1	$\times$	-	-
N51.9.600 $\mathrm{GM3}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{T2}^+$	$\surd$	1	1	$\times$	-	-
N51.9.601 $\mathrm{GM3}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{T3}^-$	$\surd$	1	1	$\times$	-	-
N51.9.602 $\mathrm{GM3}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{T4}^+$	$\surd$	1	1	$\times$	-	-
N51.9.603 $\mathrm{GM3}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	1	$\times$	-	-
N51.9.604 $\mathrm{GM3}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\times$	-	-
N51.9.605 $\mathrm{GM3}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Y1}^-$	$\surd$	1	1	$\times$	-	-
N51.9.606 $\mathrm{GM3}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\times$	-	-
N51.9.607 $\mathrm{GM3}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\times$	-	-
N51.9.608 $\mathrm{GM3}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\times$	-	-
N51.9.609 $\mathrm{GM3}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\times$	-	-
N51.9.610 $\mathrm{GM3}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\times$	-	-
N51.9.611 $\mathrm{GM3}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\times$	-	-
N51.9.612 $\mathrm{GM3}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\times$	-	-
N51.9.613 $\mathrm{GM3}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
N51.9.614 $\mathrm{GM3}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\times$	-	-
N51.9.615 $\mathrm{GM3}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
N51.9.616 $\mathrm{GM3}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\times$	-	-
N51.9.617 $\mathrm{GM3}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N51.9.618 $\mathrm{GM3}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\times$	-	-
N51.9.619 $\mathrm{GM3}^+ \oplus \mathrm{T1}^- \oplus \mathrm{T1}^-$	$\surd$	1	1	$\times$	-	-
N51.9.620 $\mathrm{GM3}^+ \oplus \mathrm{T1}^- \oplus \mathrm{T2}^+$	$\surd$	1	1	$\times$	-	-
N51.9.621 $\mathrm{GM3}^+ \oplus \mathrm{T1}^- \oplus \mathrm{T3}^-$	$\surd$	1	1	$\times$	-	-
N51.9.622 $\mathrm{GM3}^+ \oplus \mathrm{T1}^- \oplus \mathrm{T4}^+$	$\surd$	1	1	$\times$	-	-
N51.9.623 $\mathrm{GM3}^+ \oplus \mathrm{T1}^- \oplus \mathrm{Y1}^+$	$\surd$	1	1	$\times$	-	-
N51.9.624 $\mathrm{GM3}^+ \oplus \mathrm{T1}^- \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\times$	-	-
N51.9.625 $\mathrm{GM3}^+ \oplus \mathrm{T1}^- \oplus \mathrm{Y1}^-$	$\surd$	1	1	$\times$	-	-
N51.9.626 $\mathrm{GM3}^+ \oplus \mathrm{T1}^- \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $Pmma$ (No. 51) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N51.9.627 $\mathrm{GM3}^{+}\oplus\mathrm{T1}^{-}\oplus\mathrm{Y2}^{+}$	$\surd$	1	1	$\times$	-	-
N51.9.628 $\mathrm{GM3}^{+}\oplus\mathrm{T1}^{-}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.629 $\mathrm{GM3}^{+}\oplus\mathrm{T1}^{-}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.630 $\mathrm{GM3}^{+}\oplus\mathrm{T1}^{-}\oplus\mathrm{Y3}^{+}$	$\surd$	1	1	$\times$	-	-
N51.9.631 $\mathrm{GM3}^{+}\oplus\mathrm{T1}^{-}\oplus\mathrm{Z1}^{+}$	$\surd$	1	1	$\times$	-	-
N51.9.632 $\mathrm{GM3}^{+}\oplus\mathrm{T1}^{-}\oplus\mathrm{Z2}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.633 $\mathrm{GM3}^{+}\oplus\mathrm{T1}^{-}\oplus\mathrm{Z1}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.634 $\mathrm{GM3}^{+}\oplus\mathrm{T1}^{-}\oplus\mathrm{Z2}^{+}$	$\surd$	1	1	$\times$	-	-
N51.9.635 $\mathrm{GM3}^{+}\oplus\mathrm{T1}^{-}\oplus\mathrm{Z3}^{+}$	$\surd$	1	1	$\times$	-	-
N51.9.636 $\mathrm{GM3}^{+}\oplus\mathrm{T1}^{-}\oplus\mathrm{Z4}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.637 $\mathrm{GM3}^{+}\oplus\mathrm{T1}^{-}\oplus\mathrm{Z3}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.638 $\mathrm{GM3}^{+}\oplus\mathrm{T1}^{-}\oplus\mathrm{Z4}^{+}$	$\surd$	1	1	$\times$	-	-
N51.9.639 $\mathrm{GM3}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y1}^{+}$	$\surd$	1	1	$\times$	-	-
N51.9.640 $\mathrm{GM3}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y4}^{-}$	$\surd$	1	1	$\surd$	$mm2$	B2
N51.9.641 $\mathrm{GM3}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y1}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.642 $\mathrm{GM3}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y4}^{+}$	$\surd$	1	1	$\times$	-	-
N51.9.643 $\mathrm{GM3}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y2}^{+}$	$\surd$	1	1	$\times$	-	-
N51.9.644 $\mathrm{GM3}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.645 $\mathrm{GM3}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.646 $\mathrm{GM3}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y3}^{+}$	$\surd$	1	1	$\times$	-	-
N51.9.647 $\mathrm{GM3}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Z1}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N51.9.648 $\mathrm{GM3}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Z1}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N51.9.649 $\mathrm{GM3}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Z3}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N51.9.650 $\mathrm{GM3}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Z3}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N51.9.651 $\mathrm{GM3}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y1}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.652 $\mathrm{GM3}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y4}^{+}$	$\surd$	1	1	$\surd$	$mm2$	B2
N51.9.653 $\mathrm{GM3}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y2}^{+}$	$\surd$	1	1	$\times$	-	-
N51.9.654 $\mathrm{GM3}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.655 $\mathrm{GM3}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.656 $\mathrm{GM3}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y3}^{+}$	$\surd$	1	1	$\times$	-	-
N51.9.657 $\mathrm{GM3}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Z1}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N51.9.658 $\mathrm{GM3}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Z1}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N51.9.659 $\mathrm{GM3}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Z3}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N51.9.660 $\mathrm{GM3}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Z3}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N51.9.661 $\mathrm{GM3}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Y2}^{+}$	$\surd$	1	1	$\times$	-	-
N51.9.662 $\mathrm{GM3}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\surd$	$mm2$	B2
N51.9.663 $\mathrm{GM3}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.664 $\mathrm{GM3}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Y3}^{+}$	$\surd$	1	1	$\times$	-	-
N51.9.665 $\mathrm{GM3}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Z1}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N51.9.666 $\mathrm{GM3}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Z1}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N51.9.667 $\mathrm{GM3}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Z3}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N51.9.668 $\mathrm{GM3}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Z3}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N51.9.669 $\mathrm{GM3}^{+}\oplus\mathrm{Y2}^{-}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.670 $\mathrm{GM3}^{+}\oplus\mathrm{Y2}^{-}\oplus\mathrm{Y3}^{+}$	$\surd$	1	1	$\surd$	$mm2$	B2
N51.9.671 $\mathrm{GM3}^{+}\oplus\mathrm{Y2}^{-}\oplus\mathrm{Z1}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N51.9.672 $\mathrm{GM3}^{+}\oplus\mathrm{Y2}^{-}\oplus\mathrm{Z1}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$

Non-coplanar SSGs with parent space group $Pmma$ (No. 51) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N51.9.673 $\mathrm{GM3^+} \oplus \mathrm{Y2^-} \oplus \mathrm{Z3^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N51.9.674 $\mathrm{GM3^+} \oplus \mathrm{Y2^-} \oplus \mathrm{Z3^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N51.9.675 $\mathrm{GM3^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z1^+}$	$\surd$	1	1	$\times$	-	-
N51.9.676 $\mathrm{GM3^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\surd$	$mm2$	B2
N51.9.677 $\mathrm{GM3^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z1^-}$	$\surd$	1	1	$\times$	-	-
N51.9.678 $\mathrm{GM3^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z2^+}$	$\surd$	1	1	$\times$	-	-
N51.9.679 $\mathrm{GM3^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z3^+}$	$\surd$	1	1	$\times$	-	-
N51.9.680 $\mathrm{GM3^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z4^-}$	$\surd$	1	1	$\times$	-	-
N51.9.681 $\mathrm{GM3^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z3^-}$	$\surd$	1	1	$\times$	-	-
N51.9.682 $\mathrm{GM3^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z4^+}$	$\surd$	1	1	$\times$	-	-
N51.9.683 $\mathrm{GM3^+} \oplus \mathrm{Z1^-} \oplus \mathrm{Z1^-}$	$\surd$	1	1	$\times$	-	-
N51.9.684 $\mathrm{GM3^+} \oplus \mathrm{Z1^-} \oplus \mathrm{Z2^+}$	$\surd$	1	1	$\surd$	$mm2$	B2
N51.9.685 $\mathrm{GM3^+} \oplus \mathrm{Z1^-} \oplus \mathrm{Z3^+}$	$\surd$	1	1	$\times$	-	-
N51.9.686 $\mathrm{GM3^+} \oplus \mathrm{Z1^-} \oplus \mathrm{Z4^-}$	$\surd$	1	1	$\times$	-	-
N51.9.687 $\mathrm{GM3^+} \oplus \mathrm{Z1^-} \oplus \mathrm{Z3^-}$	$\surd$	1	1	$\times$	-	-
N51.9.688 $\mathrm{GM3^+} \oplus \mathrm{Z1^-} \oplus \mathrm{Z4^+}$	$\surd$	1	1	$\times$	-	-
N51.9.689 $\mathrm{GM3^+} \oplus \mathrm{Z3^+} \oplus \mathrm{Z3^+}$	$\surd$	1	1	$\times$	-	-
N51.9.690 $\mathrm{GM3^+} \oplus \mathrm{Z3^+} \oplus \mathrm{Z4^-}$	$\surd$	1	1	$\surd$	$mm2$	B2
N51.9.691 $\mathrm{GM3^+} \oplus \mathrm{Z3^+} \oplus \mathrm{Z3^-}$	$\surd$	1	1	$\times$	-	-
N51.9.692 $\mathrm{GM3^+} \oplus \mathrm{Z3^+} \oplus \mathrm{Z4^+}$	$\surd$	1	1	$\times$	-	-
N51.9.693 $\mathrm{GM3^+} \oplus \mathrm{Z3^-} \oplus \mathrm{Z3^-}$	$\surd$	1	1	$\times$	-	-
N51.9.694 $\mathrm{GM3^+} \oplus \mathrm{Z3^-} \oplus \mathrm{Z4^+}$	$\surd$	1	1	$\surd$	$mm2$	B2
N51.9.695 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
N51.9.696 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{GM4^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B2_g}$
N51.9.697 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N51.9.698 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{T1^+}$	$\surd$	0	0	$\surd$	-	-
N51.9.699 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{T1^-}$	$\surd$	0	0	$\surd$	-	-
N51.9.700 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{Y1^+}$	$\surd$	0	0	$\surd$	-	-
N51.9.701 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{Y1^-}$	$\surd$	0	0	$\surd$	-	-
N51.9.702 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{Y2^+}$	$\surd$	0	0	$\surd$	-	-
N51.9.703 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{Y2^-}$	$\surd$	0	0	$\surd$	-	-
N51.9.704 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{Z1^+}$	$\surd$	0	0	$\surd$	-	-
N51.9.705 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{Z1^-}$	$\surd$	0	0	$\surd$	-	-
N51.9.706 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{Z3^+}$	$\surd$	0	0	$\surd$	-	-
N51.9.707 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{Z3^-}$	$\surd$	0	0	$\surd$	-	-
N51.9.708 $\mathrm{GM3^-} \oplus \mathrm{GM4^+} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B1} \oplus \mathrm{B1}$
N51.9.709 $\mathrm{GM3^-} \oplus \mathrm{GM4^+} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u} \oplus \mathrm{B2_g}$
N51.9.710 $\mathrm{GM3^-} \oplus \mathrm{GM4^+} \oplus \mathrm{T1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g}$
N51.9.711 $\mathrm{GM3^-} \oplus \mathrm{GM4^+} \oplus \mathrm{T1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g}$
N51.9.712 $\mathrm{GM3^-} \oplus \mathrm{GM4^+} \oplus \mathrm{Y1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g}$
N51.9.713 $\mathrm{GM3^-} \oplus \mathrm{GM4^+} \oplus \mathrm{Y1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g}$
N51.9.714 $\mathrm{GM3^-} \oplus \mathrm{GM4^+} \oplus \mathrm{Y2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g}$
N51.9.715 $\mathrm{GM3^-} \oplus \mathrm{GM4^+} \oplus \mathrm{Y2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g}$
N51.9.716 $\mathrm{GM3^-} \oplus \mathrm{GM4^+} \oplus \mathrm{Z1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g}$
N51.9.717 $\mathrm{GM3^-} \oplus \mathrm{GM4^+} \oplus \mathrm{Z1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g}$
N51.9.718 $\mathrm{GM3^-} \oplus \mathrm{GM4^+} \oplus \mathrm{Z3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g}$

Non-coplanar SSGs with parent space group $Pmma$ (No. 51) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N51.9.719 $\mathrm{GM3^-}\oplus\mathrm{GM4^+}\oplus\mathrm{Z3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B2_g}$
N51.9.720 $\mathrm{GM3^-}\oplus\mathrm{GM4^-}\oplus\mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N51.9.721 $\mathrm{GM3^-}\oplus\mathrm{GM4^-}\oplus\mathrm{T1^+}$	$\surd$	0	0	$\surd$	-	-
N51.9.722 $\mathrm{GM3^-}\oplus\mathrm{GM4^-}\oplus\mathrm{T1^-}$	$\surd$	0	0	$\surd$	-	-
N51.9.723 $\mathrm{GM3^-}\oplus\mathrm{GM4^-}\oplus\mathrm{Y1^+}$	$\surd$	0	0	$\surd$	-	-
N51.9.724 $\mathrm{GM3^-}\oplus\mathrm{GM4^-}\oplus\mathrm{Y1^-}$	$\surd$	0	0	$\surd$	-	-
N51.9.725 $\mathrm{GM3^-}\oplus\mathrm{GM4^-}\oplus\mathrm{Y2^+}$	$\surd$	0	0	$\surd$	-	-
N51.9.726 $\mathrm{GM3^-}\oplus\mathrm{GM4^-}\oplus\mathrm{Y2^-}$	$\surd$	0	0	$\surd$	-	-
N51.9.727 $\mathrm{GM3^-}\oplus\mathrm{GM4^-}\oplus\mathrm{Z1^+}$	$\surd$	0	0	$\surd$	-	-
N51.9.728 $\mathrm{GM3^-}\oplus\mathrm{GM4^-}\oplus\mathrm{Z1^-}$	$\surd$	0	0	$\surd$	-	-
N51.9.729 $\mathrm{GM3^-}\oplus\mathrm{GM4^-}\oplus\mathrm{Z3^+}$	$\surd$	0	0	$\surd$	-	-
N51.9.730 $\mathrm{GM3^-}\oplus\mathrm{GM4^-}\oplus\mathrm{Z3^-}$	$\surd$	0	0	$\surd$	-	-
N51.9.731 $\mathrm{GM3^-}\oplus\mathrm{T1^+}\oplus\mathrm{T1^+}$	$\surd$	1	0	$\times$	-	-
N51.9.732 $\mathrm{GM3^-}\oplus\mathrm{T1^+}\oplus\mathrm{T2^-}$	$\surd$	1	1	$\times$	-	-
N51.9.733 $\mathrm{GM3^-}\oplus\mathrm{T1^+}\oplus\mathrm{T3^+}$	$\surd$	1	0	$\times$	-	-
N51.9.734 $\mathrm{GM3^-}\oplus\mathrm{T1^+}\oplus\mathrm{T4^-}$	$\surd$	1	1	$\times$	-	-
N51.9.735 $\mathrm{GM3^-}\oplus\mathrm{T1^+}\oplus\mathrm{T1^-}$	$\surd$	1	1	$\times$	-	-
N51.9.736 $\mathrm{GM3^-}\oplus\mathrm{T1^+}\oplus\mathrm{T2^+}$	$\surd$	1	0	$\times$	-	-
N51.9.737 $\mathrm{GM3^-}\oplus\mathrm{T1^+}\oplus\mathrm{T3^-}$	$\surd$	1	1	$\times$	-	-
N51.9.738 $\mathrm{GM3^-}\oplus\mathrm{T1^+}\oplus\mathrm{T4^+}$	$\surd$	1	0	$\times$	-	-
N51.9.739 $\mathrm{GM3^-}\oplus\mathrm{T1^+}\oplus\mathrm{Y1^+}$	$\surd$	1	0	$\times$	-	-
N51.9.740 $\mathrm{GM3^-}\oplus\mathrm{T1^+}\oplus\mathrm{Y4^-}$	$\surd$	1	0	$\times$	-	-
N51.9.741 $\mathrm{GM3^-}\oplus\mathrm{T1^+}\oplus\mathrm{Y1^-}$	$\surd$	1	0	$\times$	-	-
N51.9.742 $\mathrm{GM3^-}\oplus\mathrm{T1^+}\oplus\mathrm{Y4^+}$	$\surd$	1	0	$\times$	-	-
N51.9.743 $\mathrm{GM3^-}\oplus\mathrm{T1^+}\oplus\mathrm{Y2^+}$	$\surd$	1	0	$\times$	-	-
N51.9.744 $\mathrm{GM3^-}\oplus\mathrm{T1^+}\oplus\mathrm{Y3^-}$	$\surd$	1	0	$\times$	-	-
N51.9.745 $\mathrm{GM3^-}\oplus\mathrm{T1^+}\oplus\mathrm{Y2^-}$	$\surd$	1	0	$\times$	-	-
N51.9.746 $\mathrm{GM3^-}\oplus\mathrm{T1^+}\oplus\mathrm{Y3^+}$	$\surd$	1	0	$\times$	-	-
N51.9.747 $\mathrm{GM3^-}\oplus\mathrm{T1^+}\oplus\mathrm{Z1^+}$	$\surd$	1	0	$\times$	-	-
N51.9.748 $\mathrm{GM3^-}\oplus\mathrm{T1^+}\oplus\mathrm{Z2^-}$	$\surd$	1	0	$\times$	-	-
N51.9.749 $\mathrm{GM3^-}\oplus\mathrm{T1^+}\oplus\mathrm{Z1^-}$	$\surd$	1	0	$\times$	-	-
N51.9.750 $\mathrm{GM3^-}\oplus\mathrm{T1^+}\oplus\mathrm{Z2^+}$	$\surd$	1	0	$\times$	-	-
N51.9.751 $\mathrm{GM3^-}\oplus\mathrm{T1^+}\oplus\mathrm{Z3^+}$	$\surd$	1	0	$\times$	-	-
N51.9.752 $\mathrm{GM3^-}\oplus\mathrm{T1^+}\oplus\mathrm{Z4^-}$	$\surd$	1	0	$\times$	-	-
N51.9.753 $\mathrm{GM3^-}\oplus\mathrm{T1^+}\oplus\mathrm{Z3^-}$	$\surd$	1	0	$\times$	-	-
N51.9.754 $\mathrm{GM3^-}\oplus\mathrm{T1^+}\oplus\mathrm{Z4^+}$	$\surd$	1	0	$\times$	-	-
N51.9.755 $\mathrm{GM3^-}\oplus\mathrm{T1^-}\oplus\mathrm{T1^-}$	$\surd$	1	0	$\times$	-	-
N51.9.756 $\mathrm{GM3^-}\oplus\mathrm{T1^-}\oplus\mathrm{T2^+}$	$\surd$	1	1	$\times$	-	-
N51.9.757 $\mathrm{GM3^-}\oplus\mathrm{T1^-}\oplus\mathrm{T3^-}$	$\surd$	1	0	$\times$	-	-
N51.9.758 $\mathrm{GM3^-}\oplus\mathrm{T1^-}\oplus\mathrm{T4^+}$	$\surd$	1	1	$\times$	-	-
N51.9.759 $\mathrm{GM3^-}\oplus\mathrm{T1^-}\oplus\mathrm{Y1^+}$	$\surd$	1	0	$\times$	-	-
N51.9.760 $\mathrm{GM3^-}\oplus\mathrm{T1^-}\oplus\mathrm{Y4^-}$	$\surd$	1	0	$\times$	-	-
N51.9.761 $\mathrm{GM3^-}\oplus\mathrm{T1^-}\oplus\mathrm{Y1^-}$	$\surd$	1	0	$\times$	-	-
N51.9.762 $\mathrm{GM3^-}\oplus\mathrm{T1^-}\oplus\mathrm{Y4^+}$	$\surd$	1	0	$\times$	-	-
N51.9.763 $\mathrm{GM3^-}\oplus\mathrm{T1^-}\oplus\mathrm{Y2^+}$	$\surd$	1	0	$\times$	-	-
N51.9.764 $\mathrm{GM3^-}\oplus\mathrm{T1^-}\oplus\mathrm{Y3^-}$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $Pmma$ (No. 51) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N51.9.765 GM3$^-$ ⊕ T1$^-$ ⊕ Y2$^-$	√	1	0	×	-	-
N51.9.766 GM3$^-$ ⊕ T1$^-$ ⊕ Y3$^+$	√	1	0	×	-	-
N51.9.767 GM3$^-$ ⊕ T1$^-$ ⊕ Z1$^+$	√	1	0	×	-	-
N51.9.768 GM3$^-$ ⊕ T1$^-$ ⊕ Z2$^-$	√	1	0	×	-	-
N51.9.769 GM3$^-$ ⊕ T1$^-$ ⊕ Z1$^-$	√	1	0	×	-	-
N51.9.770 GM3$^-$ ⊕ T1$^-$ ⊕ Z2$^+$	√	1	0	×	-	-
N51.9.771 GM3$^-$ ⊕ T1$^-$ ⊕ Z3$^+$	√	1	0	×	-	-
N51.9.772 GM3$^-$ ⊕ T1$^-$ ⊕ Z4$^-$	√	1	0	×	-	-
N51.9.773 GM3$^-$ ⊕ T1$^-$ ⊕ Z3$^-$	√	1	0	×	-	-
N51.9.774 GM3$^-$ ⊕ T1$^-$ ⊕ Z4$^+$	√	1	0	×	-	-
N51.9.775 GM3$^-$ ⊕ Y1$^+$ ⊕ Y1$^+$	√	1	0	×	-	-
N51.9.776 GM3$^-$ ⊕ Y1$^+$ ⊕ Y4$^-$	√	1	1	√	mmm	$\mathrm{B2_u}$
N51.9.777 GM3$^-$ ⊕ Y1$^+$ ⊕ Y1$^-$	√	1	1	×	-	-
N51.9.778 GM3$^-$ ⊕ Y1$^+$ ⊕ Y4$^+$	√	1	0	×	-	-
N51.9.779 GM3$^-$ ⊕ Y1$^+$ ⊕ Y2$^+$	√	1	0	×	-	-
N51.9.780 GM3$^-$ ⊕ Y1$^+$ ⊕ Y3$^-$	√	1	1	×	-	-
N51.9.781 GM3$^-$ ⊕ Y1$^+$ ⊕ Y2$^-$	√	1	1	×	-	-
N51.9.782 GM3$^-$ ⊕ Y1$^+$ ⊕ Y3$^+$	√	1	0	×	-	-
N51.9.783 GM3$^-$ ⊕ Y1$^+$ ⊕ Z1$^+$	√	1	0	×	-	-
N51.9.784 GM3$^-$ ⊕ Y1$^+$ ⊕ Z1$^-$	√	1	0	×	-	-
N51.9.785 GM3$^-$ ⊕ Y1$^+$ ⊕ Z3$^+$	√	1	0	×	-	-
N51.9.786 GM3$^-$ ⊕ Y1$^+$ ⊕ Z3$^-$	√	1	0	×	-	-
N51.9.787 GM3$^-$ ⊕ Y1$^-$ ⊕ Y1$^-$	√	1	0	×	-	-
N51.9.788 GM3$^-$ ⊕ Y1$^-$ ⊕ Y4$^+$	√	1	1	√	mmm	$\mathrm{B2_u}$
N51.9.789 GM3$^-$ ⊕ Y1$^-$ ⊕ Y2$^+$	√	1	1	×	-	-
N51.9.790 GM3$^-$ ⊕ Y1$^-$ ⊕ Y3$^-$	√	1	0	×	-	-
N51.9.791 GM3$^-$ ⊕ Y1$^-$ ⊕ Y2$^-$	√	1	0	×	-	-
N51.9.792 GM3$^-$ ⊕ Y1$^-$ ⊕ Y3$^+$	√	1	1	×	-	-
N51.9.793 GM3$^-$ ⊕ Y1$^-$ ⊕ Z1$^+$	√	1	0	×	-	-
N51.9.794 GM3$^-$ ⊕ Y1$^-$ ⊕ Z1$^-$	√	1	0	×	-	-
N51.9.795 GM3$^-$ ⊕ Y1$^-$ ⊕ Z3$^+$	√	1	0	×	-	-
N51.9.796 GM3$^-$ ⊕ Y1$^-$ ⊕ Z3$^-$	√	1	0	×	-	-
N51.9.797 GM3$^-$ ⊕ Y2$^+$ ⊕ Y2$^+$	√	1	0	×	-	-
N51.9.798 GM3$^-$ ⊕ Y2$^+$ ⊕ Y3$^-$	√	1	1	√	mmm	$\mathrm{B2_u}$
N51.9.799 GM3$^-$ ⊕ Y2$^+$ ⊕ Y2$^-$	√	1	1	×	-	-
N51.9.800 GM3$^-$ ⊕ Y2$^+$ ⊕ Y3$^+$	√	1	0	×	-	-
N51.9.801 GM3$^-$ ⊕ Y2$^+$ ⊕ Z1$^+$	√	1	0	×	-	-
N51.9.802 GM3$^-$ ⊕ Y2$^+$ ⊕ Z1$^-$	√	1	0	×	-	-
N51.9.803 GM3$^-$ ⊕ Y2$^+$ ⊕ Z3$^+$	√	1	0	×	-	-
N51.9.804 GM3$^-$ ⊕ Y2$^+$ ⊕ Z3$^-$	√	1	0	×	-	-
N51.9.805 GM3$^-$ ⊕ Y2$^-$ ⊕ Y2$^-$	√	1	0	×	-	-
N51.9.806 GM3$^-$ ⊕ Y2$^-$ ⊕ Y3$^+$	√	1	1	√	mmm	$\mathrm{B2_u}$
N51.9.807 GM3$^-$ ⊕ Y2$^-$ ⊕ Z1$^+$	√	1	0	×	-	-
N51.9.808 GM3$^-$ ⊕ Y2$^-$ ⊕ Z1$^-$	√	1	0	×	-	-
N51.9.809 GM3$^-$ ⊕ Y2$^-$ ⊕ Z3$^+$	√	1	0	×	-	-
N51.9.810 GM3$^-$ ⊕ Y2$^-$ ⊕ Z3$^-$	√	1	0	×	-	-

Non-coplanar SSGs with parent space group $Pmma$ (No. 51) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N51.9.811 $\mathrm{GM3^-}\oplus\mathrm{Z1^+}\oplus\mathrm{Z1^+}$	$\surd$	1	0	$\times$	-	-
N51.9.812 $\mathrm{GM3^-}\oplus\mathrm{Z1^+}\oplus\mathrm{Z2^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.9.813 $\mathrm{GM3^-}\oplus\mathrm{Z1^+}\oplus\mathrm{Z1^-}$	$\surd$	1	1	$\times$	-	-
N51.9.814 $\mathrm{GM3^-}\oplus\mathrm{Z1^+}\oplus\mathrm{Z2^+}$	$\surd$	1	0	$\times$	-	-
N51.9.815 $\mathrm{GM3^-}\oplus\mathrm{Z1^+}\oplus\mathrm{Z3^+}$	$\surd$	1	0	$\times$	-	-
N51.9.816 $\mathrm{GM3^-}\oplus\mathrm{Z1^+}\oplus\mathrm{Z4^-}$	$\surd$	1	1	$\times$	-	-
N51.9.817 $\mathrm{GM3^-}\oplus\mathrm{Z1^+}\oplus\mathrm{Z3^-}$	$\surd$	1	1	$\times$	-	-
N51.9.818 $\mathrm{GM3^-}\oplus\mathrm{Z1^+}\oplus\mathrm{Z4^+}$	$\surd$	1	0	$\times$	-	-
N51.9.819 $\mathrm{GM3^-}\oplus\mathrm{Z1^-}\oplus\mathrm{Z1^-}$	$\surd$	1	0	$\times$	-	-
N51.9.820 $\mathrm{GM3^-}\oplus\mathrm{Z1^-}\oplus\mathrm{Z2^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.9.821 $\mathrm{GM3^-}\oplus\mathrm{Z1^-}\oplus\mathrm{Z3^+}$	$\surd$	1	1	$\times$	-	-
N51.9.822 $\mathrm{GM3^-}\oplus\mathrm{Z1^-}\oplus\mathrm{Z4^-}$	$\surd$	1	0	$\times$	-	-
N51.9.823 $\mathrm{GM3^-}\oplus\mathrm{Z1^-}\oplus\mathrm{Z3^-}$	$\surd$	1	0	$\times$	-	-
N51.9.824 $\mathrm{GM3^-}\oplus\mathrm{Z1^-}\oplus\mathrm{Z4^+}$	$\surd$	1	1	$\times$	-	-
N51.9.825 $\mathrm{GM3^-}\oplus\mathrm{Z3^+}\oplus\mathrm{Z3^+}$	$\surd$	1	0	$\times$	-	-
N51.9.826 $\mathrm{GM3^-}\oplus\mathrm{Z3^+}\oplus\mathrm{Z4^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.9.827 $\mathrm{GM3^-}\oplus\mathrm{Z3^+}\oplus\mathrm{Z3^-}$	$\surd$	1	1	$\times$	-	-
N51.9.828 $\mathrm{GM3^-}\oplus\mathrm{Z3^+}\oplus\mathrm{Z4^+}$	$\surd$	1	0	$\times$	-	-
N51.9.829 $\mathrm{GM3^-}\oplus\mathrm{Z3^-}\oplus\mathrm{Z3^-}$	$\surd$	1	0	$\times$	-	-
N51.9.830 $\mathrm{GM3^-}\oplus\mathrm{Z3^-}\oplus\mathrm{Z4^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.9.831 $\mathrm{GM4^+}\oplus\mathrm{GM4^+}\oplus\mathrm{GM4^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B2_g}\oplus\mathrm{B2_g}\oplus\mathrm{B2_g}$
N51.9.832 $\mathrm{GM4^+}\oplus\mathrm{GM4^+}\oplus\mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2}\oplus\mathrm{A2}$
N51.9.833 $\mathrm{GM4^+}\oplus\mathrm{GM4^+}\oplus\mathrm{T1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_g}\oplus\mathrm{B2_g}$
N51.9.834 $\mathrm{GM4^+}\oplus\mathrm{GM4^+}\oplus\mathrm{T1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_g}\oplus\mathrm{B2_g}$
N51.9.835 $\mathrm{GM4^+}\oplus\mathrm{GM4^+}\oplus\mathrm{Y1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_g}\oplus\mathrm{B2_g}$
N51.9.836 $\mathrm{GM4^+}\oplus\mathrm{GM4^+}\oplus\mathrm{Y1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_g}\oplus\mathrm{B2_g}$
N51.9.837 $\mathrm{GM4^+}\oplus\mathrm{GM4^+}\oplus\mathrm{Y2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_g}\oplus\mathrm{B2_g}$
N51.9.838 $\mathrm{GM4^+}\oplus\mathrm{GM4^+}\oplus\mathrm{Y2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_g}\oplus\mathrm{B2_g}$
N51.9.839 $\mathrm{GM4^+}\oplus\mathrm{GM4^+}\oplus\mathrm{Z1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_g}\oplus\mathrm{B2_g}$
N51.9.840 $\mathrm{GM4^+}\oplus\mathrm{GM4^+}\oplus\mathrm{Z1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_g}\oplus\mathrm{B2_g}$
N51.9.841 $\mathrm{GM4^+}\oplus\mathrm{GM4^+}\oplus\mathrm{Z3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_g}\oplus\mathrm{B2_g}$
N51.9.842 $\mathrm{GM4^+}\oplus\mathrm{GM4^+}\oplus\mathrm{Z3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_g}\oplus\mathrm{B2_g}$
N51.9.843 $\mathrm{GM4^+}\oplus\mathrm{GM4^-}\oplus\mathrm{GM4^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{A_u}\oplus\mathrm{B2_g}$
N51.9.844 $\mathrm{GM4^+}\oplus\mathrm{GM4^-}\oplus\mathrm{T1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B2_g}$
N51.9.845 $\mathrm{GM4^+}\oplus\mathrm{GM4^-}\oplus\mathrm{T1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B2_g}$
N51.9.846 $\mathrm{GM4^+}\oplus\mathrm{GM4^-}\oplus\mathrm{Y1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B2_g}$
N51.9.847 $\mathrm{GM4^+}\oplus\mathrm{GM4^-}\oplus\mathrm{Y1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B2_g}$
N51.9.848 $\mathrm{GM4^+}\oplus\mathrm{GM4^-}\oplus\mathrm{Y2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B2_g}$
N51.9.849 $\mathrm{GM4^+}\oplus\mathrm{GM4^-}\oplus\mathrm{Y2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B2_g}$
N51.9.850 $\mathrm{GM4^+}\oplus\mathrm{GM4^-}\oplus\mathrm{Z1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B2_g}$
N51.9.851 $\mathrm{GM4^+}\oplus\mathrm{GM4^-}\oplus\mathrm{Z1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B2_g}$
N51.9.852 $\mathrm{GM4^+}\oplus\mathrm{GM4^-}\oplus\mathrm{Z3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B2_g}$
N51.9.853 $\mathrm{GM4^+}\oplus\mathrm{GM4^-}\oplus\mathrm{Z3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B2_g}$
N51.9.854 $\mathrm{GM4^+}\oplus\mathrm{T1^+}\oplus\mathrm{T1^+}$	$\surd$	1	1	$\times$	-	-
N51.9.855 $\mathrm{GM4^+}\oplus\mathrm{T1^+}\oplus\mathrm{T2^-}$	$\surd$	1	1	$\times$	-	-
N51.9.856 $\mathrm{GM4^+}\oplus\mathrm{T1^+}\oplus\mathrm{T3^+}$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $Pmma$ (No. 51) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N51.9.857 $\mathrm{GM4}^{+}\oplus\mathrm{T1}^{+}\oplus\mathrm{T4}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.858 $\mathrm{GM4}^{+}\oplus\mathrm{T1}^{+}\oplus\mathrm{T1}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.859 $\mathrm{GM4}^{+}\oplus\mathrm{T1}^{+}\oplus\mathrm{T2}^{+}$	$\surd$	1	1	$\times$	-	-
N51.9.860 $\mathrm{GM4}^{+}\oplus\mathrm{T1}^{+}\oplus\mathrm{T3}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.861 $\mathrm{GM4}^{+}\oplus\mathrm{T1}^{+}\oplus\mathrm{T4}^{+}$	$\surd$	1	1	$\times$	-	-
N51.9.862 $\mathrm{GM4}^{+}\oplus\mathrm{T1}^{+}\oplus\mathrm{Y1}^{+}$	$\surd$	1	1	$\times$	-	-
N51.9.863 $\mathrm{GM4}^{+}\oplus\mathrm{T1}^{+}\oplus\mathrm{Y4}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.864 $\mathrm{GM4}^{+}\oplus\mathrm{T1}^{+}\oplus\mathrm{Y1}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.865 $\mathrm{GM4}^{+}\oplus\mathrm{T1}^{+}\oplus\mathrm{Y4}^{+}$	$\surd$	1	1	$\times$	-	-
N51.9.866 $\mathrm{GM4}^{+}\oplus\mathrm{T1}^{+}\oplus\mathrm{Y2}^{+}$	$\surd$	1	1	$\times$	-	-
N51.9.867 $\mathrm{GM4}^{+}\oplus\mathrm{T1}^{+}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.868 $\mathrm{GM4}^{+}\oplus\mathrm{T1}^{+}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.869 $\mathrm{GM4}^{+}\oplus\mathrm{T1}^{+}\oplus\mathrm{Y3}^{+}$	$\surd$	1	1	$\times$	-	-
N51.9.870 $\mathrm{GM4}^{+}\oplus\mathrm{T1}^{+}\oplus\mathrm{Z1}^{+}$	$\surd$	1	1	$\times$	-	-
N51.9.871 $\mathrm{GM4}^{+}\oplus\mathrm{T1}^{+}\oplus\mathrm{Z2}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.872 $\mathrm{GM4}^{+}\oplus\mathrm{T1}^{+}\oplus\mathrm{Z1}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.873 $\mathrm{GM4}^{+}\oplus\mathrm{T1}^{+}\oplus\mathrm{Z2}^{+}$	$\surd$	1	1	$\times$	-	-
N51.9.874 $\mathrm{GM4}^{+}\oplus\mathrm{T1}^{+}\oplus\mathrm{Z3}^{+}$	$\surd$	1	1	$\times$	-	-
N51.9.875 $\mathrm{GM4}^{+}\oplus\mathrm{T1}^{+}\oplus\mathrm{Z4}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.876 $\mathrm{GM4}^{+}\oplus\mathrm{T1}^{+}\oplus\mathrm{Z3}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.877 $\mathrm{GM4}^{+}\oplus\mathrm{T1}^{+}\oplus\mathrm{Z4}^{+}$	$\surd$	1	1	$\times$	-	-
N51.9.878 $\mathrm{GM4}^{+}\oplus\mathrm{T1}^{-}\oplus\mathrm{T1}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.879 $\mathrm{GM4}^{+}\oplus\mathrm{T1}^{-}\oplus\mathrm{T2}^{+}$	$\surd$	1	1	$\times$	-	-
N51.9.880 $\mathrm{GM4}^{+}\oplus\mathrm{T1}^{-}\oplus\mathrm{T3}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.881 $\mathrm{GM4}^{+}\oplus\mathrm{T1}^{-}\oplus\mathrm{T4}^{+}$	$\surd$	1	1	$\times$	-	-
N51.9.882 $\mathrm{GM4}^{+}\oplus\mathrm{T1}^{-}\oplus\mathrm{Y1}^{+}$	$\surd$	1	1	$\times$	-	-
N51.9.883 $\mathrm{GM4}^{+}\oplus\mathrm{T1}^{-}\oplus\mathrm{Y4}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.884 $\mathrm{GM4}^{+}\oplus\mathrm{T1}^{-}\oplus\mathrm{Y1}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.885 $\mathrm{GM4}^{+}\oplus\mathrm{T1}^{-}\oplus\mathrm{Y4}^{+}$	$\surd$	1	1	$\times$	-	-
N51.9.886 $\mathrm{GM4}^{+}\oplus\mathrm{T1}^{-}\oplus\mathrm{Y2}^{+}$	$\surd$	1	1	$\times$	-	-
N51.9.887 $\mathrm{GM4}^{+}\oplus\mathrm{T1}^{-}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.888 $\mathrm{GM4}^{+}\oplus\mathrm{T1}^{-}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.889 $\mathrm{GM4}^{+}\oplus\mathrm{T1}^{-}\oplus\mathrm{Y3}^{+}$	$\surd$	1	1	$\times$	-	-
N51.9.890 $\mathrm{GM4}^{+}\oplus\mathrm{T1}^{-}\oplus\mathrm{Z1}^{+}$	$\surd$	1	1	$\times$	-	-
N51.9.891 $\mathrm{GM4}^{+}\oplus\mathrm{T1}^{-}\oplus\mathrm{Z2}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.892 $\mathrm{GM4}^{+}\oplus\mathrm{T1}^{-}\oplus\mathrm{Z1}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.893 $\mathrm{GM4}^{+}\oplus\mathrm{T1}^{-}\oplus\mathrm{Z2}^{+}$	$\surd$	1	1	$\times$	-	-
N51.9.894 $\mathrm{GM4}^{+}\oplus\mathrm{T1}^{-}\oplus\mathrm{Z3}^{+}$	$\surd$	1	1	$\times$	-	-
N51.9.895 $\mathrm{GM4}^{+}\oplus\mathrm{T1}^{-}\oplus\mathrm{Z4}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.896 $\mathrm{GM4}^{+}\oplus\mathrm{T1}^{-}\oplus\mathrm{Z3}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.897 $\mathrm{GM4}^{+}\oplus\mathrm{T1}^{-}\oplus\mathrm{Z4}^{+}$	$\surd$	1	1	$\times$	-	-
N51.9.898 $\mathrm{GM4}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y1}^{+}$	$\surd$	1	1	$\times$	-	-
N51.9.899 $\mathrm{GM4}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y4}^{-}$	$\surd$	1	1	$\surd$	222	B2
N51.9.900 $\mathrm{GM4}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y1}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.901 $\mathrm{GM4}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y4}^{+}$	$\surd$	1	1	$\times$	-	-
N51.9.902 $\mathrm{GM4}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y2}^{+}$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $Pmma$ (No. 51) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N51.9.903 $\mathrm{GM4}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.904 $\mathrm{GM4}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.905 $\mathrm{GM4}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y3}^{+}$	$\surd$	1	1	$\times$	-	-
N51.9.906 $\mathrm{GM4}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Z1}^{+}$	$\surd$	1	1	$\times$	-	-
N51.9.907 $\mathrm{GM4}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Z1}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.908 $\mathrm{GM4}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Z3}^{+}$	$\surd$	1	1	$\times$	-	-
N51.9.909 $\mathrm{GM4}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Z3}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.910 $\mathrm{GM4}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y1}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.911 $\mathrm{GM4}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y4}^{+}$	$\surd$	1	1	$\surd$	222	B2
N51.9.912 $\mathrm{GM4}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y2}^{+}$	$\surd$	1	1	$\times$	-	-
N51.9.913 $\mathrm{GM4}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.914 $\mathrm{GM4}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.915 $\mathrm{GM4}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y3}^{+}$	$\surd$	1	1	$\times$	-	-
N51.9.916 $\mathrm{GM4}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Z1}^{+}$	$\surd$	1	1	$\times$	-	-
N51.9.917 $\mathrm{GM4}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Z1}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.918 $\mathrm{GM4}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Z3}^{+}$	$\surd$	1	1	$\times$	-	-
N51.9.919 $\mathrm{GM4}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Z3}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.920 $\mathrm{GM4}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Y2}^{+}$	$\surd$	1	1	$\times$	-	-
N51.9.921 $\mathrm{GM4}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\surd$	222	B2
N51.9.922 $\mathrm{GM4}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.923 $\mathrm{GM4}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Y3}^{+}$	$\surd$	1	1	$\times$	-	-
N51.9.924 $\mathrm{GM4}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Z1}^{+}$	$\surd$	1	1	$\times$	-	-
N51.9.925 $\mathrm{GM4}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Z1}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.926 $\mathrm{GM4}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Z3}^{+}$	$\surd$	1	1	$\times$	-	-
N51.9.927 $\mathrm{GM4}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Z3}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.928 $\mathrm{GM4}^{+}\oplus\mathrm{Y2}^{-}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.929 $\mathrm{GM4}^{+}\oplus\mathrm{Y2}^{-}\oplus\mathrm{Y3}^{+}$	$\surd$	1	1	$\surd$	222	B2
N51.9.930 $\mathrm{GM4}^{+}\oplus\mathrm{Y2}^{-}\oplus\mathrm{Z1}^{+}$	$\surd$	1	1	$\times$	-	-
N51.9.931 $\mathrm{GM4}^{+}\oplus\mathrm{Y2}^{-}\oplus\mathrm{Z1}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.932 $\mathrm{GM4}^{+}\oplus\mathrm{Y2}^{-}\oplus\mathrm{Z3}^{+}$	$\surd$	1	1	$\times$	-	-
N51.9.933 $\mathrm{GM4}^{+}\oplus\mathrm{Y2}^{-}\oplus\mathrm{Z3}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.934 $\mathrm{GM4}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z1}^{+}$	$\surd$	1	1	$\times$	-	-
N51.9.935 $\mathrm{GM4}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z2}^{-}$	$\surd$	1	1	$\surd$	$mm2$	B1
N51.9.936 $\mathrm{GM4}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z1}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.937 $\mathrm{GM4}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z2}^{+}$	$\surd$	1	1	$\times$	-	-
N51.9.938 $\mathrm{GM4}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z3}^{+}$	$\surd$	1	1	$\times$	-	-
N51.9.939 $\mathrm{GM4}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z4}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.940 $\mathrm{GM4}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z3}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.941 $\mathrm{GM4}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z4}^{+}$	$\surd$	1	1	$\times$	-	-
N51.9.942 $\mathrm{GM4}^{+}\oplus\mathrm{Z1}^{-}\oplus\mathrm{Z1}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.943 $\mathrm{GM4}^{+}\oplus\mathrm{Z1}^{-}\oplus\mathrm{Z2}^{+}$	$\surd$	1	1	$\surd$	$mm2$	B1
N51.9.944 $\mathrm{GM4}^{+}\oplus\mathrm{Z1}^{-}\oplus\mathrm{Z3}^{+}$	$\surd$	1	1	$\times$	-	-
N51.9.945 $\mathrm{GM4}^{+}\oplus\mathrm{Z1}^{-}\oplus\mathrm{Z4}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.946 $\mathrm{GM4}^{+}\oplus\mathrm{Z1}^{-}\oplus\mathrm{Z3}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.947 $\mathrm{GM4}^{+}\oplus\mathrm{Z1}^{-}\oplus\mathrm{Z4}^{+}$	$\surd$	1	1	$\times$	-	-
N51.9.948 $\mathrm{GM4}^{+}\oplus\mathrm{Z3}^{+}\oplus\mathrm{Z3}^{+}$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $Pmma$ (No. 51) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N51.9.949 $\mathrm{GM4}^{+}\oplus\mathrm{Z3}^{+}\oplus\mathrm{Z4}^{-}$	$\surd$	1	1	$\surd$	$mm2$	B1
N51.9.950 $\mathrm{GM4}^{+}\oplus\mathrm{Z3}^{+}\oplus\mathrm{Z3}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.951 $\mathrm{GM4}^{+}\oplus\mathrm{Z3}^{+}\oplus\mathrm{Z4}^{+}$	$\surd$	1	1	$\times$	-	-
N51.9.952 $\mathrm{GM4}^{+}\oplus\mathrm{Z3}^{-}\oplus\mathrm{Z3}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.953 $\mathrm{GM4}^{+}\oplus\mathrm{Z3}^{-}\oplus\mathrm{Z4}^{+}$	$\surd$	1	1	$\surd$	$mm2$	B1
N51.9.954 $\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
N51.9.955 $\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}\oplus\mathrm{T1}^{+}$	$\surd$	0	0	$\surd$	-	-
N51.9.956 $\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}\oplus\mathrm{T1}^{-}$	$\surd$	0	0	$\surd$	-	-
N51.9.957 $\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}\oplus\mathrm{Y1}^{+}$	$\surd$	0	0	$\surd$	-	-
N51.9.958 $\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}\oplus\mathrm{Y1}^{-}$	$\surd$	0	0	$\surd$	-	-
N51.9.959 $\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}\oplus\mathrm{Y2}^{+}$	$\surd$	0	0	$\surd$	-	-
N51.9.960 $\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}\oplus\mathrm{Y2}^{-}$	$\surd$	0	0	$\surd$	-	-
N51.9.961 $\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}\oplus\mathrm{Z1}^{+}$	$\surd$	0	0	$\surd$	-	-
N51.9.962 $\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}\oplus\mathrm{Z1}^{-}$	$\surd$	0	0	$\surd$	-	-
N51.9.963 $\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}\oplus\mathrm{Z3}^{+}$	$\surd$	0	0	$\surd$	-	-
N51.9.964 $\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}\oplus\mathrm{Z3}^{-}$	$\surd$	0	0	$\surd$	-	-
N51.9.965 $\mathrm{GM4}^{-}\oplus\mathrm{T1}^{+}\oplus\mathrm{T1}^{+}$	$\surd$	1	0	$\times$	-	-
N51.9.966 $\mathrm{GM4}^{-}\oplus\mathrm{T1}^{+}\oplus\mathrm{T2}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.967 $\mathrm{GM4}^{-}\oplus\mathrm{T1}^{+}\oplus\mathrm{T3}^{+}$	$\surd$	1	0	$\times$	-	-
N51.9.968 $\mathrm{GM4}^{-}\oplus\mathrm{T1}^{+}\oplus\mathrm{T4}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.969 $\mathrm{GM4}^{-}\oplus\mathrm{T1}^{+}\oplus\mathrm{T1}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.970 $\mathrm{GM4}^{-}\oplus\mathrm{T1}^{+}\oplus\mathrm{T2}^{+}$	$\surd$	1	0	$\times$	-	-
N51.9.971 $\mathrm{GM4}^{-}\oplus\mathrm{T1}^{+}\oplus\mathrm{T3}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.972 $\mathrm{GM4}^{-}\oplus\mathrm{T1}^{+}\oplus\mathrm{T4}^{+}$	$\surd$	1	0	$\times$	-	-
N51.9.973 $\mathrm{GM4}^{-}\oplus\mathrm{T1}^{+}\oplus\mathrm{Y1}^{+}$	$\surd$	1	0	$\times$	-	-
N51.9.974 $\mathrm{GM4}^{-}\oplus\mathrm{T1}^{+}\oplus\mathrm{Y4}^{-}$	$\surd$	1	0	$\times$	-	-
N51.9.975 $\mathrm{GM4}^{-}\oplus\mathrm{T1}^{+}\oplus\mathrm{Y1}^{-}$	$\surd$	1	0	$\times$	-	-
N51.9.976 $\mathrm{GM4}^{-}\oplus\mathrm{T1}^{+}\oplus\mathrm{Y4}^{+}$	$\surd$	1	0	$\times$	-	-
N51.9.977 $\mathrm{GM4}^{-}\oplus\mathrm{T1}^{+}\oplus\mathrm{Y2}^{+}$	$\surd$	1	0	$\times$	-	-
N51.9.978 $\mathrm{GM4}^{-}\oplus\mathrm{T1}^{+}\oplus\mathrm{Y3}^{-}$	$\surd$	1	0	$\times$	-	-
N51.9.979 $\mathrm{GM4}^{-}\oplus\mathrm{T1}^{+}\oplus\mathrm{Y2}^{-}$	$\surd$	1	0	$\times$	-	-
N51.9.980 $\mathrm{GM4}^{-}\oplus\mathrm{T1}^{+}\oplus\mathrm{Y3}^{+}$	$\surd$	1	0	$\times$	-	-
N51.9.981 $\mathrm{GM4}^{-}\oplus\mathrm{T1}^{+}\oplus\mathrm{Z1}^{+}$	$\surd$	1	0	$\times$	-	-
N51.9.982 $\mathrm{GM4}^{-}\oplus\mathrm{T1}^{+}\oplus\mathrm{Z2}^{-}$	$\surd$	1	0	$\times$	-	-
N51.9.983 $\mathrm{GM4}^{-}\oplus\mathrm{T1}^{+}\oplus\mathrm{Z1}^{-}$	$\surd$	1	0	$\times$	-	-
N51.9.984 $\mathrm{GM4}^{-}\oplus\mathrm{T1}^{+}\oplus\mathrm{Z2}^{+}$	$\surd$	1	0	$\times$	-	-
N51.9.985 $\mathrm{GM4}^{-}\oplus\mathrm{T1}^{+}\oplus\mathrm{Z3}^{+}$	$\surd$	1	0	$\times$	-	-
N51.9.986 $\mathrm{GM4}^{-}\oplus\mathrm{T1}^{+}\oplus\mathrm{Z4}^{-}$	$\surd$	1	0	$\times$	-	-
N51.9.987 $\mathrm{GM4}^{-}\oplus\mathrm{T1}^{+}\oplus\mathrm{Z3}^{-}$	$\surd$	1	0	$\times$	-	-
N51.9.988 $\mathrm{GM4}^{-}\oplus\mathrm{T1}^{+}\oplus\mathrm{Z4}^{+}$	$\surd$	1	0	$\times$	-	-
N51.9.989 $\mathrm{GM4}^{-}\oplus\mathrm{T1}^{-}\oplus\mathrm{T1}^{-}$	$\surd$	1	0	$\times$	-	-
N51.9.990 $\mathrm{GM4}^{-}\oplus\mathrm{T1}^{-}\oplus\mathrm{T2}^{+}$	$\surd$	1	1	$\times$	-	-
N51.9.991 $\mathrm{GM4}^{-}\oplus\mathrm{T1}^{-}\oplus\mathrm{T3}^{-}$	$\surd$	1	0	$\times$	-	-
N51.9.992 $\mathrm{GM4}^{-}\oplus\mathrm{T1}^{-}\oplus\mathrm{T4}^{+}$	$\surd$	1	1	$\times$	-	-
N51.9.993 $\mathrm{GM4}^{-}\oplus\mathrm{T1}^{-}\oplus\mathrm{Y1}^{+}$	$\surd$	1	0	$\times$	-	-
N51.9.994 $\mathrm{GM4}^{-}\oplus\mathrm{T1}^{-}\oplus\mathrm{Y4}^{-}$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $Pmma$ (No. 51) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N51.9.995 $\mathrm{GM4^-}\oplus\mathrm{T1^-}\oplus\mathrm{Y1^-}$	$\surd$	1	0	$\times$	-	-
N51.9.996 $\mathrm{GM4^-}\oplus\mathrm{T1^-}\oplus\mathrm{Y4^+}$	$\surd$	1	0	$\times$	-	-
N51.9.997 $\mathrm{GM4^-}\oplus\mathrm{T1^-}\oplus\mathrm{Y2^+}$	$\surd$	1	0	$\times$	-	-
N51.9.998 $\mathrm{GM4^-}\oplus\mathrm{T1^-}\oplus\mathrm{Y3^-}$	$\surd$	1	0	$\times$	-	-
N51.9.999 $\mathrm{GM4^-}\oplus\mathrm{T1^-}\oplus\mathrm{Y2^-}$	$\surd$	1	0	$\times$	-	-
N51.9.1000 $\mathrm{GM4^-}\oplus\mathrm{T1^-}\oplus\mathrm{Y3^+}$	$\surd$	1	0	$\times$	-	-
N51.9.1001 $\mathrm{GM4^-}\oplus\mathrm{T1^-}\oplus\mathrm{Z1^+}$	$\surd$	1	0	$\times$	-	-
N51.9.1002 $\mathrm{GM4^-}\oplus\mathrm{T1^-}\oplus\mathrm{Z2^-}$	$\surd$	1	0	$\times$	-	-
N51.9.1003 $\mathrm{GM4^-}\oplus\mathrm{T1^-}\oplus\mathrm{Z1^-}$	$\surd$	1	0	$\times$	-	-
N51.9.1004 $\mathrm{GM4^-}\oplus\mathrm{T1^-}\oplus\mathrm{Z2^+}$	$\surd$	1	0	$\times$	-	-
N51.9.1005 $\mathrm{GM4^-}\oplus\mathrm{T1^-}\oplus\mathrm{Z3^+}$	$\surd$	1	0	$\times$	-	-
N51.9.1006 $\mathrm{GM4^-}\oplus\mathrm{T1^-}\oplus\mathrm{Z4^-}$	$\surd$	1	0	$\times$	-	-
N51.9.1007 $\mathrm{GM4^-}\oplus\mathrm{T1^-}\oplus\mathrm{Z3^-}$	$\surd$	1	0	$\times$	-	-
N51.9.1008 $\mathrm{GM4^-}\oplus\mathrm{T1^-}\oplus\mathrm{Z4^+}$	$\surd$	1	0	$\times$	-	-
N51.9.1009 $\mathrm{GM4^-}\oplus\mathrm{Y1^+}\oplus\mathrm{Y1^+}$	$\surd$	1	0	$\times$	-	-
N51.9.1010 $\mathrm{GM4^-}\oplus\mathrm{Y1^+}\oplus\mathrm{Y4^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N51.9.1011 $\mathrm{GM4^-}\oplus\mathrm{Y1^+}\oplus\mathrm{Y1^-}$	$\surd$	1	1	$\times$	-	-
N51.9.1012 $\mathrm{GM4^-}\oplus\mathrm{Y1^+}\oplus\mathrm{Y4^+}$	$\surd$	1	0	$\times$	-	-
N51.9.1013 $\mathrm{GM4^-}\oplus\mathrm{Y1^+}\oplus\mathrm{Y2^+}$	$\surd$	1	0	$\times$	-	-
N51.9.1014 $\mathrm{GM4^-}\oplus\mathrm{Y1^+}\oplus\mathrm{Y3^-}$	$\surd$	1	1	$\times$	-	-
N51.9.1015 $\mathrm{GM4^-}\oplus\mathrm{Y1^+}\oplus\mathrm{Y2^-}$	$\surd$	1	1	$\times$	-	-
N51.9.1016 $\mathrm{GM4^-}\oplus\mathrm{Y1^+}\oplus\mathrm{Y3^+}$	$\surd$	1	0	$\times$	-	-
N51.9.1017 $\mathrm{GM4^-}\oplus\mathrm{Y1^+}\oplus\mathrm{Z1^+}$	$\surd$	1	0	$\times$	-	-
N51.9.1018 $\mathrm{GM4^-}\oplus\mathrm{Y1^+}\oplus\mathrm{Z1^-}$	$\surd$	1	0	$\times$	-	-
N51.9.1019 $\mathrm{GM4^-}\oplus\mathrm{Y1^+}\oplus\mathrm{Z3^+}$	$\surd$	1	0	$\times$	-	-
N51.9.1020 $\mathrm{GM4^-}\oplus\mathrm{Y1^+}\oplus\mathrm{Z3^-}$	$\surd$	1	0	$\times$	-	-
N51.9.1021 $\mathrm{GM4^-}\oplus\mathrm{Y1^-}\oplus\mathrm{Y1^-}$	$\surd$	1	0	$\times$	-	-
N51.9.1022 $\mathrm{GM4^-}\oplus\mathrm{Y1^-}\oplus\mathrm{Y4^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N51.9.1023 $\mathrm{GM4^-}\oplus\mathrm{Y1^-}\oplus\mathrm{Y2^+}$	$\surd$	1	1	$\times$	-	-
N51.9.1024 $\mathrm{GM4^-}\oplus\mathrm{Y1^-}\oplus\mathrm{Y3^-}$	$\surd$	1	0	$\times$	-	-
N51.9.1025 $\mathrm{GM4^-}\oplus\mathrm{Y1^-}\oplus\mathrm{Y2^-}$	$\surd$	1	0	$\times$	-	-
N51.9.1026 $\mathrm{GM4^-}\oplus\mathrm{Y1^-}\oplus\mathrm{Y3^+}$	$\surd$	1	1	$\times$	-	-
N51.9.1027 $\mathrm{GM4^-}\oplus\mathrm{Y1^-}\oplus\mathrm{Z1^+}$	$\surd$	1	0	$\times$	-	-
N51.9.1028 $\mathrm{GM4^-}\oplus\mathrm{Y1^-}\oplus\mathrm{Z1^-}$	$\surd$	1	0	$\times$	-	-
N51.9.1029 $\mathrm{GM4^-}\oplus\mathrm{Y1^-}\oplus\mathrm{Z3^+}$	$\surd$	1	0	$\times$	-	-
N51.9.1030 $\mathrm{GM4^-}\oplus\mathrm{Y1^-}\oplus\mathrm{Z3^-}$	$\surd$	1	0	$\times$	-	-
N51.9.1031 $\mathrm{GM4^-}\oplus\mathrm{Y2^+}\oplus\mathrm{Y2^+}$	$\surd$	1	0	$\times$	-	-
N51.9.1032 $\mathrm{GM4^-}\oplus\mathrm{Y2^+}\oplus\mathrm{Y3^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N51.9.1033 $\mathrm{GM4^-}\oplus\mathrm{Y2^+}\oplus\mathrm{Y2^-}$	$\surd$	1	1	$\times$	-	-
N51.9.1034 $\mathrm{GM4^-}\oplus\mathrm{Y2^+}\oplus\mathrm{Y3^+}$	$\surd$	1	0	$\times$	-	-
N51.9.1035 $\mathrm{GM4^-}\oplus\mathrm{Y2^+}\oplus\mathrm{Z1^+}$	$\surd$	1	0	$\times$	-	-
N51.9.1036 $\mathrm{GM4^-}\oplus\mathrm{Y2^+}\oplus\mathrm{Z1^-}$	$\surd$	1	0	$\times$	-	-
N51.9.1037 $\mathrm{GM4^-}\oplus\mathrm{Y2^+}\oplus\mathrm{Z3^+}$	$\surd$	1	0	$\times$	-	-
N51.9.1038 $\mathrm{GM4^-}\oplus\mathrm{Y2^+}\oplus\mathrm{Z3^-}$	$\surd$	1	0	$\times$	-	-
N51.9.1039 $\mathrm{GM4^-}\oplus\mathrm{Y2^-}\oplus\mathrm{Y2^-}$	$\surd$	1	0	$\times$	-	-
N51.9.1040 $\mathrm{GM4^-}\oplus\mathrm{Y2^-}\oplus\mathrm{Y3^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$

Non-coplanar SSGs with parent space group $Pmma$ (No. 51) (continued).

SSG		Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N51.9.1041	$\mathrm{GM4}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N51.9.1042	$\mathrm{GM4}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N51.9.1043	$\mathrm{GM4}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N51.9.1044	$\mathrm{GM4}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N51.9.1045	$\mathrm{GM4}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N51.9.1046	$\mathrm{GM4}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.9.1047	$\mathrm{GM4}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
N51.9.1048	$\mathrm{GM4}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N51.9.1049	$\mathrm{GM4}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N51.9.1050	$\mathrm{GM4}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\times$	-	-
N51.9.1051	$\mathrm{GM4}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N51.9.1052	$\mathrm{GM4}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N51.9.1053	$\mathrm{GM4}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N51.9.1054	$\mathrm{GM4}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.9.1055	$\mathrm{GM4}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
N51.9.1056	$\mathrm{GM4}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z4}^-$	$\surd$	1	0	$\times$	-	-
N51.9.1057	$\mathrm{GM4}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N51.9.1058	$\mathrm{GM4}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\times$	-	-
N51.9.1059	$\mathrm{GM4}^- \oplus \mathrm{Z3}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N51.9.1060	$\mathrm{GM4}^- \oplus \mathrm{Z3}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.9.1061	$\mathrm{GM4}^- \oplus \mathrm{Z3}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N51.9.1062	$\mathrm{GM4}^- \oplus \mathrm{Z3}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N51.9.1063	$\mathrm{GM4}^- \oplus \mathrm{Z3}^- \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N51.9.1064	$\mathrm{GM4}^- \oplus \mathrm{Z3}^- \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.9.1065	$\mathrm{T1}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{T1}^+$	$\surd$	0	0	$\surd$	-	-
N51.9.1066	$\mathrm{T1}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{T2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N51.9.1067	$\mathrm{T1}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{T3}^+$	$\surd$	0	0	$\surd$	-	-
N51.9.1068	$\mathrm{T1}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{T4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_u} \oplus \mathrm{B2_u}$
N51.9.1069	$\mathrm{T1}^+ \oplus \mathrm{T2}^- \oplus \mathrm{T3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N51.9.1070	$\mathrm{T1}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{T1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u}$
N51.9.1071	$\mathrm{T1}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{T2}^+$	$\surd$	0	0	$\surd$	-	-
N51.9.1072	$\mathrm{T1}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{T3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B3_u}$
N51.9.1073	$\mathrm{T1}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{T4}^+$	$\surd$	0	0	$\surd$	-	-
N51.9.1074	$\mathrm{T1}^+ \oplus \mathrm{T2}^- \oplus \mathrm{T1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u}$
N51.9.1075	$\mathrm{T1}^+ \oplus \mathrm{T2}^- \oplus \mathrm{T3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u}$
N51.9.1076	$\mathrm{T1}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{T1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u}$
N51.9.1077	$\mathrm{T1}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{T2}^+$	$\surd$	0	0	$\surd$	-	-
N51.9.1078	$\mathrm{T1}^+ \oplus \mathrm{T4}^- \oplus \mathrm{T1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B2_u}$
N51.9.1079	$\mathrm{T1}^+ \oplus \mathrm{T4}^- \oplus \mathrm{T2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_u}$
N51.9.1080	$\mathrm{T1}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	0	$\times$	-	-
N51.9.1081	$\mathrm{T1}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	0	$\times$	-	-
N51.9.1082	$\mathrm{T1}^+ \oplus \mathrm{T2}^- \oplus \mathrm{Y1}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.9.1083	$\mathrm{T1}^+ \oplus \mathrm{T2}^- \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.9.1084	$\mathrm{T1}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	0	$\times$	-	-
N51.9.1085	$\mathrm{T1}^+ \oplus \mathrm{T4}^- \oplus \mathrm{Y1}^+$	$\surd$	1	1	$\times$	-	-
N51.9.1086	$\mathrm{T1}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Y1}^-$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $Pmma$ (No. 51) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N51.9.1087 $\mathrm{T1}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
N51.9.1088 $\mathrm{T1}^+ \oplus \mathrm{T2}^- \oplus \mathrm{Y1}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.9.1089 $\mathrm{T1}^+ \oplus \mathrm{T2}^- \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.9.1090 $\mathrm{T1}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{Y1}^-$	$\surd$	1	0	$\times$	-	-
N51.9.1091 $\mathrm{T1}^+ \oplus \mathrm{T4}^- \oplus \mathrm{Y1}^-$	$\surd$	1	1	$\times$	-	-
N51.9.1092 $\mathrm{T1}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N51.9.1093 $\mathrm{T1}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N51.9.1094 $\mathrm{T1}^+ \oplus \mathrm{T2}^- \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.9.1095 $\mathrm{T1}^+ \oplus \mathrm{T2}^- \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.9.1096 $\mathrm{T1}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N51.9.1097 $\mathrm{T1}^+ \oplus \mathrm{T4}^- \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\times$	-	-
N51.9.1098 $\mathrm{T1}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N51.9.1099 $\mathrm{T1}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N51.9.1100 $\mathrm{T1}^+ \oplus \mathrm{T2}^- \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.9.1101 $\mathrm{T1}^+ \oplus \mathrm{T2}^- \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.9.1102 $\mathrm{T1}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N51.9.1103 $\mathrm{T1}^+ \oplus \mathrm{T4}^- \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\times$	-	-
N51.9.1104 $\mathrm{T1}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N51.9.1105 $\mathrm{T1}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-
N51.9.1106 $\mathrm{T1}^+ \oplus \mathrm{T2}^- \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\times$	-	-
N51.9.1107 $\mathrm{T1}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N51.9.1108 $\mathrm{T1}^+ \oplus \mathrm{T4}^- \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N51.9.1109 $\mathrm{T1}^+ \oplus \mathrm{T4}^- \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N51.9.1110 $\mathrm{T1}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N51.9.1111 $\mathrm{T1}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N51.9.1112 $\mathrm{T1}^+ \oplus \mathrm{T2}^- \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
N51.9.1113 $\mathrm{T1}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N51.9.1114 $\mathrm{T1}^+ \oplus \mathrm{T4}^- \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N51.9.1115 $\mathrm{T1}^+ \oplus \mathrm{T4}^- \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N51.9.1116 $\mathrm{T1}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N51.9.1117 $\mathrm{T1}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	0	$\times$	-	-
N51.9.1118 $\mathrm{T1}^+ \oplus \mathrm{T2}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
N51.9.1119 $\mathrm{T1}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N51.9.1120 $\mathrm{T1}^+ \oplus \mathrm{T4}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N51.9.1121 $\mathrm{T1}^+ \oplus \mathrm{T4}^- \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N51.9.1122 $\mathrm{T1}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N51.9.1123 $\mathrm{T1}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N51.9.1124 $\mathrm{T1}^+ \oplus \mathrm{T2}^- \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N51.9.1125 $\mathrm{T1}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N51.9.1126 $\mathrm{T1}^+ \oplus \mathrm{T4}^- \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N51.9.1127 $\mathrm{T1}^+ \oplus \mathrm{T4}^- \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N51.9.1128 $\mathrm{T1}^+ \oplus \mathrm{T1}^- \oplus \mathrm{T1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u}$
N51.9.1129 $\mathrm{T1}^+ \oplus \mathrm{T1}^- \oplus \mathrm{T2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u}$
N51.9.1130 $\mathrm{T1}^+ \oplus \mathrm{T1}^- \oplus \mathrm{T3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u}$
N51.9.1131 $\mathrm{T1}^+ \oplus \mathrm{T1}^- \oplus \mathrm{T4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B2_u}$
N51.9.1132 $\mathrm{T1}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{T2}^+$	$\surd$	0	0	$\surd$	-	-

Non-coplanar SSGs with parent space group $Pmma$ (No. 51) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N51.9.1133 $\mathrm{T1}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{T3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_u}$
N51.9.1134 $\mathrm{T1}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{T4}^+$	$\surd$	0	0	$\surd$	-	-
N51.9.1135 $\mathrm{T1}^+ \oplus \mathrm{T3}^- \oplus \mathrm{T3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B3_u}$
N51.9.1136 $\mathrm{T1}^+ \oplus \mathrm{T3}^- \oplus \mathrm{T4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u}$
N51.9.1137 $\mathrm{T1}^+ \oplus \mathrm{T4}^+ \oplus \mathrm{T4}^+$	$\surd$	0	0	$\surd$	-	-
N51.9.1138 $\mathrm{T1}^+ \oplus \mathrm{T1}^- \oplus \mathrm{Y1}^+$	$\surd$	1	1	$\times$	-	-
N51.9.1139 $\mathrm{T1}^+ \oplus \mathrm{T1}^- \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\times$	-	-
N51.9.1140 $\mathrm{T1}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	0	$\times$	-	-
N51.9.1141 $\mathrm{T1}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	0	$\times$	-	-
N51.9.1142 $\mathrm{T1}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Y1}^+$	$\surd$	1	1	$\times$	-	-
N51.9.1143 $\mathrm{T1}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\times$	-	-
N51.9.1144 $\mathrm{T1}^+ \oplus \mathrm{T4}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	0	$\times$	-	-
N51.9.1145 $\mathrm{T1}^+ \oplus \mathrm{T4}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	0	$\times$	-	-
N51.9.1146 $\mathrm{T1}^+ \oplus \mathrm{T1}^- \oplus \mathrm{Y1}^-$	$\surd$	1	1	$\times$	-	-
N51.9.1147 $\mathrm{T1}^+ \oplus \mathrm{T1}^- \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\times$	-	-
N51.9.1148 $\mathrm{T1}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{Y1}^-$	$\surd$	1	0	$\times$	-	-
N51.9.1149 $\mathrm{T1}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
N51.9.1150 $\mathrm{T1}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Y1}^-$	$\surd$	1	1	$\times$	-	-
N51.9.1151 $\mathrm{T1}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\times$	-	-
N51.9.1152 $\mathrm{T1}^+ \oplus \mathrm{T4}^+ \oplus \mathrm{Y1}^-$	$\surd$	1	0	$\times$	-	-
N51.9.1153 $\mathrm{T1}^+ \oplus \mathrm{T4}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
N51.9.1154 $\mathrm{T1}^+ \oplus \mathrm{T1}^- \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\times$	-	-
N51.9.1155 $\mathrm{T1}^+ \oplus \mathrm{T1}^- \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\times$	-	-
N51.9.1156 $\mathrm{T1}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N51.9.1157 $\mathrm{T1}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N51.9.1158 $\mathrm{T1}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\times$	-	-
N51.9.1159 $\mathrm{T1}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\times$	-	-
N51.9.1160 $\mathrm{T1}^+ \oplus \mathrm{T4}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N51.9.1161 $\mathrm{T1}^+ \oplus \mathrm{T4}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N51.9.1162 $\mathrm{T1}^+ \oplus \mathrm{T1}^- \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\times$	-	-
N51.9.1163 $\mathrm{T1}^+ \oplus \mathrm{T1}^- \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\times$	-	-
N51.9.1164 $\mathrm{T1}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N51.9.1165 $\mathrm{T1}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N51.9.1166 $\mathrm{T1}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\times$	-	-
N51.9.1167 $\mathrm{T1}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\times$	-	-
N51.9.1168 $\mathrm{T1}^+ \oplus \mathrm{T4}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N51.9.1169 $\mathrm{T1}^+ \oplus \mathrm{T4}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N51.9.1170 $\mathrm{T1}^+ \oplus \mathrm{T1}^- \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\times$	-	-
N51.9.1171 $\mathrm{T1}^+ \oplus \mathrm{T1}^- \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\times$	-	-
N51.9.1172 $\mathrm{T1}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N51.9.1173 $\mathrm{T1}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-
N51.9.1174 $\mathrm{T1}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\times$	-	-
N51.9.1175 $\mathrm{T1}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\times$	-	-
N51.9.1176 $\mathrm{T1}^+ \oplus \mathrm{T4}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N51.9.1177 $\mathrm{T1}^+ \oplus \mathrm{T4}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-
N51.9.1178 $\mathrm{T1}^+ \oplus \mathrm{T1}^- \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $Pmma$ (No. 51) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N51.9.1179 $\mathrm{T1}^+ \oplus \mathrm{T1}^- \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\times$	-	-
N51.9.1180 $\mathrm{T1}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N51.9.1181 $\mathrm{T1}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N51.9.1182 $\mathrm{T1}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
N51.9.1183 $\mathrm{T1}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\times$	-	-
N51.9.1184 $\mathrm{T1}^+ \oplus \mathrm{T4}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N51.9.1185 $\mathrm{T1}^+ \oplus \mathrm{T4}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N51.9.1186 $\mathrm{T1}^+ \oplus \mathrm{T1}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
N51.9.1187 $\mathrm{T1}^+ \oplus \mathrm{T1}^- \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\times$	-	-
N51.9.1188 $\mathrm{T1}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N51.9.1189 $\mathrm{T1}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	0	$\times$	-	-
N51.9.1190 $\mathrm{T1}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
N51.9.1191 $\mathrm{T1}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\times$	-	-
N51.9.1192 $\mathrm{T1}^+ \oplus \mathrm{T4}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N51.9.1193 $\mathrm{T1}^+ \oplus \mathrm{T4}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	0	$\times$	-	-
N51.9.1194 $\mathrm{T1}^+ \oplus \mathrm{T1}^- \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N51.9.1195 $\mathrm{T1}^+ \oplus \mathrm{T1}^- \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\times$	-	-
N51.9.1196 $\mathrm{T1}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N51.9.1197 $\mathrm{T1}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N51.9.1198 $\mathrm{T1}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N51.9.1199 $\mathrm{T1}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\times$	-	-
N51.9.1200 $\mathrm{T1}^+ \oplus \mathrm{T4}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N51.9.1201 $\mathrm{T1}^+ \oplus \mathrm{T4}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N51.9.1202 $\mathrm{T1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	0	$\times$	-	-
N51.9.1203 $\mathrm{T1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N51.9.1204 $\mathrm{T1}^+ \oplus \mathrm{Y4}^- \oplus \mathrm{Y4}^-$	$\surd$	1	0	$\times$	-	-
N51.9.1205 $\mathrm{T1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^-$	$\surd$	1	1	$\times$	-	-
N51.9.1206 $\mathrm{T1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
N51.9.1207 $\mathrm{T1}^+ \oplus \mathrm{Y4}^- \oplus \mathrm{Y1}^-$	$\surd$	1	0	$\times$	-	-
N51.9.1208 $\mathrm{T1}^+ \oplus \mathrm{Y4}^- \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\times$	-	-
N51.9.1209 $\mathrm{T1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N51.9.1210 $\mathrm{T1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\times$	-	-
N51.9.1211 $\mathrm{T1}^+ \oplus \mathrm{Y4}^- \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\times$	-	-
N51.9.1212 $\mathrm{T1}^+ \oplus \mathrm{Y4}^- \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N51.9.1213 $\mathrm{T1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.9.1214 $\mathrm{T1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N51.9.1215 $\mathrm{T1}^+ \oplus \mathrm{Y4}^- \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N51.9.1216 $\mathrm{T1}^+ \oplus \mathrm{Y4}^- \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.9.1217 $\mathrm{T1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Z1}^+$	$\times$	-	-	-	-	-
N51.9.1218 $\mathrm{T1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Z2}^-$	$\times$	-	-	-	-	-
N51.9.1219 $\mathrm{T1}^+ \oplus \mathrm{Y4}^- \oplus \mathrm{Z1}^+$	$\times$	-	-	-	-	-
N51.9.1220 $\mathrm{T1}^+ \oplus \mathrm{Y4}^- \oplus \mathrm{Z2}^-$	$\times$	-	-	-	-	-
N51.9.1221 $\mathrm{T1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Z1}^-$	$\times$	-	-	-	-	-
N51.9.1222 $\mathrm{T1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Z2}^+$	$\times$	-	-	-	-	-
N51.9.1223 $\mathrm{T1}^+ \oplus \mathrm{Y4}^- \oplus \mathrm{Z1}^-$	$\times$	-	-	-	-	-
N51.9.1224 $\mathrm{T1}^+ \oplus \mathrm{Y4}^- \oplus \mathrm{Z2}^+$	$\times$	-	-	-	-	-

Non-coplanar SSGs with parent space group $Pmma$ (No. 51) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N51.9.1225 $\mathrm{T1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Z3}^+$	×	-	-	-	-	-
N51.9.1226 $\mathrm{T1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Z4}^-$	×	-	-	-	-	-
N51.9.1227 $\mathrm{T1}^+ \oplus \mathrm{Y4}^- \oplus \mathrm{Z3}^+$	×	-	-	-	-	-
N51.9.1228 $\mathrm{T1}^+ \oplus \mathrm{Y4}^- \oplus \mathrm{Z4}^-$	×	-	-	-	-	-
N51.9.1229 $\mathrm{T1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Z3}^-$	×	-	-	-	-	-
N51.9.1230 $\mathrm{T1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Z4}^+$	×	-	-	-	-	-
N51.9.1231 $\mathrm{T1}^+ \oplus \mathrm{Y4}^- \oplus \mathrm{Z3}^-$	×	-	-	-	-	-
N51.9.1232 $\mathrm{T1}^+ \oplus \mathrm{Y4}^- \oplus \mathrm{Z4}^+$	×	-	-	-	-	-
N51.9.1233 $\mathrm{T1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y1}^-$	√	1	0	×	-	-
N51.9.1234 $\mathrm{T1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y4}^+$	√	1	1	√	mmm	$\mathrm{B2_u}$
N51.9.1235 $\mathrm{T1}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{Y4}^+$	√	1	0	×	-	-
N51.9.1236 $\mathrm{T1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y2}^+$	√	1	1	√	mmm	$\mathrm{B1_u}$
N51.9.1237 $\mathrm{T1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y3}^-$	√	1	0	×	-	-
N51.9.1238 $\mathrm{T1}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{Y2}^+$	√	1	0	×	-	-
N51.9.1239 $\mathrm{T1}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{Y3}^-$	√	1	1	√	mmm	$\mathrm{B1_u}$
N51.9.1240 $\mathrm{T1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y2}^-$	√	1	0	×	-	-
N51.9.1241 $\mathrm{T1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y3}^+$	√	1	1	×	-	-
N51.9.1242 $\mathrm{T1}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{Y2}^-$	√	1	1	×	-	-
N51.9.1243 $\mathrm{T1}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{Y3}^+$	√	1	0	×	-	-
N51.9.1244 $\mathrm{T1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Z1}^+$	×	-	-	-	-	-
N51.9.1245 $\mathrm{T1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Z2}^-$	×	-	-	-	-	-
N51.9.1246 $\mathrm{T1}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{Z1}^+$	×	-	-	-	-	-
N51.9.1247 $\mathrm{T1}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{Z2}^-$	×	-	-	-	-	-
N51.9.1248 $\mathrm{T1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Z1}^-$	×	-	-	-	-	-
N51.9.1249 $\mathrm{T1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Z2}^+$	×	-	-	-	-	-
N51.9.1250 $\mathrm{T1}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{Z1}^-$	×	-	-	-	-	-
N51.9.1251 $\mathrm{T1}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{Z2}^+$	×	-	-	-	-	-
N51.9.1252 $\mathrm{T1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Z3}^+$	×	-	-	-	-	-
N51.9.1253 $\mathrm{T1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Z4}^-$	×	-	-	-	-	-
N51.9.1254 $\mathrm{T1}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{Z3}^+$	×	-	-	-	-	-
N51.9.1255 $\mathrm{T1}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{Z4}^-$	×	-	-	-	-	-
N51.9.1256 $\mathrm{T1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Z3}^-$	×	-	-	-	-	-
N51.9.1257 $\mathrm{T1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Z4}^+$	×	-	-	-	-	-
N51.9.1258 $\mathrm{T1}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{Z3}^-$	×	-	-	-	-	-
N51.9.1259 $\mathrm{T1}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{Z4}^+$	×	-	-	-	-	-
N51.9.1260 $\mathrm{T1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^+$	√	1	0	×	-	-
N51.9.1261 $\mathrm{T1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^-$	√	1	1	√	mmm	$\mathrm{B2_u}$
N51.9.1262 $\mathrm{T1}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Y3}^-$	√	1	0	×	-	-
N51.9.1263 $\mathrm{T1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^-$	√	1	1	×	-	-
N51.9.1264 $\mathrm{T1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^+$	√	1	0	×	-	-
N51.9.1265 $\mathrm{T1}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Y2}^-$	√	1	0	×	-	-
N51.9.1266 $\mathrm{T1}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Y3}^+$	√	1	1	×	-	-
N51.9.1267 $\mathrm{T1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Z1}^+$	×	-	-	-	-	-
N51.9.1268 $\mathrm{T1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Z2}^-$	×	-	-	-	-	-
N51.9.1269 $\mathrm{T1}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Z1}^+$	×	-	-	-	-	-
N51.9.1270 $\mathrm{T1}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Z2}^-$	×	-	-	-	-	-

Non-coplanar SSGs with parent space group $Pmma$ (No. 51) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N51.9.1271 $\mathrm{T1}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Z1}^{-}$	×	-	-	-	-	-
N51.9.1272 $\mathrm{T1}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Z2}^{+}$	×	-	-	-	-	-
N51.9.1273 $\mathrm{T1}^{+}\oplus\mathrm{Y3}^{-}\oplus\mathrm{Z1}^{-}$	×	-	-	-	-	-
N51.9.1274 $\mathrm{T1}^{+}\oplus\mathrm{Y3}^{-}\oplus\mathrm{Z2}^{+}$	×	-	-	-	-	-
N51.9.1275 $\mathrm{T1}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Z3}^{+}$	×	-	-	-	-	-
N51.9.1276 $\mathrm{T1}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Z4}^{-}$	×	-	-	-	-	-
N51.9.1277 $\mathrm{T1}^{+}\oplus\mathrm{Y3}^{-}\oplus\mathrm{Z3}^{+}$	×	-	-	-	-	-
N51.9.1278 $\mathrm{T1}^{+}\oplus\mathrm{Y3}^{-}\oplus\mathrm{Z4}^{-}$	×	-	-	-	-	-
N51.9.1279 $\mathrm{T1}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Z3}^{-}$	×	-	-	-	-	-
N51.9.1280 $\mathrm{T1}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Z4}^{+}$	×	-	-	-	-	-
N51.9.1281 $\mathrm{T1}^{+}\oplus\mathrm{Y3}^{-}\oplus\mathrm{Z3}^{-}$	×	-	-	-	-	-
N51.9.1282 $\mathrm{T1}^{+}\oplus\mathrm{Y3}^{-}\oplus\mathrm{Z4}^{+}$	×	-	-	-	-	-
N51.9.1283 $\mathrm{T1}^{+}\oplus\mathrm{Y2}^{-}\oplus\mathrm{Y2}^{-}$	√	1	0	×	-	-
N51.9.1284 $\mathrm{T1}^{+}\oplus\mathrm{Y2}^{-}\oplus\mathrm{Y3}^{+}$	√	1	1	√	mmm	$\mathrm{B2_u}$
N51.9.1285 $\mathrm{T1}^{+}\oplus\mathrm{Y3}^{+}\oplus\mathrm{Y3}^{+}$	√	1	0	×	-	-
N51.9.1286 $\mathrm{T1}^{+}\oplus\mathrm{Y2}^{-}\oplus\mathrm{Z1}^{+}$	×	-	-	-	-	-
N51.9.1287 $\mathrm{T1}^{+}\oplus\mathrm{Y2}^{-}\oplus\mathrm{Z2}^{-}$	×	-	-	-	-	-
N51.9.1288 $\mathrm{T1}^{+}\oplus\mathrm{Y3}^{+}\oplus\mathrm{Z1}^{+}$	×	-	-	-	-	-
N51.9.1289 $\mathrm{T1}^{+}\oplus\mathrm{Y3}^{+}\oplus\mathrm{Z2}^{-}$	×	-	-	-	-	-
N51.9.1290 $\mathrm{T1}^{+}\oplus\mathrm{Y2}^{-}\oplus\mathrm{Z1}^{-}$	×	-	-	-	-	-
N51.9.1291 $\mathrm{T1}^{+}\oplus\mathrm{Y2}^{-}\oplus\mathrm{Z2}^{+}$	×	-	-	-	-	-
N51.9.1292 $\mathrm{T1}^{+}\oplus\mathrm{Y3}^{+}\oplus\mathrm{Z1}^{-}$	×	-	-	-	-	-
N51.9.1293 $\mathrm{T1}^{+}\oplus\mathrm{Y3}^{+}\oplus\mathrm{Z2}^{+}$	×	-	-	-	-	-
N51.9.1294 $\mathrm{T1}^{+}\oplus\mathrm{Y2}^{-}\oplus\mathrm{Z3}^{+}$	×	-	-	-	-	-
N51.9.1295 $\mathrm{T1}^{+}\oplus\mathrm{Y2}^{-}\oplus\mathrm{Z4}^{-}$	×	-	-	-	-	-
N51.9.1296 $\mathrm{T1}^{+}\oplus\mathrm{Y3}^{+}\oplus\mathrm{Z3}^{+}$	×	-	-	-	-	-
N51.9.1297 $\mathrm{T1}^{+}\oplus\mathrm{Y3}^{+}\oplus\mathrm{Z4}^{-}$	×	-	-	-	-	-
N51.9.1298 $\mathrm{T1}^{+}\oplus\mathrm{Y2}^{-}\oplus\mathrm{Z3}^{-}$	×	-	-	-	-	-
N51.9.1299 $\mathrm{T1}^{+}\oplus\mathrm{Y2}^{-}\oplus\mathrm{Z4}^{+}$	×	-	-	-	-	-
N51.9.1300 $\mathrm{T1}^{+}\oplus\mathrm{Y3}^{+}\oplus\mathrm{Z3}^{-}$	×	-	-	-	-	-
N51.9.1301 $\mathrm{T1}^{+}\oplus\mathrm{Y3}^{+}\oplus\mathrm{Z4}^{+}$	×	-	-	-	-	-
N51.9.1302 $\mathrm{T1}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z1}^{+}$	√	1	0	×	-	-
N51.9.1303 $\mathrm{T1}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z2}^{-}$	√	1	1	√	mmm	$\mathrm{B1_u}$
N51.9.1304 $\mathrm{T1}^{+}\oplus\mathrm{Z2}^{-}\oplus\mathrm{Z2}^{-}$	√	1	0	×	-	-
N51.9.1305 $\mathrm{T1}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z1}^{-}$	√	1	1	×	-	-
N51.9.1306 $\mathrm{T1}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z2}^{+}$	√	1	0	×	-	-
N51.9.1307 $\mathrm{T1}^{+}\oplus\mathrm{Z2}^{-}\oplus\mathrm{Z1}^{-}$	√	1	0	×	-	-
N51.9.1308 $\mathrm{T1}^{+}\oplus\mathrm{Z2}^{-}\oplus\mathrm{Z2}^{+}$	√	1	1	×	-	-
N51.9.1309 $\mathrm{T1}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z3}^{+}$	√	1	0	×	-	-
N51.9.1310 $\mathrm{T1}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z4}^{-}$	√	1	1	√	mmm	$\mathrm{B2_u}$
N51.9.1311 $\mathrm{T1}^{+}\oplus\mathrm{Z2}^{-}\oplus\mathrm{Z3}^{+}$	√	1	1	√	mmm	$\mathrm{B2_u}$
N51.9.1312 $\mathrm{T1}^{+}\oplus\mathrm{Z2}^{-}\oplus\mathrm{Z4}^{-}$	√	1	0	×	-	-
N51.9.1313 $\mathrm{T1}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z3}^{-}$	√	1	1	×	-	-
N51.9.1314 $\mathrm{T1}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z4}^{+}$	√	1	0	×	-	-
N51.9.1315 $\mathrm{T1}^{+}\oplus\mathrm{Z2}^{-}\oplus\mathrm{Z3}^{-}$	√	1	0	×	-	-
N51.9.1316 $\mathrm{T1}^{+}\oplus\mathrm{Z2}^{-}\oplus\mathrm{Z4}^{+}$	√	1	1	×	-	-

Non-coplanar SSGs with parent space group $Pmma$ (No. 51) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N51.9.1317 $\mathrm{T1}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N51.9.1318 $\mathrm{T1}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.9.1319 $\mathrm{T1}^+ \oplus \mathrm{Z2}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N51.9.1320 $\mathrm{T1}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
N51.9.1321 $\mathrm{T1}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z4}^-$	$\surd$	1	0	$\times$	-	-
N51.9.1322 $\mathrm{T1}^+ \oplus \mathrm{Z2}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N51.9.1323 $\mathrm{T1}^+ \oplus \mathrm{Z2}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\times$	-	-
N51.9.1324 $\mathrm{T1}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N51.9.1325 $\mathrm{T1}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N51.9.1326 $\mathrm{T1}^+ \oplus \mathrm{Z2}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N51.9.1327 $\mathrm{T1}^+ \oplus \mathrm{Z2}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N51.9.1328 $\mathrm{T1}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N51.9.1329 $\mathrm{T1}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.9.1330 $\mathrm{T1}^+ \oplus \mathrm{Z4}^- \oplus \mathrm{Z4}^-$	$\surd$	1	0	$\times$	-	-
N51.9.1331 $\mathrm{T1}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N51.9.1332 $\mathrm{T1}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N51.9.1333 $\mathrm{T1}^+ \oplus \mathrm{Z4}^- \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N51.9.1334 $\mathrm{T1}^+ \oplus \mathrm{Z4}^- \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\times$	-	-
N51.9.1335 $\mathrm{T1}^+ \oplus \mathrm{Z3}^- \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N51.9.1336 $\mathrm{T1}^+ \oplus \mathrm{Z3}^- \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.9.1337 $\mathrm{T1}^+ \oplus \mathrm{Z4}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N51.9.1338 $\mathrm{T1}^- \oplus \mathrm{T1}^- \oplus \mathrm{T1}^-$	$\surd$	0	0	$\surd$	-	-
N51.9.1339 $\mathrm{T1}^- \oplus \mathrm{T1}^- \oplus \mathrm{T2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N51.9.1340 $\mathrm{T1}^- \oplus \mathrm{T1}^- \oplus \mathrm{T3}^-$	$\surd$	0	0	$\surd$	-	-
N51.9.1341 $\mathrm{T1}^- \oplus \mathrm{T1}^- \oplus \mathrm{T4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_u} \oplus \mathrm{B2_u}$
N51.9.1342 $\mathrm{T1}^- \oplus \mathrm{T2}^+ \oplus \mathrm{T3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N51.9.1343 $\mathrm{T1}^- \oplus \mathrm{T1}^- \oplus \mathrm{Y1}^+$	$\surd$	1	0	$\times$	-	-
N51.9.1344 $\mathrm{T1}^- \oplus \mathrm{T1}^- \oplus \mathrm{Y4}^-$	$\surd$	1	0	$\times$	-	-
N51.9.1345 $\mathrm{T1}^- \oplus \mathrm{T2}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.9.1346 $\mathrm{T1}^- \oplus \mathrm{T2}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.9.1347 $\mathrm{T1}^- \oplus \mathrm{T3}^- \oplus \mathrm{Y1}^+$	$\surd$	1	0	$\times$	-	-
N51.9.1348 $\mathrm{T1}^- \oplus \mathrm{T4}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	1	$\times$	-	-
N51.9.1349 $\mathrm{T1}^- \oplus \mathrm{T1}^- \oplus \mathrm{Y1}^-$	$\surd$	1	0	$\times$	-	-
N51.9.1350 $\mathrm{T1}^- \oplus \mathrm{T1}^- \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
N51.9.1351 $\mathrm{T1}^- \oplus \mathrm{T2}^+ \oplus \mathrm{Y1}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.9.1352 $\mathrm{T1}^- \oplus \mathrm{T2}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.9.1353 $\mathrm{T1}^- \oplus \mathrm{T3}^- \oplus \mathrm{Y1}^-$	$\surd$	1	0	$\times$	-	-
N51.9.1354 $\mathrm{T1}^- \oplus \mathrm{T4}^+ \oplus \mathrm{Y1}^-$	$\surd$	1	1	$\times$	-	-
N51.9.1355 $\mathrm{T1}^- \oplus \mathrm{T1}^- \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N51.9.1356 $\mathrm{T1}^- \oplus \mathrm{T1}^- \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N51.9.1357 $\mathrm{T1}^- \oplus \mathrm{T2}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.9.1358 $\mathrm{T1}^- \oplus \mathrm{T2}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.9.1359 $\mathrm{T1}^- \oplus \mathrm{T3}^- \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N51.9.1360 $\mathrm{T1}^- \oplus \mathrm{T4}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\times$	-	-
N51.9.1361 $\mathrm{T1}^- \oplus \mathrm{T1}^- \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N51.9.1362 $\mathrm{T1}^- \oplus \mathrm{T1}^- \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $Pmma$ (No. 51) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N51.9.1363 $\mathrm{T1}^- \oplus \mathrm{T2}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.9.1364 $\mathrm{T1}^- \oplus \mathrm{T2}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.9.1365 $\mathrm{T1}^- \oplus \mathrm{T3}^- \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N51.9.1366 $\mathrm{T1}^- \oplus \mathrm{T4}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\times$	-	-
N51.9.1367 $\mathrm{T1}^- \oplus \mathrm{T1}^- \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N51.9.1368 $\mathrm{T1}^- \oplus \mathrm{T1}^- \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-
N51.9.1369 $\mathrm{T1}^- \oplus \mathrm{T2}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\times$	-	-
N51.9.1370 $\mathrm{T1}^- \oplus \mathrm{T3}^- \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N51.9.1371 $\mathrm{T1}^- \oplus \mathrm{T4}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N51.9.1372 $\mathrm{T1}^- \oplus \mathrm{T4}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N51.9.1373 $\mathrm{T1}^- \oplus \mathrm{T1}^- \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N51.9.1374 $\mathrm{T1}^- \oplus \mathrm{T1}^- \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N51.9.1375 $\mathrm{T1}^- \oplus \mathrm{T2}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
N51.9.1376 $\mathrm{T1}^- \oplus \mathrm{T3}^- \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N51.9.1377 $\mathrm{T1}^- \oplus \mathrm{T4}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N51.9.1378 $\mathrm{T1}^- \oplus \mathrm{T4}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N51.9.1379 $\mathrm{T1}^- \oplus \mathrm{T1}^- \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N51.9.1380 $\mathrm{T1}^- \oplus \mathrm{T1}^- \oplus \mathrm{Z4}^-$	$\surd$	1	0	$\times$	-	-
N51.9.1381 $\mathrm{T1}^- \oplus \mathrm{T2}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
N51.9.1382 $\mathrm{T1}^- \oplus \mathrm{T3}^- \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N51.9.1383 $\mathrm{T1}^- \oplus \mathrm{T4}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N51.9.1384 $\mathrm{T1}^- \oplus \mathrm{T4}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N51.9.1385 $\mathrm{T1}^- \oplus \mathrm{T1}^- \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N51.9.1386 $\mathrm{T1}^- \oplus \mathrm{T1}^- \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N51.9.1387 $\mathrm{T1}^- \oplus \mathrm{T2}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N51.9.1388 $\mathrm{T1}^- \oplus \mathrm{T3}^- \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N51.9.1389 $\mathrm{T1}^- \oplus \mathrm{T4}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N51.9.1390 $\mathrm{T1}^- \oplus \mathrm{T4}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N51.9.1391 $\mathrm{T1}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	0	$\times$	-	-
N51.9.1392 $\mathrm{T1}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N51.9.1393 $\mathrm{T1}^- \oplus \mathrm{Y4}^- \oplus \mathrm{Y4}^-$	$\surd$	1	0	$\times$	-	-
N51.9.1394 $\mathrm{T1}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^-$	$\surd$	1	1	$\times$	-	-
N51.9.1395 $\mathrm{T1}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
N51.9.1396 $\mathrm{T1}^- \oplus \mathrm{Y4}^- \oplus \mathrm{Y1}^-$	$\surd$	1	0	$\times$	-	-
N51.9.1397 $\mathrm{T1}^- \oplus \mathrm{Y4}^- \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\times$	-	-
N51.9.1398 $\mathrm{T1}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N51.9.1399 $\mathrm{T1}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\times$	-	-
N51.9.1400 $\mathrm{T1}^- \oplus \mathrm{Y4}^- \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\times$	-	-
N51.9.1401 $\mathrm{T1}^- \oplus \mathrm{Y4}^- \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N51.9.1402 $\mathrm{T1}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.9.1403 $\mathrm{T1}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N51.9.1404 $\mathrm{T1}^- \oplus \mathrm{Y4}^- \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N51.9.1405 $\mathrm{T1}^- \oplus \mathrm{Y4}^- \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.9.1406 $\mathrm{T1}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Z1}^+$	$\times$	-	-	-	-	-
N51.9.1407 $\mathrm{T1}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Z2}^-$	$\times$	-	-	-	-	-
N51.9.1408 $\mathrm{T1}^- \oplus \mathrm{Y4}^- \oplus \mathrm{Z1}^+$	$\times$	-	-	-	-	-

Non-coplanar SSGs with parent space group $Pmma$ (No. 51) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N51.9.1409 $\mathrm{T1}^- \oplus \mathrm{Y4}^- \oplus \mathrm{Z2}^-$	×	-	-	-	-	-
N51.9.1410 $\mathrm{T1}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Z1}^-$	×	-	-	-	-	-
N51.9.1411 $\mathrm{T1}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Z2}^+$	×	-	-	-	-	-
N51.9.1412 $\mathrm{T1}^- \oplus \mathrm{Y4}^- \oplus \mathrm{Z1}^-$	×	-	-	-	-	-
N51.9.1413 $\mathrm{T1}^- \oplus \mathrm{Y4}^- \oplus \mathrm{Z2}^+$	×	-	-	-	-	-
N51.9.1414 $\mathrm{T1}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Z3}^+$	×	-	-	-	-	-
N51.9.1415 $\mathrm{T1}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Z4}^-$	×	-	-	-	-	-
N51.9.1416 $\mathrm{T1}^- \oplus \mathrm{Y4}^- \oplus \mathrm{Z3}^+$	×	-	-	-	-	-
N51.9.1417 $\mathrm{T1}^- \oplus \mathrm{Y4}^- \oplus \mathrm{Z4}^-$	×	-	-	-	-	-
N51.9.1418 $\mathrm{T1}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Z3}^-$	×	-	-	-	-	-
N51.9.1419 $\mathrm{T1}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Z4}^+$	×	-	-	-	-	-
N51.9.1420 $\mathrm{T1}^- \oplus \mathrm{Y4}^- \oplus \mathrm{Z3}^-$	×	-	-	-	-	-
N51.9.1421 $\mathrm{T1}^- \oplus \mathrm{Y4}^- \oplus \mathrm{Z4}^+$	×	-	-	-	-	-
N51.9.1422 $\mathrm{T1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y1}^-$	√	1	0	×	-	-
N51.9.1423 $\mathrm{T1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y4}^+$	√	1	1	√	mmm	$\mathrm{B2_u}$
N51.9.1424 $\mathrm{T1}^- \oplus \mathrm{Y4}^+ \oplus \mathrm{Y4}^+$	√	1	0	×	-	-
N51.9.1425 $\mathrm{T1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y2}^+$	√	1	1	√	mmm	$\mathrm{B1_u}$
N51.9.1426 $\mathrm{T1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y3}^-$	√	1	0	×	-	-
N51.9.1427 $\mathrm{T1}^- \oplus \mathrm{Y4}^+ \oplus \mathrm{Y2}^+$	√	1	0	×	-	-
N51.9.1428 $\mathrm{T1}^- \oplus \mathrm{Y4}^+ \oplus \mathrm{Y3}^-$	√	1	1	√	mmm	$\mathrm{B1_u}$
N51.9.1429 $\mathrm{T1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y2}^-$	√	1	0	×	-	-
N51.9.1430 $\mathrm{T1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y3}^+$	√	1	1	×	-	-
N51.9.1431 $\mathrm{T1}^- \oplus \mathrm{Y4}^+ \oplus \mathrm{Y2}^-$	√	1	1	×	-	-
N51.9.1432 $\mathrm{T1}^- \oplus \mathrm{Y4}^+ \oplus \mathrm{Y3}^+$	√	1	0	×	-	-
N51.9.1433 $\mathrm{T1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Z1}^+$	×	-	-	-	-	-
N51.9.1434 $\mathrm{T1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Z2}^-$	×	-	-	-	-	-
N51.9.1435 $\mathrm{T1}^- \oplus \mathrm{Y4}^+ \oplus \mathrm{Z1}^+$	×	-	-	-	-	-
N51.9.1436 $\mathrm{T1}^- \oplus \mathrm{Y4}^+ \oplus \mathrm{Z2}^-$	×	-	-	-	-	-
N51.9.1437 $\mathrm{T1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Z1}^-$	×	-	-	-	-	-
N51.9.1438 $\mathrm{T1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Z2}^+$	×	-	-	-	-	-
N51.9.1439 $\mathrm{T1}^- \oplus \mathrm{Y4}^+ \oplus \mathrm{Z1}^-$	×	-	-	-	-	-
N51.9.1440 $\mathrm{T1}^- \oplus \mathrm{Y4}^+ \oplus \mathrm{Z2}^+$	×	-	-	-	-	-
N51.9.1441 $\mathrm{T1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Z3}^+$	×	-	-	-	-	-
N51.9.1442 $\mathrm{T1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Z4}^-$	×	-	-	-	-	-
N51.9.1443 $\mathrm{T1}^- \oplus \mathrm{Y4}^+ \oplus \mathrm{Z3}^+$	×	-	-	-	-	-
N51.9.1444 $\mathrm{T1}^- \oplus \mathrm{Y4}^+ \oplus \mathrm{Z4}^-$	×	-	-	-	-	-
N51.9.1445 $\mathrm{T1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Z3}^-$	×	-	-	-	-	-
N51.9.1446 $\mathrm{T1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Z4}^+$	×	-	-	-	-	-
N51.9.1447 $\mathrm{T1}^- \oplus \mathrm{Y4}^+ \oplus \mathrm{Z3}^-$	×	-	-	-	-	-
N51.9.1448 $\mathrm{T1}^- \oplus \mathrm{Y4}^+ \oplus \mathrm{Z4}^+$	×	-	-	-	-	-
N51.9.1449 $\mathrm{T1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^+$	√	1	0	×	-	-
N51.9.1450 $\mathrm{T1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^-$	√	1	1	√	mmm	$\mathrm{B2_u}$
N51.9.1451 $\mathrm{T1}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Y3}^-$	√	1	0	×	-	-
N51.9.1452 $\mathrm{T1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^-$	√	1	1	×	-	-
N51.9.1453 $\mathrm{T1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^+$	√	1	0	×	-	-
N51.9.1454 $\mathrm{T1}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Y2}^-$	√	1	0	×	-	-

Non-coplanar SSGs with parent space group $Pmma$ (No. 51) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N51.9.1455 $\mathrm{T1}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\times$	-	-
N51.9.1456 $\mathrm{T1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Z1}^+$	$\times$	-	-	-	-	-
N51.9.1457 $\mathrm{T1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Z2}^-$	$\times$	-	-	-	-	-
N51.9.1458 $\mathrm{T1}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Z1}^+$	$\times$	-	-	-	-	-
N51.9.1459 $\mathrm{T1}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Z2}^-$	$\times$	-	-	-	-	-
N51.9.1460 $\mathrm{T1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Z1}^-$	$\times$	-	-	-	-	-
N51.9.1461 $\mathrm{T1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Z2}^+$	$\times$	-	-	-	-	-
N51.9.1462 $\mathrm{T1}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Z1}^-$	$\times$	-	-	-	-	-
N51.9.1463 $\mathrm{T1}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Z2}^+$	$\times$	-	-	-	-	-
N51.9.1464 $\mathrm{T1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Z3}^+$	$\times$	-	-	-	-	-
N51.9.1465 $\mathrm{T1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Z4}^-$	$\times$	-	-	-	-	-
N51.9.1466 $\mathrm{T1}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Z3}^+$	$\times$	-	-	-	-	-
N51.9.1467 $\mathrm{T1}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Z4}^-$	$\times$	-	-	-	-	-
N51.9.1468 $\mathrm{T1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Z3}^-$	$\times$	-	-	-	-	-
N51.9.1469 $\mathrm{T1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Z4}^+$	$\times$	-	-	-	-	-
N51.9.1470 $\mathrm{T1}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Z3}^-$	$\times$	-	-	-	-	-
N51.9.1471 $\mathrm{T1}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Z4}^+$	$\times$	-	-	-	-	-
N51.9.1472 $\mathrm{T1}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N51.9.1473 $\mathrm{T1}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N51.9.1474 $\mathrm{T1}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N51.9.1475 $\mathrm{T1}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Z1}^+$	$\times$	-	-	-	-	-
N51.9.1476 $\mathrm{T1}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Z2}^-$	$\times$	-	-	-	-	-
N51.9.1477 $\mathrm{T1}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Z1}^+$	$\times$	-	-	-	-	-
N51.9.1478 $\mathrm{T1}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Z2}^-$	$\times$	-	-	-	-	-
N51.9.1479 $\mathrm{T1}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Z1}^-$	$\times$	-	-	-	-	-
N51.9.1480 $\mathrm{T1}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Z2}^+$	$\times$	-	-	-	-	-
N51.9.1481 $\mathrm{T1}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Z1}^-$	$\times$	-	-	-	-	-
N51.9.1482 $\mathrm{T1}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Z2}^+$	$\times$	-	-	-	-	-
N51.9.1483 $\mathrm{T1}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Z3}^+$	$\times$	-	-	-	-	-
N51.9.1484 $\mathrm{T1}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Z4}^-$	$\times$	-	-	-	-	-
N51.9.1485 $\mathrm{T1}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Z3}^+$	$\times$	-	-	-	-	-
N51.9.1486 $\mathrm{T1}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Z4}^-$	$\times$	-	-	-	-	-
N51.9.1487 $\mathrm{T1}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Z3}^-$	$\times$	-	-	-	-	-
N51.9.1488 $\mathrm{T1}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Z4}^+$	$\times$	-	-	-	-	-
N51.9.1489 $\mathrm{T1}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Z3}^-$	$\times$	-	-	-	-	-
N51.9.1490 $\mathrm{T1}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Z4}^+$	$\times$	-	-	-	-	-
N51.9.1491 $\mathrm{T1}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N51.9.1492 $\mathrm{T1}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.9.1493 $\mathrm{T1}^- \oplus \mathrm{Z2}^- \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-
N51.9.1494 $\mathrm{T1}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
N51.9.1495 $\mathrm{T1}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N51.9.1496 $\mathrm{T1}^- \oplus \mathrm{Z2}^- \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N51.9.1497 $\mathrm{T1}^- \oplus \mathrm{Z2}^- \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\times$	-	-
N51.9.1498 $\mathrm{T1}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N51.9.1499 $\mathrm{T1}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N51.9.1500 $\mathrm{T1}^- \oplus \mathrm{Z2}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$

Non-coplanar SSGs with parent space group $Pmma$ (No. 51) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N51.9.1501 $\mathrm{T1}^- \oplus \mathrm{Z2}^- \oplus \mathrm{Z4}^-$	$\surd$	1	0	$\times$	-	-
N51.9.1502 $\mathrm{T1}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N51.9.1503 $\mathrm{T1}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N51.9.1504 $\mathrm{T1}^- \oplus \mathrm{Z2}^- \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N51.9.1505 $\mathrm{T1}^- \oplus \mathrm{Z2}^- \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\times$	-	-
N51.9.1506 $\mathrm{T1}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N51.9.1507 $\mathrm{T1}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.9.1508 $\mathrm{T1}^- \oplus \mathrm{Z2}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N51.9.1509 $\mathrm{T1}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
N51.9.1510 $\mathrm{T1}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z4}^-$	$\surd$	1	0	$\times$	-	-
N51.9.1511 $\mathrm{T1}^- \oplus \mathrm{Z2}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N51.9.1512 $\mathrm{T1}^- \oplus \mathrm{Z2}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\times$	-	-
N51.9.1513 $\mathrm{T1}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N51.9.1514 $\mathrm{T1}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N51.9.1515 $\mathrm{T1}^- \oplus \mathrm{Z2}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N51.9.1516 $\mathrm{T1}^- \oplus \mathrm{Z2}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N51.9.1517 $\mathrm{T1}^- \oplus \mathrm{Z3}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N51.9.1518 $\mathrm{T1}^- \oplus \mathrm{Z3}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.9.1519 $\mathrm{T1}^- \oplus \mathrm{Z4}^- \oplus \mathrm{Z4}^-$	$\surd$	1	0	$\times$	-	-
N51.9.1520 $\mathrm{T1}^- \oplus \mathrm{Z3}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N51.9.1521 $\mathrm{T1}^- \oplus \mathrm{Z3}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N51.9.1522 $\mathrm{T1}^- \oplus \mathrm{Z4}^- \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N51.9.1523 $\mathrm{T1}^- \oplus \mathrm{Z4}^- \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\times$	-	-
N51.9.1524 $\mathrm{T1}^- \oplus \mathrm{Z3}^- \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N51.9.1525 $\mathrm{T1}^- \oplus \mathrm{Z3}^- \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.9.1526 $\mathrm{T1}^- \oplus \mathrm{Z4}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N51.9.1527 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^+$	$\surd$	0	0	$\surd$	-	-
N51.9.1528 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_u} \oplus \mathrm{B2_u}$
N51.9.1529 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u}$
N51.9.1530 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y4}^+$	$\surd$	0	0	$\surd$	-	-
N51.9.1531 $\mathrm{Y1}^+ \oplus \mathrm{Y4}^- \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B2_u}$
N51.9.1532 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^+$	$\surd$	0	0	$\surd$	-	-
N51.9.1533 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B3_u}$
N51.9.1534 $\mathrm{Y1}^+ \oplus \mathrm{Y4}^- \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_u}$
N51.9.1535 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N51.9.1536 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y3}^+$	$\surd$	0	0	$\surd$	-	-
N51.9.1537 $\mathrm{Y1}^+ \oplus \mathrm{Y4}^- \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N51.9.1538 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N51.9.1539 $\mathrm{Y1}^+ \oplus \mathrm{Y4}^- \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N51.9.1540 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N51.9.1541 $\mathrm{Y1}^+ \oplus \mathrm{Y4}^- \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N51.9.1542 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N51.9.1543 $\mathrm{Y1}^+ \oplus \mathrm{Y4}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N51.9.1544 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N51.9.1545 $\mathrm{Y1}^+ \oplus \mathrm{Y4}^- \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N51.9.1546 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u}$

Non-coplanar SSGs with parent space group $Pmma$ (No. 51) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N51.9.1547 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B2_u}$
N51.9.1548 $\mathrm{Y1}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{Y4}^+$	$\surd$	0	0	$\surd$	-	-
N51.9.1549 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u}$
N51.9.1550 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u}$
N51.9.1551 $\mathrm{Y1}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{Y2}^+$	$\surd$	0	0	$\surd$	-	-
N51.9.1552 $\mathrm{Y1}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u}$
N51.9.1553 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u}$
N51.9.1554 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u}$
N51.9.1555 $\mathrm{Y1}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u}$
N51.9.1556 $\mathrm{Y1}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{Y3}^+$	$\surd$	0	0	$\surd$	-	-
N51.9.1557 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\times$	-	-
N51.9.1558 $\mathrm{Y1}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N51.9.1559 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
N51.9.1560 $\mathrm{Y1}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N51.9.1561 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
N51.9.1562 $\mathrm{Y1}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N51.9.1563 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N51.9.1564 $\mathrm{Y1}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N51.9.1565 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^+$	$\surd$	0	0	$\surd$	-	-
N51.9.1566 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_u}$
N51.9.1567 $\mathrm{Y1}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B3_u}$
N51.9.1568 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u}$
N51.9.1569 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^+$	$\surd$	0	0	$\surd$	-	-
N51.9.1570 $\mathrm{Y1}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u}$
N51.9.1571 $\mathrm{Y1}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u}$
N51.9.1572 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N51.9.1573 $\mathrm{Y1}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\times$	-	-
N51.9.1574 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N51.9.1575 $\mathrm{Y1}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
N51.9.1576 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N51.9.1577 $\mathrm{Y1}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
N51.9.1578 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N51.9.1579 $\mathrm{Y1}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N51.9.1580 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N51.9.1581 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N51.9.1582 $\mathrm{Y1}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^+$	$\surd$	0	0	$\surd$	-	-
N51.9.1583 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\times$	-	-
N51.9.1584 $\mathrm{Y1}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N51.9.1585 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
N51.9.1586 $\mathrm{Y1}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N51.9.1587 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
N51.9.1588 $\mathrm{Y1}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N51.9.1589 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N51.9.1590 $\mathrm{Y1}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N51.9.1591 $\mathrm{Y1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N51.9.1592 $\mathrm{Y1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$

Non-coplanar SSGs with parent space group $Pmma$ (No. 51) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N51.9.1593 $\mathrm{Y1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
N51.9.1594 $\mathrm{Y1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N51.9.1595 $\mathrm{Y1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N51.9.1596 $\mathrm{Y1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\times$	-	-
N51.9.1597 $\mathrm{Y1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N51.9.1598 $\mathrm{Y1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N51.9.1599 $\mathrm{Y1}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N51.9.1600 $\mathrm{Y1}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.9.1601 $\mathrm{Y1}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
N51.9.1602 $\mathrm{Y1}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z4}^-$	$\surd$	1	0	$\times$	-	-
N51.9.1603 $\mathrm{Y1}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N51.9.1604 $\mathrm{Y1}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\times$	-	-
N51.9.1605 $\mathrm{Y1}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N51.9.1606 $\mathrm{Y1}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.9.1607 $\mathrm{Y1}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N51.9.1608 $\mathrm{Y1}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N51.9.1609 $\mathrm{Y1}^+ \oplus \mathrm{Z3}^- \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N51.9.1610 $\mathrm{Y1}^+ \oplus \mathrm{Z3}^- \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.9.1611 $\mathrm{Y1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y1}^-$	$\surd$	0	0	$\surd$	-	-
N51.9.1612 $\mathrm{Y1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_u} \oplus \mathrm{B2_u}$
N51.9.1613 $\mathrm{Y1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N51.9.1614 $\mathrm{Y1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y3}^-$	$\surd$	0	0	$\surd$	-	-
N51.9.1615 $\mathrm{Y1}^- \oplus \mathrm{Y4}^+ \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N51.9.1616 $\mathrm{Y1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y2}^-$	$\surd$	0	0	$\surd$	-	-
N51.9.1617 $\mathrm{Y1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B3_u}$
N51.9.1618 $\mathrm{Y1}^- \oplus \mathrm{Y4}^+ \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_u}$
N51.9.1619 $\mathrm{Y1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N51.9.1620 $\mathrm{Y1}^- \oplus \mathrm{Y4}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N51.9.1621 $\mathrm{Y1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N51.9.1622 $\mathrm{Y1}^- \oplus \mathrm{Y4}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N51.9.1623 $\mathrm{Y1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N51.9.1624 $\mathrm{Y1}^- \oplus \mathrm{Y4}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N51.9.1625 $\mathrm{Y1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N51.9.1626 $\mathrm{Y1}^- \oplus \mathrm{Y4}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N51.9.1627 $\mathrm{Y1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N51.9.1628 $\mathrm{Y1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N51.9.1629 $\mathrm{Y1}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Y3}^-$	$\surd$	0	0	$\surd$	-	-
N51.9.1630 $\mathrm{Y1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u}$
N51.9.1631 $\mathrm{Y1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u}$
N51.9.1632 $\mathrm{Y1}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Y2}^-$	$\surd$	0	0	$\surd$	-	-
N51.9.1633 $\mathrm{Y1}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u}$
N51.9.1634 $\mathrm{Y1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\times$	-	-
N51.9.1635 $\mathrm{Y1}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N51.9.1636 $\mathrm{Y1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
N51.9.1637 $\mathrm{Y1}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N51.9.1638 $\mathrm{Y1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $Pmma$ (No. 51) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N51.9.1639 $\mathrm{Y1}^{-} \oplus \mathrm{Y3}^{-} \oplus \mathrm{Z3}^{+}$	$\surd$	1	0	$\times$	-	-
N51.9.1640 $\mathrm{Y1}^{-} \oplus \mathrm{Y2}^{+} \oplus \mathrm{Z3}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.1641 $\mathrm{Y1}^{-} \oplus \mathrm{Y3}^{-} \oplus \mathrm{Z3}^{-}$	$\surd$	1	0	$\times$	-	-
N51.9.1642 $\mathrm{Y1}^{-} \oplus \mathrm{Y2}^{-} \oplus \mathrm{Y2}^{-}$	$\surd$	0	0	$\surd$	-	-
N51.9.1643 $\mathrm{Y1}^{-} \oplus \mathrm{Y2}^{-} \oplus \mathrm{Y3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_u}$
N51.9.1644 $\mathrm{Y1}^{-} \oplus \mathrm{Y3}^{+} \oplus \mathrm{Y3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B3_u}$
N51.9.1645 $\mathrm{Y1}^{-} \oplus \mathrm{Y2}^{-} \oplus \mathrm{Z1}^{+}$	$\surd$	1	0	$\times$	-	-
N51.9.1646 $\mathrm{Y1}^{-} \oplus \mathrm{Y3}^{+} \oplus \mathrm{Z1}^{+}$	$\surd$	1	1	$\times$	-	-
N51.9.1647 $\mathrm{Y1}^{-} \oplus \mathrm{Y2}^{-} \oplus \mathrm{Z1}^{-}$	$\surd$	1	0	$\times$	-	-
N51.9.1648 $\mathrm{Y1}^{-} \oplus \mathrm{Y3}^{+} \oplus \mathrm{Z1}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.1649 $\mathrm{Y1}^{-} \oplus \mathrm{Y2}^{-} \oplus \mathrm{Z3}^{+}$	$\surd$	1	0	$\times$	-	-
N51.9.1650 $\mathrm{Y1}^{-} \oplus \mathrm{Y3}^{+} \oplus \mathrm{Z3}^{+}$	$\surd$	1	1	$\times$	-	-
N51.9.1651 $\mathrm{Y1}^{-} \oplus \mathrm{Y2}^{-} \oplus \mathrm{Z3}^{-}$	$\surd$	1	0	$\times$	-	-
N51.9.1652 $\mathrm{Y1}^{-} \oplus \mathrm{Y3}^{+} \oplus \mathrm{Z3}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.1653 $\mathrm{Y1}^{-} \oplus \mathrm{Z1}^{+} \oplus \mathrm{Z1}^{+}$	$\surd$	1	0	$\times$	-	-
N51.9.1654 $\mathrm{Y1}^{-} \oplus \mathrm{Z1}^{+} \oplus \mathrm{Z2}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.9.1655 $\mathrm{Y1}^{-} \oplus \mathrm{Z1}^{+} \oplus \mathrm{Z1}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.1656 $\mathrm{Y1}^{-} \oplus \mathrm{Z1}^{+} \oplus \mathrm{Z2}^{+}$	$\surd$	1	0	$\times$	-	-
N51.9.1657 $\mathrm{Y1}^{-} \oplus \mathrm{Z1}^{+} \oplus \mathrm{Z3}^{+}$	$\surd$	1	0	$\times$	-	-
N51.9.1658 $\mathrm{Y1}^{-} \oplus \mathrm{Z1}^{+} \oplus \mathrm{Z4}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.1659 $\mathrm{Y1}^{-} \oplus \mathrm{Z1}^{+} \oplus \mathrm{Z3}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.1660 $\mathrm{Y1}^{-} \oplus \mathrm{Z1}^{+} \oplus \mathrm{Z4}^{+}$	$\surd$	1	0	$\times$	-	-
N51.9.1661 $\mathrm{Y1}^{-} \oplus \mathrm{Z1}^{-} \oplus \mathrm{Z1}^{-}$	$\surd$	1	0	$\times$	-	-
N51.9.1662 $\mathrm{Y1}^{-} \oplus \mathrm{Z1}^{-} \oplus \mathrm{Z2}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.9.1663 $\mathrm{Y1}^{-} \oplus \mathrm{Z1}^{-} \oplus \mathrm{Z3}^{+}$	$\surd$	1	1	$\times$	-	-
N51.9.1664 $\mathrm{Y1}^{-} \oplus \mathrm{Z1}^{-} \oplus \mathrm{Z4}^{-}$	$\surd$	1	0	$\times$	-	-
N51.9.1665 $\mathrm{Y1}^{-} \oplus \mathrm{Z1}^{-} \oplus \mathrm{Z3}^{-}$	$\surd$	1	0	$\times$	-	-
N51.9.1666 $\mathrm{Y1}^{-} \oplus \mathrm{Z1}^{-} \oplus \mathrm{Z4}^{+}$	$\surd$	1	1	$\times$	-	-
N51.9.1667 $\mathrm{Y1}^{-} \oplus \mathrm{Z3}^{+} \oplus \mathrm{Z3}^{+}$	$\surd$	1	0	$\times$	-	-
N51.9.1668 $\mathrm{Y1}^{-} \oplus \mathrm{Z3}^{+} \oplus \mathrm{Z4}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.9.1669 $\mathrm{Y1}^{-} \oplus \mathrm{Z3}^{+} \oplus \mathrm{Z3}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.1670 $\mathrm{Y1}^{-} \oplus \mathrm{Z3}^{+} \oplus \mathrm{Z4}^{+}$	$\surd$	1	0	$\times$	-	-
N51.9.1671 $\mathrm{Y1}^{-} \oplus \mathrm{Z3}^{-} \oplus \mathrm{Z3}^{-}$	$\surd$	1	0	$\times$	-	-
N51.9.1672 $\mathrm{Y1}^{-} \oplus \mathrm{Z3}^{-} \oplus \mathrm{Z4}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.9.1673 $\mathrm{Y2}^{+} \oplus \mathrm{Y2}^{+} \oplus \mathrm{Y2}^{+}$	$\surd$	0	0	$\surd$	-	-
N51.9.1674 $\mathrm{Y2}^{+} \oplus \mathrm{Y2}^{+} \oplus \mathrm{Y3}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_u} \oplus \mathrm{B2_u}$
N51.9.1675 $\mathrm{Y2}^{+} \oplus \mathrm{Y2}^{+} \oplus \mathrm{Y2}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u}$
N51.9.1676 $\mathrm{Y2}^{+} \oplus \mathrm{Y2}^{+} \oplus \mathrm{Y3}^{+}$	$\surd$	0	0	$\surd$	-	-
N51.9.1677 $\mathrm{Y2}^{+} \oplus \mathrm{Y3}^{-} \oplus \mathrm{Y2}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B2_u}$
N51.9.1678 $\mathrm{Y2}^{+} \oplus \mathrm{Y2}^{+} \oplus \mathrm{Z1}^{+}$	$\surd$	1	0	$\times$	-	-
N51.9.1679 $\mathrm{Y2}^{+} \oplus \mathrm{Y3}^{-} \oplus \mathrm{Z1}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N51.9.1680 $\mathrm{Y2}^{+} \oplus \mathrm{Y2}^{+} \oplus \mathrm{Z1}^{-}$	$\surd$	1	0	$\times$	-	-
N51.9.1681 $\mathrm{Y2}^{+} \oplus \mathrm{Y3}^{-} \oplus \mathrm{Z1}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N51.9.1682 $\mathrm{Y2}^{+} \oplus \mathrm{Y2}^{+} \oplus \mathrm{Z3}^{+}$	$\surd$	1	0	$\times$	-	-
N51.9.1683 $\mathrm{Y2}^{+} \oplus \mathrm{Y3}^{-} \oplus \mathrm{Z3}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N51.9.1684 $\mathrm{Y2}^{+} \oplus \mathrm{Y2}^{+} \oplus \mathrm{Z3}^{-}$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $Pmma$ (No. 51) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N51.9.1685 $\mathrm{Y2}^{+}\oplus\mathrm{Y3}^{-}\oplus\mathrm{Z3}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N51.9.1686 $\mathrm{Y2}^{+}\oplus\mathrm{Y2}^{-}\oplus\mathrm{Y2}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{A_u}$
N51.9.1687 $\mathrm{Y2}^{+}\oplus\mathrm{Y2}^{-}\oplus\mathrm{Y3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B2_u}$
N51.9.1688 $\mathrm{Y2}^{+}\oplus\mathrm{Y3}^{+}\oplus\mathrm{Y3}^{+}$	$\surd$	0	0	$\surd$	-	-
N51.9.1689 $\mathrm{Y2}^{+}\oplus\mathrm{Y2}^{-}\oplus\mathrm{Z1}^{+}$	$\surd$	1	1	$\times$	-	-
N51.9.1690 $\mathrm{Y2}^{+}\oplus\mathrm{Y3}^{+}\oplus\mathrm{Z1}^{+}$	$\surd$	1	0	$\times$	-	-
N51.9.1691 $\mathrm{Y2}^{+}\oplus\mathrm{Y2}^{-}\oplus\mathrm{Z1}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.1692 $\mathrm{Y2}^{+}\oplus\mathrm{Y3}^{+}\oplus\mathrm{Z1}^{-}$	$\surd$	1	0	$\times$	-	-
N51.9.1693 $\mathrm{Y2}^{+}\oplus\mathrm{Y2}^{-}\oplus\mathrm{Z3}^{+}$	$\surd$	1	1	$\times$	-	-
N51.9.1694 $\mathrm{Y2}^{+}\oplus\mathrm{Y3}^{+}\oplus\mathrm{Z3}^{+}$	$\surd$	1	0	$\times$	-	-
N51.9.1695 $\mathrm{Y2}^{+}\oplus\mathrm{Y2}^{-}\oplus\mathrm{Z3}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.1696 $\mathrm{Y2}^{+}\oplus\mathrm{Y3}^{+}\oplus\mathrm{Z3}^{-}$	$\surd$	1	0	$\times$	-	-
N51.9.1697 $\mathrm{Y2}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z1}^{+}$	$\surd$	1	0	$\times$	-	-
N51.9.1698 $\mathrm{Y2}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z2}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.9.1699 $\mathrm{Y2}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z1}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.1700 $\mathrm{Y2}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z2}^{+}$	$\surd$	1	0	$\times$	-	-
N51.9.1701 $\mathrm{Y2}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z3}^{+}$	$\surd$	1	0	$\times$	-	-
N51.9.1702 $\mathrm{Y2}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z4}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.1703 $\mathrm{Y2}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z3}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.1704 $\mathrm{Y2}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z4}^{+}$	$\surd$	1	0	$\times$	-	-
N51.9.1705 $\mathrm{Y2}^{+}\oplus\mathrm{Z1}^{-}\oplus\mathrm{Z1}^{-}$	$\surd$	1	0	$\times$	-	-
N51.9.1706 $\mathrm{Y2}^{+}\oplus\mathrm{Z1}^{-}\oplus\mathrm{Z2}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.9.1707 $\mathrm{Y2}^{+}\oplus\mathrm{Z1}^{-}\oplus\mathrm{Z3}^{+}$	$\surd$	1	1	$\times$	-	-
N51.9.1708 $\mathrm{Y2}^{+}\oplus\mathrm{Z1}^{-}\oplus\mathrm{Z4}^{-}$	$\surd$	1	0	$\times$	-	-
N51.9.1709 $\mathrm{Y2}^{+}\oplus\mathrm{Z1}^{-}\oplus\mathrm{Z3}^{-}$	$\surd$	1	0	$\times$	-	-
N51.9.1710 $\mathrm{Y2}^{+}\oplus\mathrm{Z1}^{-}\oplus\mathrm{Z4}^{+}$	$\surd$	1	1	$\times$	-	-
N51.9.1711 $\mathrm{Y2}^{+}\oplus\mathrm{Z3}^{+}\oplus\mathrm{Z3}^{+}$	$\surd$	1	0	$\times$	-	-
N51.9.1712 $\mathrm{Y2}^{+}\oplus\mathrm{Z3}^{+}\oplus\mathrm{Z4}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.9.1713 $\mathrm{Y2}^{+}\oplus\mathrm{Z3}^{+}\oplus\mathrm{Z3}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.1714 $\mathrm{Y2}^{+}\oplus\mathrm{Z3}^{+}\oplus\mathrm{Z4}^{+}$	$\surd$	1	0	$\times$	-	-
N51.9.1715 $\mathrm{Y2}^{+}\oplus\mathrm{Z3}^{-}\oplus\mathrm{Z3}^{-}$	$\surd$	1	0	$\times$	-	-
N51.9.1716 $\mathrm{Y2}^{+}\oplus\mathrm{Z3}^{-}\oplus\mathrm{Z4}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.9.1717 $\mathrm{Y2}^{-}\oplus\mathrm{Y2}^{-}\oplus\mathrm{Y2}^{-}$	$\surd$	0	0	$\surd$	-	-
N51.9.1718 $\mathrm{Y2}^{-}\oplus\mathrm{Y2}^{-}\oplus\mathrm{Y3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_u}\oplus\mathrm{B2_u}$
N51.9.1719 $\mathrm{Y2}^{-}\oplus\mathrm{Y2}^{-}\oplus\mathrm{Z1}^{+}$	$\surd$	1	0	$\times$	-	-
N51.9.1720 $\mathrm{Y2}^{-}\oplus\mathrm{Y3}^{+}\oplus\mathrm{Z1}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N51.9.1721 $\mathrm{Y2}^{-}\oplus\mathrm{Y2}^{-}\oplus\mathrm{Z1}^{-}$	$\surd$	1	0	$\times$	-	-
N51.9.1722 $\mathrm{Y2}^{-}\oplus\mathrm{Y3}^{+}\oplus\mathrm{Z1}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N51.9.1723 $\mathrm{Y2}^{-}\oplus\mathrm{Y2}^{-}\oplus\mathrm{Z3}^{+}$	$\surd$	1	0	$\times$	-	-
N51.9.1724 $\mathrm{Y2}^{-}\oplus\mathrm{Y3}^{+}\oplus\mathrm{Z3}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N51.9.1725 $\mathrm{Y2}^{-}\oplus\mathrm{Y2}^{-}\oplus\mathrm{Z3}^{-}$	$\surd$	1	0	$\times$	-	-
N51.9.1726 $\mathrm{Y2}^{-}\oplus\mathrm{Y3}^{+}\oplus\mathrm{Z3}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N51.9.1727 $\mathrm{Y2}^{-}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z1}^{+}$	$\surd$	1	0	$\times$	-	-
N51.9.1728 $\mathrm{Y2}^{-}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z2}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.9.1729 $\mathrm{Y2}^{-}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z1}^{-}$	$\surd$	1	1	$\times$	-	-
N51.9.1730 $\mathrm{Y2}^{-}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z2}^{+}$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $Pmma$ (No. 51) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N51.9.1731 $\mathrm{Y2}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N51.9.1732 $\mathrm{Y2}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\times$	-	-
N51.9.1733 $\mathrm{Y2}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N51.9.1734 $\mathrm{Y2}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N51.9.1735 $\mathrm{Y2}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N51.9.1736 $\mathrm{Y2}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.9.1737 $\mathrm{Y2}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
N51.9.1738 $\mathrm{Y2}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z4}^-$	$\surd$	1	0	$\times$	-	-
N51.9.1739 $\mathrm{Y2}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N51.9.1740 $\mathrm{Y2}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\times$	-	-
N51.9.1741 $\mathrm{Y2}^- \oplus \mathrm{Z3}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N51.9.1742 $\mathrm{Y2}^- \oplus \mathrm{Z3}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.9.1743 $\mathrm{Y2}^- \oplus \mathrm{Z3}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N51.9.1744 $\mathrm{Y2}^- \oplus \mathrm{Z3}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N51.9.1745 $\mathrm{Y2}^- \oplus \mathrm{Z3}^- \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N51.9.1746 $\mathrm{Y2}^- \oplus \mathrm{Z3}^- \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.9.1747 $\mathrm{Z1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^+$	$\surd$	0	0	$\surd$	-	-
N51.9.1748 $\mathrm{Z1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N51.9.1749 $\mathrm{Z1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u}$
N51.9.1750 $\mathrm{Z1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^+$	$\surd$	0	0	$\surd$	-	-
N51.9.1751 $\mathrm{Z1}^+ \oplus \mathrm{Z2}^- \oplus \mathrm{Z1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u}$
N51.9.1752 $\mathrm{Z1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^+$	$\surd$	0	0	$\surd$	-	-
N51.9.1753 $\mathrm{Z1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_u} \oplus \mathrm{B2_u}$
N51.9.1754 $\mathrm{Z1}^+ \oplus \mathrm{Z2}^- \oplus \mathrm{Z3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N51.9.1755 $\mathrm{Z1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B3_u}$
N51.9.1756 $\mathrm{Z1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z4}^+$	$\surd$	0	0	$\surd$	-	-
N51.9.1757 $\mathrm{Z1}^+ \oplus \mathrm{Z2}^- \oplus \mathrm{Z3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u}$
N51.9.1758 $\mathrm{Z1}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u}$
N51.9.1759 $\mathrm{Z1}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u}$
N51.9.1760 $\mathrm{Z1}^+ \oplus \mathrm{Z2}^+ \oplus \mathrm{Z2}^+$	$\surd$	0	0	$\surd$	-	-
N51.9.1761 $\mathrm{Z1}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u}$
N51.9.1762 $\mathrm{Z1}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B2_u}$
N51.9.1763 $\mathrm{Z1}^+ \oplus \mathrm{Z2}^+ \oplus \mathrm{Z3}^+$	$\surd$	0	0	$\surd$	-	-
N51.9.1764 $\mathrm{Z1}^+ \oplus \mathrm{Z2}^+ \oplus \mathrm{Z4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_u}$
N51.9.1765 $\mathrm{Z1}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u}$
N51.9.1766 $\mathrm{Z1}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B2_u}$
N51.9.1767 $\mathrm{Z1}^+ \oplus \mathrm{Z2}^+ \oplus \mathrm{Z3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_u}$
N51.9.1768 $\mathrm{Z1}^+ \oplus \mathrm{Z2}^+ \oplus \mathrm{Z4}^+$	$\surd$	0	0	$\surd$	-	-
N51.9.1769 $\mathrm{Z1}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z3}^+$	$\surd$	0	0	$\surd$	-	-
N51.9.1770 $\mathrm{Z1}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N51.9.1771 $\mathrm{Z1}^+ \oplus \mathrm{Z4}^- \oplus \mathrm{Z4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_u} \oplus \mathrm{B2_u}$
N51.9.1772 $\mathrm{Z1}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u}$
N51.9.1773 $\mathrm{Z1}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z4}^+$	$\surd$	0	0	$\surd$	-	-
N51.9.1774 $\mathrm{Z1}^+ \oplus \mathrm{Z4}^- \oplus \mathrm{Z3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_u}$
N51.9.1775 $\mathrm{Z1}^+ \oplus \mathrm{Z4}^- \oplus \mathrm{Z4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B2_u}$
N51.9.1776 $\mathrm{Z1}^+ \oplus \mathrm{Z3}^- \oplus \mathrm{Z3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B3_u}$

Non-coplanar SSGs with parent space group $Pmma$ (No. 51) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N51.9.1777 $\mathrm{Z1^+} \oplus \mathrm{Z3^-} \oplus \mathrm{Z4^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u}$
N51.9.1778 $\mathrm{Z1^+} \oplus \mathrm{Z4^+} \oplus \mathrm{Z4^+}$	$\surd$	0	0	$\surd$	-	-
N51.9.1779 $\mathrm{Z1^-} \oplus \mathrm{Z1^-} \oplus \mathrm{Z1^-}$	$\surd$	0	0	$\surd$	-	-
N51.9.1780 $\mathrm{Z1^-} \oplus \mathrm{Z1^-} \oplus \mathrm{Z2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N51.9.1781 $\mathrm{Z1^-} \oplus \mathrm{Z1^-} \oplus \mathrm{Z3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B3_u}$
N51.9.1782 $\mathrm{Z1^-} \oplus \mathrm{Z1^-} \oplus \mathrm{Z4^-}$	$\surd$	0	0	$\surd$	-	-
N51.9.1783 $\mathrm{Z1^-} \oplus \mathrm{Z2^+} \oplus \mathrm{Z3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u}$
N51.9.1784 $\mathrm{Z1^-} \oplus \mathrm{Z1^-} \oplus \mathrm{Z3^-}$	$\surd$	0	0	$\surd$	-	-
N51.9.1785 $\mathrm{Z1^-} \oplus \mathrm{Z1^-} \oplus \mathrm{Z4^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_u} \oplus \mathrm{B2_u}$
N51.9.1786 $\mathrm{Z1^-} \oplus \mathrm{Z2^+} \oplus \mathrm{Z3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N51.9.1787 $\mathrm{Z1^-} \oplus \mathrm{Z3^+} \oplus \mathrm{Z3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B3_u}$
N51.9.1788 $\mathrm{Z1^-} \oplus \mathrm{Z3^+} \oplus \mathrm{Z4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u}$
N51.9.1789 $\mathrm{Z1^-} \oplus \mathrm{Z4^-} \oplus \mathrm{Z4^-}$	$\surd$	0	0	$\surd$	-	-
N51.9.1790 $\mathrm{Z1^-} \oplus \mathrm{Z3^+} \oplus \mathrm{Z3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u}$
N51.9.1791 $\mathrm{Z1^-} \oplus \mathrm{Z3^+} \oplus \mathrm{Z4^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_u}$
N51.9.1792 $\mathrm{Z1^-} \oplus \mathrm{Z4^-} \oplus \mathrm{Z3^-}$	$\surd$	0	0	$\surd$	-	-
N51.9.1793 $\mathrm{Z1^-} \oplus \mathrm{Z4^-} \oplus \mathrm{Z4^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B2_u}$
N51.9.1794 $\mathrm{Z1^-} \oplus \mathrm{Z3^-} \oplus \mathrm{Z3^-}$	$\surd$	0	0	$\surd$	-	-
N51.9.1795 $\mathrm{Z1^-} \oplus \mathrm{Z3^-} \oplus \mathrm{Z4^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N51.9.1796 $\mathrm{Z1^-} \oplus \mathrm{Z4^+} \oplus \mathrm{Z4^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_u} \oplus \mathrm{B2_u}$
N51.9.1797 $\mathrm{Z3^+} \oplus \mathrm{Z3^+} \oplus \mathrm{Z3^+}$	$\surd$	0	0	$\surd$	-	-
N51.9.1798 $\mathrm{Z3^+} \oplus \mathrm{Z3^+} \oplus \mathrm{Z4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N51.9.1799 $\mathrm{Z3^+} \oplus \mathrm{Z3^+} \oplus \mathrm{Z3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u}$
N51.9.1800 $\mathrm{Z3^+} \oplus \mathrm{Z3^+} \oplus \mathrm{Z4^+}$	$\surd$	0	0	$\surd$	-	-
N51.9.1801 $\mathrm{Z3^+} \oplus \mathrm{Z4^-} \oplus \mathrm{Z3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u}$
N51.9.1802 $\mathrm{Z3^+} \oplus \mathrm{Z3^-} \oplus \mathrm{Z3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u}$
N51.9.1803 $\mathrm{Z3^+} \oplus \mathrm{Z3^-} \oplus \mathrm{Z4^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u}$
N51.9.1804 $\mathrm{Z3^+} \oplus \mathrm{Z4^+} \oplus \mathrm{Z4^+}$	$\surd$	0	0	$\surd$	-	-
N51.9.1805 $\mathrm{Z3^-} \oplus \mathrm{Z3^-} \oplus \mathrm{Z3^-}$	$\surd$	0	0	$\surd$	-	-
N51.9.1806 $\mathrm{Z3^-} \oplus \mathrm{Z3^-} \oplus \mathrm{Z4^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N51.12.1 $\mathrm{GM1^-} \oplus \mathrm{R1}$	$\surd$	1	1	$\times$	-	-
N51.12.2 $\mathrm{GM1^-} \oplus \mathrm{S1}$	$\surd$	1	1	$\times$	-	-
N51.12.3 $\mathrm{GM1^-} \oplus \mathrm{U1}$	$\surd$	1	1	$\times$	-	-
N51.12.4 $\mathrm{GM1^-} \oplus \mathrm{U2}$	$\surd$	1	1	$\times$	-	-
N51.12.5 $\mathrm{GM1^-} \oplus \mathrm{X1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N51.12.6 $\mathrm{GM1^-} \oplus \mathrm{X2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N51.12.7 $\mathrm{GM2^+} \oplus \mathrm{R1}$	$\surd$	1	1	$\times$	-	-
N51.12.8 $\mathrm{GM2^+} \oplus \mathrm{S1}$	$\surd$	1	1	$\times$	-	-
N51.12.9 $\mathrm{GM2^+} \oplus \mathrm{U1}$	$\surd$	1	1	$\times$	-	-
N51.12.10 $\mathrm{GM2^+} \oplus \mathrm{U2}$	$\surd$	1	1	$\times$	-	-
N51.12.11 $\mathrm{GM2^+} \oplus \mathrm{X1}$	$\surd$	1	1	$\surd$	$mm2$	B1
N51.12.12 $\mathrm{GM2^+} \oplus \mathrm{X2}$	$\surd$	1	1	$\surd$	$mm2$	B1
N51.12.13 $\mathrm{GM2^-} \oplus \mathrm{R1}$	$\surd$	1	1	$\times$	-	-
N51.12.14 $\mathrm{GM2^-} \oplus \mathrm{S1}$	$\surd$	1	1	$\times$	-	-
N51.12.15 $\mathrm{GM2^-} \oplus \mathrm{U1}$	$\surd$	1	1	$\times$	-	-
N51.12.16 $\mathrm{GM2^-} \oplus \mathrm{U2}$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $Pmma$ (No. 51) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N51.12.17 $\mathrm{GM2}^{-} \oplus \mathrm{X1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N51.12.18 $\mathrm{GM2}^{-} \oplus \mathrm{X2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N51.12.19 $\mathrm{GM3}^{+} \oplus \mathrm{R1}$	$\surd$	1	1	$\times$	-	-
N51.12.20 $\mathrm{GM3}^{+} \oplus \mathrm{S1}$	$\surd$	1	1	$\times$	-	-
N51.12.21 $\mathrm{GM3}^{+} \oplus \mathrm{U1}$	$\surd$	1	1	$\times$	-	-
N51.12.22 $\mathrm{GM3}^{+} \oplus \mathrm{U2}$	$\surd$	1	1	$\times$	-	-
N51.12.23 $\mathrm{GM3}^{+} \oplus \mathrm{X1}$	$\surd$	1	1	$\surd$	222	B3
N51.12.24 $\mathrm{GM3}^{+} \oplus \mathrm{X2}$	$\surd$	1	1	$\surd$	222	B3
N51.12.25 $\mathrm{GM3}^{-} \oplus \mathrm{R1}$	$\surd$	1	1	$\times$	-	-
N51.12.26 $\mathrm{GM3}^{-} \oplus \mathrm{S1}$	$\surd$	1	1	$\times$	-	-
N51.12.27 $\mathrm{GM3}^{-} \oplus \mathrm{U1}$	$\surd$	1	1	$\times$	-	-
N51.12.28 $\mathrm{GM3}^{-} \oplus \mathrm{U2}$	$\surd$	1	1	$\times$	-	-
N51.12.29 $\mathrm{GM3}^{-} \oplus \mathrm{X1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N51.12.30 $\mathrm{GM3}^{-} \oplus \mathrm{X2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N51.12.31 $\mathrm{GM4}^{+} \oplus \mathrm{R1}$	$\surd$	1	1	$\times$	-	-
N51.12.32 $\mathrm{GM4}^{+} \oplus \mathrm{S1}$	$\surd$	1	1	$\times$	-	-
N51.12.33 $\mathrm{GM4}^{+} \oplus \mathrm{U1}$	$\surd$	1	1	$\times$	-	-
N51.12.34 $\mathrm{GM4}^{+} \oplus \mathrm{U2}$	$\surd$	1	1	$\times$	-	-
N51.12.35 $\mathrm{GM4}^{+} \oplus \mathrm{X1}$	$\surd$	1	1	$\surd$	$mm2$	B1
N51.12.36 $\mathrm{GM4}^{+} \oplus \mathrm{X2}$	$\surd$	1	1	$\surd$	$mm2$	B1
N51.12.37 $\mathrm{GM4}^{-} \oplus \mathrm{R1}$	$\surd$	1	1	$\times$	-	-
N51.12.38 $\mathrm{GM4}^{-} \oplus \mathrm{S1}$	$\surd$	1	1	$\times$	-	-
N51.12.39 $\mathrm{GM4}^{-} \oplus \mathrm{U1}$	$\surd$	1	1	$\times$	-	-
N51.12.40 $\mathrm{GM4}^{-} \oplus \mathrm{U2}$	$\surd$	1	1	$\times$	-	-
N51.12.41 $\mathrm{GM4}^{-} \oplus \mathrm{X1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N51.12.42 $\mathrm{GM4}^{-} \oplus \mathrm{X2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N51.12.43 $\mathrm{T1}^{+} \oplus \mathrm{R1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N51.12.44 $\mathrm{T1}^{+} \oplus \mathrm{R2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N51.12.45 $\mathrm{T1}^{+} \oplus \mathrm{S1}$	$\surd$	1	1	$\times$	-	-
N51.12.46 $\mathrm{T1}^{+} \oplus \mathrm{S2}$	$\surd$	1	1	$\times$	-	-
N51.12.47 $\mathrm{T1}^{+} \oplus \mathrm{U1}$	$\surd$	1	1	$\times$	-	-
N51.12.48 $\mathrm{T1}^{+} \oplus \mathrm{U2}$	$\surd$	1	1	$\times$	-	-
N51.12.49 $\mathrm{T1}^{+} \oplus \mathrm{X1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N51.12.50 $\mathrm{T1}^{+} \oplus \mathrm{X2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N51.12.51 $\mathrm{T1}^{-} \oplus \mathrm{R1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N51.12.52 $\mathrm{T1}^{-} \oplus \mathrm{R2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N51.12.53 $\mathrm{T1}^{-} \oplus \mathrm{S1}$	$\surd$	1	1	$\times$	-	-
N51.12.54 $\mathrm{T1}^{-} \oplus \mathrm{S2}$	$\surd$	1	1	$\times$	-	-
N51.12.55 $\mathrm{T1}^{-} \oplus \mathrm{U1}$	$\surd$	1	1	$\times$	-	-
N51.12.56 $\mathrm{T1}^{-} \oplus \mathrm{U2}$	$\surd$	1	1	$\times$	-	-
N51.12.57 $\mathrm{T1}^{-} \oplus \mathrm{X1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N51.12.58 $\mathrm{T1}^{-} \oplus \mathrm{X2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N51.12.59 $\mathrm{Y1}^{+} \oplus \mathrm{R1}$	$\surd$	1	1	$\times$	-	-
N51.12.60 $\mathrm{Y1}^{+} \oplus \mathrm{R2}$	$\surd$	1	1	$\times$	-	-
N51.12.61 $\mathrm{Y1}^{+} \oplus \mathrm{S1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N51.12.62 $\mathrm{Y1}^{+} \oplus \mathrm{S2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$

Non-coplanar SSGs with parent space group $Pmma$ (No. 51) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N51.12.63 $\mathrm{Y1}^{+}\oplus\mathrm{U1}$	$\surd$	1	1	$\times$	-	-
N51.12.64 $\mathrm{Y1}^{+}\oplus\mathrm{U2}$	$\surd$	1	1	$\times$	-	-
N51.12.65 $\mathrm{Y1}^{+}\oplus\mathrm{X1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N51.12.66 $\mathrm{Y1}^{+}\oplus\mathrm{X2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N51.12.67 $\mathrm{Y1}^{-}\oplus\mathrm{R1}$	$\surd$	1	1	$\times$	-	-
N51.12.68 $\mathrm{Y1}^{-}\oplus\mathrm{R2}$	$\surd$	1	1	$\times$	-	-
N51.12.69 $\mathrm{Y1}^{-}\oplus\mathrm{S1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N51.12.70 $\mathrm{Y1}^{-}\oplus\mathrm{S2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N51.12.71 $\mathrm{Y1}^{-}\oplus\mathrm{U1}$	$\surd$	1	1	$\times$	-	-
N51.12.72 $\mathrm{Y1}^{-}\oplus\mathrm{U2}$	$\surd$	1	1	$\times$	-	-
N51.12.73 $\mathrm{Y1}^{-}\oplus\mathrm{X1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N51.12.74 $\mathrm{Y1}^{-}\oplus\mathrm{X2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N51.12.75 $\mathrm{Y2}^{+}\oplus\mathrm{R1}$	$\surd$	1	1	$\times$	-	-
N51.12.76 $\mathrm{Y2}^{+}\oplus\mathrm{R2}$	$\surd$	1	1	$\times$	-	-
N51.12.77 $\mathrm{Y2}^{+}\oplus\mathrm{S1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N51.12.78 $\mathrm{Y2}^{+}\oplus\mathrm{S2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N51.12.79 $\mathrm{Y2}^{+}\oplus\mathrm{U1}$	$\surd$	1	1	$\times$	-	-
N51.12.80 $\mathrm{Y2}^{+}\oplus\mathrm{U2}$	$\surd$	1	1	$\times$	-	-
N51.12.81 $\mathrm{Y2}^{+}\oplus\mathrm{X1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N51.12.82 $\mathrm{Y2}^{+}\oplus\mathrm{X2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N51.12.83 $\mathrm{Y2}^{-}\oplus\mathrm{R1}$	$\surd$	1	1	$\times$	-	-
N51.12.84 $\mathrm{Y2}^{-}\oplus\mathrm{R2}$	$\surd$	1	1	$\times$	-	-
N51.12.85 $\mathrm{Y2}^{-}\oplus\mathrm{S1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N51.12.86 $\mathrm{Y2}^{-}\oplus\mathrm{S2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N51.12.87 $\mathrm{Y2}^{-}\oplus\mathrm{U1}$	$\surd$	1	1	$\times$	-	-
N51.12.88 $\mathrm{Y2}^{-}\oplus\mathrm{U2}$	$\surd$	1	1	$\times$	-	-
N51.12.89 $\mathrm{Y2}^{-}\oplus\mathrm{X1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N51.12.90 $\mathrm{Y2}^{-}\oplus\mathrm{X2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N51.12.91 $\mathrm{Z1}^{+}\oplus\mathrm{R1}$	$\surd$	1	1	$\times$	-	-
N51.12.92 $\mathrm{Z1}^{+}\oplus\mathrm{S1}$	$\surd$	1	1	$\times$	-	-
N51.12.93 $\mathrm{Z1}^{+}\oplus\mathrm{U1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N51.12.94 $\mathrm{Z1}^{+}\oplus\mathrm{U2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N51.12.95 $\mathrm{Z1}^{+}\oplus\mathrm{X1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N51.12.96 $\mathrm{Z1}^{+}\oplus\mathrm{X2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N51.12.97 $\mathrm{Z1}^{-}\oplus\mathrm{R1}$	$\surd$	1	1	$\times$	-	-
N51.12.98 $\mathrm{Z1}^{-}\oplus\mathrm{S1}$	$\surd$	1	1	$\times$	-	-
N51.12.99 $\mathrm{Z1}^{-}\oplus\mathrm{U1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N51.12.100 $\mathrm{Z1}^{-}\oplus\mathrm{U2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N51.12.101 $\mathrm{Z1}^{-}\oplus\mathrm{X1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N51.12.102 $\mathrm{Z1}^{-}\oplus\mathrm{X2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N51.12.103 $\mathrm{Z3}^{+}\oplus\mathrm{R1}$	$\surd$	1	1	$\times$	-	-
N51.12.104 $\mathrm{Z3}^{+}\oplus\mathrm{S1}$	$\surd$	1	1	$\times$	-	-
N51.12.105 $\mathrm{Z3}^{+}\oplus\mathrm{U1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N51.12.106 $\mathrm{Z3}^{+}\oplus\mathrm{U2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N51.12.107 $\mathrm{Z3}^{+}\oplus\mathrm{X1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N51.12.108 $\mathrm{Z3}^{+}\oplus\mathrm{X2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$

Non-coplanar SSGs with parent space group $Pmma$ (No. 51) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N51.12.109 Z3$^-$ ⊕ R1	√	1	1	×	-	-
N51.12.110 Z3$^-$ ⊕ S1	√	1	1	×	-	-
N51.12.111 Z3$^-$ ⊕ U1	√	1	1	√	mmm	$\mathrm{B3_u}$
N51.12.112 Z3$^-$ ⊕ U2	√	1	1	√	mmm	$\mathrm{B3_u}$
N51.12.113 Z3$^-$ ⊕ X1	√	1	1	√	mmm	$\mathrm{B3_u}$
N51.12.114 Z3$^-$ ⊕ X2	√	1	1	√	mmm	$\mathrm{B3_u}$
N51.14.1 GM1$^-$ ⊕ SM1	√	1	1	√	mmm	$\mathrm{B3_u}$
N51.14.2 GM1$^-$ ⊕ SM2	√	1	1	√	mmm	$\mathrm{B3_u}$
N51.14.3 GM1$^-$ ⊕ A1	√	1	1	×	-	-
N51.14.4 GM1$^-$ ⊕ A2	√	1	1	×	-	-
N51.14.5 GM1$^-$ ⊕ C1	√	1	1	×	-	-
N51.14.6 GM1$^-$ ⊕ E1	√	1	1	×	-	-
N51.14.7 GM1$^-$ ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N51.14.8 GM1$^-$ ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
N51.14.9 GM1$^-$ ⊕ DT3	√	1	1	√	mmm	$\mathrm{B2_u}$
N51.14.10 GM1$^-$ ⊕ DT4	√	1	1	√	mmm	$\mathrm{B2_u}$
N51.14.11 GM1$^-$ ⊕ B1	√	1	1	×	-	-
N51.14.12 GM1$^-$ ⊕ B2	√	1	1	×	-	-
N51.14.13 GM1$^-$ ⊕ LD1	√	1	1	√	mmm	$\mathrm{B1_u}$
N51.14.14 GM1$^-$ ⊕ LD2	√	1	1	√	mmm	$\mathrm{B1_u}$
N51.14.15 GM1$^-$ ⊕ LD3	√	1	1	√	mmm	$\mathrm{B1_u}$
N51.14.16 GM1$^-$ ⊕ LD4	√	1	1	√	mmm	$\mathrm{B1_u}$
N51.14.17 GM1$^-$ ⊕ H1	√	1	1	×	-	-
N51.14.18 GM1$^-$ ⊕ H2	√	1	1	×	-	-
N51.14.19 GM2$^+$ ⊕ SM1	√	1	1	√	$mm2$	B1
N51.14.20 GM2$^+$ ⊕ SM2	√	1	1	√	$mm2$	B1
N51.14.21 GM2$^+$ ⊕ A1	√	1	1	×	-	-
N51.14.22 GM2$^+$ ⊕ A2	√	1	1	×	-	-
N51.14.23 GM2$^+$ ⊕ C1	√	1	1	×	-	-
N51.14.24 GM2$^+$ ⊕ E1	√	1	1	×	-	-
N51.14.25 GM2$^+$ ⊕ DT1	√	1	1	√	$mm2$	B2
N51.14.26 GM2$^+$ ⊕ DT2	√	1	1	√	$mm2$	B2
N51.14.27 GM2$^+$ ⊕ DT3	√	1	1	√	$mm2$	B2
N51.14.28 GM2$^+$ ⊕ DT4	√	1	1	√	$mm2$	B2
N51.14.29 GM2$^+$ ⊕ B1	√	1	1	×	-	-
N51.14.30 GM2$^+$ ⊕ B2	√	1	1	×	-	-
N51.14.31 GM2$^+$ ⊕ LD1	√	1	1	√	222	B1
N51.14.32 GM2$^+$ ⊕ LD2	√	1	1	√	222	B1
N51.14.33 GM2$^+$ ⊕ LD3	√	1	1	√	222	B1
N51.14.34 GM2$^+$ ⊕ LD4	√	1	1	√	222	B1
N51.14.35 GM2$^+$ ⊕ H1	√	1	1	×	-	-
N51.14.36 GM2$^+$ ⊕ H2	√	1	1	×	-	-
N51.14.37 GM2$^-$ ⊕ SM1	√	1	1	√	mmm	$\mathrm{B3_u}$
N51.14.38 GM2$^-$ ⊕ SM2	√	1	1	√	mmm	$\mathrm{B3_u}$
N51.14.39 GM2$^-$ ⊕ A1	√	1	1	×	-	-
N51.14.40 GM2$^-$ ⊕ A2	√	1	1	×	-	-

Non-coplanar SSGs with parent space group $Pmma$ (No. 51) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N51.14.41 GM2$^-$ ⊕ C1	√	1	1	×	-	-
N51.14.42 GM2$^-$ ⊕ E1	√	1	1	×	-	-
N51.14.43 GM2$^-$ ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N51.14.44 GM2$^-$ ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
N51.14.45 GM2$^-$ ⊕ DT3	√	1	1	√	mmm	$\mathrm{B2_u}$
N51.14.46 GM2$^-$ ⊕ DT4	√	1	1	√	mmm	$\mathrm{B2_u}$
N51.14.47 GM2$^-$ ⊕ B1	√	1	1	×	-	-
N51.14.48 GM2$^-$ ⊕ B2	√	1	1	×	-	-
N51.14.49 GM2$^-$ ⊕ LD1	√	1	1	√	mmm	$\mathrm{B1_u}$
N51.14.50 GM2$^-$ ⊕ LD2	√	1	1	√	mmm	$\mathrm{B1_u}$
N51.14.51 GM2$^-$ ⊕ LD3	√	1	1	√	mmm	$\mathrm{B1_u}$
N51.14.52 GM2$^-$ ⊕ LD4	√	1	1	√	mmm	$\mathrm{B1_u}$
N51.14.53 GM2$^-$ ⊕ H1	√	1	1	×	-	-
N51.14.54 GM2$^-$ ⊕ H2	√	1	1	×	-	-
N51.14.55 GM3$^+$ ⊕ SM1	√	1	1	√	222	B3
N51.14.56 GM3$^+$ ⊕ SM2	√	1	1	√	222	B3
N51.14.57 GM3$^+$ ⊕ A1	√	1	1	×	-	-
N51.14.58 GM3$^+$ ⊕ A2	√	1	1	×	-	-
N51.14.59 GM3$^+$ ⊕ C1	√	1	1	×	-	-
N51.14.60 GM3$^+$ ⊕ E1	√	1	1	×	-	-
N51.14.61 GM3$^+$ ⊕ DT1	√	1	1	√	$mm2$	B2
N51.14.62 GM3$^+$ ⊕ DT2	√	1	1	√	$mm2$	B2
N51.14.63 GM3$^+$ ⊕ DT3	√	1	1	√	$mm2$	B2
N51.14.64 GM3$^+$ ⊕ DT4	√	1	1	√	$mm2$	B2
N51.14.65 GM3$^+$ ⊕ B1	√	1	1	×	-	-
N51.14.66 GM3$^+$ ⊕ B2	√	1	1	×	-	-
N51.14.67 GM3$^+$ ⊕ LD1	√	1	1	√	$mm2$	B2
N51.14.68 GM3$^+$ ⊕ LD2	√	1	1	√	$mm2$	B2
N51.14.69 GM3$^+$ ⊕ LD3	√	1	1	√	$mm2$	B2
N51.14.70 GM3$^+$ ⊕ LD4	√	1	1	√	$mm2$	B2
N51.14.71 GM3$^+$ ⊕ H1	√	1	1	×	-	-
N51.14.72 GM3$^+$ ⊕ H2	√	1	1	×	-	-
N51.14.73 GM3$^-$ ⊕ SM1	√	1	1	√	mmm	$\mathrm{B3_u}$
N51.14.74 GM3$^-$ ⊕ SM2	√	1	1	√	mmm	$\mathrm{B3_u}$
N51.14.75 GM3$^-$ ⊕ A1	√	1	1	×	-	-
N51.14.76 GM3$^-$ ⊕ A2	√	1	1	×	-	-
N51.14.77 GM3$^-$ ⊕ C1	√	1	1	×	-	-
N51.14.78 GM3$^-$ ⊕ E1	√	1	1	×	-	-
N51.14.79 GM3$^-$ ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N51.14.80 GM3$^-$ ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
N51.14.81 GM3$^-$ ⊕ DT3	√	1	1	√	mmm	$\mathrm{B2_u}$
N51.14.82 GM3$^-$ ⊕ DT4	√	1	1	√	mmm	$\mathrm{B2_u}$
N51.14.83 GM3$^-$ ⊕ B1	√	1	1	×	-	-
N51.14.84 GM3$^-$ ⊕ B2	√	1	1	×	-	-
N51.14.85 GM3$^-$ ⊕ LD1	√	1	1	√	mmm	$\mathrm{B1_u}$
N51.14.86 GM3$^-$ ⊕ LD2	√	1	1	√	mmm	$\mathrm{B1_u}$

Non-coplanar SSGs with parent space group $Pmma$ (No. 51) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N51.14.87 GM3$^-$ ⊕ LD3	√	1	1	√	mmm	B1$_\mathrm{u}$
N51.14.88 GM3$^-$ ⊕ LD4	√	1	1	√	mmm	B1$_\mathrm{u}$
N51.14.89 GM3$^-$ ⊕ H1	√	1	1	×	-	-
N51.14.90 GM3$^-$ ⊕ H2	√	1	1	×	-	-
N51.14.91 GM4$^+$ ⊕ SM1	√	1	1	√	$mm2$	B1
N51.14.92 GM4$^+$ ⊕ SM2	√	1	1	√	$mm2$	B1
N51.14.93 GM4$^+$ ⊕ A1	√	1	1	×	-	-
N51.14.94 GM4$^+$ ⊕ A2	√	1	1	×	-	-
N51.14.95 GM4$^+$ ⊕ C1	√	1	1	×	-	-
N51.14.96 GM4$^+$ ⊕ E1	√	1	1	×	-	-
N51.14.97 GM4$^+$ ⊕ DT1	√	1	1	√	222	B2
N51.14.98 GM4$^+$ ⊕ DT2	√	1	1	√	222	B2
N51.14.99 GM4$^+$ ⊕ DT3	√	1	1	√	222	B2
N51.14.100 GM4$^+$ ⊕ DT4	√	1	1	√	222	B2
N51.14.101 GM4$^+$ ⊕ B1	√	1	1	×	-	-
N51.14.102 GM4$^+$ ⊕ B2	√	1	1	×	-	-
N51.14.103 GM4$^+$ ⊕ LD1	√	1	1	√	$mm2$	B1
N51.14.104 GM4$^+$ ⊕ LD2	√	1	1	√	$mm2$	B1
N51.14.105 GM4$^+$ ⊕ LD3	√	1	1	√	$mm2$	B1
N51.14.106 GM4$^+$ ⊕ LD4	√	1	1	√	$mm2$	B1
N51.14.107 GM4$^+$ ⊕ H1	√	1	1	×	-	-
N51.14.108 GM4$^+$ ⊕ H2	√	1	1	×	-	-
N51.14.109 GM4$^-$ ⊕ SM1	√	1	1	√	mmm	B3$_\mathrm{u}$
N51.14.110 GM4$^-$ ⊕ SM2	√	1	1	√	mmm	B3$_\mathrm{u}$
N51.14.111 GM4$^-$ ⊕ A1	√	1	1	×	-	-
N51.14.112 GM4$^-$ ⊕ A2	√	1	1	×	-	-
N51.14.113 GM4$^-$ ⊕ C1	√	1	1	×	-	-
N51.14.114 GM4$^-$ ⊕ E1	√	1	1	×	-	-
N51.14.115 GM4$^-$ ⊕ DT1	√	1	1	√	mmm	B2$_\mathrm{u}$
N51.14.116 GM4$^-$ ⊕ DT2	√	1	1	√	mmm	B2$_\mathrm{u}$
N51.14.117 GM4$^-$ ⊕ DT3	√	1	1	√	mmm	B2$_\mathrm{u}$
N51.14.118 GM4$^-$ ⊕ DT4	√	1	1	√	mmm	B2$_\mathrm{u}$
N51.14.119 GM4$^-$ ⊕ B1	√	1	1	×	-	-
N51.14.120 GM4$^-$ ⊕ B2	√	1	1	×	-	-
N51.14.121 GM4$^-$ ⊕ LD1	√	1	1	√	mmm	B1$_\mathrm{u}$
N51.14.122 GM4$^-$ ⊕ LD2	√	1	1	√	mmm	B1$_\mathrm{u}$
N51.14.123 GM4$^-$ ⊕ LD3	√	1	1	√	mmm	B1$_\mathrm{u}$
N51.14.124 GM4$^-$ ⊕ LD4	√	1	1	√	mmm	B1$_\mathrm{u}$
N51.14.125 GM4$^-$ ⊕ H1	√	1	1	×	-	-
N51.14.126 GM4$^-$ ⊕ H2	√	1	1	×	-	-
N51.14.127 T1$^+$ ⊕ SM1	√	1	1	√	mmm	B3$_\mathrm{u}$
N51.14.128 T1$^+$ ⊕ SM2	√	1	1	√	mmm	B3$_\mathrm{u}$
N51.14.129 T1$^+$ ⊕ A1	√	1	1	×	-	-
N51.14.130 T1$^+$ ⊕ A2	√	1	1	×	-	-
N51.14.131 T1$^+$ ⊕ C1	√	1	1	×	-	-
N51.14.132 T1$^+$ ⊕ C2	√	1	1	×	-	-

Non-coplanar SSGs with parent space group $Pmma$ (No. 51) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N51.14.133 $\mathrm{T1}^{+} \oplus \mathrm{E1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N51.14.134 $\mathrm{T1}^{+} \oplus \mathrm{E2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N51.14.135 $\mathrm{T1}^{+} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N51.14.136 $\mathrm{T1}^{+} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N51.14.137 $\mathrm{T1}^{+} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N51.14.138 $\mathrm{T1}^{+} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N51.14.139 $\mathrm{T1}^{+} \oplus \mathrm{B1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N51.14.140 $\mathrm{T1}^{+} \oplus \mathrm{B3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N51.14.141 $\mathrm{T1}^{+} \oplus \mathrm{B2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N51.14.142 $\mathrm{T1}^{+} \oplus \mathrm{B4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N51.14.143 $\mathrm{T1}^{+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.14.144 $\mathrm{T1}^{+} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.14.145 $\mathrm{T1}^{+} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.14.146 $\mathrm{T1}^{+} \oplus \mathrm{LD4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.14.147 $\mathrm{T1}^{+} \oplus \mathrm{H1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.14.148 $\mathrm{T1}^{+} \oplus \mathrm{H3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.14.149 $\mathrm{T1}^{+} \oplus \mathrm{H2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.14.150 $\mathrm{T1}^{+} \oplus \mathrm{H4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.14.151 $\mathrm{T1}^{-} \oplus \mathrm{SM1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N51.14.152 $\mathrm{T1}^{-} \oplus \mathrm{SM2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N51.14.153 $\mathrm{T1}^{-} \oplus \mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N51.14.154 $\mathrm{T1}^{-} \oplus \mathrm{A2}$	$\surd$	1	1	$\times$	-	-
N51.14.155 $\mathrm{T1}^{-} \oplus \mathrm{C1}$	$\surd$	1	1	$\times$	-	-
N51.14.156 $\mathrm{T1}^{-} \oplus \mathrm{C2}$	$\surd$	1	1	$\times$	-	-
N51.14.157 $\mathrm{T1}^{-} \oplus \mathrm{E1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N51.14.158 $\mathrm{T1}^{-} \oplus \mathrm{E2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N51.14.159 $\mathrm{T1}^{-} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N51.14.160 $\mathrm{T1}^{-} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N51.14.161 $\mathrm{T1}^{-} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N51.14.162 $\mathrm{T1}^{-} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N51.14.163 $\mathrm{T1}^{-} \oplus \mathrm{B1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N51.14.164 $\mathrm{T1}^{-} \oplus \mathrm{B3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N51.14.165 $\mathrm{T1}^{-} \oplus \mathrm{B2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N51.14.166 $\mathrm{T1}^{-} \oplus \mathrm{B4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N51.14.167 $\mathrm{T1}^{-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.14.168 $\mathrm{T1}^{-} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.14.169 $\mathrm{T1}^{-} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.14.170 $\mathrm{T1}^{-} \oplus \mathrm{LD4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.14.171 $\mathrm{T1}^{-} \oplus \mathrm{H1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.14.172 $\mathrm{T1}^{-} \oplus \mathrm{H3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.14.173 $\mathrm{T1}^{-} \oplus \mathrm{H2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.14.174 $\mathrm{T1}^{-} \oplus \mathrm{H4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.14.175 $\mathrm{Y1}^{+} \oplus \mathrm{SM1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N51.14.176 $\mathrm{Y1}^{+} \oplus \mathrm{SM2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N51.14.177 $\mathrm{Y1}^{+} \oplus \mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N51.14.178 $\mathrm{Y1}^{+} \oplus \mathrm{A2}$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $Pmma$ (No. 51) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N51.14.179 $\mathrm{Y1}^{+} \oplus \mathrm{C1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N51.14.180 $\mathrm{Y1}^{+} \oplus \mathrm{C2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N51.14.181 $\mathrm{Y1}^{+} \oplus \mathrm{E1}$	$\surd$	1	1	$\times$	-	-
N51.14.182 $\mathrm{Y1}^{+} \oplus \mathrm{E2}$	$\surd$	1	1	$\times$	-	-
N51.14.183 $\mathrm{Y1}^{+} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N51.14.184 $\mathrm{Y1}^{+} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N51.14.185 $\mathrm{Y1}^{+} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N51.14.186 $\mathrm{Y1}^{+} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N51.14.187 $\mathrm{Y1}^{+} \oplus \mathrm{B1}$	$\surd$	1	1	$\times$	-	-
N51.14.188 $\mathrm{Y1}^{+} \oplus \mathrm{B2}$	$\surd$	1	1	$\times$	-	-
N51.14.189 $\mathrm{Y1}^{+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.14.190 $\mathrm{Y1}^{+} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.14.191 $\mathrm{Y1}^{+} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.14.192 $\mathrm{Y1}^{+} \oplus \mathrm{LD4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.14.193 $\mathrm{Y1}^{+} \oplus \mathrm{H1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.14.194 $\mathrm{Y1}^{+} \oplus \mathrm{H3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.14.195 $\mathrm{Y1}^{+} \oplus \mathrm{H2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.14.196 $\mathrm{Y1}^{+} \oplus \mathrm{H4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.14.197 $\mathrm{Y1}^{-} \oplus \mathrm{SM1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N51.14.198 $\mathrm{Y1}^{-} \oplus \mathrm{SM2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N51.14.199 $\mathrm{Y1}^{-} \oplus \mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N51.14.200 $\mathrm{Y1}^{-} \oplus \mathrm{A2}$	$\surd$	1	1	$\times$	-	-
N51.14.201 $\mathrm{Y1}^{-} \oplus \mathrm{C1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N51.14.202 $\mathrm{Y1}^{-} \oplus \mathrm{C2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N51.14.203 $\mathrm{Y1}^{-} \oplus \mathrm{E1}$	$\surd$	1	1	$\times$	-	-
N51.14.204 $\mathrm{Y1}^{-} \oplus \mathrm{E2}$	$\surd$	1	1	$\times$	-	-
N51.14.205 $\mathrm{Y1}^{-} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N51.14.206 $\mathrm{Y1}^{-} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N51.14.207 $\mathrm{Y1}^{-} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N51.14.208 $\mathrm{Y1}^{-} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N51.14.209 $\mathrm{Y1}^{-} \oplus \mathrm{B1}$	$\surd$	1	1	$\times$	-	-
N51.14.210 $\mathrm{Y1}^{-} \oplus \mathrm{B2}$	$\surd$	1	1	$\times$	-	-
N51.14.211 $\mathrm{Y1}^{-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.14.212 $\mathrm{Y1}^{-} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.14.213 $\mathrm{Y1}^{-} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.14.214 $\mathrm{Y1}^{-} \oplus \mathrm{LD4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.14.215 $\mathrm{Y1}^{-} \oplus \mathrm{H1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.14.216 $\mathrm{Y1}^{-} \oplus \mathrm{H3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.14.217 $\mathrm{Y1}^{-} \oplus \mathrm{H2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.14.218 $\mathrm{Y1}^{-} \oplus \mathrm{H4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.14.219 $\mathrm{Y2}^{+} \oplus \mathrm{SM1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N51.14.220 $\mathrm{Y2}^{+} \oplus \mathrm{SM2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N51.14.221 $\mathrm{Y2}^{+} \oplus \mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N51.14.222 $\mathrm{Y2}^{+} \oplus \mathrm{A2}$	$\surd$	1	1	$\times$	-	-
N51.14.223 $\mathrm{Y2}^{+} \oplus \mathrm{C1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N51.14.224 $\mathrm{Y2}^{+} \oplus \mathrm{C2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$

Non-coplanar SSGs with parent space group $Pmma$ (No. 51) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N51.14.225 $\mathrm{Y2}^{+} \oplus \mathrm{E1}$	$\surd$	1	1	$\times$	-	-
N51.14.226 $\mathrm{Y2}^{+} \oplus \mathrm{E2}$	$\surd$	1	1	$\times$	-	-
N51.14.227 $\mathrm{Y2}^{+} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N51.14.228 $\mathrm{Y2}^{+} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N51.14.229 $\mathrm{Y2}^{+} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N51.14.230 $\mathrm{Y2}^{+} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N51.14.231 $\mathrm{Y2}^{+} \oplus \mathrm{B1}$	$\surd$	1	1	$\times$	-	-
N51.14.232 $\mathrm{Y2}^{+} \oplus \mathrm{B2}$	$\surd$	1	1	$\times$	-	-
N51.14.233 $\mathrm{Y2}^{+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.14.234 $\mathrm{Y2}^{+} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.14.235 $\mathrm{Y2}^{+} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.14.236 $\mathrm{Y2}^{+} \oplus \mathrm{LD4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.14.237 $\mathrm{Y2}^{+} \oplus \mathrm{H1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.14.238 $\mathrm{Y2}^{+} \oplus \mathrm{H3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.14.239 $\mathrm{Y2}^{+} \oplus \mathrm{H2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.14.240 $\mathrm{Y2}^{+} \oplus \mathrm{H4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.14.241 $\mathrm{Y2}^{-} \oplus \mathrm{SM1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N51.14.242 $\mathrm{Y2}^{-} \oplus \mathrm{SM2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N51.14.243 $\mathrm{Y2}^{-} \oplus \mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N51.14.244 $\mathrm{Y2}^{-} \oplus \mathrm{A2}$	$\surd$	1	1	$\times$	-	-
N51.14.245 $\mathrm{Y2}^{-} \oplus \mathrm{C1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N51.14.246 $\mathrm{Y2}^{-} \oplus \mathrm{C2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N51.14.247 $\mathrm{Y2}^{-} \oplus \mathrm{E1}$	$\surd$	1	1	$\times$	-	-
N51.14.248 $\mathrm{Y2}^{-} \oplus \mathrm{E2}$	$\surd$	1	1	$\times$	-	-
N51.14.249 $\mathrm{Y2}^{-} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N51.14.250 $\mathrm{Y2}^{-} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N51.14.251 $\mathrm{Y2}^{-} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N51.14.252 $\mathrm{Y2}^{-} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N51.14.253 $\mathrm{Y2}^{-} \oplus \mathrm{B1}$	$\surd$	1	1	$\times$	-	-
N51.14.254 $\mathrm{Y2}^{-} \oplus \mathrm{B2}$	$\surd$	1	1	$\times$	-	-
N51.14.255 $\mathrm{Y2}^{-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.14.256 $\mathrm{Y2}^{-} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.14.257 $\mathrm{Y2}^{-} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.14.258 $\mathrm{Y2}^{-} \oplus \mathrm{LD4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.14.259 $\mathrm{Y2}^{-} \oplus \mathrm{H1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.14.260 $\mathrm{Y2}^{-} \oplus \mathrm{H3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.14.261 $\mathrm{Y2}^{-} \oplus \mathrm{H2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.14.262 $\mathrm{Y2}^{-} \oplus \mathrm{H4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N51.14.263 $\mathrm{Z1}^{+} \oplus \mathrm{SM1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N51.14.264 $\mathrm{Z1}^{+} \oplus \mathrm{SM2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N51.14.265 $\mathrm{Z1}^{+} \oplus \mathrm{A1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N51.14.266 $\mathrm{Z1}^{+} \oplus \mathrm{A2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N51.14.267 $\mathrm{Z1}^{+} \oplus \mathrm{C1}$	$\surd$	1	1	$\times$	-	-
N51.14.268 $\mathrm{Z1}^{+} \oplus \mathrm{E1}$	$\surd$	1	1	$\times$	-	-
N51.14.269 $\mathrm{Z1}^{+} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N51.14.270 $\mathrm{Z1}^{+} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$

Non-coplanar SSGs with parent space group $Pmma$ (No. 51) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N51.14.271 $Z1^{+}\oplus DT3$	$\surd$	1	1	$\surd$	mmm	$B2_{u}$
N51.14.272 $Z1^{+}\oplus DT4$	$\surd$	1	1	$\surd$	mmm	$B2_{u}$
N51.14.273 $Z1^{+}\oplus B1$	$\surd$	1	1	$\surd$	mmm	$B2_{u}$
N51.14.274 $Z1^{+}\oplus B3$	$\surd$	1	1	$\surd$	mmm	$B2_{u}$
N51.14.275 $Z1^{+}\oplus B2$	$\surd$	1	1	$\surd$	mmm	$B2_{u}$
N51.14.276 $Z1^{+}\oplus B4$	$\surd$	1	1	$\surd$	mmm	$B2_{u}$
N51.14.277 $Z1^{+}\oplus LD1$	$\surd$	1	1	$\surd$	mmm	$B1_{u}$
N51.14.278 $Z1^{+}\oplus LD2$	$\surd$	1	1	$\surd$	mmm	$B1_{u}$
N51.14.279 $Z1^{+}\oplus LD3$	$\surd$	1	1	$\surd$	mmm	$B1_{u}$
N51.14.280 $Z1^{+}\oplus LD4$	$\surd$	1	1	$\surd$	mmm	$B1_{u}$
N51.14.281 $Z1^{+}\oplus H1$	$\surd$	1	1	$\times$	-	-
N51.14.282 $Z1^{+}\oplus H2$	$\surd$	1	1	$\times$	-	-
N51.14.283 $Z1^{-}\oplus SM1$	$\surd$	1	1	$\surd$	mmm	$B3_{u}$
N51.14.284 $Z1^{-}\oplus SM2$	$\surd$	1	1	$\surd$	mmm	$B3_{u}$
N51.14.285 $Z1^{-}\oplus A1$	$\surd$	1	1	$\surd$	mmm	$B3_{u}$
N51.14.286 $Z1^{-}\oplus A2$	$\surd$	1	1	$\surd$	mmm	$B3_{u}$
N51.14.287 $Z1^{-}\oplus C1$	$\surd$	1	1	$\times$	-	-
N51.14.288 $Z1^{-}\oplus E1$	$\surd$	1	1	$\times$	-	-
N51.14.289 $Z1^{-}\oplus DT1$	$\surd$	1	1	$\surd$	mmm	$B2_{u}$
N51.14.290 $Z1^{-}\oplus DT2$	$\surd$	1	1	$\surd$	mmm	$B2_{u}$
N51.14.291 $Z1^{-}\oplus DT3$	$\surd$	1	1	$\surd$	mmm	$B2_{u}$
N51.14.292 $Z1^{-}\oplus DT4$	$\surd$	1	1	$\surd$	mmm	$B2_{u}$
N51.14.293 $Z1^{-}\oplus B1$	$\surd$	1	1	$\surd$	mmm	$B2_{u}$
N51.14.294 $Z1^{-}\oplus B3$	$\surd$	1	1	$\surd$	mmm	$B2_{u}$
N51.14.295 $Z1^{-}\oplus B2$	$\surd$	1	1	$\surd$	mmm	$B2_{u}$
N51.14.296 $Z1^{-}\oplus B4$	$\surd$	1	1	$\surd$	mmm	$B2_{u}$
N51.14.297 $Z1^{-}\oplus LD1$	$\surd$	1	1	$\surd$	mmm	$B1_{u}$
N51.14.298 $Z1^{-}\oplus LD2$	$\surd$	1	1	$\surd$	mmm	$B1_{u}$
N51.14.299 $Z1^{-}\oplus LD3$	$\surd$	1	1	$\surd$	mmm	$B1_{u}$
N51.14.300 $Z1^{-}\oplus LD4$	$\surd$	1	1	$\surd$	mmm	$B1_{u}$
N51.14.301 $Z1^{-}\oplus H1$	$\surd$	1	1	$\times$	-	-
N51.14.302 $Z1^{-}\oplus H2$	$\surd$	1	1	$\times$	-	-
N51.14.303 $Z3^{+}\oplus SM1$	$\surd$	1	1	$\surd$	mmm	$B3_{u}$
N51.14.304 $Z3^{+}\oplus SM2$	$\surd$	1	1	$\surd$	mmm	$B3_{u}$
N51.14.305 $Z3^{+}\oplus A1$	$\surd$	1	1	$\surd$	mmm	$B3_{u}$
N51.14.306 $Z3^{+}\oplus A2$	$\surd$	1	1	$\surd$	mmm	$B3_{u}$
N51.14.307 $Z3^{+}\oplus C1$	$\surd$	1	1	$\times$	-	-
N51.14.308 $Z3^{+}\oplus E1$	$\surd$	1	1	$\times$	-	-
N51.14.309 $Z3^{+}\oplus DT1$	$\surd$	1	1	$\surd$	mmm	$B2_{u}$
N51.14.310 $Z3^{+}\oplus DT2$	$\surd$	1	1	$\surd$	mmm	$B2_{u}$
N51.14.311 $Z3^{+}\oplus DT3$	$\surd$	1	1	$\surd$	mmm	$B2_{u}$
N51.14.312 $Z3^{+}\oplus DT4$	$\surd$	1	1	$\surd$	mmm	$B2_{u}$
N51.14.313 $Z3^{+}\oplus B1$	$\surd$	1	1	$\surd$	mmm	$B2_{u}$
N51.14.314 $Z3^{+}\oplus B3$	$\surd$	1	1	$\surd$	mmm	$B2_{u}$
N51.14.315 $Z3^{+}\oplus B2$	$\surd$	1	1	$\surd$	mmm	$B2_{u}$
N51.14.316 $Z3^{+}\oplus B4$	$\surd$	1	1	$\surd$	mmm	$B2_{u}$

Non-coplanar SSGs with parent space group $Pmma$ (No. 51) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N51.14.317 Z3$^+$ ⊕ LD1	√	1	1	√	mmm	$\mathrm{B1_u}$
N51.14.318 Z3$^+$ ⊕ LD2	√	1	1	√	mmm	$\mathrm{B1_u}$
N51.14.319 Z3$^+$ ⊕ LD3	√	1	1	√	mmm	$\mathrm{B1_u}$
N51.14.320 Z3$^+$ ⊕ LD4	√	1	1	√	mmm	$\mathrm{B1_u}$
N51.14.321 Z3$^+$ ⊕ H1	√	1	1	×	-	-
N51.14.322 Z3$^+$ ⊕ H2	√	1	1	×	-	-
N51.14.323 Z3$^-$ ⊕ SM1	√	1	1	√	mmm	$\mathrm{B3_u}$
N51.14.324 Z3$^-$ ⊕ SM2	√	1	1	√	mmm	$\mathrm{B3_u}$
N51.14.325 Z3$^-$ ⊕ A1	√	1	1	√	mmm	$\mathrm{B3_u}$
N51.14.326 Z3$^-$ ⊕ A2	√	1	1	√	mmm	$\mathrm{B3_u}$
N51.14.327 Z3$^-$ ⊕ C1	√	1	1	×	-	-
N51.14.328 Z3$^-$ ⊕ E1	√	1	1	×	-	-
N51.14.329 Z3$^-$ ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N51.14.330 Z3$^-$ ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
N51.14.331 Z3$^-$ ⊕ DT3	√	1	1	√	mmm	$\mathrm{B2_u}$
N51.14.332 Z3$^-$ ⊕ DT4	√	1	1	√	mmm	$\mathrm{B2_u}$
N51.14.333 Z3$^-$ ⊕ B1	√	1	1	√	mmm	$\mathrm{B2_u}$
N51.14.334 Z3$^-$ ⊕ B3	√	1	1	√	mmm	$\mathrm{B2_u}$
N51.14.335 Z3$^-$ ⊕ B2	√	1	1	√	mmm	$\mathrm{B2_u}$
N51.14.336 Z3$^-$ ⊕ B4	√	1	1	√	mmm	$\mathrm{B2_u}$
N51.14.337 Z3$^-$ ⊕ LD1	√	1	1	√	mmm	$\mathrm{B1_u}$
N51.14.338 Z3$^-$ ⊕ LD2	√	1	1	√	mmm	$\mathrm{B1_u}$
N51.14.339 Z3$^-$ ⊕ LD3	√	1	1	√	mmm	$\mathrm{B1_u}$
N51.14.340 Z3$^-$ ⊕ LD4	√	1	1	√	mmm	$\mathrm{B1_u}$
N51.14.341 Z3$^-$ ⊕ H1	√	1	1	×	-	-
N51.14.342 Z3$^-$ ⊕ H2	√	1	1	×	-	-

TABLE S154: Collinear SSGs with parent space group $Pnna$ (No. 52).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L52.1.1 GM1$^+$	1	mmm	$\mathrm{A_g}$
L52.2.1 GM1$^-$	0	-	-
L52.2.2 GM2$^+$	1	mmm	$\mathrm{B1_g}$
L52.2.3 GM2$^-$	0	-	-
L52.2.4 GM3$^+$	1	mmm	$\mathrm{B3_g}$
L52.2.5 GM3$^-$	0	-	-
L52.2.6 GM4$^+$	1	mmm	$\mathrm{B2_g}$
L52.2.7 GM4$^-$	0	-	-

TABLE S155: Coplanar SSGs with parent space group $Pnna$ (No. 52).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P52.1.1 GM1$^+$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
P52.2.1 GM1$^-$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
P52.2.2 GM2$^+$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
P52.2.3 GM2$^-$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$

Coplanar SSGs with parent space group $Pnna$ (No. 52) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P52.2.4 $\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g}$
P52.2.5 $\mathrm{GM3}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u}$
P52.2.6 $\mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B2_g}$
P52.2.7 $\mathrm{GM4}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B2_u}$
P52.3.1 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-}$	$\surd$	0	0	$\surd$	-	-
P52.3.2 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
P52.3.3 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
P52.3.4 $\mathrm{GM1}^{-} \oplus \mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u}$
P52.3.5 $\mathrm{GM1}^{-} \oplus \mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
P52.3.6 $\mathrm{GM1}^{-} \oplus \mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_g} \oplus \mathrm{B2_u}$
P52.3.7 $\mathrm{GM1}^{-} \oplus \mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
P52.3.8 $\mathrm{GM2}^{+} \oplus \mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
P52.3.9 $\mathrm{GM2}^{+} \oplus \mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
P52.3.10 $\mathrm{GM2}^{+} \oplus \mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
P52.3.11 $\mathrm{GM2}^{+} \oplus \mathrm{GM3}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
P52.3.12 $\mathrm{GM2}^{+} \oplus \mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
P52.3.13 $\mathrm{GM2}^{+} \oplus \mathrm{GM4}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_u}$
P52.3.14 $\mathrm{GM2}^{-} \oplus \mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
P52.3.15 $\mathrm{GM2}^{-} \oplus \mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
P52.3.16 $\mathrm{GM2}^{-} \oplus \mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
P52.3.17 $\mathrm{GM2}^{-} \oplus \mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_g}$
P52.3.18 $\mathrm{GM2}^{-} \oplus \mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
P52.3.19 $\mathrm{GM3}^{+} \oplus \mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
P52.3.20 $\mathrm{GM3}^{+} \oplus \mathrm{GM3}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
P52.3.21 $\mathrm{GM3}^{+} \oplus \mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g}$
P52.3.22 $\mathrm{GM3}^{+} \oplus \mathrm{GM4}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
P52.3.23 $\mathrm{GM3}^{-} \oplus \mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
P52.3.24 $\mathrm{GM3}^{-} \oplus \mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g}$
P52.3.25 $\mathrm{GM3}^{-} \oplus \mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
P52.3.26 $\mathrm{GM4}^{+} \oplus \mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_g} \oplus \mathrm{B2_g}$
P52.3.27 $\mathrm{GM4}^{+} \oplus \mathrm{GM4}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B2_g}$
P52.3.28 $\mathrm{GM4}^{-} \oplus \mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
P52.6.1 R1	$\surd$	1	1	$\times$	-	-
P52.6.2 $\mathrm{T1}^{+}$	$\surd$	1	0	$\times$	-	-
P52.6.3 U1	$\surd$	1	1	$\times$	-	-
P52.6.4 X1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P52.6.5 X2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P52.6.6 Y1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P52.6.7 Y2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P52.6.8 Z1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P52.6.9 Z2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P52.8.1 SM1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P52.8.2 SM3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P52.8.3 DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P52.8.4 DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P52.8.5 P1	$\surd$	1	1	$\times$	-	-

Coplanar SSGs with parent space group $Pnna$ (No. 52) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P52.8.6 LD1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P52.8.7 LD3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$

TABLE S156: Non-coplanar SSGs with parent space group $Pnna$ (No. 52).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N52.1.1 $\mathrm{GM1^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g\oplus A_g\oplus A_g}$
N52.2.1 $\mathrm{GM1^-}$	$\surd$	2	2	$\surd$	222	$\mathrm{A1\oplus A1}$
N52.2.2 $\mathrm{GM2^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g\oplus A_g\oplus B1_g}$
N52.2.3 $\mathrm{GM2^-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1\oplus A1}$
N52.2.4 $\mathrm{GM3^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g\oplus A_g\oplus B3_g}$
N52.2.5 $\mathrm{GM3^-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1\oplus A1}$
N52.2.6 $\mathrm{GM4^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g\oplus A_g\oplus B2_g}$
N52.2.7 $\mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1\oplus A1}$
N52.3.1 $\mathrm{GM1^-\oplus GM1^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g\oplus A_u\oplus A_u}$
N52.3.2 $\mathrm{GM1^-\oplus GM2^+}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1\oplus A2}$
N52.3.3 $\mathrm{GM1^-\oplus GM2^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g\oplus A_u\oplus B1_u}$
N52.3.4 $\mathrm{GM1^-\oplus GM3^+}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1\oplus A2}$
N52.3.5 $\mathrm{GM1^-\oplus GM3^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g\oplus A_u\oplus B3_u}$
N52.3.6 $\mathrm{GM1^-\oplus GM4^+}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1\oplus A2}$
N52.3.7 $\mathrm{GM1^-\oplus GM4^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g\oplus A_u\oplus B2_u}$
N52.3.8 $\mathrm{GM2^+\oplus GM2^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g\oplus B1_g\oplus B1_g}$
N52.3.9 $\mathrm{GM2^+\oplus GM2^-}$	$\surd$	2	2	$\surd$	222	$\mathrm{A1\oplus B1}$
N52.3.10 $\mathrm{GM2^+\oplus GM3^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g\oplus B1_g\oplus B3_g}$
N52.3.11 $\mathrm{GM2^+\oplus GM3^-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1\oplus B1}$
N52.3.12 $\mathrm{GM2^+\oplus GM4^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g\oplus B1_g\oplus B2_g}$
N52.3.13 $\mathrm{GM2^+\oplus GM4^-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1\oplus B2}$
N52.3.14 $\mathrm{GM2^-\oplus GM2^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g\oplus B1_u\oplus B1_u}$
N52.3.15 $\mathrm{GM2^-\oplus GM3^+}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1\oplus B2}$
N52.3.16 $\mathrm{GM2^-\oplus GM3^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g\oplus B1_u\oplus B3_u}$
N52.3.17 $\mathrm{GM2^-\oplus GM4^+}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1\oplus B1}$
N52.3.18 $\mathrm{GM2^-\oplus GM4^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g\oplus B1_u\oplus B2_u}$
N52.3.19 $\mathrm{GM3^+\oplus GM3^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g\oplus B3_g\oplus B3_g}$
N52.3.20 $\mathrm{GM3^+\oplus GM3^-}$	$\surd$	2	2	$\surd$	222	$\mathrm{A1\oplus B3}$
N52.3.21 $\mathrm{GM3^+\oplus GM4^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g\oplus B3_g\oplus B2_g}$
N52.3.22 $\mathrm{GM3^+\oplus GM4^-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1\oplus B2}$
N52.3.23 $\mathrm{GM3^-\oplus GM3^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g\oplus B3_u\oplus B3_u}$
N52.3.24 $\mathrm{GM3^-\oplus GM4^+}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1\oplus B1}$
N52.3.25 $\mathrm{GM3^-\oplus GM4^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g\oplus B3_u\oplus B2_u}$
N52.3.26 $\mathrm{GM4^+\oplus GM4^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g\oplus B2_g\oplus B2_g}$
N52.3.27 $\mathrm{GM4^+\oplus GM4^-}$	$\surd$	2	2	$\surd$	222	$\mathrm{A1\oplus B2}$
N52.3.28 $\mathrm{GM4^-\oplus GM4^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g\oplus B2_u\oplus B2_u}$
N52.6.1 R1	$\surd$	1	1	$\surd$	$mm2$	A1
N52.6.2 $\mathrm{T1^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N52.6.3 U1	$\surd$	1	1	$\surd$	$mm2$	A1
N52.6.4 X1	$\surd$	1	1	$\surd$	$mm2$	A1

Non-coplanar SSGs with parent space group $Pnna$ (No. 52) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N52.6.5 X2	√	1	1	√	$mm2$	A1
N52.6.6 Y1	√	1	1	√	$mm2$	A1
N52.6.7 Y2	√	1	1	√	$mm2$	A1
N52.6.8 Z1	√	1	1	√	$mm2$	A1
N52.6.9 Z2	√	1	1	√	$mm2$	A1
N52.8.1 SM1	√	1	1	√	$mm2$	A1
N52.8.2 SM3	√	1	1	√	$mm2$	A1
N52.8.3 DT1	√	1	1	√	$mm2$	A1
N52.8.4 DT2	√	1	1	√	$mm2$	A1
N52.8.5 P1	√	1	1	√	$mm2$	A1
N52.8.6 LD1	√	1	1	√	$mm2$	A1
N52.8.7 LD3	√	1	1	√	$mm2$	A1
N52.9.1 $\mathrm{GM1^-}\oplus\mathrm{GM1^-}\oplus\mathrm{GM1^-}$	√	0	0	√	-	-
N52.9.2 $\mathrm{GM1^-}\oplus\mathrm{GM1^-}\oplus\mathrm{GM2^+}$	√	3	3	√	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_u}\oplus\mathrm{B1_u}$
N52.9.3 $\mathrm{GM1^-}\oplus\mathrm{GM1^-}\oplus\mathrm{GM2^-}$	√	0	0	√	-	-
N52.9.4 $\mathrm{GM1^-}\oplus\mathrm{GM1^-}\oplus\mathrm{GM3^+}$	√	3	3	√	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_u}\oplus\mathrm{B3_u}$
N52.9.5 $\mathrm{GM1^-}\oplus\mathrm{GM1^-}\oplus\mathrm{GM3^-}$	√	0	0	√	-	-
N52.9.6 $\mathrm{GM1^-}\oplus\mathrm{GM1^-}\oplus\mathrm{GM4^+}$	√	3	3	√	mmm	$\mathrm{B2_g}\oplus\mathrm{B2_u}\oplus\mathrm{B2_u}$
N52.9.7 $\mathrm{GM1^-}\oplus\mathrm{GM1^-}\oplus\mathrm{GM4^-}$	√	0	0	√	-	-
N52.9.8 $\mathrm{GM1^-}\oplus\mathrm{GM2^+}\oplus\mathrm{GM2^+}$	√	2	2	√	222	$\mathrm{B1}\oplus\mathrm{B1}$
N52.9.9 $\mathrm{GM1^-}\oplus\mathrm{GM2^+}\oplus\mathrm{GM2^-}$	√	3	3	√	mmm	$\mathrm{A_u}\oplus\mathrm{B1_g}\oplus\mathrm{B1_u}$
N52.9.10 $\mathrm{GM1^-}\oplus\mathrm{GM2^+}\oplus\mathrm{GM3^+}$	√	2	2	√	$mm2$	$\mathrm{B2}\oplus\mathrm{B1}$
N52.9.11 $\mathrm{GM1^-}\oplus\mathrm{GM2^+}\oplus\mathrm{GM3^-}$	√	3	3	√	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_u}\oplus\mathrm{B2_u}$
N52.9.12 $\mathrm{GM1^-}\oplus\mathrm{GM2^+}\oplus\mathrm{GM4^+}$	√	2	2	√	$mm2$	$\mathrm{B2}\oplus\mathrm{B1}$
N52.9.13 $\mathrm{GM1^-}\oplus\mathrm{GM2^+}\oplus\mathrm{GM4^-}$	√	3	3	√	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_u}\oplus\mathrm{B3_u}$
N52.9.14 $\mathrm{GM1^-}\oplus\mathrm{GM2^-}\oplus\mathrm{GM2^-}$	√	0	0	√	-	-
N52.9.15 $\mathrm{GM1^-}\oplus\mathrm{GM2^-}\oplus\mathrm{GM3^+}$	√	3	3	√	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_u}\oplus\mathrm{B2_u}$
N52.9.16 $\mathrm{GM1^-}\oplus\mathrm{GM2^-}\oplus\mathrm{GM3^-}$	√	0	0	√	-	-
N52.9.17 $\mathrm{GM1^-}\oplus\mathrm{GM2^-}\oplus\mathrm{GM4^+}$	√	3	3	√	mmm	$\mathrm{B3_u}\oplus\mathrm{B2_g}\oplus\mathrm{B2_u}$
N52.9.18 $\mathrm{GM1^-}\oplus\mathrm{GM2^-}\oplus\mathrm{GM4^-}$	√	0	0	√	-	-
N52.9.19 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{GM3^+}$	√	2	2	√	222	$\mathrm{B3}\oplus\mathrm{B3}$
N52.9.20 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{GM3^-}$	√	3	3	√	mmm	$\mathrm{A_u}\oplus\mathrm{B3_g}\oplus\mathrm{B3_u}$
N52.9.21 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{GM4^+}$	√	2	2	√	$mm2$	$\mathrm{B2}\oplus\mathrm{B1}$
N52.9.22 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{GM4^-}$	√	3	3	√	mmm	$\mathrm{B1_u}\oplus\mathrm{B3_g}\oplus\mathrm{B3_u}$
N52.9.23 $\mathrm{GM1^-}\oplus\mathrm{GM3^-}\oplus\mathrm{GM3^-}$	√	0	0	√	-	-
N52.9.24 $\mathrm{GM1^-}\oplus\mathrm{GM3^-}\oplus\mathrm{GM4^+}$	√	3	3	√	mmm	$\mathrm{B1_u}\oplus\mathrm{B2_g}\oplus\mathrm{B2_u}$
N52.9.25 $\mathrm{GM1^-}\oplus\mathrm{GM3^-}\oplus\mathrm{GM4^-}$	√	0	0	√	-	-
N52.9.26 $\mathrm{GM1^-}\oplus\mathrm{GM4^+}\oplus\mathrm{GM4^+}$	√	2	2	√	222	$\mathrm{B2}\oplus\mathrm{B2}$
N52.9.27 $\mathrm{GM1^-}\oplus\mathrm{GM4^+}\oplus\mathrm{GM4^-}$	√	3	3	√	mmm	$\mathrm{A_u}\oplus\mathrm{B2_g}\oplus\mathrm{B2_u}$
N52.9.28 $\mathrm{GM1^-}\oplus\mathrm{GM4^-}\oplus\mathrm{GM4^-}$	√	0	0	√	-	-
N52.9.29 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{GM2^+}$	√	3	3	√	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B1_g}$
N52.9.30 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{GM2^-}$	√	2	2	√	$mm2$	$\mathrm{A2}\oplus\mathrm{A2}$
N52.9.31 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{GM3^+}$	√	3	3	√	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B3_g}$
N52.9.32 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{GM3^-}$	√	2	2	√	$mm2$	$\mathrm{B2}\oplus\mathrm{B2}$
N52.9.33 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{GM4^+}$	√	3	3	√	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B2_g}$
N52.9.34 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{GM4^-}$	√	2	2	√	$mm2$	$\mathrm{B1}\oplus\mathrm{B1}$

Non-coplanar SSGs with parent space group $Pnna$ (No. 52) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N52.9.35 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}$	√	3	3	√	mmm	$\mathrm{A_u}\oplus\mathrm{A_u}\oplus\mathrm{B1_g}$
N52.9.36 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{+}$	√	2	2	√	$mm2$	$\mathrm{A2}\oplus\mathrm{B2}$
N52.9.37 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}$	√	3	3	√	mmm	$\mathrm{A_u}\oplus\mathrm{B1_g}\oplus\mathrm{B2_u}$
N52.9.38 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}\oplus\mathrm{GM4}^{+}$	√	2	2	√	$mm2$	$\mathrm{A2}\oplus\mathrm{B1}$
N52.9.39 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}\oplus\mathrm{GM4}^{-}$	√	3	3	√	mmm	$\mathrm{A_u}\oplus\mathrm{B1_g}\oplus\mathrm{B3_u}$
N52.9.40 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{+}$	√	3	3	√	mmm	$\mathrm{B1_g}\oplus\mathrm{B3_g}\oplus\mathrm{B3_g}$
N52.9.41 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{-}$	√	2	2	√	$mm2$	$\mathrm{A2}\oplus\mathrm{B2}$
N52.9.42 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{+}\oplus\mathrm{GM4}^{+}$	√	3	3	√	mmm	$\mathrm{B1_g}\oplus\mathrm{B3_g}\oplus\mathrm{B2_g}$
N52.9.43 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{+}\oplus\mathrm{GM4}^{-}$	√	2	2	√	222	$\mathrm{B1}\oplus\mathrm{B3}$
N52.9.44 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}$	√	3	3	√	mmm	$\mathrm{B1_g}\oplus\mathrm{B2_u}\oplus\mathrm{B2_u}$
N52.9.45 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{+}$	√	2	2	√	222	$\mathrm{B1}\oplus\mathrm{B2}$
N52.9.46 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{-}$	√	3	3	√	mmm	$\mathrm{B1_g}\oplus\mathrm{B3_u}\oplus\mathrm{B2_u}$
N52.9.47 $\mathrm{GM2}^{+}\oplus\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{+}$	√	3	3	√	mmm	$\mathrm{B1_g}\oplus\mathrm{B2_g}\oplus\mathrm{B2_g}$
N52.9.48 $\mathrm{GM2}^{+}\oplus\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{-}$	√	2	2	√	$mm2$	$\mathrm{A2}\oplus\mathrm{B1}$
N52.9.49 $\mathrm{GM2}^{+}\oplus\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}$	√	3	3	√	mmm	$\mathrm{B1_g}\oplus\mathrm{B3_u}\oplus\mathrm{B3_u}$
N52.9.50 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}$	√	0	0	√	-	-
N52.9.51 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{+}$	√	3	3	√	mmm	$\mathrm{B3_g}\oplus\mathrm{B2_u}\oplus\mathrm{B2_u}$
N52.9.52 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}$	√	0	0	√	-	-
N52.9.53 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{GM4}^{+}$	√	3	3	√	mmm	$\mathrm{B3_u}\oplus\mathrm{B3_u}\oplus\mathrm{B2_g}$
N52.9.54 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{GM4}^{-}$	√	0	0	√	-	-
N52.9.55 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{+}$	√	2	2	√	$mm2$	$\mathrm{B2}\oplus\mathrm{B2}$
N52.9.56 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{-}$	√	3	3	√	mmm	$\mathrm{A_u}\oplus\mathrm{B3_g}\oplus\mathrm{B2_u}$
N52.9.57 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{+}\oplus\mathrm{GM4}^{+}$	√	2	2	√	222	$\mathrm{B3}\oplus\mathrm{B2}$
N52.9.58 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{+}\oplus\mathrm{GM4}^{-}$	√	3	3	√	mmm	$\mathrm{B1_u}\oplus\mathrm{B3_g}\oplus\mathrm{B2_u}$
N52.9.59 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}$	√	0	0	√	-	-
N52.9.60 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{+}$	√	3	3	√	mmm	$\mathrm{B1_u}\oplus\mathrm{B3_u}\oplus\mathrm{B2_g}$
N52.9.61 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{-}$	√	0	0	√	-	-
N52.9.62 $\mathrm{GM2}^{-}\oplus\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{+}$	√	2	2	√	$mm2$	$\mathrm{B1}\oplus\mathrm{B1}$
N52.9.63 $\mathrm{GM2}^{-}\oplus\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{-}$	√	3	3	√	mmm	$\mathrm{A_u}\oplus\mathrm{B3_u}\oplus\mathrm{B2_g}$
N52.9.64 $\mathrm{GM2}^{-}\oplus\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}$	√	0	0	√	-	-
N52.9.65 $\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{+}$	√	3	3	√	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_g}\oplus\mathrm{B3_g}$
N52.9.66 $\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{-}$	√	2	2	√	$mm2$	$\mathrm{A2}\oplus\mathrm{A2}$
N52.9.67 $\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{+}\oplus\mathrm{GM4}^{+}$	√	3	3	√	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_g}\oplus\mathrm{B2_g}$
N52.9.68 $\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{+}\oplus\mathrm{GM4}^{-}$	√	2	2	√	$mm2$	$\mathrm{B2}\oplus\mathrm{B2}$
N52.9.69 $\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}$	√	3	3	√	mmm	$\mathrm{A_u}\oplus\mathrm{A_u}\oplus\mathrm{B3_g}$
N52.9.70 $\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{+}$	√	2	2	√	$mm2$	$\mathrm{A2}\oplus\mathrm{B2}$
N52.9.71 $\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{-}$	√	3	3	√	mmm	$\mathrm{A_u}\oplus\mathrm{B1_u}\oplus\mathrm{B3_g}$
N52.9.72 $\mathrm{GM3}^{+}\oplus\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{+}$	√	3	3	√	mmm	$\mathrm{B3_g}\oplus\mathrm{B2_g}\oplus\mathrm{B2_g}$
N52.9.73 $\mathrm{GM3}^{+}\oplus\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{-}$	√	2	2	√	$mm2$	$\mathrm{A2}\oplus\mathrm{B1}$
N52.9.74 $\mathrm{GM3}^{+}\oplus\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}$	√	3	3	√	mmm	$\mathrm{B1_u}\oplus\mathrm{B1_u}\oplus\mathrm{B3_g}$
N52.9.75 $\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}$	√	0	0	√	-	-
N52.9.76 $\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{+}$	√	3	3	√	mmm	$\mathrm{B1_u}\oplus\mathrm{B1_u}\oplus\mathrm{B2_g}$
N52.9.77 $\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{-}$	√	0	0	√	-	-
N52.9.78 $\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{+}$	√	2	2	√	$mm2$	$\mathrm{B1}\oplus\mathrm{B1}$
N52.9.79 $\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{-}$	√	3	3	√	mmm	$\mathrm{A_u}\oplus\mathrm{B1_u}\oplus\mathrm{B2_g}$
N52.9.80 $\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}$	√	0	0	√	-	-

Non-coplanar SSGs with parent space group $Pnna$ (No. 52) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N52.9.81 $\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B2_g}\oplus\mathrm{B2_g}\oplus\mathrm{B2_g}$
N52.9.82 $\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2}\oplus\mathrm{A2}$
N52.9.83 $\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{A_u}\oplus\mathrm{B2_g}$
N52.9.84 $\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
N52.12.1 $\mathrm{GM1}^{-}\oplus\mathrm{R1}$	$\surd$	1	1	$\times$	-	-
N52.12.2 $\mathrm{GM1}^{-}\oplus\mathrm{T1}^{+}$	$\surd$	1	0	$\times$	-	-
N52.12.3 $\mathrm{GM1}^{-}\oplus\mathrm{U1}$	$\surd$	1	1	$\times$	-	-
N52.12.4 $\mathrm{GM1}^{-}\oplus\mathrm{X1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N52.12.5 $\mathrm{GM1}^{-}\oplus\mathrm{X2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N52.12.6 $\mathrm{GM1}^{-}\oplus\mathrm{Y1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N52.12.7 $\mathrm{GM1}^{-}\oplus\mathrm{Y2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N52.12.8 $\mathrm{GM1}^{-}\oplus\mathrm{Z1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N52.12.9 $\mathrm{GM1}^{-}\oplus\mathrm{Z2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N52.12.10 $\mathrm{GM2}^{+}\oplus\mathrm{R1}$	$\surd$	1	1	$\times$	-	-
N52.12.11 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{+}$	$\surd$	1	1	$\times$	-	-
N52.12.12 $\mathrm{GM2}^{+}\oplus\mathrm{U1}$	$\surd$	1	1	$\times$	-	-
N52.12.13 $\mathrm{GM2}^{+}\oplus\mathrm{X1}$	$\surd$	1	1	$\surd$	$mm2$	B1
N52.12.14 $\mathrm{GM2}^{+}\oplus\mathrm{X2}$	$\surd$	1	1	$\surd$	$mm2$	B1
N52.12.15 $\mathrm{GM2}^{+}\oplus\mathrm{Y1}$	$\surd$	1	1	$\surd$	$mm2$	B2
N52.12.16 $\mathrm{GM2}^{+}\oplus\mathrm{Y2}$	$\surd$	1	1	$\surd$	$mm2$	B2
N52.12.17 $\mathrm{GM2}^{+}\oplus\mathrm{Z1}$	$\surd$	1	1	$\surd$	222	B1
N52.12.18 $\mathrm{GM2}^{+}\oplus\mathrm{Z2}$	$\surd$	1	1	$\surd$	222	B1
N52.12.19 $\mathrm{GM2}^{-}\oplus\mathrm{R1}$	$\surd$	1	1	$\times$	-	-
N52.12.20 $\mathrm{GM2}^{-}\oplus\mathrm{T1}^{+}$	$\surd$	1	0	$\times$	-	-
N52.12.21 $\mathrm{GM2}^{-}\oplus\mathrm{U1}$	$\surd$	1	1	$\times$	-	-
N52.12.22 $\mathrm{GM2}^{-}\oplus\mathrm{X1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N52.12.23 $\mathrm{GM2}^{-}\oplus\mathrm{X2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N52.12.24 $\mathrm{GM2}^{-}\oplus\mathrm{Y1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N52.12.25 $\mathrm{GM2}^{-}\oplus\mathrm{Y2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N52.12.26 $\mathrm{GM2}^{-}\oplus\mathrm{Z1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N52.12.27 $\mathrm{GM2}^{-}\oplus\mathrm{Z2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N52.12.28 $\mathrm{GM3}^{+}\oplus\mathrm{R1}$	$\surd$	1	1	$\times$	-	-
N52.12.29 $\mathrm{GM3}^{+}\oplus\mathrm{T1}^{+}$	$\surd$	1	1	$\times$	-	-
N52.12.30 $\mathrm{GM3}^{+}\oplus\mathrm{U1}$	$\surd$	1	1	$\times$	-	-
N52.12.31 $\mathrm{GM3}^{+}\oplus\mathrm{X1}$	$\surd$	1	1	$\surd$	222	B3
N52.12.32 $\mathrm{GM3}^{+}\oplus\mathrm{X2}$	$\surd$	1	1	$\surd$	222	B3
N52.12.33 $\mathrm{GM3}^{+}\oplus\mathrm{Y1}$	$\surd$	1	1	$\surd$	$mm2$	B2
N52.12.34 $\mathrm{GM3}^{+}\oplus\mathrm{Y2}$	$\surd$	1	1	$\surd$	$mm2$	B2
N52.12.35 $\mathrm{GM3}^{+}\oplus\mathrm{Z1}$	$\surd$	1	1	$\surd$	$mm2$	B2
N52.12.36 $\mathrm{GM3}^{+}\oplus\mathrm{Z2}$	$\surd$	1	1	$\surd$	$mm2$	B2
N52.12.37 $\mathrm{GM3}^{-}\oplus\mathrm{R1}$	$\surd$	1	1	$\times$	-	-
N52.12.38 $\mathrm{GM3}^{-}\oplus\mathrm{T1}^{+}$	$\surd$	1	0	$\times$	-	-
N52.12.39 $\mathrm{GM3}^{-}\oplus\mathrm{U1}$	$\surd$	1	1	$\times$	-	-
N52.12.40 $\mathrm{GM3}^{-}\oplus\mathrm{X1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N52.12.41 $\mathrm{GM3}^{-}\oplus\mathrm{X2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N52.12.42 $\mathrm{GM3}^{-}\oplus\mathrm{Y1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$

Non-coplanar SSGs with parent space group $Pnna$ (No. 52) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N52.12.43 GM3$^-$ ⊕ Y2	√	1	1	√	mmm	B2$_\mathrm{u}$
N52.12.44 GM3$^-$ ⊕ Z1	√	1	1	√	mmm	B1$_\mathrm{u}$
N52.12.45 GM3$^-$ ⊕ Z2	√	1	1	√	mmm	B1$_\mathrm{u}$
N52.12.46 GM4$^+$ ⊕ R1	√	1	1	×	-	-
N52.12.47 GM4$^+$ ⊕ T1$^+$	√	1	1	×	-	-
N52.12.48 GM4$^+$ ⊕ U1	√	1	1	×	-	-
N52.12.49 GM4$^+$ ⊕ X1	√	1	1	√	$mm2$	B1
N52.12.50 GM4$^+$ ⊕ X2	√	1	1	√	$mm2$	B1
N52.12.51 GM4$^+$ ⊕ Y1	√	1	1	√	222	B2
N52.12.52 GM4$^+$ ⊕ Y2	√	1	1	√	222	B2
N52.12.53 GM4$^+$ ⊕ Z1	√	1	1	√	$mm2$	B1
N52.12.54 GM4$^+$ ⊕ Z2	√	1	1	√	$mm2$	B1
N52.12.55 GM4$^-$ ⊕ R1	√	1	1	×	-	-
N52.12.56 GM4$^-$ ⊕ T1$^+$	√	1	0	×	-	-
N52.12.57 GM4$^-$ ⊕ U1	√	1	1	×	-	-
N52.12.58 GM4$^-$ ⊕ X1	√	1	1	√	mmm	B3$_\mathrm{u}$
N52.12.59 GM4$^-$ ⊕ X2	√	1	1	√	mmm	B3$_\mathrm{u}$
N52.12.60 GM4$^-$ ⊕ Y1	√	1	1	√	mmm	B2$_\mathrm{u}$
N52.12.61 GM4$^-$ ⊕ Y2	√	1	1	√	mmm	B2$_\mathrm{u}$
N52.12.62 GM4$^-$ ⊕ Z1	√	1	1	√	mmm	B1$_\mathrm{u}$
N52.12.63 GM4$^-$ ⊕ Z2	√	1	1	√	mmm	B1$_\mathrm{u}$
N52.14.1 GM1$^-$ ⊕ SM1	√	1	1	√	mmm	B3$_\mathrm{u}$
N52.14.2 GM1$^-$ ⊕ SM3	√	1	1	√	mmm	B3$_\mathrm{u}$
N52.14.3 GM1$^-$ ⊕ DT1	√	1	1	√	mmm	B2$_\mathrm{u}$
N52.14.4 GM1$^-$ ⊕ DT2	√	1	1	√	mmm	B2$_\mathrm{u}$
N52.14.5 GM1$^-$ ⊕ P1	√	1	1	×	-	-
N52.14.6 GM1$^-$ ⊕ LD1	√	1	1	√	mmm	B1$_\mathrm{u}$
N52.14.7 GM1$^-$ ⊕ LD3	√	1	1	√	mmm	B1$_\mathrm{u}$
N52.14.8 GM2$^+$ ⊕ SM1	√	1	1	√	$mm2$	B1
N52.14.9 GM2$^+$ ⊕ SM3	√	1	1	√	$mm2$	B1
N52.14.10 GM2$^+$ ⊕ DT1	√	1	1	√	$mm2$	B2
N52.14.11 GM2$^+$ ⊕ DT2	√	1	1	√	$mm2$	B2
N52.14.12 GM2$^+$ ⊕ P1	√	1	1	×	-	-
N52.14.13 GM2$^+$ ⊕ LD1	√	1	1	√	222	B1
N52.14.14 GM2$^+$ ⊕ LD3	√	1	1	√	222	B1
N52.14.15 GM2$^-$ ⊕ SM1	√	1	1	√	mmm	B3$_\mathrm{u}$
N52.14.16 GM2$^-$ ⊕ SM3	√	1	1	√	mmm	B3$_\mathrm{u}$
N52.14.17 GM2$^-$ ⊕ DT1	√	1	1	√	mmm	B2$_\mathrm{u}$
N52.14.18 GM2$^-$ ⊕ DT2	√	1	1	√	mmm	B2$_\mathrm{u}$
N52.14.19 GM2$^-$ ⊕ P1	√	1	1	×	-	-
N52.14.20 GM2$^-$ ⊕ LD1	√	1	1	√	mmm	B1$_\mathrm{u}$
N52.14.21 GM2$^-$ ⊕ LD3	√	1	1	√	mmm	B1$_\mathrm{u}$
N52.14.22 GM3$^+$ ⊕ SM1	√	1	1	√	222	B3
N52.14.23 GM3$^+$ ⊕ SM3	√	1	1	√	222	B3
N52.14.24 GM3$^+$ ⊕ DT1	√	1	1	√	$mm2$	B2
N52.14.25 GM3$^+$ ⊕ DT2	√	1	1	√	$mm2$	B2

Non-coplanar SSGs with parent space group $Pnna$ (No. 52) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N52.14.26 GM3$^+$ ⊕ P1	√	1	1	×	-	-
N52.14.27 GM3$^+$ ⊕ LD1	√	1	1	√	$mm2$	B2
N52.14.28 GM3$^+$ ⊕ LD3	√	1	1	√	$mm2$	B2
N52.14.29 GM3$^-$ ⊕ SM1	√	1	1	√	mmm	$\mathrm{B3_u}$
N52.14.30 GM3$^-$ ⊕ SM3	√	1	1	√	mmm	$\mathrm{B3_u}$
N52.14.31 GM3$^-$ ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N52.14.32 GM3$^-$ ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
N52.14.33 GM3$^-$ ⊕ P1	√	1	1	×	-	-
N52.14.34 GM3$^-$ ⊕ LD1	√	1	1	√	mmm	$\mathrm{B1_u}$
N52.14.35 GM3$^-$ ⊕ LD3	√	1	1	√	mmm	$\mathrm{B1_u}$
N52.14.36 GM4$^+$ ⊕ SM1	√	1	1	√	$mm2$	B1
N52.14.37 GM4$^+$ ⊕ SM3	√	1	1	√	$mm2$	B1
N52.14.38 GM4$^+$ ⊕ DT1	√	1	1	√	222	B2
N52.14.39 GM4$^+$ ⊕ DT2	√	1	1	√	222	B2
N52.14.40 GM4$^+$ ⊕ P1	√	1	1	×	-	-
N52.14.41 GM4$^+$ ⊕ LD1	√	1	1	√	$mm2$	B1
N52.14.42 GM4$^+$ ⊕ LD3	√	1	1	√	$mm2$	B1
N52.14.43 GM4$^-$ ⊕ SM1	√	1	1	√	mmm	$\mathrm{B3_u}$
N52.14.44 GM4$^-$ ⊕ SM3	√	1	1	√	mmm	$\mathrm{B3_u}$
N52.14.45 GM4$^-$ ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N52.14.46 GM4$^-$ ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
N52.14.47 GM4$^-$ ⊕ P1	√	1	1	×	-	-
N52.14.48 GM4$^-$ ⊕ LD1	√	1	1	√	mmm	$\mathrm{B1_u}$
N52.14.49 GM4$^-$ ⊕ LD3	√	1	1	√	mmm	$\mathrm{B1_u}$

TABLE S157: Collinear SSGs with parent space group $Pmna$ (No. 53).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L53.1.1 GM1$^+$	1	mmm	$\mathrm{A_g}$
L53.2.1 GM1$^-$	0	-	-
L53.2.2 GM2$^+$	1	mmm	$\mathrm{B1_g}$
L53.2.3 GM2$^-$	0	-	-
L53.2.4 GM3$^+$	1	mmm	$\mathrm{B3_g}$
L53.2.5 GM3$^-$	0	-	-
L53.2.6 GM4$^+$	1	mmm	$\mathrm{B2_g}$
L53.2.7 GM4$^-$	0	-	-
L53.2.8 Y1$^+$	0	-	-
L53.2.9 Y1$^-$	0	-	-
L53.2.10 Y2$^+$	0	-	-
L53.2.11 Y2$^-$	0	-	-

TABLE S158: Coplanar SSGs with parent space group $Pmna$ (No. 53).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P53.1.1 GM1$^+$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$

Coplanar SSGs with parent space group $Pmna$ (No. 53) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P53.2.1 $\mathrm{GM1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
P53.2.2 $\mathrm{GM2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
P53.2.3 $\mathrm{GM2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
P53.2.4 $\mathrm{GM3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g}$
P53.2.5 $\mathrm{GM3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u}$
P53.2.6 $\mathrm{GM4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B2_g}$
P53.2.7 $\mathrm{GM4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B2_u}$
P53.2.8 $\mathrm{Y1}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P53.2.9 $\mathrm{Y1}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P53.2.10 $\mathrm{Y2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P53.2.11 $\mathrm{Y2}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P53.3.1 $\mathrm{GM1}^- \oplus \mathrm{GM1}^-$	$\surd$	0	0	$\surd$	-	-
P53.3.2 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
P53.3.3 $\mathrm{GM1}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
P53.3.4 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u}$
P53.3.5 $\mathrm{GM1}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
P53.3.6 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_g} \oplus \mathrm{B2_u}$
P53.3.7 $\mathrm{GM1}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
P53.3.8 $\mathrm{GM1}^- \oplus \mathrm{Y1}^+$	$\surd$	1	1	$\times$	-	-
P53.3.9 $\mathrm{GM1}^- \oplus \mathrm{Y1}^-$	$\surd$	1	1	$\times$	-	-
P53.3.10 $\mathrm{GM1}^- \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\times$	-	-
P53.3.11 $\mathrm{GM1}^- \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\times$	-	-
P53.3.12 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
P53.3.13 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
P53.3.14 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
P53.3.15 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
P53.3.16 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
P53.3.17 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_u}$
P53.3.18 $\mathrm{GM2}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	0	$\times$	-	-
P53.3.19 $\mathrm{GM2}^+ \oplus \mathrm{Y1}^-$	$\surd$	1	0	$\times$	-	-
P53.3.20 $\mathrm{GM2}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
P53.3.21 $\mathrm{GM2}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
P53.3.22 $\mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
P53.3.23 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
P53.3.24 $\mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
P53.3.25 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_g}$
P53.3.26 $\mathrm{GM2}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
P53.3.27 $\mathrm{GM2}^- \oplus \mathrm{Y1}^+$	$\surd$	1	1	$\times$	-	-
P53.3.28 $\mathrm{GM2}^- \oplus \mathrm{Y1}^-$	$\surd$	1	1	$\times$	-	-
P53.3.29 $\mathrm{GM2}^- \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\times$	-	-
P53.3.30 $\mathrm{GM2}^- \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\times$	-	-
P53.3.31 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
P53.3.32 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
P53.3.33 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g}$
P53.3.34 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
P53.3.35 $\mathrm{GM3}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	0	$\times$	-	-

Coplanar SSGs with parent space group $Pmna$ (No. 53) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P53.3.36 $\mathrm{GM3}^{+} \oplus \mathrm{Y1}^{-}$	$\surd$	1	0	$\times$	-	-
P53.3.37 $\mathrm{GM3}^{+} \oplus \mathrm{Y2}^{+}$	$\surd$	1	0	$\times$	-	-
P53.3.38 $\mathrm{GM3}^{+} \oplus \mathrm{Y2}^{-}$	$\surd$	1	0	$\times$	-	-
P53.3.39 $\mathrm{GM3}^{-} \oplus \mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
P53.3.40 $\mathrm{GM3}^{-} \oplus \mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g}$
P53.3.41 $\mathrm{GM3}^{-} \oplus \mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
P53.3.42 $\mathrm{GM3}^{-} \oplus \mathrm{Y1}^{+}$	$\surd$	1	1	$\times$	-	-
P53.3.43 $\mathrm{GM3}^{-} \oplus \mathrm{Y1}^{-}$	$\surd$	1	1	$\times$	-	-
P53.3.44 $\mathrm{GM3}^{-} \oplus \mathrm{Y2}^{+}$	$\surd$	1	1	$\times$	-	-
P53.3.45 $\mathrm{GM3}^{-} \oplus \mathrm{Y2}^{-}$	$\surd$	1	1	$\times$	-	-
P53.3.46 $\mathrm{GM4}^{+} \oplus \mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_g} \oplus \mathrm{B2_g}$
P53.3.47 $\mathrm{GM4}^{+} \oplus \mathrm{GM4}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B2_g}$
P53.3.48 $\mathrm{GM4}^{+} \oplus \mathrm{Y1}^{+}$	$\surd$	1	0	$\times$	-	-
P53.3.49 $\mathrm{GM4}^{+} \oplus \mathrm{Y1}^{-}$	$\surd$	1	0	$\times$	-	-
P53.3.50 $\mathrm{GM4}^{+} \oplus \mathrm{Y2}^{+}$	$\surd$	1	0	$\times$	-	-
P53.3.51 $\mathrm{GM4}^{+} \oplus \mathrm{Y2}^{-}$	$\surd$	1	0	$\times$	-	-
P53.3.52 $\mathrm{GM4}^{-} \oplus \mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
P53.3.53 $\mathrm{GM4}^{-} \oplus \mathrm{Y1}^{+}$	$\surd$	1	1	$\times$	-	-
P53.3.54 $\mathrm{GM4}^{-} \oplus \mathrm{Y1}^{-}$	$\surd$	1	1	$\times$	-	-
P53.3.55 $\mathrm{GM4}^{-} \oplus \mathrm{Y2}^{+}$	$\surd$	1	1	$\times$	-	-
P53.3.56 $\mathrm{GM4}^{-} \oplus \mathrm{Y2}^{-}$	$\surd$	1	1	$\times$	-	-
P53.3.57 $\mathrm{Y1}^{+} \oplus \mathrm{Y1}^{+}$	$\surd$	1	0	$\times$	-	-
P53.3.58 $\mathrm{Y1}^{+} \oplus \mathrm{Y4}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P53.3.59 $\mathrm{Y1}^{+} \oplus \mathrm{Y1}^{-}$	$\surd$	1	1	$\times$	-	-
P53.3.60 $\mathrm{Y1}^{+} \oplus \mathrm{Y4}^{+}$	$\surd$	1	0	$\times$	-	-
P53.3.61 $\mathrm{Y1}^{+} \oplus \mathrm{Y2}^{+}$	$\surd$	1	0	$\times$	-	-
P53.3.62 $\mathrm{Y1}^{+} \oplus \mathrm{Y3}^{-}$	$\surd$	1	1	$\times$	-	-
P53.3.63 $\mathrm{Y1}^{+} \oplus \mathrm{Y2}^{-}$	$\surd$	1	1	$\times$	-	-
P53.3.64 $\mathrm{Y1}^{+} \oplus \mathrm{Y3}^{+}$	$\surd$	1	0	$\times$	-	-
P53.3.65 $\mathrm{Y1}^{-} \oplus \mathrm{Y1}^{-}$	$\surd$	1	0	$\times$	-	-
P53.3.66 $\mathrm{Y1}^{-} \oplus \mathrm{Y4}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P53.3.67 $\mathrm{Y1}^{-} \oplus \mathrm{Y2}^{+}$	$\surd$	1	1	$\times$	-	-
P53.3.68 $\mathrm{Y1}^{-} \oplus \mathrm{Y3}^{-}$	$\surd$	1	0	$\times$	-	-
P53.3.69 $\mathrm{Y1}^{-} \oplus \mathrm{Y2}^{-}$	$\surd$	1	0	$\times$	-	-
P53.3.70 $\mathrm{Y1}^{-} \oplus \mathrm{Y3}^{+}$	$\surd$	1	1	$\times$	-	-
P53.3.71 $\mathrm{Y2}^{+} \oplus \mathrm{Y2}^{+}$	$\surd$	1	0	$\times$	-	-
P53.3.72 $\mathrm{Y2}^{+} \oplus \mathrm{Y3}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P53.3.73 $\mathrm{Y2}^{+} \oplus \mathrm{Y2}^{-}$	$\surd$	1	1	$\times$	-	-
P53.3.74 $\mathrm{Y2}^{+} \oplus \mathrm{Y3}^{+}$	$\surd$	1	0	$\times$	-	-
P53.3.75 $\mathrm{Y2}^{-} \oplus \mathrm{Y2}^{-}$	$\surd$	1	0	$\times$	-	-
P53.3.76 $\mathrm{Y2}^{-} \oplus \mathrm{Y3}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P53.6.1 $\mathrm{R1}^{+}$	$\surd$	1	0	$\times$	-	-
P53.6.2 S1	$\surd$	1	1	$\times$	-	-
P53.6.3 T1	$\surd$	1	1	$\times$	-	-
P53.6.4 T2	$\surd$	1	1	$\times$	-	-
P53.6.5 $\mathrm{U1}^{+}$	$\surd$	1	0	$\times$	-	-

Coplanar SSGs with parent space group $Pmna$ (No. 53) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P53.6.6 X1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P53.6.7 X2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P53.6.8 Z1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P53.6.9 Z2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P53.8.1 SM1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P53.8.2 SM3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P53.8.3 C1	$\surd$	1	1	$\times$	-	-
P53.8.4 DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P53.8.5 DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P53.8.6 DT3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P53.8.7 DT4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P53.8.8 LD1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P53.8.9 LD2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P53.8.10 H1	$\surd$	1	1	$\times$	-	-
P53.8.11 H2	$\surd$	1	1	$\times$	-	-

TABLE S159: Non-coplanar SSGs with parent space group $Pmna$ (No. 53).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N53.1.1 $\mathrm{GM1^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g \oplus A_g \oplus A_g}$
N53.2.1 $\mathrm{GM1^-}$	$\surd$	2	2	$\surd$	222	$\mathrm{A1 \oplus A1}$
N53.2.2 $\mathrm{GM2^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g \oplus A_g \oplus B1_g}$
N53.2.3 $\mathrm{GM2^-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1 \oplus A1}$
N53.2.4 $\mathrm{GM3^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g \oplus A_g \oplus B3_g}$
N53.2.5 $\mathrm{GM3^-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1 \oplus A1}$
N53.2.6 $\mathrm{GM4^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g \oplus A_g \oplus B2_g}$
N53.2.7 $\mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1 \oplus A1}$
N53.2.8 $\mathrm{Y1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g \oplus A_g}$
N53.2.9 $\mathrm{Y1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g \oplus A_g}$
N53.2.10 $\mathrm{Y2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g \oplus A_g}$
N53.2.11 $\mathrm{Y2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g \oplus A_g}$
N53.3.1 $\mathrm{GM1^- \oplus GM1^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g \oplus A_u \oplus A_u}$
N53.3.2 $\mathrm{GM1^- \oplus GM2^+}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1 \oplus A2}$
N53.3.3 $\mathrm{GM1^- \oplus GM2^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g \oplus A_u \oplus B1_u}$
N53.3.4 $\mathrm{GM1^- \oplus GM3^+}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1 \oplus A2}$
N53.3.5 $\mathrm{GM1^- \oplus GM3^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g \oplus A_u \oplus B3_u}$
N53.3.6 $\mathrm{GM1^- \oplus GM4^+}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1 \oplus A2}$
N53.3.7 $\mathrm{GM1^- \oplus GM4^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g \oplus A_u \oplus B2_u}$
N53.3.8 $\mathrm{GM1^- \oplus Y1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g \oplus A_u}$
N53.3.9 $\mathrm{GM1^- \oplus Y1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g \oplus A_u}$
N53.3.10 $\mathrm{GM1^- \oplus Y2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g \oplus A_u}$
N53.3.11 $\mathrm{GM1^- \oplus Y2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g \oplus A_u}$
N53.3.12 $\mathrm{GM2^+ \oplus GM2^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g \oplus B1_g \oplus B1_g}$
N53.3.13 $\mathrm{GM2^+ \oplus GM2^-}$	$\surd$	2	2	$\surd$	222	$\mathrm{A1 \oplus B1}$
N53.3.14 $\mathrm{GM2^+ \oplus GM3^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g \oplus B1_g \oplus B3_g}$
N53.3.15 $\mathrm{GM2^+ \oplus GM3^-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1 \oplus B1}$

Non-coplanar SSGs with parent space group $Pmna$ (No. 53) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N53.3.16 $\mathrm{GM2}^{+}\oplus\mathrm{GM4}^{+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B1_g}\oplus\mathrm{B2_g}$
N53.3.17 $\mathrm{GM2}^{+}\oplus\mathrm{GM4}^{-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1}\oplus\mathrm{B2}$
N53.3.18 $\mathrm{GM2}^{+}\oplus\mathrm{Y1}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B1_g}$
N53.3.19 $\mathrm{GM2}^{+}\oplus\mathrm{Y1}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B1_g}$
N53.3.20 $\mathrm{GM2}^{+}\oplus\mathrm{Y2}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B1_g}$
N53.3.21 $\mathrm{GM2}^{+}\oplus\mathrm{Y2}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B1_g}$
N53.3.22 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B1_u}\oplus\mathrm{B1_u}$
N53.3.23 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1}\oplus\mathrm{B2}$
N53.3.24 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B1_u}\oplus\mathrm{B3_u}$
N53.3.25 $\mathrm{GM2}^{-}\oplus\mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1}\oplus\mathrm{B1}$
N53.3.26 $\mathrm{GM2}^{-}\oplus\mathrm{GM4}^{-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B1_u}\oplus\mathrm{B2_u}$
N53.3.27 $\mathrm{GM2}^{-}\oplus\mathrm{Y1}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B1_u}$
N53.3.28 $\mathrm{GM2}^{-}\oplus\mathrm{Y1}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B1_u}$
N53.3.29 $\mathrm{GM2}^{-}\oplus\mathrm{Y2}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B1_u}$
N53.3.30 $\mathrm{GM2}^{-}\oplus\mathrm{Y2}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B1_u}$
N53.3.31 $\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}\oplus\mathrm{B3_g}$
N53.3.32 $\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{-}$	$\surd$	2	2	$\surd$	222	$\mathrm{A1}\oplus\mathrm{B3}$
N53.3.33 $\mathrm{GM3}^{+}\oplus\mathrm{GM4}^{+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}\oplus\mathrm{B2_g}$
N53.3.34 $\mathrm{GM3}^{+}\oplus\mathrm{GM4}^{-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1}\oplus\mathrm{B2}$
N53.3.35 $\mathrm{GM3}^{+}\oplus\mathrm{Y1}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}$
N53.3.36 $\mathrm{GM3}^{+}\oplus\mathrm{Y1}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}$
N53.3.37 $\mathrm{GM3}^{+}\oplus\mathrm{Y2}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}$
N53.3.38 $\mathrm{GM3}^{+}\oplus\mathrm{Y2}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}$
N53.3.39 $\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}\oplus\mathrm{B3_u}$
N53.3.40 $\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1}\oplus\mathrm{B1}$
N53.3.41 $\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}\oplus\mathrm{B2_u}$
N53.3.42 $\mathrm{GM3}^{-}\oplus\mathrm{Y1}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}$
N53.3.43 $\mathrm{GM3}^{-}\oplus\mathrm{Y1}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}$
N53.3.44 $\mathrm{GM3}^{-}\oplus\mathrm{Y2}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}$
N53.3.45 $\mathrm{GM3}^{-}\oplus\mathrm{Y2}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}$
N53.3.46 $\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B2_g}\oplus\mathrm{B2_g}$
N53.3.47 $\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{-}$	$\surd$	2	2	$\surd$	222	$\mathrm{A1}\oplus\mathrm{B2}$
N53.3.48 $\mathrm{GM4}^{+}\oplus\mathrm{Y1}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B2_g}$
N53.3.49 $\mathrm{GM4}^{+}\oplus\mathrm{Y1}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B2_g}$
N53.3.50 $\mathrm{GM4}^{+}\oplus\mathrm{Y2}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B2_g}$
N53.3.51 $\mathrm{GM4}^{+}\oplus\mathrm{Y2}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B2_g}$
N53.3.52 $\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B2_u}\oplus\mathrm{B2_u}$
N53.3.53 $\mathrm{GM4}^{-}\oplus\mathrm{Y1}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B2_u}$
N53.3.54 $\mathrm{GM4}^{-}\oplus\mathrm{Y1}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B2_u}$
N53.3.55 $\mathrm{GM4}^{-}\oplus\mathrm{Y2}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B2_u}$
N53.3.56 $\mathrm{GM4}^{-}\oplus\mathrm{Y2}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B2_u}$
N53.3.57 $\mathrm{Y1}^{+}\oplus\mathrm{Y1}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N53.3.58 $\mathrm{Y1}^{+}\oplus\mathrm{Y4}^{-}$	$\surd$	1	1	$\surd$	$mm2$	$\mathrm{A1}$
N53.3.59 $\mathrm{Y1}^{+}\oplus\mathrm{Y1}^{-}$	$\surd$	1	1	$\surd$	222	$\mathrm{A1}$
N53.3.60 $\mathrm{Y1}^{+}\oplus\mathrm{Y4}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N53.3.61 $\mathrm{Y1}^{+}\oplus\mathrm{Y2}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$

Non-coplanar SSGs with parent space group $Pmna$ (No. 53) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N53.3.62 $\mathrm{Y1}^{+} \oplus \mathrm{Y3}^{-}$	$\surd$	1	1	$\surd$	$mm2$	A1
N53.3.63 $\mathrm{Y1}^{+} \oplus \mathrm{Y2}^{-}$	$\surd$	1	1	$\surd$	$mm2$	A1
N53.3.64 $\mathrm{Y1}^{+} \oplus \mathrm{Y3}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N53.3.65 $\mathrm{Y1}^{-} \oplus \mathrm{Y1}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N53.3.66 $\mathrm{Y1}^{-} \oplus \mathrm{Y4}^{+}$	$\surd$	1	1	$\surd$	$mm2$	A1
N53.3.67 $\mathrm{Y1}^{-} \oplus \mathrm{Y2}^{+}$	$\surd$	1	1	$\surd$	$mm2$	A1
N53.3.68 $\mathrm{Y1}^{-} \oplus \mathrm{Y3}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N53.3.69 $\mathrm{Y1}^{-} \oplus \mathrm{Y2}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N53.3.70 $\mathrm{Y1}^{-} \oplus \mathrm{Y3}^{+}$	$\surd$	1	1	$\surd$	$mm2$	A1
N53.3.71 $\mathrm{Y2}^{+} \oplus \mathrm{Y2}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N53.3.72 $\mathrm{Y2}^{+} \oplus \mathrm{Y3}^{-}$	$\surd$	1	1	$\surd$	$mm2$	A1
N53.3.73 $\mathrm{Y2}^{+} \oplus \mathrm{Y2}^{-}$	$\surd$	1	1	$\surd$	222	A1
N53.3.74 $\mathrm{Y2}^{+} \oplus \mathrm{Y3}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N53.3.75 $\mathrm{Y2}^{-} \oplus \mathrm{Y2}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N53.3.76 $\mathrm{Y2}^{-} \oplus \mathrm{Y3}^{+}$	$\surd$	1	1	$\surd$	$mm2$	A1
N53.6.1 $\mathrm{R1}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N53.6.2 S1	$\surd$	1	1	$\surd$	$mm2$	A1
N53.6.3 T1	$\surd$	1	1	$\surd$	$mm2$	A1
N53.6.4 T2	$\surd$	1	1	$\surd$	$mm2$	A1
N53.6.5 $\mathrm{U1}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N53.6.6 X1	$\surd$	1	1	$\surd$	$mm2$	A1
N53.6.7 X2	$\surd$	1	1	$\surd$	$mm2$	A1
N53.6.8 Z1	$\surd$	1	1	$\surd$	$mm2$	A1
N53.6.9 Z2	$\surd$	1	1	$\surd$	$mm2$	A1
N53.8.1 SM1	$\surd$	1	1	$\surd$	$mm2$	A1
N53.8.2 SM3	$\surd$	1	1	$\surd$	$mm2$	A1
N53.8.3 C1	$\surd$	1	1	$\surd$	$mm2$	A1
N53.8.4 DT1	$\surd$	1	1	$\surd$	$mm2$	A1
N53.8.5 DT2	$\surd$	1	1	$\surd$	$mm2$	A1
N53.8.6 DT3	$\surd$	1	1	$\surd$	$mm2$	A1
N53.8.7 DT4	$\surd$	1	1	$\surd$	$mm2$	A1
N53.8.8 LD1	$\surd$	1	1	$\surd$	$mm2$	A1
N53.8.9 LD2	$\surd$	1	1	$\surd$	$mm2$	A1
N53.8.10 H1	$\surd$	1	1	$\surd$	$mm2$	A1
N53.8.11 H2	$\surd$	1	1	$\surd$	$mm2$	A1
N53.9.1 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-}$	$\surd$	0	0	$\surd$	-	-
N53.9.2 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-} \oplus \mathrm{GM2}^{+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N53.9.3 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-} \oplus \mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
N53.9.4 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-} \oplus \mathrm{GM3}^{+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N53.9.5 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-} \oplus \mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
N53.9.6 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-} \oplus \mathrm{GM4}^{+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B2_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N53.9.7 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-} \oplus \mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
N53.9.8 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-} \oplus \mathrm{Y1}^{+}$	$\surd$	0	0	$\surd$	-	-
N53.9.9 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-} \oplus \mathrm{Y1}^{-}$	$\surd$	0	0	$\surd$	-	-
N53.9.10 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-} \oplus \mathrm{Y2}^{+}$	$\surd$	0	0	$\surd$	-	-
N53.9.11 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-} \oplus \mathrm{Y2}^{-}$	$\surd$	0	0	$\surd$	-	-

Non-coplanar SSGs with parent space group $Pmna$ (No. 53) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N53.9.12 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	2	2	$\surd$	222	$\mathrm{B1} \oplus \mathrm{B1}$
N53.9.13 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N53.9.14 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2} \oplus \mathrm{B1}$
N53.9.15 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_u}$
N53.9.16 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2} \oplus \mathrm{B1}$
N53.9.17 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B3_u}$
N53.9.18 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N53.9.19 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N53.9.20 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N53.9.21 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N53.9.22 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
N53.9.23 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N53.9.24 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N53.9.25 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N53.9.26 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N53.9.27 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Y1}^+$	$\surd$	0	0	$\surd$	-	-
N53.9.28 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Y1}^-$	$\surd$	0	0	$\surd$	-	-
N53.9.29 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Y2}^+$	$\surd$	0	0	$\surd$	-	-
N53.9.30 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Y2}^-$	$\surd$	0	0	$\surd$	-	-
N53.9.31 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	222	$\mathrm{B3} \oplus \mathrm{B3}$
N53.9.32 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N53.9.33 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2} \oplus \mathrm{B1}$
N53.9.34 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N53.9.35 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u}$
N53.9.36 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u}$
N53.9.37 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u}$
N53.9.38 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u}$
N53.9.39 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N53.9.40 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N53.9.41 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N53.9.42 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y1}^+$	$\surd$	0	0	$\surd$	-	-
N53.9.43 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y1}^-$	$\surd$	0	0	$\surd$	-	-
N53.9.44 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y2}^+$	$\surd$	0	0	$\surd$	-	-
N53.9.45 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y2}^-$	$\surd$	0	0	$\surd$	-	-
N53.9.46 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	222	$\mathrm{B2} \oplus \mathrm{B2}$
N53.9.47 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N53.9.48 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_g} \oplus \mathrm{B2_u}$
N53.9.49 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_g} \oplus \mathrm{B2_u}$
N53.9.50 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_g} \oplus \mathrm{B2_u}$
N53.9.51 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_g} \oplus \mathrm{B2_u}$
N53.9.52 $\mathrm{GM1}^- \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N53.9.53 $\mathrm{GM1}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Y1}^+$	$\surd$	0	0	$\surd$	-	-
N53.9.54 $\mathrm{GM1}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Y1}^-$	$\surd$	0	0	$\surd$	-	-
N53.9.55 $\mathrm{GM1}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Y2}^+$	$\surd$	0	0	$\surd$	-	-
N53.9.56 $\mathrm{GM1}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Y2}^-$	$\surd$	0	0	$\surd$	-	-
N53.9.57 $\mathrm{GM1}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $Pmna$ (No. 53) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N53.9.58 $\mathrm{GM1^-}\oplus\mathrm{Y1^+}\oplus\mathrm{Y4^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N53.9.59 $\mathrm{GM1^-}\oplus\mathrm{Y1^+}\oplus\mathrm{Y1^-}$	$\surd$	1	1	$\times$	-	-
N53.9.60 $\mathrm{GM1^-}\oplus\mathrm{Y1^+}\oplus\mathrm{Y4^+}$	$\surd$	1	0	$\times$	-	-
N53.9.61 $\mathrm{GM1^-}\oplus\mathrm{Y1^+}\oplus\mathrm{Y2^+}$	$\surd$	1	0	$\times$	-	-
N53.9.62 $\mathrm{GM1^-}\oplus\mathrm{Y1^+}\oplus\mathrm{Y3^-}$	$\surd$	1	1	$\times$	-	-
N53.9.63 $\mathrm{GM1^-}\oplus\mathrm{Y1^+}\oplus\mathrm{Y2^-}$	$\surd$	1	1	$\times$	-	-
N53.9.64 $\mathrm{GM1^-}\oplus\mathrm{Y1^+}\oplus\mathrm{Y3^+}$	$\surd$	1	0	$\times$	-	-
N53.9.65 $\mathrm{GM1^-}\oplus\mathrm{Y1^-}\oplus\mathrm{Y1^-}$	$\surd$	1	0	$\times$	-	-
N53.9.66 $\mathrm{GM1^-}\oplus\mathrm{Y1^-}\oplus\mathrm{Y4^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N53.9.67 $\mathrm{GM1^-}\oplus\mathrm{Y1^-}\oplus\mathrm{Y2^+}$	$\surd$	1	1	$\times$	-	-
N53.9.68 $\mathrm{GM1^-}\oplus\mathrm{Y1^-}\oplus\mathrm{Y3^-}$	$\surd$	1	0	$\times$	-	-
N53.9.69 $\mathrm{GM1^-}\oplus\mathrm{Y1^-}\oplus\mathrm{Y2^-}$	$\surd$	1	0	$\times$	-	-
N53.9.70 $\mathrm{GM1^-}\oplus\mathrm{Y1^-}\oplus\mathrm{Y3^+}$	$\surd$	1	1	$\times$	-	-
N53.9.71 $\mathrm{GM1^-}\oplus\mathrm{Y2^+}\oplus\mathrm{Y2^+}$	$\surd$	1	0	$\times$	-	-
N53.9.72 $\mathrm{GM1^-}\oplus\mathrm{Y2^+}\oplus\mathrm{Y3^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N53.9.73 $\mathrm{GM1^-}\oplus\mathrm{Y2^+}\oplus\mathrm{Y2^-}$	$\surd$	1	1	$\times$	-	-
N53.9.74 $\mathrm{GM1^-}\oplus\mathrm{Y2^+}\oplus\mathrm{Y3^+}$	$\surd$	1	0	$\times$	-	-
N53.9.75 $\mathrm{GM1^-}\oplus\mathrm{Y2^-}\oplus\mathrm{Y2^-}$	$\surd$	1	0	$\times$	-	-
N53.9.76 $\mathrm{GM1^-}\oplus\mathrm{Y2^-}\oplus\mathrm{Y3^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N53.9.77 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{GM2^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B1_g}$
N53.9.78 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{GM2^-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2}\oplus\mathrm{A2}$
N53.9.79 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{GM3^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B3_g}$
N53.9.80 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{GM3^-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2}\oplus\mathrm{B2}$
N53.9.81 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{GM4^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B2_g}$
N53.9.82 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B1}\oplus\mathrm{B1}$
N53.9.83 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{Y1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_g}$
N53.9.84 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{Y1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_g}$
N53.9.85 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{Y2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_g}$
N53.9.86 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{Y2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_g}$
N53.9.87 $\mathrm{GM2^+}\oplus\mathrm{GM2^-}\oplus\mathrm{GM2^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{A_u}\oplus\mathrm{B1_g}$
N53.9.88 $\mathrm{GM2^+}\oplus\mathrm{GM2^-}\oplus\mathrm{GM3^+}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2}\oplus\mathrm{B2}$
N53.9.89 $\mathrm{GM2^+}\oplus\mathrm{GM2^-}\oplus\mathrm{GM3^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B1_g}\oplus\mathrm{B2_u}$
N53.9.90 $\mathrm{GM2^+}\oplus\mathrm{GM2^-}\oplus\mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2}\oplus\mathrm{B1}$
N53.9.91 $\mathrm{GM2^+}\oplus\mathrm{GM2^-}\oplus\mathrm{GM4^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B1_g}\oplus\mathrm{B3_u}$
N53.9.92 $\mathrm{GM2^+}\oplus\mathrm{GM2^-}\oplus\mathrm{Y1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B1_g}$
N53.9.93 $\mathrm{GM2^+}\oplus\mathrm{GM2^-}\oplus\mathrm{Y1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B1_g}$
N53.9.94 $\mathrm{GM2^+}\oplus\mathrm{GM2^-}\oplus\mathrm{Y2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B1_g}$
N53.9.95 $\mathrm{GM2^+}\oplus\mathrm{GM2^-}\oplus\mathrm{Y2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B1_g}$
N53.9.96 $\mathrm{GM2^+}\oplus\mathrm{GM3^+}\oplus\mathrm{GM3^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B3_g}\oplus\mathrm{B3_g}$
N53.9.97 $\mathrm{GM2^+}\oplus\mathrm{GM3^+}\oplus\mathrm{GM3^-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2}\oplus\mathrm{B2}$
N53.9.98 $\mathrm{GM2^+}\oplus\mathrm{GM3^+}\oplus\mathrm{GM4^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B3_g}\oplus\mathrm{B2_g}$
N53.9.99 $\mathrm{GM2^+}\oplus\mathrm{GM3^+}\oplus\mathrm{GM4^-}$	$\surd$	2	2	$\surd$	222	$\mathrm{B1}\oplus\mathrm{B3}$
N53.9.100 $\mathrm{GM2^+}\oplus\mathrm{GM3^+}\oplus\mathrm{Y1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B3_g}$
N53.9.101 $\mathrm{GM2^+}\oplus\mathrm{GM3^+}\oplus\mathrm{Y1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B3_g}$
N53.9.102 $\mathrm{GM2^+}\oplus\mathrm{GM3^+}\oplus\mathrm{Y2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B3_g}$
N53.9.103 $\mathrm{GM2^+}\oplus\mathrm{GM3^+}\oplus\mathrm{Y2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B3_g}$

Non-coplanar SSGs with parent space group $Pmna$ (No. 53) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N53.9.104 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N53.9.105 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	222	$\mathrm{B1} \oplus \mathrm{B2}$
N53.9.106 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N53.9.107 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N53.9.108 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N53.9.109 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N53.9.110 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N53.9.111 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N53.9.112 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{B1}$
N53.9.113 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
N53.9.114 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
N53.9.115 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
N53.9.116 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
N53.9.117 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N53.9.118 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_u}$
N53.9.119 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_u}$
N53.9.120 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_u}$
N53.9.121 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_u}$
N53.9.122 $\mathrm{GM2}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	1	$\times$	-	-
N53.9.123 $\mathrm{GM2}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\surd$	$mm2$	$\mathrm{B2}$
N53.9.124 $\mathrm{GM2}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^-$	$\surd$	1	1	$\times$	-	-
N53.9.125 $\mathrm{GM2}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\times$	-	-
N53.9.126 $\mathrm{GM2}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\times$	-	-
N53.9.127 $\mathrm{GM2}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\times$	-	-
N53.9.128 $\mathrm{GM2}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\times$	-	-
N53.9.129 $\mathrm{GM2}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\times$	-	-
N53.9.130 $\mathrm{GM2}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y1}^-$	$\surd$	1	1	$\times$	-	-
N53.9.131 $\mathrm{GM2}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\surd$	$mm2$	$\mathrm{B2}$
N53.9.132 $\mathrm{GM2}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\times$	-	-
N53.9.133 $\mathrm{GM2}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\times$	-	-
N53.9.134 $\mathrm{GM2}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\times$	-	-
N53.9.135 $\mathrm{GM2}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\times$	-	-
N53.9.136 $\mathrm{GM2}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\times$	-	-
N53.9.137 $\mathrm{GM2}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\surd$	$mm2$	$\mathrm{B2}$
N53.9.138 $\mathrm{GM2}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\times$	-	-
N53.9.139 $\mathrm{GM2}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\times$	-	-
N53.9.140 $\mathrm{GM2}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\times$	-	-
N53.9.141 $\mathrm{GM2}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\surd$	$mm2$	$\mathrm{B2}$
N53.9.142 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
N53.9.143 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N53.9.144 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N53.9.145 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_g}$
N53.9.146 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N53.9.147 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Y1}^+$	$\surd$	0	0	$\surd$	-	-
N53.9.148 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Y1}^-$	$\surd$	0	0	$\surd$	-	-
N53.9.149 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Y2}^+$	$\surd$	0	0	$\surd$	-	-

Non-coplanar SSGs with parent space group $Pmna$ (No. 53) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N53.9.150 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Y2}^-$	$\surd$	0	0	$\surd$	-	-
N53.9.151 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2} \oplus \mathrm{B2}$
N53.9.152 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N53.9.153 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	222	$\mathrm{B3} \oplus \mathrm{B2}$
N53.9.154 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N53.9.155 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N53.9.156 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N53.9.157 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N53.9.158 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N53.9.159 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N53.9.160 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_g}$
N53.9.161 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N53.9.162 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y1}^+$	$\surd$	0	0	$\surd$	-	-
N53.9.163 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y1}^-$	$\surd$	0	0	$\surd$	-	-
N53.9.164 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y2}^+$	$\surd$	0	0	$\surd$	-	-
N53.9.165 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y2}^-$	$\surd$	0	0	$\surd$	-	-
N53.9.166 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B1} \oplus \mathrm{B1}$
N53.9.167 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_g}$
N53.9.168 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_g}$
N53.9.169 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_g}$
N53.9.170 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_g}$
N53.9.171 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_g}$
N53.9.172 $\mathrm{GM2}^- \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N53.9.173 $\mathrm{GM2}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Y1}^+$	$\surd$	0	0	$\surd$	-	-
N53.9.174 $\mathrm{GM2}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Y1}^-$	$\surd$	0	0	$\surd$	-	-
N53.9.175 $\mathrm{GM2}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Y2}^+$	$\surd$	0	0	$\surd$	-	-
N53.9.176 $\mathrm{GM2}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Y2}^-$	$\surd$	0	0	$\surd$	-	-
N53.9.177 $\mathrm{GM2}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	0	$\times$	-	-
N53.9.178 $\mathrm{GM2}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N53.9.179 $\mathrm{GM2}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^-$	$\surd$	1	1	$\times$	-	-
N53.9.180 $\mathrm{GM2}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
N53.9.181 $\mathrm{GM2}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N53.9.182 $\mathrm{GM2}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\times$	-	-
N53.9.183 $\mathrm{GM2}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\times$	-	-
N53.9.184 $\mathrm{GM2}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N53.9.185 $\mathrm{GM2}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y1}^-$	$\surd$	1	0	$\times$	-	-
N53.9.186 $\mathrm{GM2}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N53.9.187 $\mathrm{GM2}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\times$	-	-
N53.9.188 $\mathrm{GM2}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N53.9.189 $\mathrm{GM2}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N53.9.190 $\mathrm{GM2}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\times$	-	-
N53.9.191 $\mathrm{GM2}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N53.9.192 $\mathrm{GM2}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N53.9.193 $\mathrm{GM2}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\times$	-	-
N53.9.194 $\mathrm{GM2}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N53.9.195 $\mathrm{GM2}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $Pmna$ (No. 53) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N53.9.196 $\mathrm{GM2^-} \oplus \mathrm{Y2^-} \oplus \mathrm{Y3^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N53.9.197 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{GM3^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N53.9.198 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{GM3^-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{A2}$
N53.9.199 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{GM4^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N53.9.200 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2} \oplus \mathrm{B2}$
N53.9.201 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{Y1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
N53.9.202 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{Y1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
N53.9.203 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{Y2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
N53.9.204 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{Y2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
N53.9.205 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{GM3^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B3_g}$
N53.9.206 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{B2}$
N53.9.207 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u} \oplus \mathrm{B3_g}$
N53.9.208 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{Y1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N53.9.209 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{Y1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N53.9.210 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{Y2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N53.9.211 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{Y2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N53.9.212 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{GM4^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N53.9.213 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{B1}$
N53.9.214 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{Y1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g}$
N53.9.215 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{Y1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g}$
N53.9.216 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{Y2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g}$
N53.9.217 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{Y2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g}$
N53.9.218 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B3_g}$
N53.9.219 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Y1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N53.9.220 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Y1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N53.9.221 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Y2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N53.9.222 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Y2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N53.9.223 $\mathrm{GM3^+} \oplus \mathrm{Y1^+} \oplus \mathrm{Y1^+}$	$\surd$	1	1	$\times$	-	-
N53.9.224 $\mathrm{GM3^+} \oplus \mathrm{Y1^+} \oplus \mathrm{Y4^-}$	$\surd$	1	1	$\surd$	$mm2$	B2
N53.9.225 $\mathrm{GM3^+} \oplus \mathrm{Y1^+} \oplus \mathrm{Y1^-}$	$\surd$	1	1	$\times$	-	-
N53.9.226 $\mathrm{GM3^+} \oplus \mathrm{Y1^+} \oplus \mathrm{Y4^+}$	$\surd$	1	1	$\times$	-	-
N53.9.227 $\mathrm{GM3^+} \oplus \mathrm{Y1^+} \oplus \mathrm{Y2^+}$	$\surd$	1	1	$\times$	-	-
N53.9.228 $\mathrm{GM3^+} \oplus \mathrm{Y1^+} \oplus \mathrm{Y3^-}$	$\surd$	1	1	$\times$	-	-
N53.9.229 $\mathrm{GM3^+} \oplus \mathrm{Y1^+} \oplus \mathrm{Y2^-}$	$\surd$	1	1	$\times$	-	-
N53.9.230 $\mathrm{GM3^+} \oplus \mathrm{Y1^+} \oplus \mathrm{Y3^+}$	$\surd$	1	1	$\times$	-	-
N53.9.231 $\mathrm{GM3^+} \oplus \mathrm{Y1^-} \oplus \mathrm{Y1^-}$	$\surd$	1	1	$\times$	-	-
N53.9.232 $\mathrm{GM3^+} \oplus \mathrm{Y1^-} \oplus \mathrm{Y4^+}$	$\surd$	1	1	$\surd$	$mm2$	B2
N53.9.233 $\mathrm{GM3^+} \oplus \mathrm{Y1^-} \oplus \mathrm{Y2^+}$	$\surd$	1	1	$\times$	-	-
N53.9.234 $\mathrm{GM3^+} \oplus \mathrm{Y1^-} \oplus \mathrm{Y3^-}$	$\surd$	1	1	$\times$	-	-
N53.9.235 $\mathrm{GM3^+} \oplus \mathrm{Y1^-} \oplus \mathrm{Y2^-}$	$\surd$	1	1	$\times$	-	-
N53.9.236 $\mathrm{GM3^+} \oplus \mathrm{Y1^-} \oplus \mathrm{Y3^+}$	$\surd$	1	1	$\times$	-	-
N53.9.237 $\mathrm{GM3^+} \oplus \mathrm{Y2^+} \oplus \mathrm{Y2^+}$	$\surd$	1	1	$\times$	-	-
N53.9.238 $\mathrm{GM3^+} \oplus \mathrm{Y2^+} \oplus \mathrm{Y3^-}$	$\surd$	1	1	$\surd$	$mm2$	B2
N53.9.239 $\mathrm{GM3^+} \oplus \mathrm{Y2^+} \oplus \mathrm{Y2^-}$	$\surd$	1	1	$\times$	-	-
N53.9.240 $\mathrm{GM3^+} \oplus \mathrm{Y2^+} \oplus \mathrm{Y3^+}$	$\surd$	1	1	$\times$	-	-
N53.9.241 $\mathrm{GM3^+} \oplus \mathrm{Y2^-} \oplus \mathrm{Y2^-}$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $Pmna$ (No. 53) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N53.9.242 $\mathrm{GM3}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\surd$	$mm2$	$\mathrm{B2}$
N53.9.243 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N53.9.244 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B2_g}$
N53.9.245 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N53.9.246 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y1}^+$	$\surd$	0	0	$\surd$	-	-
N53.9.247 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y1}^-$	$\surd$	0	0	$\surd$	-	-
N53.9.248 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y2}^+$	$\surd$	0	0	$\surd$	-	-
N53.9.249 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y2}^-$	$\surd$	0	0	$\surd$	-	-
N53.9.250 $\mathrm{GM3}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B1} \oplus \mathrm{B1}$
N53.9.251 $\mathrm{GM3}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u} \oplus \mathrm{B2_g}$
N53.9.252 $\mathrm{GM3}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g}$
N53.9.253 $\mathrm{GM3}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g}$
N53.9.254 $\mathrm{GM3}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g}$
N53.9.255 $\mathrm{GM3}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g}$
N53.9.256 $\mathrm{GM3}^- \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N53.9.257 $\mathrm{GM3}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Y1}^+$	$\surd$	0	0	$\surd$	-	-
N53.9.258 $\mathrm{GM3}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Y1}^-$	$\surd$	0	0	$\surd$	-	-
N53.9.259 $\mathrm{GM3}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Y2}^+$	$\surd$	0	0	$\surd$	-	-
N53.9.260 $\mathrm{GM3}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Y2}^-$	$\surd$	0	0	$\surd$	-	-
N53.9.261 $\mathrm{GM3}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	0	$\times$	-	-
N53.9.262 $\mathrm{GM3}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N53.9.263 $\mathrm{GM3}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^-$	$\surd$	1	1	$\times$	-	-
N53.9.264 $\mathrm{GM3}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
N53.9.265 $\mathrm{GM3}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N53.9.266 $\mathrm{GM3}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\times$	-	-
N53.9.267 $\mathrm{GM3}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\times$	-	-
N53.9.268 $\mathrm{GM3}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N53.9.269 $\mathrm{GM3}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y1}^-$	$\surd$	1	0	$\times$	-	-
N53.9.270 $\mathrm{GM3}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N53.9.271 $\mathrm{GM3}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\times$	-	-
N53.9.272 $\mathrm{GM3}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N53.9.273 $\mathrm{GM3}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N53.9.274 $\mathrm{GM3}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\times$	-	-
N53.9.275 $\mathrm{GM3}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N53.9.276 $\mathrm{GM3}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N53.9.277 $\mathrm{GM3}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\times$	-	-
N53.9.278 $\mathrm{GM3}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N53.9.279 $\mathrm{GM3}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N53.9.280 $\mathrm{GM3}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N53.9.281 $\mathrm{GM4}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N53.9.282 $\mathrm{GM4}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{A2}$
N53.9.283 $\mathrm{GM4}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_g} \oplus \mathrm{B2_g}$
N53.9.284 $\mathrm{GM4}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_g} \oplus \mathrm{B2_g}$
N53.9.285 $\mathrm{GM4}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_g} \oplus \mathrm{B2_g}$
N53.9.286 $\mathrm{GM4}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_g} \oplus \mathrm{B2_g}$
N53.9.287 $\mathrm{GM4}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B2_g}$

Non-coplanar SSGs with parent space group $Pmna$ (No. 53) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N53.9.288 $\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{-}\oplus\mathrm{Y1}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B2_g}$
N53.9.289 $\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{-}\oplus\mathrm{Y1}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B2_g}$
N53.9.290 $\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{-}\oplus\mathrm{Y2}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B2_g}$
N53.9.291 $\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{-}\oplus\mathrm{Y2}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B2_g}$
N53.9.292 $\mathrm{GM4}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y1}^{+}$	$\surd$	1	1	$\times$	-	-
N53.9.293 $\mathrm{GM4}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y4}^{-}$	$\surd$	1	1	$\surd$	222	B2
N53.9.294 $\mathrm{GM4}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y1}^{-}$	$\surd$	1	1	$\times$	-	-
N53.9.295 $\mathrm{GM4}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y4}^{+}$	$\surd$	1	1	$\times$	-	-
N53.9.296 $\mathrm{GM4}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y2}^{+}$	$\surd$	1	1	$\times$	-	-
N53.9.297 $\mathrm{GM4}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\times$	-	-
N53.9.298 $\mathrm{GM4}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\times$	-	-
N53.9.299 $\mathrm{GM4}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y3}^{+}$	$\surd$	1	1	$\times$	-	-
N53.9.300 $\mathrm{GM4}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y1}^{-}$	$\surd$	1	1	$\times$	-	-
N53.9.301 $\mathrm{GM4}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y4}^{+}$	$\surd$	1	1	$\surd$	222	B2
N53.9.302 $\mathrm{GM4}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y2}^{+}$	$\surd$	1	1	$\times$	-	-
N53.9.303 $\mathrm{GM4}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\times$	-	-
N53.9.304 $\mathrm{GM4}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\times$	-	-
N53.9.305 $\mathrm{GM4}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y3}^{+}$	$\surd$	1	1	$\times$	-	-
N53.9.306 $\mathrm{GM4}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Y2}^{+}$	$\surd$	1	1	$\times$	-	-
N53.9.307 $\mathrm{GM4}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\surd$	222	B2
N53.9.308 $\mathrm{GM4}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\times$	-	-
N53.9.309 $\mathrm{GM4}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Y3}^{+}$	$\surd$	1	1	$\times$	-	-
N53.9.310 $\mathrm{GM4}^{+}\oplus\mathrm{Y2}^{-}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\times$	-	-
N53.9.311 $\mathrm{GM4}^{+}\oplus\mathrm{Y2}^{-}\oplus\mathrm{Y3}^{+}$	$\surd$	1	1	$\surd$	222	B2
N53.9.312 $\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
N53.9.313 $\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}\oplus\mathrm{Y1}^{+}$	$\surd$	0	0	$\surd$	-	-
N53.9.314 $\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}\oplus\mathrm{Y1}^{-}$	$\surd$	0	0	$\surd$	-	-
N53.9.315 $\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}\oplus\mathrm{Y2}^{+}$	$\surd$	0	0	$\surd$	-	-
N53.9.316 $\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}\oplus\mathrm{Y2}^{-}$	$\surd$	0	0	$\surd$	-	-
N53.9.317 $\mathrm{GM4}^{-}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y1}^{+}$	$\surd$	1	0	$\times$	-	-
N53.9.318 $\mathrm{GM4}^{-}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y4}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N53.9.319 $\mathrm{GM4}^{-}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y1}^{-}$	$\surd$	1	1	$\times$	-	-
N53.9.320 $\mathrm{GM4}^{-}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y4}^{+}$	$\surd$	1	0	$\times$	-	-
N53.9.321 $\mathrm{GM4}^{-}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y2}^{+}$	$\surd$	1	0	$\times$	-	-
N53.9.322 $\mathrm{GM4}^{-}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\times$	-	-
N53.9.323 $\mathrm{GM4}^{-}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\times$	-	-
N53.9.324 $\mathrm{GM4}^{-}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y3}^{+}$	$\surd$	1	0	$\times$	-	-
N53.9.325 $\mathrm{GM4}^{-}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y1}^{-}$	$\surd$	1	0	$\times$	-	-
N53.9.326 $\mathrm{GM4}^{-}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y4}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N53.9.327 $\mathrm{GM4}^{-}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y2}^{+}$	$\surd$	1	1	$\times$	-	-
N53.9.328 $\mathrm{GM4}^{-}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y3}^{-}$	$\surd$	1	0	$\times$	-	-
N53.9.329 $\mathrm{GM4}^{-}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y2}^{-}$	$\surd$	1	0	$\times$	-	-
N53.9.330 $\mathrm{GM4}^{-}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y3}^{+}$	$\surd$	1	1	$\times$	-	-
N53.9.331 $\mathrm{GM4}^{-}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Y2}^{+}$	$\surd$	1	0	$\times$	-	-
N53.9.332 $\mathrm{GM4}^{-}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N53.9.333 $\mathrm{GM4}^{-}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $Pmna$ (No. 53) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N53.9.334 $\mathrm{GM4}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N53.9.335 $\mathrm{GM4}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N53.9.336 $\mathrm{GM4}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N53.9.337 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^+$	$\surd$	0	0	$\surd$	-	-
N53.9.338 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_u} \oplus \mathrm{B2_u}$
N53.9.339 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u}$
N53.9.340 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y4}^+$	$\surd$	0	0	$\surd$	-	-
N53.9.341 $\mathrm{Y1}^+ \oplus \mathrm{Y4}^- \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B2_u}$
N53.9.342 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^+$	$\surd$	0	0	$\surd$	-	-
N53.9.343 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B3_u}$
N53.9.344 $\mathrm{Y1}^+ \oplus \mathrm{Y4}^- \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_u}$
N53.9.345 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N53.9.346 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y3}^+$	$\surd$	0	0	$\surd$	-	-
N53.9.347 $\mathrm{Y1}^+ \oplus \mathrm{Y4}^- \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N53.9.348 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u}$
N53.9.349 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B2_u}$
N53.9.350 $\mathrm{Y1}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{Y4}^+$	$\surd$	0	0	$\surd$	-	-
N53.9.351 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u}$
N53.9.352 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u}$
N53.9.353 $\mathrm{Y1}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{Y2}^+$	$\surd$	0	0	$\surd$	-	-
N53.9.354 $\mathrm{Y1}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u}$
N53.9.355 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u}$
N53.9.356 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u}$
N53.9.357 $\mathrm{Y1}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u}$
N53.9.358 $\mathrm{Y1}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{Y3}^+$	$\surd$	0	0	$\surd$	-	-
N53.9.359 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^+$	$\surd$	0	0	$\surd$	-	-
N53.9.360 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_u}$
N53.9.361 $\mathrm{Y1}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B3_u}$
N53.9.362 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u}$
N53.9.363 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^+$	$\surd$	0	0	$\surd$	-	-
N53.9.364 $\mathrm{Y1}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u}$
N53.9.365 $\mathrm{Y1}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u}$
N53.9.366 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N53.9.367 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N53.9.368 $\mathrm{Y1}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^+$	$\surd$	0	0	$\surd$	-	-
N53.9.369 $\mathrm{Y1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y1}^-$	$\surd$	0	0	$\surd$	-	-
N53.9.370 $\mathrm{Y1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_u} \oplus \mathrm{B2_u}$
N53.9.371 $\mathrm{Y1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N53.9.372 $\mathrm{Y1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y3}^-$	$\surd$	0	0	$\surd$	-	-
N53.9.373 $\mathrm{Y1}^- \oplus \mathrm{Y4}^+ \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N53.9.374 $\mathrm{Y1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y2}^-$	$\surd$	0	0	$\surd$	-	-
N53.9.375 $\mathrm{Y1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B3_u}$
N53.9.376 $\mathrm{Y1}^- \oplus \mathrm{Y4}^+ \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_u}$
N53.9.377 $\mathrm{Y1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N53.9.378 $\mathrm{Y1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N53.9.379 $\mathrm{Y1}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Y3}^-$	$\surd$	0	0	$\surd$	-	-

Non-coplanar SSGs with parent space group $Pmna$ (No. 53) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N53.9.380 $\mathrm{Y1^-}\oplus\mathrm{Y2^+}\oplus\mathrm{Y2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B1_u}$
N53.9.381 $\mathrm{Y1^-}\oplus\mathrm{Y2^+}\oplus\mathrm{Y3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B3_u}$
N53.9.382 $\mathrm{Y1^-}\oplus\mathrm{Y3^-}\oplus\mathrm{Y2^-}$	$\surd$	0	0	$\surd$	-	-
N53.9.383 $\mathrm{Y1^-}\oplus\mathrm{Y3^-}\oplus\mathrm{Y3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B3_u}$
N53.9.384 $\mathrm{Y1^-}\oplus\mathrm{Y2^-}\oplus\mathrm{Y2^-}$	$\surd$	0	0	$\surd$	-	-
N53.9.385 $\mathrm{Y1^-}\oplus\mathrm{Y2^-}\oplus\mathrm{Y3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u}\oplus\mathrm{B2_u}$
N53.9.386 $\mathrm{Y1^-}\oplus\mathrm{Y3^+}\oplus\mathrm{Y3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u}\oplus\mathrm{B3_u}$
N53.9.387 $\mathrm{Y2^+}\oplus\mathrm{Y2^+}\oplus\mathrm{Y2^+}$	$\surd$	0	0	$\surd$	-	-
N53.9.388 $\mathrm{Y2^+}\oplus\mathrm{Y2^+}\oplus\mathrm{Y3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_u}\oplus\mathrm{B2_u}$
N53.9.389 $\mathrm{Y2^+}\oplus\mathrm{Y2^+}\oplus\mathrm{Y2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{A_u}$
N53.9.390 $\mathrm{Y2^+}\oplus\mathrm{Y2^+}\oplus\mathrm{Y3^+}$	$\surd$	0	0	$\surd$	-	-
N53.9.391 $\mathrm{Y2^+}\oplus\mathrm{Y3^-}\oplus\mathrm{Y2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B2_u}$
N53.9.392 $\mathrm{Y2^+}\oplus\mathrm{Y2^-}\oplus\mathrm{Y2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{A_u}$
N53.9.393 $\mathrm{Y2^+}\oplus\mathrm{Y2^-}\oplus\mathrm{Y3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B2_u}$
N53.9.394 $\mathrm{Y2^+}\oplus\mathrm{Y3^+}\oplus\mathrm{Y3^+}$	$\surd$	0	0	$\surd$	-	-
N53.9.395 $\mathrm{Y2^-}\oplus\mathrm{Y2^-}\oplus\mathrm{Y2^-}$	$\surd$	0	0	$\surd$	-	-
N53.9.396 $\mathrm{Y2^-}\oplus\mathrm{Y2^-}\oplus\mathrm{Y3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_u}\oplus\mathrm{B2_u}$
N53.12.1 $\mathrm{GM1^-}\oplus\mathrm{R1^+}$	$\surd$	1	0	$\times$	-	-
N53.12.2 $\mathrm{GM1^-}\oplus\mathrm{S1}$	$\surd$	1	1	$\times$	-	-
N53.12.3 $\mathrm{GM1^-}\oplus\mathrm{T1}$	$\surd$	1	1	$\times$	-	-
N53.12.4 $\mathrm{GM1^-}\oplus\mathrm{T2}$	$\surd$	1	1	$\times$	-	-
N53.12.5 $\mathrm{GM1^-}\oplus\mathrm{U1^+}$	$\surd$	1	0	$\times$	-	-
N53.12.6 $\mathrm{GM1^-}\oplus\mathrm{X1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N53.12.7 $\mathrm{GM1^-}\oplus\mathrm{X2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N53.12.8 $\mathrm{GM1^-}\oplus\mathrm{Z1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N53.12.9 $\mathrm{GM1^-}\oplus\mathrm{Z2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N53.12.10 $\mathrm{GM2^+}\oplus\mathrm{R1^+}$	$\surd$	1	1	$\times$	-	-
N53.12.11 $\mathrm{GM2^+}\oplus\mathrm{S1}$	$\surd$	1	1	$\times$	-	-
N53.12.12 $\mathrm{GM2^+}\oplus\mathrm{T1}$	$\surd$	1	1	$\times$	-	-
N53.12.13 $\mathrm{GM2^+}\oplus\mathrm{T2}$	$\surd$	1	1	$\times$	-	-
N53.12.14 $\mathrm{GM2^+}\oplus\mathrm{U1^+}$	$\surd$	1	1	$\times$	-	-
N53.12.15 $\mathrm{GM2^+}\oplus\mathrm{X1}$	$\surd$	1	1	$\surd$	$mm2$	B1
N53.12.16 $\mathrm{GM2^+}\oplus\mathrm{X2}$	$\surd$	1	1	$\surd$	$mm2$	B1
N53.12.17 $\mathrm{GM2^+}\oplus\mathrm{Z1}$	$\surd$	1	1	$\surd$	222	B1
N53.12.18 $\mathrm{GM2^+}\oplus\mathrm{Z2}$	$\surd$	1	1	$\surd$	222	B1
N53.12.19 $\mathrm{GM2^-}\oplus\mathrm{R1^+}$	$\surd$	1	0	$\times$	-	-
N53.12.20 $\mathrm{GM2^-}\oplus\mathrm{S1}$	$\surd$	1	1	$\times$	-	-
N53.12.21 $\mathrm{GM2^-}\oplus\mathrm{T1}$	$\surd$	1	1	$\times$	-	-
N53.12.22 $\mathrm{GM2^-}\oplus\mathrm{T2}$	$\surd$	1	1	$\times$	-	-
N53.12.23 $\mathrm{GM2^-}\oplus\mathrm{U1^+}$	$\surd$	1	0	$\times$	-	-
N53.12.24 $\mathrm{GM2^-}\oplus\mathrm{X1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N53.12.25 $\mathrm{GM2^-}\oplus\mathrm{X2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N53.12.26 $\mathrm{GM2^-}\oplus\mathrm{Z1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N53.12.27 $\mathrm{GM2^-}\oplus\mathrm{Z2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N53.12.28 $\mathrm{GM3^+}\oplus\mathrm{R1^+}$	$\surd$	1	1	$\times$	-	-
N53.12.29 $\mathrm{GM3^+}\oplus\mathrm{S1}$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $Pmna$ (No. 53) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N53.12.30 $\mathrm{GM3}^{+} \oplus \mathrm{T1}$	$\surd$	1	1	$\times$	-	-
N53.12.31 $\mathrm{GM3}^{+} \oplus \mathrm{T2}$	$\surd$	1	1	$\times$	-	-
N53.12.32 $\mathrm{GM3}^{+} \oplus \mathrm{U1}^{+}$	$\surd$	1	1	$\times$	-	-
N53.12.33 $\mathrm{GM3}^{+} \oplus \mathrm{X1}$	$\surd$	1	1	$\surd$	222	B3
N53.12.34 $\mathrm{GM3}^{+} \oplus \mathrm{X2}$	$\surd$	1	1	$\surd$	222	B3
N53.12.35 $\mathrm{GM3}^{+} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$mm2$	B2
N53.12.36 $\mathrm{GM3}^{+} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	$mm2$	B2
N53.12.37 $\mathrm{GM3}^{-} \oplus \mathrm{R1}^{+}$	$\surd$	1	0	$\times$	-	-
N53.12.38 $\mathrm{GM3}^{-} \oplus \mathrm{S1}$	$\surd$	1	1	$\times$	-	-
N53.12.39 $\mathrm{GM3}^{-} \oplus \mathrm{T1}$	$\surd$	1	1	$\times$	-	-
N53.12.40 $\mathrm{GM3}^{-} \oplus \mathrm{T2}$	$\surd$	1	1	$\times$	-	-
N53.12.41 $\mathrm{GM3}^{-} \oplus \mathrm{U1}^{+}$	$\surd$	1	0	$\times$	-	-
N53.12.42 $\mathrm{GM3}^{-} \oplus \mathrm{X1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N53.12.43 $\mathrm{GM3}^{-} \oplus \mathrm{X2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N53.12.44 $\mathrm{GM3}^{-} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N53.12.45 $\mathrm{GM3}^{-} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N53.12.46 $\mathrm{GM4}^{+} \oplus \mathrm{R1}^{+}$	$\surd$	1	1	$\times$	-	-
N53.12.47 $\mathrm{GM4}^{+} \oplus \mathrm{S1}$	$\surd$	1	1	$\times$	-	-
N53.12.48 $\mathrm{GM4}^{+} \oplus \mathrm{T1}$	$\surd$	1	1	$\times$	-	-
N53.12.49 $\mathrm{GM4}^{+} \oplus \mathrm{T2}$	$\surd$	1	1	$\times$	-	-
N53.12.50 $\mathrm{GM4}^{+} \oplus \mathrm{U1}^{+}$	$\surd$	1	1	$\times$	-	-
N53.12.51 $\mathrm{GM4}^{+} \oplus \mathrm{X1}$	$\surd$	1	1	$\surd$	$mm2$	B1
N53.12.52 $\mathrm{GM4}^{+} \oplus \mathrm{X2}$	$\surd$	1	1	$\surd$	$mm2$	B1
N53.12.53 $\mathrm{GM4}^{+} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$mm2$	B1
N53.12.54 $\mathrm{GM4}^{+} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	$mm2$	B1
N53.12.55 $\mathrm{GM4}^{-} \oplus \mathrm{R1}^{+}$	$\surd$	1	0	$\times$	-	-
N53.12.56 $\mathrm{GM4}^{-} \oplus \mathrm{S1}$	$\surd$	1	1	$\times$	-	-
N53.12.57 $\mathrm{GM4}^{-} \oplus \mathrm{T1}$	$\surd$	1	1	$\times$	-	-
N53.12.58 $\mathrm{GM4}^{-} \oplus \mathrm{T2}$	$\surd$	1	1	$\times$	-	-
N53.12.59 $\mathrm{GM4}^{-} \oplus \mathrm{U1}^{+}$	$\surd$	1	0	$\times$	-	-
N53.12.60 $\mathrm{GM4}^{-} \oplus \mathrm{X1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N53.12.61 $\mathrm{GM4}^{-} \oplus \mathrm{X2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N53.12.62 $\mathrm{GM4}^{-} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N53.12.63 $\mathrm{GM4}^{-} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N53.12.64 $\mathrm{Y1}^{+} \oplus \mathrm{R1}^{+}$	$\surd$	1	0	$\times$	-	-
N53.12.65 $\mathrm{Y1}^{+} \oplus \mathrm{S1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N53.12.66 $\mathrm{Y1}^{+} \oplus \mathrm{S2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N53.12.67 $\mathrm{Y1}^{+} \oplus \mathrm{T1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N53.12.68 $\mathrm{Y1}^{+} \oplus \mathrm{T2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N53.12.69 $\mathrm{Y1}^{+} \oplus \mathrm{U1}^{+}$	$\surd$	1	0	$\times$	-	-
N53.12.70 $\mathrm{Y1}^{+} \oplus \mathrm{X1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N53.12.71 $\mathrm{Y1}^{+} \oplus \mathrm{X2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N53.12.72 $\mathrm{Y1}^{+} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N53.12.73 $\mathrm{Y1}^{+} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N53.12.74 $\mathrm{Y1}^{-} \oplus \mathrm{R1}^{+}$	$\surd$	1	0	$\times$	-	-
N53.12.75 $\mathrm{Y1}^{-} \oplus \mathrm{S1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$

Non-coplanar SSGs with parent space group $Pmna$ (No. 53) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N53.12.76 $\mathrm{Y1}^{-} \oplus \mathrm{S2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N53.12.77 $\mathrm{Y1}^{-} \oplus \mathrm{T1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N53.12.78 $\mathrm{Y1}^{-} \oplus \mathrm{T2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N53.12.79 $\mathrm{Y1}^{-} \oplus \mathrm{U1}^{+}$	$\surd$	1	0	$\times$	-	-
N53.12.80 $\mathrm{Y1}^{-} \oplus \mathrm{X1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N53.12.81 $\mathrm{Y1}^{-} \oplus \mathrm{X2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N53.12.82 $\mathrm{Y1}^{-} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N53.12.83 $\mathrm{Y1}^{-} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N53.12.84 $\mathrm{Y2}^{+} \oplus \mathrm{R1}^{+}$	$\surd$	1	0	$\times$	-	-
N53.12.85 $\mathrm{Y2}^{+} \oplus \mathrm{S1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N53.12.86 $\mathrm{Y2}^{+} \oplus \mathrm{S2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N53.12.87 $\mathrm{Y2}^{+} \oplus \mathrm{T1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N53.12.88 $\mathrm{Y2}^{+} \oplus \mathrm{T2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N53.12.89 $\mathrm{Y2}^{+} \oplus \mathrm{U1}^{+}$	$\surd$	1	0	$\times$	-	-
N53.12.90 $\mathrm{Y2}^{+} \oplus \mathrm{X1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N53.12.91 $\mathrm{Y2}^{+} \oplus \mathrm{X2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N53.12.92 $\mathrm{Y2}^{+} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N53.12.93 $\mathrm{Y2}^{+} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N53.12.94 $\mathrm{Y2}^{-} \oplus \mathrm{R1}^{+}$	$\surd$	1	0	$\times$	-	-
N53.12.95 $\mathrm{Y2}^{-} \oplus \mathrm{S1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N53.12.96 $\mathrm{Y2}^{-} \oplus \mathrm{S2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N53.12.97 $\mathrm{Y2}^{-} \oplus \mathrm{T1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N53.12.98 $\mathrm{Y2}^{-} \oplus \mathrm{T2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N53.12.99 $\mathrm{Y2}^{-} \oplus \mathrm{U1}^{+}$	$\surd$	1	0	$\times$	-	-
N53.12.100 $\mathrm{Y2}^{-} \oplus \mathrm{X1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N53.12.101 $\mathrm{Y2}^{-} \oplus \mathrm{X2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N53.12.102 $\mathrm{Y2}^{-} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N53.12.103 $\mathrm{Y2}^{-} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N53.14.1 $\mathrm{GM1}^{-} \oplus \mathrm{SM1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N53.14.2 $\mathrm{GM1}^{-} \oplus \mathrm{SM3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N53.14.3 $\mathrm{GM1}^{-} \oplus \mathrm{C1}$	$\surd$	1	1	$\times$	-	-
N53.14.4 $\mathrm{GM1}^{-} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N53.14.5 $\mathrm{GM1}^{-} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N53.14.6 $\mathrm{GM1}^{-} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N53.14.7 $\mathrm{GM1}^{-} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N53.14.8 $\mathrm{GM1}^{-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N53.14.9 $\mathrm{GM1}^{-} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N53.14.10 $\mathrm{GM1}^{-} \oplus \mathrm{H1}$	$\surd$	1	1	$\times$	-	-
N53.14.11 $\mathrm{GM1}^{-} \oplus \mathrm{H2}$	$\surd$	1	1	$\times$	-	-
N53.14.12 $\mathrm{GM2}^{+} \oplus \mathrm{SM1}$	$\surd$	1	1	$\surd$	$mm2$	B1
N53.14.13 $\mathrm{GM2}^{+} \oplus \mathrm{SM3}$	$\surd$	1	1	$\surd$	$mm2$	B1
N53.14.14 $\mathrm{GM2}^{+} \oplus \mathrm{C1}$	$\surd$	1	1	$\times$	-	-
N53.14.15 $\mathrm{GM2}^{+} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	$mm2$	B2
N53.14.16 $\mathrm{GM2}^{+} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	$mm2$	B2
N53.14.17 $\mathrm{GM2}^{+} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	$mm2$	B2
N53.14.18 $\mathrm{GM2}^{+} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	$mm2$	B2

Non-coplanar SSGs with parent space group $Pmna$ (No. 53) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N53.14.19 GM2$^+$ ⊕ LD1	√	1	1	√	222	B1
N53.14.20 GM2$^+$ ⊕ LD2	√	1	1	√	222	B1
N53.14.21 GM2$^+$ ⊕ H1	√	1	1	×	-	-
N53.14.22 GM2$^+$ ⊕ H2	√	1	1	×	-	-
N53.14.23 GM2$^-$ ⊕ SM1	√	1	1	√	mmm	$\mathrm{B3_u}$
N53.14.24 GM2$^-$ ⊕ SM3	√	1	1	√	mmm	$\mathrm{B3_u}$
N53.14.25 GM2$^-$ ⊕ C1	√	1	1	×	-	-
N53.14.26 GM2$^-$ ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N53.14.27 GM2$^-$ ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
N53.14.28 GM2$^-$ ⊕ DT3	√	1	1	√	mmm	$\mathrm{B2_u}$
N53.14.29 GM2$^-$ ⊕ DT4	√	1	1	√	mmm	$\mathrm{B2_u}$
N53.14.30 GM2$^-$ ⊕ LD1	√	1	1	√	mmm	$\mathrm{B1_u}$
N53.14.31 GM2$^-$ ⊕ LD2	√	1	1	√	mmm	$\mathrm{B1_u}$
N53.14.32 GM2$^-$ ⊕ H1	√	1	1	×	-	-
N53.14.33 GM2$^-$ ⊕ H2	√	1	1	×	-	-
N53.14.34 GM3$^+$ ⊕ SM1	√	1	1	√	222	B3
N53.14.35 GM3$^+$ ⊕ SM3	√	1	1	√	222	B3
N53.14.36 GM3$^+$ ⊕ C1	√	1	1	×	-	-
N53.14.37 GM3$^+$ ⊕ DT1	√	1	1	√	$mm2$	B2
N53.14.38 GM3$^+$ ⊕ DT2	√	1	1	√	$mm2$	B2
N53.14.39 GM3$^+$ ⊕ DT3	√	1	1	√	$mm2$	B2
N53.14.40 GM3$^+$ ⊕ DT4	√	1	1	√	$mm2$	B2
N53.14.41 GM3$^+$ ⊕ LD1	√	1	1	√	$mm2$	B2
N53.14.42 GM3$^+$ ⊕ LD2	√	1	1	√	$mm2$	B2
N53.14.43 GM3$^+$ ⊕ H1	√	1	1	×	-	-
N53.14.44 GM3$^+$ ⊕ H2	√	1	1	×	-	-
N53.14.45 GM3$^-$ ⊕ SM1	√	1	1	√	mmm	$\mathrm{B3_u}$
N53.14.46 GM3$^-$ ⊕ SM3	√	1	1	√	mmm	$\mathrm{B3_u}$
N53.14.47 GM3$^-$ ⊕ C1	√	1	1	×	-	-
N53.14.48 GM3$^-$ ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N53.14.49 GM3$^-$ ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
N53.14.50 GM3$^-$ ⊕ DT3	√	1	1	√	mmm	$\mathrm{B2_u}$
N53.14.51 GM3$^-$ ⊕ DT4	√	1	1	√	mmm	$\mathrm{B2_u}$
N53.14.52 GM3$^-$ ⊕ LD1	√	1	1	√	mmm	$\mathrm{B1_u}$
N53.14.53 GM3$^-$ ⊕ LD2	√	1	1	√	mmm	$\mathrm{B1_u}$
N53.14.54 GM3$^-$ ⊕ H1	√	1	1	×	-	-
N53.14.55 GM3$^-$ ⊕ H2	√	1	1	×	-	-
N53.14.56 GM4$^+$ ⊕ SM1	√	1	1	√	$mm2$	B1
N53.14.57 GM4$^+$ ⊕ SM3	√	1	1	√	$mm2$	B1
N53.14.58 GM4$^+$ ⊕ C1	√	1	1	×	-	-
N53.14.59 GM4$^+$ ⊕ DT1	√	1	1	√	222	B2
N53.14.60 GM4$^+$ ⊕ DT2	√	1	1	√	222	B2
N53.14.61 GM4$^+$ ⊕ DT3	√	1	1	√	222	B2
N53.14.62 GM4$^+$ ⊕ DT4	√	1	1	√	222	B2
N53.14.63 GM4$^+$ ⊕ LD1	√	1	1	√	$mm2$	B1
N53.14.64 GM4$^+$ ⊕ LD2	√	1	1	√	$mm2$	B1

Non-coplanar SSGs with parent space group $Pmna$ (No. 53) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N53.14.65 $\mathrm{GM4}^{+} \oplus \mathrm{H1}$	$\surd$	1	1	$\times$	-	-
N53.14.66 $\mathrm{GM4}^{+} \oplus \mathrm{H2}$	$\surd$	1	1	$\times$	-	-
N53.14.67 $\mathrm{GM4}^{-} \oplus \mathrm{SM1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N53.14.68 $\mathrm{GM4}^{-} \oplus \mathrm{SM3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N53.14.69 $\mathrm{GM4}^{-} \oplus \mathrm{C1}$	$\surd$	1	1	$\times$	-	-
N53.14.70 $\mathrm{GM4}^{-} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N53.14.71 $\mathrm{GM4}^{-} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N53.14.72 $\mathrm{GM4}^{-} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N53.14.73 $\mathrm{GM4}^{-} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N53.14.74 $\mathrm{GM4}^{-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N53.14.75 $\mathrm{GM4}^{-} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N53.14.76 $\mathrm{GM4}^{-} \oplus \mathrm{H1}$	$\surd$	1	1	$\times$	-	-
N53.14.77 $\mathrm{GM4}^{-} \oplus \mathrm{H2}$	$\surd$	1	1	$\times$	-	-
N53.14.78 $\mathrm{Y1}^{+} \oplus \mathrm{SM1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N53.14.79 $\mathrm{Y1}^{+} \oplus \mathrm{SM3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N53.14.80 $\mathrm{Y1}^{+} \oplus \mathrm{C1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N53.14.81 $\mathrm{Y1}^{+} \oplus \mathrm{C3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N53.14.82 $\mathrm{Y1}^{+} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N53.14.83 $\mathrm{Y1}^{+} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N53.14.84 $\mathrm{Y1}^{+} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N53.14.85 $\mathrm{Y1}^{+} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N53.14.86 $\mathrm{Y1}^{+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N53.14.87 $\mathrm{Y1}^{+} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N53.14.88 $\mathrm{Y1}^{+} \oplus \mathrm{H1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N53.14.89 $\mathrm{Y1}^{+} \oplus \mathrm{H2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N53.14.90 $\mathrm{Y1}^{-} \oplus \mathrm{SM1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N53.14.91 $\mathrm{Y1}^{-} \oplus \mathrm{SM3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N53.14.92 $\mathrm{Y1}^{-} \oplus \mathrm{C1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N53.14.93 $\mathrm{Y1}^{-} \oplus \mathrm{C3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N53.14.94 $\mathrm{Y1}^{-} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N53.14.95 $\mathrm{Y1}^{-} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N53.14.96 $\mathrm{Y1}^{-} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N53.14.97 $\mathrm{Y1}^{-} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N53.14.98 $\mathrm{Y1}^{-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N53.14.99 $\mathrm{Y1}^{-} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N53.14.100 $\mathrm{Y1}^{-} \oplus \mathrm{H1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N53.14.101 $\mathrm{Y1}^{-} \oplus \mathrm{H2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N53.14.102 $\mathrm{Y2}^{+} \oplus \mathrm{SM1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N53.14.103 $\mathrm{Y2}^{+} \oplus \mathrm{SM3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N53.14.104 $\mathrm{Y2}^{+} \oplus \mathrm{C1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N53.14.105 $\mathrm{Y2}^{+} \oplus \mathrm{C3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N53.14.106 $\mathrm{Y2}^{+} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N53.14.107 $\mathrm{Y2}^{+} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N53.14.108 $\mathrm{Y2}^{+} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N53.14.109 $\mathrm{Y2}^{+} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N53.14.110 $\mathrm{Y2}^{+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$

Non-coplanar SSGs with parent space group $Pmna$ (No. 53) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N53.14.111 $\mathrm{Y2}^{+} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N53.14.112 $\mathrm{Y2}^{+} \oplus \mathrm{H1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N53.14.113 $\mathrm{Y2}^{+} \oplus \mathrm{H2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N53.14.114 $\mathrm{Y2}^{-} \oplus \mathrm{SM1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N53.14.115 $\mathrm{Y2}^{-} \oplus \mathrm{SM3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N53.14.116 $\mathrm{Y2}^{-} \oplus \mathrm{C1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N53.14.117 $\mathrm{Y2}^{-} \oplus \mathrm{C3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N53.14.118 $\mathrm{Y2}^{-} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N53.14.119 $\mathrm{Y2}^{-} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N53.14.120 $\mathrm{Y2}^{-} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N53.14.121 $\mathrm{Y2}^{-} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N53.14.122 $\mathrm{Y2}^{-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N53.14.123 $\mathrm{Y2}^{-} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N53.14.124 $\mathrm{Y2}^{-} \oplus \mathrm{H1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N53.14.125 $\mathrm{Y2}^{-} \oplus \mathrm{H2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$

TABLE S160: Collinear SSGs with parent space group $Pcca$ (No. 54).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L54.1.1 $\mathrm{GM1}^{+}$	1	mmm	$\mathrm{A_g}$
L54.2.1 $\mathrm{GM1}^{-}$	0	-	-
L54.2.2 $\mathrm{GM2}^{+}$	1	mmm	$\mathrm{B1_g}$
L54.2.3 $\mathrm{GM2}^{-}$	0	-	-
L54.2.4 $\mathrm{GM3}^{+}$	1	mmm	$\mathrm{B3_g}$
L54.2.5 $\mathrm{GM3}^{-}$	0	-	-
L54.2.6 $\mathrm{GM4}^{+}$	1	mmm	$\mathrm{B2_g}$
L54.2.7 $\mathrm{GM4}^{-}$	0	-	-
L54.2.8 $\mathrm{Y1}^{+}$	0	-	-
L54.2.9 $\mathrm{Y1}^{-}$	0	-	-
L54.2.10 $\mathrm{Y2}^{+}$	0	-	-
L54.2.11 $\mathrm{Y2}^{-}$	0	-	-

TABLE S161: Coplanar SSGs with parent space group $Pcca$ (No. 54).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P54.1.1 $\mathrm{GM1}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
P54.2.1 $\mathrm{GM1}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
P54.2.2 $\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
P54.2.3 $\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
P54.2.4 $\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g}$
P54.2.5 $\mathrm{GM3}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u}$
P54.2.6 $\mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B2_g}$
P54.2.7 $\mathrm{GM4}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B2_u}$
P54.2.8 $\mathrm{Y1}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P54.2.9 $\mathrm{Y1}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P54.2.10 $\mathrm{Y2}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$

Coplanar SSGs with parent space group $Pcca$ (No. 54) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P54.2.11 $\mathrm{Y2}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P54.3.1 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-}$	$\surd$	0	0	$\surd$	-	-
P54.3.2 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
P54.3.3 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
P54.3.4 $\mathrm{GM1}^{-} \oplus \mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u}$
P54.3.5 $\mathrm{GM1}^{-} \oplus \mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
P54.3.6 $\mathrm{GM1}^{-} \oplus \mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_g} \oplus \mathrm{B2_u}$
P54.3.7 $\mathrm{GM1}^{-} \oplus \mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
P54.3.8 $\mathrm{GM1}^{-} \oplus \mathrm{Y1}^{+}$	$\surd$	1	1	$\times$	-	-
P54.3.9 $\mathrm{GM1}^{-} \oplus \mathrm{Y1}^{-}$	$\surd$	1	1	$\times$	-	-
P54.3.10 $\mathrm{GM1}^{-} \oplus \mathrm{Y2}^{+}$	$\surd$	1	1	$\times$	-	-
P54.3.11 $\mathrm{GM1}^{-} \oplus \mathrm{Y2}^{-}$	$\surd$	1	1	$\times$	-	-
P54.3.12 $\mathrm{GM2}^{+} \oplus \mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
P54.3.13 $\mathrm{GM2}^{+} \oplus \mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
P54.3.14 $\mathrm{GM2}^{+} \oplus \mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
P54.3.15 $\mathrm{GM2}^{+} \oplus \mathrm{GM3}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
P54.3.16 $\mathrm{GM2}^{+} \oplus \mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
P54.3.17 $\mathrm{GM2}^{+} \oplus \mathrm{GM4}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_u}$
P54.3.18 $\mathrm{GM2}^{+} \oplus \mathrm{Y1}^{+}$	$\surd$	1	0	$\times$	-	-
P54.3.19 $\mathrm{GM2}^{+} \oplus \mathrm{Y1}^{-}$	$\surd$	1	0	$\times$	-	-
P54.3.20 $\mathrm{GM2}^{+} \oplus \mathrm{Y2}^{+}$	$\surd$	1	0	$\times$	-	-
P54.3.21 $\mathrm{GM2}^{+} \oplus \mathrm{Y2}^{-}$	$\surd$	1	0	$\times$	-	-
P54.3.22 $\mathrm{GM2}^{-} \oplus \mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
P54.3.23 $\mathrm{GM2}^{-} \oplus \mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
P54.3.24 $\mathrm{GM2}^{-} \oplus \mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
P54.3.25 $\mathrm{GM2}^{-} \oplus \mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_g}$
P54.3.26 $\mathrm{GM2}^{-} \oplus \mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
P54.3.27 $\mathrm{GM2}^{-} \oplus \mathrm{Y1}^{+}$	$\surd$	1	1	$\times$	-	-
P54.3.28 $\mathrm{GM2}^{-} \oplus \mathrm{Y1}^{-}$	$\surd$	1	1	$\times$	-	-
P54.3.29 $\mathrm{GM2}^{-} \oplus \mathrm{Y2}^{+}$	$\surd$	1	1	$\times$	-	-
P54.3.30 $\mathrm{GM2}^{-} \oplus \mathrm{Y2}^{-}$	$\surd$	1	1	$\times$	-	-
P54.3.31 $\mathrm{GM3}^{+} \oplus \mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
P54.3.32 $\mathrm{GM3}^{+} \oplus \mathrm{GM3}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
P54.3.33 $\mathrm{GM3}^{+} \oplus \mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g}$
P54.3.34 $\mathrm{GM3}^{+} \oplus \mathrm{GM4}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
P54.3.35 $\mathrm{GM3}^{+} \oplus \mathrm{Y1}^{+}$	$\surd$	1	0	$\times$	-	-
P54.3.36 $\mathrm{GM3}^{+} \oplus \mathrm{Y1}^{-}$	$\surd$	1	0	$\times$	-	-
P54.3.37 $\mathrm{GM3}^{+} \oplus \mathrm{Y2}^{+}$	$\surd$	1	0	$\times$	-	-
P54.3.38 $\mathrm{GM3}^{+} \oplus \mathrm{Y2}^{-}$	$\surd$	1	0	$\times$	-	-
P54.3.39 $\mathrm{GM3}^{-} \oplus \mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
P54.3.40 $\mathrm{GM3}^{-} \oplus \mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g}$
P54.3.41 $\mathrm{GM3}^{-} \oplus \mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
P54.3.42 $\mathrm{GM3}^{-} \oplus \mathrm{Y1}^{+}$	$\surd$	1	1	$\times$	-	-
P54.3.43 $\mathrm{GM3}^{-} \oplus \mathrm{Y1}^{-}$	$\surd$	1	1	$\times$	-	-
P54.3.44 $\mathrm{GM3}^{-} \oplus \mathrm{Y2}^{+}$	$\surd$	1	1	$\times$	-	-
P54.3.45 $\mathrm{GM3}^{-} \oplus \mathrm{Y2}^{-}$	$\surd$	1	1	$\times$	-	-

Coplanar SSGs with parent space group $Pcca$ (No. 54) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P54.3.46 $\mathrm{GM4}^{+} \oplus \mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_g} \oplus \mathrm{B2_g}$
P54.3.47 $\mathrm{GM4}^{+} \oplus \mathrm{GM4}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B2_g}$
P54.3.48 $\mathrm{GM4}^{+} \oplus \mathrm{Y1}^{+}$	$\surd$	1	0	$\times$	-	-
P54.3.49 $\mathrm{GM4}^{+} \oplus \mathrm{Y1}^{-}$	$\surd$	1	0	$\times$	-	-
P54.3.50 $\mathrm{GM4}^{+} \oplus \mathrm{Y2}^{+}$	$\surd$	1	0	$\times$	-	-
P54.3.51 $\mathrm{GM4}^{+} \oplus \mathrm{Y2}^{-}$	$\surd$	1	0	$\times$	-	-
P54.3.52 $\mathrm{GM4}^{-} \oplus \mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
P54.3.53 $\mathrm{GM4}^{-} \oplus \mathrm{Y1}^{+}$	$\surd$	1	1	$\times$	-	-
P54.3.54 $\mathrm{GM4}^{-} \oplus \mathrm{Y1}^{-}$	$\surd$	1	1	$\times$	-	-
P54.3.55 $\mathrm{GM4}^{-} \oplus \mathrm{Y2}^{+}$	$\surd$	1	1	$\times$	-	-
P54.3.56 $\mathrm{GM4}^{-} \oplus \mathrm{Y2}^{-}$	$\surd$	1	1	$\times$	-	-
P54.3.57 $\mathrm{Y1}^{+} \oplus \mathrm{Y1}^{+}$	$\surd$	1	0	$\times$	-	-
P54.3.58 $\mathrm{Y1}^{+} \oplus \mathrm{Y4}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P54.3.59 $\mathrm{Y1}^{+} \oplus \mathrm{Y1}^{-}$	$\surd$	1	1	$\times$	-	-
P54.3.60 $\mathrm{Y1}^{+} \oplus \mathrm{Y4}^{+}$	$\surd$	1	0	$\times$	-	-
P54.3.61 $\mathrm{Y1}^{+} \oplus \mathrm{Y2}^{+}$	$\surd$	1	0	$\times$	-	-
P54.3.62 $\mathrm{Y1}^{+} \oplus \mathrm{Y3}^{-}$	$\surd$	1	1	$\times$	-	-
P54.3.63 $\mathrm{Y1}^{+} \oplus \mathrm{Y2}^{-}$	$\surd$	1	1	$\times$	-	-
P54.3.64 $\mathrm{Y1}^{+} \oplus \mathrm{Y3}^{+}$	$\surd$	1	0	$\times$	-	-
P54.3.65 $\mathrm{Y1}^{-} \oplus \mathrm{Y1}^{-}$	$\surd$	1	0	$\times$	-	-
P54.3.66 $\mathrm{Y1}^{-} \oplus \mathrm{Y4}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P54.3.67 $\mathrm{Y1}^{-} \oplus \mathrm{Y2}^{+}$	$\surd$	1	1	$\times$	-	-
P54.3.68 $\mathrm{Y1}^{-} \oplus \mathrm{Y3}^{-}$	$\surd$	1	0	$\times$	-	-
P54.3.69 $\mathrm{Y1}^{-} \oplus \mathrm{Y2}^{-}$	$\surd$	1	0	$\times$	-	-
P54.3.70 $\mathrm{Y1}^{-} \oplus \mathrm{Y3}^{+}$	$\surd$	1	1	$\times$	-	-
P54.3.71 $\mathrm{Y2}^{+} \oplus \mathrm{Y2}^{+}$	$\surd$	1	0	$\times$	-	-
P54.3.72 $\mathrm{Y2}^{+} \oplus \mathrm{Y3}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P54.3.73 $\mathrm{Y2}^{+} \oplus \mathrm{Y2}^{-}$	$\surd$	1	1	$\times$	-	-
P54.3.74 $\mathrm{Y2}^{+} \oplus \mathrm{Y3}^{+}$	$\surd$	1	0	$\times$	-	-
P54.3.75 $\mathrm{Y2}^{-} \oplus \mathrm{Y2}^{-}$	$\surd$	1	0	$\times$	-	-
P54.3.76 $\mathrm{Y2}^{-} \oplus \mathrm{Y3}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P54.6.1 S1	$\surd$	1	1	$\times$	-	-
P54.6.2 T1	$\surd$	1	1	$\times$	-	-
P54.6.3 X1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P54.6.4 X2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P54.6.5 Z1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P54.6.6 Z2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P54.8.1 SM1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P54.8.2 SM2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P54.8.3 C1	$\surd$	1	1	$\times$	-	-
P54.8.4 DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P54.8.5 DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P54.8.6 DT3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P54.8.7 DT4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P54.8.8 LD1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P54.8.9 LD3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$

Coplanar SSGs with parent space group $Pcca$ (No. 54) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P54.8.10 H1	$\surd$	1	1	$\times$	-	-

TABLE S162: Non-coplanar SSGs with parent space group $Pcca$ (No. 54).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N54.1.1 $\mathrm{GM1}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{A_g}$
N54.2.1 $\mathrm{GM1}^-$	$\surd$	2	2	$\surd$	222	$\mathrm{A1}\oplus\mathrm{A1}$
N54.2.2 $\mathrm{GM2}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{B1_g}$
N54.2.3 $\mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1}\oplus\mathrm{A1}$
N54.2.4 $\mathrm{GM3}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{B3_g}$
N54.2.5 $\mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1}\oplus\mathrm{A1}$
N54.2.6 $\mathrm{GM4}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{B2_g}$
N54.2.7 $\mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1}\oplus\mathrm{A1}$
N54.2.8 $\mathrm{Y1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_g}$
N54.2.9 $\mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_g}$
N54.2.10 $\mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_g}$
N54.2.11 $\mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_g}$
N54.3.1 $\mathrm{GM1}^-\oplus\mathrm{GM1}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_u}\oplus\mathrm{A_u}$
N54.3.2 $\mathrm{GM1}^-\oplus\mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1}\oplus\mathrm{A2}$
N54.3.3 $\mathrm{GM1}^-\oplus\mathrm{GM2}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_u}\oplus\mathrm{B1_u}$
N54.3.4 $\mathrm{GM1}^-\oplus\mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1}\oplus\mathrm{A2}$
N54.3.5 $\mathrm{GM1}^-\oplus\mathrm{GM3}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_u}\oplus\mathrm{B3_u}$
N54.3.6 $\mathrm{GM1}^-\oplus\mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1}\oplus\mathrm{A2}$
N54.3.7 $\mathrm{GM1}^-\oplus\mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_u}\oplus\mathrm{B2_u}$
N54.3.8 $\mathrm{GM1}^-\oplus\mathrm{Y1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_u}$
N54.3.9 $\mathrm{GM1}^-\oplus\mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_u}$
N54.3.10 $\mathrm{GM1}^-\oplus\mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_u}$
N54.3.11 $\mathrm{GM1}^-\oplus\mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_u}$
N54.3.12 $\mathrm{GM2}^+\oplus\mathrm{GM2}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B1_g}\oplus\mathrm{B1_g}$
N54.3.13 $\mathrm{GM2}^+\oplus\mathrm{GM2}^-$	$\surd$	2	2	$\surd$	222	$\mathrm{A1}\oplus\mathrm{B1}$
N54.3.14 $\mathrm{GM2}^+\oplus\mathrm{GM3}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B1_g}\oplus\mathrm{B3_g}$
N54.3.15 $\mathrm{GM2}^+\oplus\mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1}\oplus\mathrm{B1}$
N54.3.16 $\mathrm{GM2}^+\oplus\mathrm{GM4}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B1_g}\oplus\mathrm{B2_g}$
N54.3.17 $\mathrm{GM2}^+\oplus\mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1}\oplus\mathrm{B2}$
N54.3.18 $\mathrm{GM2}^+\oplus\mathrm{Y1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B1_g}$
N54.3.19 $\mathrm{GM2}^+\oplus\mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B1_g}$
N54.3.20 $\mathrm{GM2}^+\oplus\mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B1_g}$
N54.3.21 $\mathrm{GM2}^+\oplus\mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B1_g}$
N54.3.22 $\mathrm{GM2}^-\oplus\mathrm{GM2}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B1_u}\oplus\mathrm{B1_u}$
N54.3.23 $\mathrm{GM2}^-\oplus\mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1}\oplus\mathrm{B2}$
N54.3.24 $\mathrm{GM2}^-\oplus\mathrm{GM3}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B1_u}\oplus\mathrm{B3_u}$
N54.3.25 $\mathrm{GM2}^-\oplus\mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1}\oplus\mathrm{B1}$
N54.3.26 $\mathrm{GM2}^-\oplus\mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B1_u}\oplus\mathrm{B2_u}$
N54.3.27 $\mathrm{GM2}^-\oplus\mathrm{Y1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B1_u}$
N54.3.28 $\mathrm{GM2}^-\oplus\mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B1_u}$
N54.3.29 $\mathrm{GM2}^-\oplus\mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B1_u}$

Non-coplanar SSGs with parent space group $Pcca$ (No. 54) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N54.3.30 $\mathrm{GM2}^{-} \oplus \mathrm{Y2}^{-}$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
N54.3.31 $\mathrm{GM3}^{+} \oplus \mathrm{GM3}^{+}$	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N54.3.32 $\mathrm{GM3}^{+} \oplus \mathrm{GM3}^{-}$	√	2	2	√	222	$\mathrm{A1} \oplus \mathrm{B3}$
N54.3.33 $\mathrm{GM3}^{+} \oplus \mathrm{GM4}^{+}$	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N54.3.34 $\mathrm{GM3}^{+} \oplus \mathrm{GM4}^{-}$	√	2	2	√	$mm2$	$\mathrm{A1} \oplus \mathrm{B2}$
N54.3.35 $\mathrm{GM3}^{+} \oplus \mathrm{Y1}^{+}$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g}$
N54.3.36 $\mathrm{GM3}^{+} \oplus \mathrm{Y1}^{-}$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g}$
N54.3.37 $\mathrm{GM3}^{+} \oplus \mathrm{Y2}^{+}$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g}$
N54.3.38 $\mathrm{GM3}^{+} \oplus \mathrm{Y2}^{-}$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g}$
N54.3.39 $\mathrm{GM3}^{-} \oplus \mathrm{GM3}^{-}$	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N54.3.40 $\mathrm{GM3}^{-} \oplus \mathrm{GM4}^{+}$	√	2	2	√	$mm2$	$\mathrm{A1} \oplus \mathrm{B1}$
N54.3.41 $\mathrm{GM3}^{-} \oplus \mathrm{GM4}^{-}$	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N54.3.42 $\mathrm{GM3}^{-} \oplus \mathrm{Y1}^{+}$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u}$
N54.3.43 $\mathrm{GM3}^{-} \oplus \mathrm{Y1}^{-}$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u}$
N54.3.44 $\mathrm{GM3}^{-} \oplus \mathrm{Y2}^{+}$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u}$
N54.3.45 $\mathrm{GM3}^{-} \oplus \mathrm{Y2}^{-}$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u}$
N54.3.46 $\mathrm{GM4}^{+} \oplus \mathrm{GM4}^{+}$	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N54.3.47 $\mathrm{GM4}^{+} \oplus \mathrm{GM4}^{-}$	√	2	2	√	222	$\mathrm{A1} \oplus \mathrm{B2}$
N54.3.48 $\mathrm{GM4}^{+} \oplus \mathrm{Y1}^{+}$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B2_g}$
N54.3.49 $\mathrm{GM4}^{+} \oplus \mathrm{Y1}^{-}$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B2_g}$
N54.3.50 $\mathrm{GM4}^{+} \oplus \mathrm{Y2}^{+}$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B2_g}$
N54.3.51 $\mathrm{GM4}^{+} \oplus \mathrm{Y2}^{-}$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B2_g}$
N54.3.52 $\mathrm{GM4}^{-} \oplus \mathrm{GM4}^{-}$	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N54.3.53 $\mathrm{GM4}^{-} \oplus \mathrm{Y1}^{+}$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B2_u}$
N54.3.54 $\mathrm{GM4}^{-} \oplus \mathrm{Y1}^{-}$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B2_u}$
N54.3.55 $\mathrm{GM4}^{-} \oplus \mathrm{Y2}^{+}$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B2_u}$
N54.3.56 $\mathrm{GM4}^{-} \oplus \mathrm{Y2}^{-}$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B2_u}$
N54.3.57 $\mathrm{Y1}^{+} \oplus \mathrm{Y1}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N54.3.58 $\mathrm{Y1}^{+} \oplus \mathrm{Y4}^{-}$	√	1	1	√	$mm2$	A1
N54.3.59 $\mathrm{Y1}^{+} \oplus \mathrm{Y1}^{-}$	√	1	1	√	222	A1
N54.3.60 $\mathrm{Y1}^{+} \oplus \mathrm{Y4}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N54.3.61 $\mathrm{Y1}^{+} \oplus \mathrm{Y2}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N54.3.62 $\mathrm{Y1}^{+} \oplus \mathrm{Y3}^{-}$	√	1	1	√	$mm2$	A1
N54.3.63 $\mathrm{Y1}^{+} \oplus \mathrm{Y2}^{-}$	√	1	1	√	$mm2$	A1
N54.3.64 $\mathrm{Y1}^{+} \oplus \mathrm{Y3}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N54.3.65 $\mathrm{Y1}^{-} \oplus \mathrm{Y1}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N54.3.66 $\mathrm{Y1}^{-} \oplus \mathrm{Y4}^{+}$	√	1	1	√	$mm2$	A1
N54.3.67 $\mathrm{Y1}^{-} \oplus \mathrm{Y2}^{+}$	√	1	1	√	$mm2$	A1
N54.3.68 $\mathrm{Y1}^{-} \oplus \mathrm{Y3}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N54.3.69 $\mathrm{Y1}^{-} \oplus \mathrm{Y2}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N54.3.70 $\mathrm{Y1}^{-} \oplus \mathrm{Y3}^{+}$	√	1	1	√	$mm2$	A1
N54.3.71 $\mathrm{Y2}^{+} \oplus \mathrm{Y2}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N54.3.72 $\mathrm{Y2}^{+} \oplus \mathrm{Y3}^{-}$	√	1	1	√	$mm2$	A1
N54.3.73 $\mathrm{Y2}^{+} \oplus \mathrm{Y2}^{-}$	√	1	1	√	222	A1
N54.3.74 $\mathrm{Y2}^{+} \oplus \mathrm{Y3}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N54.3.75 $\mathrm{Y2}^{-} \oplus \mathrm{Y2}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$

Non-coplanar SSGs with parent space group $Pcca$ (No. 54) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N54.3.76 $\mathrm{Y2}^- \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\surd$	$mm2$	A1
N54.6.1 S1	$\surd$	1	1	$\surd$	$mm2$	A1
N54.6.2 T1	$\surd$	1	1	$\surd$	$mm2$	A1
N54.6.3 X1	$\surd$	1	1	$\surd$	$mm2$	A1
N54.6.4 X2	$\surd$	1	1	$\surd$	$mm2$	A1
N54.6.5 Z1	$\surd$	1	1	$\surd$	$mm2$	A1
N54.6.6 Z2	$\surd$	1	1	$\surd$	$mm2$	A1
N54.8.1 SM1	$\surd$	1	1	$\surd$	$mm2$	A1
N54.8.2 SM2	$\surd$	1	1	$\surd$	$mm2$	A1
N54.8.3 C1	$\surd$	1	1	$\surd$	$mm2$	A1
N54.8.4 DT1	$\surd$	1	1	$\surd$	$mm2$	A1
N54.8.5 DT2	$\surd$	1	1	$\surd$	$mm2$	A1
N54.8.6 DT3	$\surd$	1	1	$\surd$	$mm2$	A1
N54.8.7 DT4	$\surd$	1	1	$\surd$	$mm2$	A1
N54.8.8 LD1	$\surd$	1	1	$\surd$	$mm2$	A1
N54.8.9 LD3	$\surd$	1	1	$\surd$	$mm2$	A1
N54.8.10 H1	$\surd$	1	1	$\surd$	$mm2$	A1
N54.9.1 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{GM1}^-$	$\surd$	0	0	$\surd$	-	-
N54.9.2 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{GM2}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N54.9.3 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
N54.9.4 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N54.9.5 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N54.9.6 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B2_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N54.9.7 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N54.9.8 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{Y1}^+$	$\surd$	0	0	$\surd$	-	-
N54.9.9 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{Y1}^-$	$\surd$	0	0	$\surd$	-	-
N54.9.10 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{Y2}^+$	$\surd$	0	0	$\surd$	-	-
N54.9.11 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{Y2}^-$	$\surd$	0	0	$\surd$	-	-
N54.9.12 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	2	2	$\surd$	222	$\mathrm{B1} \oplus \mathrm{B1}$
N54.9.13 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N54.9.14 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2} \oplus \mathrm{B1}$
N54.9.15 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_u}$
N54.9.16 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2} \oplus \mathrm{B1}$
N54.9.17 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B3_u}$
N54.9.18 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N54.9.19 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N54.9.20 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N54.9.21 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N54.9.22 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
N54.9.23 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N54.9.24 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N54.9.25 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N54.9.26 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N54.9.27 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Y1}^+$	$\surd$	0	0	$\surd$	-	-
N54.9.28 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Y1}^-$	$\surd$	0	0	$\surd$	-	-
N54.9.29 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Y2}^+$	$\surd$	0	0	$\surd$	-	-

Non-coplanar SSGs with parent space group $Pcca$ (No. 54) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N54.9.30 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Y2}^-$	$\surd$	0	0	$\surd$	-	-
N54.9.31 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	222	$\mathrm{B3} \oplus \mathrm{B3}$
N54.9.32 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N54.9.33 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2} \oplus \mathrm{B1}$
N54.9.34 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N54.9.35 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u}$
N54.9.36 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u}$
N54.9.37 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u}$
N54.9.38 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u}$
N54.9.39 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N54.9.40 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N54.9.41 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N54.9.42 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y1}^+$	$\surd$	0	0	$\surd$	-	-
N54.9.43 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y1}^-$	$\surd$	0	0	$\surd$	-	-
N54.9.44 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y2}^+$	$\surd$	0	0	$\surd$	-	-
N54.9.45 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y2}^-$	$\surd$	0	0	$\surd$	-	-
N54.9.46 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	222	$\mathrm{B2} \oplus \mathrm{B2}$
N54.9.47 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N54.9.48 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_g} \oplus \mathrm{B2_u}$
N54.9.49 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_g} \oplus \mathrm{B2_u}$
N54.9.50 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_g} \oplus \mathrm{B2_u}$
N54.9.51 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_g} \oplus \mathrm{B2_u}$
N54.9.52 $\mathrm{GM1}^- \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N54.9.53 $\mathrm{GM1}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Y1}^+$	$\surd$	0	0	$\surd$	-	-
N54.9.54 $\mathrm{GM1}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Y1}^-$	$\surd$	0	0	$\surd$	-	-
N54.9.55 $\mathrm{GM1}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Y2}^+$	$\surd$	0	0	$\surd$	-	-
N54.9.56 $\mathrm{GM1}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Y2}^-$	$\surd$	0	0	$\surd$	-	-
N54.9.57 $\mathrm{GM1}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	0	$\times$	-	-
N54.9.58 $\mathrm{GM1}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N54.9.59 $\mathrm{GM1}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^-$	$\surd$	1	1	$\times$	-	-
N54.9.60 $\mathrm{GM1}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
N54.9.61 $\mathrm{GM1}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N54.9.62 $\mathrm{GM1}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\times$	-	-
N54.9.63 $\mathrm{GM1}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\times$	-	-
N54.9.64 $\mathrm{GM1}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N54.9.65 $\mathrm{GM1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y1}^-$	$\surd$	1	0	$\times$	-	-
N54.9.66 $\mathrm{GM1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N54.9.67 $\mathrm{GM1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\times$	-	-
N54.9.68 $\mathrm{GM1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N54.9.69 $\mathrm{GM1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N54.9.70 $\mathrm{GM1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\times$	-	-
N54.9.71 $\mathrm{GM1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N54.9.72 $\mathrm{GM1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N54.9.73 $\mathrm{GM1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\times$	-	-
N54.9.74 $\mathrm{GM1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N54.9.75 $\mathrm{GM1}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $Pcca$ (No. 54) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N54.9.76 $\mathrm{GM1}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y3}^+$	√	1	1	√	mmm	$\mathrm{B2_u}$
N54.9.77 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N54.9.78 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	√	2	2	√	$mm2$	$\mathrm{A2} \oplus \mathrm{A2}$
N54.9.79 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM3}^+$	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B3_g}$
N54.9.80 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM3}^-$	√	2	2	√	$mm2$	$\mathrm{B2} \oplus \mathrm{B2}$
N54.9.81 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM4}^+$	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B2_g}$
N54.9.82 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM4}^-$	√	2	2	√	$mm2$	$\mathrm{B1} \oplus \mathrm{B1}$
N54.9.83 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{Y1}^+$	√	2	2	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N54.9.84 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{Y1}^-$	√	2	2	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N54.9.85 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{Y2}^+$	√	2	2	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N54.9.86 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{Y2}^-$	√	2	2	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N54.9.87 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$
N54.9.88 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^+$	√	2	2	√	$mm2$	$\mathrm{A2} \oplus \mathrm{B2}$
N54.9.89 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^-$	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g} \oplus \mathrm{B2_u}$
N54.9.90 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^+$	√	2	2	√	$mm2$	$\mathrm{A2} \oplus \mathrm{B1}$
N54.9.91 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^-$	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g} \oplus \mathrm{B3_u}$
N54.9.92 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{Y1}^+$	√	2	2	√	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
N54.9.93 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{Y1}^-$	√	2	2	√	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
N54.9.94 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{Y2}^+$	√	2	2	√	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
N54.9.95 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{Y2}^-$	√	2	2	√	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
N54.9.96 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N54.9.97 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	√	2	2	√	$mm2$	$\mathrm{A2} \oplus \mathrm{B2}$
N54.9.98 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N54.9.99 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	√	2	2	√	222	$\mathrm{B1} \oplus \mathrm{B3}$
N54.9.100 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Y1}^+$	√	2	2	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N54.9.101 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Y1}^-$	√	2	2	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N54.9.102 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Y2}^+$	√	2	2	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N54.9.103 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Y2}^-$	√	2	2	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N54.9.104 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N54.9.105 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^+$	√	2	2	√	222	$\mathrm{B1} \oplus \mathrm{B2}$
N54.9.106 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N54.9.107 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Y1}^+$	√	2	2	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N54.9.108 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Y1}^-$	√	2	2	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N54.9.109 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Y2}^+$	√	2	2	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N54.9.110 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Y2}^-$	√	2	2	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N54.9.111 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N54.9.112 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	√	2	2	√	$mm2$	$\mathrm{A2} \oplus \mathrm{B1}$
N54.9.113 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{Y1}^+$	√	2	2	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
N54.9.114 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{Y1}^-$	√	2	2	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
N54.9.115 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{Y2}^+$	√	2	2	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
N54.9.116 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{Y2}^-$	√	2	2	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
N54.9.117 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N54.9.118 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{Y1}^+$	√	2	2	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_u}$
N54.9.119 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{Y1}^-$	√	2	2	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_u}$
N54.9.120 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{Y2}^+$	√	2	2	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_u}$
N54.9.121 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{Y2}^-$	√	2	2	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_u}$

Non-coplanar SSGs with parent space group $Pcca$ (No. 54) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N54.9.122 $\mathrm{GM2}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y1}^{+}$	$\surd$	1	1	$\times$	-	-
N54.9.123 $\mathrm{GM2}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y4}^{-}$	$\surd$	1	1	$\surd$	$mm2$	$\mathrm{B2}$
N54.9.124 $\mathrm{GM2}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y1}^{-}$	$\surd$	1	1	$\times$	-	-
N54.9.125 $\mathrm{GM2}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y4}^{+}$	$\surd$	1	1	$\times$	-	-
N54.9.126 $\mathrm{GM2}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y2}^{+}$	$\surd$	1	1	$\times$	-	-
N54.9.127 $\mathrm{GM2}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\times$	-	-
N54.9.128 $\mathrm{GM2}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\times$	-	-
N54.9.129 $\mathrm{GM2}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y3}^{+}$	$\surd$	1	1	$\times$	-	-
N54.9.130 $\mathrm{GM2}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y1}^{-}$	$\surd$	1	1	$\times$	-	-
N54.9.131 $\mathrm{GM2}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y4}^{+}$	$\surd$	1	1	$\surd$	$mm2$	$\mathrm{B2}$
N54.9.132 $\mathrm{GM2}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y2}^{+}$	$\surd$	1	1	$\times$	-	-
N54.9.133 $\mathrm{GM2}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\times$	-	-
N54.9.134 $\mathrm{GM2}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\times$	-	-
N54.9.135 $\mathrm{GM2}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y3}^{+}$	$\surd$	1	1	$\times$	-	-
N54.9.136 $\mathrm{GM2}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Y2}^{+}$	$\surd$	1	1	$\times$	-	-
N54.9.137 $\mathrm{GM2}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\surd$	$mm2$	$\mathrm{B2}$
N54.9.138 $\mathrm{GM2}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\times$	-	-
N54.9.139 $\mathrm{GM2}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Y3}^{+}$	$\surd$	1	1	$\times$	-	-
N54.9.140 $\mathrm{GM2}^{+}\oplus\mathrm{Y2}^{-}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\times$	-	-
N54.9.141 $\mathrm{GM2}^{+}\oplus\mathrm{Y2}^{-}\oplus\mathrm{Y3}^{+}$	$\surd$	1	1	$\surd$	$mm2$	$\mathrm{B2}$
N54.9.142 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
N54.9.143 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B2_u}\oplus\mathrm{B2_u}$
N54.9.144 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
N54.9.145 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{GM4}^{+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_u}\oplus\mathrm{B3_u}\oplus\mathrm{B2_g}$
N54.9.146 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
N54.9.147 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{Y1}^{+}$	$\surd$	0	0	$\surd$	-	-
N54.9.148 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{Y1}^{-}$	$\surd$	0	0	$\surd$	-	-
N54.9.149 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{Y2}^{+}$	$\surd$	0	0	$\surd$	-	-
N54.9.150 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{Y2}^{-}$	$\surd$	0	0	$\surd$	-	-
N54.9.151 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2}\oplus\mathrm{B2}$
N54.9.152 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B3_g}\oplus\mathrm{B2_u}$
N54.9.153 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{+}\oplus\mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	222	$\mathrm{B3}\oplus\mathrm{B2}$
N54.9.154 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{+}\oplus\mathrm{GM4}^{-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B3_g}\oplus\mathrm{B2_u}$
N54.9.155 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{+}\oplus\mathrm{Y1}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B2_u}$
N54.9.156 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{+}\oplus\mathrm{Y1}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B2_u}$
N54.9.157 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{+}\oplus\mathrm{Y2}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B2_u}$
N54.9.158 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{+}\oplus\mathrm{Y2}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B2_u}$
N54.9.159 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
N54.9.160 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B3_u}\oplus\mathrm{B2_g}$
N54.9.161 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
N54.9.162 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{Y1}^{+}$	$\surd$	0	0	$\surd$	-	-
N54.9.163 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{Y1}^{-}$	$\surd$	0	0	$\surd$	-	-
N54.9.164 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{Y2}^{+}$	$\surd$	0	0	$\surd$	-	-
N54.9.165 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{Y2}^{-}$	$\surd$	0	0	$\surd$	-	-
N54.9.166 $\mathrm{GM2}^{-}\oplus\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B1}\oplus\mathrm{B1}$
N54.9.167 $\mathrm{GM2}^{-}\oplus\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B3_u}\oplus\mathrm{B2_g}$

Non-coplanar SSGs with parent space group $Pcca$ (No. 54) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N54.9.168 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_g}$
N54.9.169 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_g}$
N54.9.170 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_g}$
N54.9.171 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_g}$
N54.9.172 $\mathrm{GM2}^- \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N54.9.173 $\mathrm{GM2}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Y1}^+$	$\surd$	0	0	$\surd$	-	-
N54.9.174 $\mathrm{GM2}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Y1}^-$	$\surd$	0	0	$\surd$	-	-
N54.9.175 $\mathrm{GM2}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Y2}^+$	$\surd$	0	0	$\surd$	-	-
N54.9.176 $\mathrm{GM2}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Y2}^-$	$\surd$	0	0	$\surd$	-	-
N54.9.177 $\mathrm{GM2}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	0	$\times$	-	-
N54.9.178 $\mathrm{GM2}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N54.9.179 $\mathrm{GM2}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^-$	$\surd$	1	1	$\times$	-	-
N54.9.180 $\mathrm{GM2}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
N54.9.181 $\mathrm{GM2}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N54.9.182 $\mathrm{GM2}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\times$	-	-
N54.9.183 $\mathrm{GM2}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\times$	-	-
N54.9.184 $\mathrm{GM2}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N54.9.185 $\mathrm{GM2}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y1}^-$	$\surd$	1	0	$\times$	-	-
N54.9.186 $\mathrm{GM2}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N54.9.187 $\mathrm{GM2}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\times$	-	-
N54.9.188 $\mathrm{GM2}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N54.9.189 $\mathrm{GM2}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N54.9.190 $\mathrm{GM2}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\times$	-	-
N54.9.191 $\mathrm{GM2}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N54.9.192 $\mathrm{GM2}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N54.9.193 $\mathrm{GM2}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\times$	-	-
N54.9.194 $\mathrm{GM2}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N54.9.195 $\mathrm{GM2}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N54.9.196 $\mathrm{GM2}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N54.9.197 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N54.9.198 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{A2}$
N54.9.199 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N54.9.200 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2} \oplus \mathrm{B2}$
N54.9.201 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
N54.9.202 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
N54.9.203 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
N54.9.204 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
N54.9.205 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B3_g}$
N54.9.206 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{B2}$
N54.9.207 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u} \oplus \mathrm{B3_g}$
N54.9.208 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N54.9.209 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N54.9.210 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N54.9.211 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N54.9.212 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N54.9.213 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{B1}$

Non-coplanar SSGs with parent space group $Pcca$ (No. 54) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N54.9.214 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g}$
N54.9.215 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g}$
N54.9.216 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g}$
N54.9.217 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g}$
N54.9.218 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B3_g}$
N54.9.219 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N54.9.220 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N54.9.221 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N54.9.222 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N54.9.223 $\mathrm{GM3}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	1	$\times$	-	-
N54.9.224 $\mathrm{GM3}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\surd$	$mm2$	B2
N54.9.225 $\mathrm{GM3}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^-$	$\surd$	1	1	$\times$	-	-
N54.9.226 $\mathrm{GM3}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\times$	-	-
N54.9.227 $\mathrm{GM3}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\times$	-	-
N54.9.228 $\mathrm{GM3}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\times$	-	-
N54.9.229 $\mathrm{GM3}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\times$	-	-
N54.9.230 $\mathrm{GM3}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\times$	-	-
N54.9.231 $\mathrm{GM3}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y1}^-$	$\surd$	1	1	$\times$	-	-
N54.9.232 $\mathrm{GM3}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\surd$	$mm2$	B2
N54.9.233 $\mathrm{GM3}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\times$	-	-
N54.9.234 $\mathrm{GM3}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\times$	-	-
N54.9.235 $\mathrm{GM3}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\times$	-	-
N54.9.236 $\mathrm{GM3}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\times$	-	-
N54.9.237 $\mathrm{GM3}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\times$	-	-
N54.9.238 $\mathrm{GM3}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\surd$	$mm2$	B2
N54.9.239 $\mathrm{GM3}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\times$	-	-
N54.9.240 $\mathrm{GM3}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\times$	-	-
N54.9.241 $\mathrm{GM3}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\times$	-	-
N54.9.242 $\mathrm{GM3}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\surd$	$mm2$	B2
N54.9.243 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N54.9.244 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B2_g}$
N54.9.245 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N54.9.246 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y1}^+$	$\surd$	0	0	$\surd$	-	-
N54.9.247 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y1}^-$	$\surd$	0	0	$\surd$	-	-
N54.9.248 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y2}^+$	$\surd$	0	0	$\surd$	-	-
N54.9.249 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y2}^-$	$\surd$	0	0	$\surd$	-	-
N54.9.250 $\mathrm{GM3}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B1} \oplus \mathrm{B1}$
N54.9.251 $\mathrm{GM3}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u} \oplus \mathrm{B2_g}$
N54.9.252 $\mathrm{GM3}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g}$
N54.9.253 $\mathrm{GM3}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g}$
N54.9.254 $\mathrm{GM3}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g}$
N54.9.255 $\mathrm{GM3}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g}$
N54.9.256 $\mathrm{GM3}^- \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N54.9.257 $\mathrm{GM3}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Y1}^+$	$\surd$	0	0	$\surd$	-	-
N54.9.258 $\mathrm{GM3}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Y1}^-$	$\surd$	0	0	$\surd$	-	-
N54.9.259 $\mathrm{GM3}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Y2}^+$	$\surd$	0	0	$\surd$	-	-

Non-coplanar SSGs with parent space group $Pcca$ (No. 54) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N54.9.260 $\mathrm{GM3^-}\oplus\mathrm{GM4^-}\oplus\mathrm{Y2^-}$	$\surd$	0	0	$\surd$	-	-
N54.9.261 $\mathrm{GM3^-}\oplus\mathrm{Y1^+}\oplus\mathrm{Y1^+}$	$\surd$	1	0	$\times$	-	-
N54.9.262 $\mathrm{GM3^-}\oplus\mathrm{Y1^+}\oplus\mathrm{Y4^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N54.9.263 $\mathrm{GM3^-}\oplus\mathrm{Y1^+}\oplus\mathrm{Y1^-}$	$\surd$	1	1	$\times$	-	-
N54.9.264 $\mathrm{GM3^-}\oplus\mathrm{Y1^+}\oplus\mathrm{Y4^+}$	$\surd$	1	0	$\times$	-	-
N54.9.265 $\mathrm{GM3^-}\oplus\mathrm{Y1^+}\oplus\mathrm{Y2^+}$	$\surd$	1	0	$\times$	-	-
N54.9.266 $\mathrm{GM3^-}\oplus\mathrm{Y1^+}\oplus\mathrm{Y3^-}$	$\surd$	1	1	$\times$	-	-
N54.9.267 $\mathrm{GM3^-}\oplus\mathrm{Y1^+}\oplus\mathrm{Y2^-}$	$\surd$	1	1	$\times$	-	-
N54.9.268 $\mathrm{GM3^-}\oplus\mathrm{Y1^+}\oplus\mathrm{Y3^+}$	$\surd$	1	0	$\times$	-	-
N54.9.269 $\mathrm{GM3^-}\oplus\mathrm{Y1^-}\oplus\mathrm{Y1^-}$	$\surd$	1	0	$\times$	-	-
N54.9.270 $\mathrm{GM3^-}\oplus\mathrm{Y1^-}\oplus\mathrm{Y4^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N54.9.271 $\mathrm{GM3^-}\oplus\mathrm{Y1^-}\oplus\mathrm{Y2^+}$	$\surd$	1	1	$\times$	-	-
N54.9.272 $\mathrm{GM3^-}\oplus\mathrm{Y1^-}\oplus\mathrm{Y3^-}$	$\surd$	1	0	$\times$	-	-
N54.9.273 $\mathrm{GM3^-}\oplus\mathrm{Y1^-}\oplus\mathrm{Y2^-}$	$\surd$	1	0	$\times$	-	-
N54.9.274 $\mathrm{GM3^-}\oplus\mathrm{Y1^-}\oplus\mathrm{Y3^+}$	$\surd$	1	1	$\times$	-	-
N54.9.275 $\mathrm{GM3^-}\oplus\mathrm{Y2^+}\oplus\mathrm{Y2^+}$	$\surd$	1	0	$\times$	-	-
N54.9.276 $\mathrm{GM3^-}\oplus\mathrm{Y2^+}\oplus\mathrm{Y3^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N54.9.277 $\mathrm{GM3^-}\oplus\mathrm{Y2^+}\oplus\mathrm{Y2^-}$	$\surd$	1	1	$\times$	-	-
N54.9.278 $\mathrm{GM3^-}\oplus\mathrm{Y2^+}\oplus\mathrm{Y3^+}$	$\surd$	1	0	$\times$	-	-
N54.9.279 $\mathrm{GM3^-}\oplus\mathrm{Y2^-}\oplus\mathrm{Y2^-}$	$\surd$	1	0	$\times$	-	-
N54.9.280 $\mathrm{GM3^-}\oplus\mathrm{Y2^-}\oplus\mathrm{Y3^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N54.9.281 $\mathrm{GM4^+}\oplus\mathrm{GM4^+}\oplus\mathrm{GM4^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B2_g}\oplus\mathrm{B2_g}\oplus\mathrm{B2_g}$
N54.9.282 $\mathrm{GM4^+}\oplus\mathrm{GM4^+}\oplus\mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2}\oplus\mathrm{A2}$
N54.9.283 $\mathrm{GM4^+}\oplus\mathrm{GM4^+}\oplus\mathrm{Y1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_g}\oplus\mathrm{B2_g}$
N54.9.284 $\mathrm{GM4^+}\oplus\mathrm{GM4^+}\oplus\mathrm{Y1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_g}\oplus\mathrm{B2_g}$
N54.9.285 $\mathrm{GM4^+}\oplus\mathrm{GM4^+}\oplus\mathrm{Y2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_g}\oplus\mathrm{B2_g}$
N54.9.286 $\mathrm{GM4^+}\oplus\mathrm{GM4^+}\oplus\mathrm{Y2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_g}\oplus\mathrm{B2_g}$
N54.9.287 $\mathrm{GM4^+}\oplus\mathrm{GM4^-}\oplus\mathrm{GM4^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{A_u}\oplus\mathrm{B2_g}$
N54.9.288 $\mathrm{GM4^+}\oplus\mathrm{GM4^-}\oplus\mathrm{Y1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B2_g}$
N54.9.289 $\mathrm{GM4^+}\oplus\mathrm{GM4^-}\oplus\mathrm{Y1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B2_g}$
N54.9.290 $\mathrm{GM4^+}\oplus\mathrm{GM4^-}\oplus\mathrm{Y2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B2_g}$
N54.9.291 $\mathrm{GM4^+}\oplus\mathrm{GM4^-}\oplus\mathrm{Y2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B2_g}$
N54.9.292 $\mathrm{GM4^+}\oplus\mathrm{Y1^+}\oplus\mathrm{Y1^+}$	$\surd$	1	1	$\times$	-	-
N54.9.293 $\mathrm{GM4^+}\oplus\mathrm{Y1^+}\oplus\mathrm{Y4^-}$	$\surd$	1	1	$\surd$	222	B2
N54.9.294 $\mathrm{GM4^+}\oplus\mathrm{Y1^+}\oplus\mathrm{Y1^-}$	$\surd$	1	1	$\times$	-	-
N54.9.295 $\mathrm{GM4^+}\oplus\mathrm{Y1^+}\oplus\mathrm{Y4^+}$	$\surd$	1	1	$\times$	-	-
N54.9.296 $\mathrm{GM4^+}\oplus\mathrm{Y1^+}\oplus\mathrm{Y2^+}$	$\surd$	1	1	$\times$	-	-
N54.9.297 $\mathrm{GM4^+}\oplus\mathrm{Y1^+}\oplus\mathrm{Y3^-}$	$\surd$	1	1	$\times$	-	-
N54.9.298 $\mathrm{GM4^+}\oplus\mathrm{Y1^+}\oplus\mathrm{Y2^-}$	$\surd$	1	1	$\times$	-	-
N54.9.299 $\mathrm{GM4^+}\oplus\mathrm{Y1^+}\oplus\mathrm{Y3^+}$	$\surd$	1	1	$\times$	-	-
N54.9.300 $\mathrm{GM4^+}\oplus\mathrm{Y1^-}\oplus\mathrm{Y1^-}$	$\surd$	1	1	$\times$	-	-
N54.9.301 $\mathrm{GM4^+}\oplus\mathrm{Y1^-}\oplus\mathrm{Y4^+}$	$\surd$	1	1	$\surd$	222	B2
N54.9.302 $\mathrm{GM4^+}\oplus\mathrm{Y1^-}\oplus\mathrm{Y2^+}$	$\surd$	1	1	$\times$	-	-
N54.9.303 $\mathrm{GM4^+}\oplus\mathrm{Y1^-}\oplus\mathrm{Y3^-}$	$\surd$	1	1	$\times$	-	-
N54.9.304 $\mathrm{GM4^+}\oplus\mathrm{Y1^-}\oplus\mathrm{Y2^-}$	$\surd$	1	1	$\times$	-	-
N54.9.305 $\mathrm{GM4^+}\oplus\mathrm{Y1^-}\oplus\mathrm{Y3^+}$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $Pcca$ (No. 54) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N54.9.306 $\mathrm{GM4}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Y2}^{+}$	$\surd$	1	1	$\times$	-	-
N54.9.307 $\mathrm{GM4}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\surd$	222	$\mathrm{B2}$
N54.9.308 $\mathrm{GM4}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\times$	-	-
N54.9.309 $\mathrm{GM4}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Y3}^{+}$	$\surd$	1	1	$\times$	-	-
N54.9.310 $\mathrm{GM4}^{+}\oplus\mathrm{Y2}^{-}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\times$	-	-
N54.9.311 $\mathrm{GM4}^{+}\oplus\mathrm{Y2}^{-}\oplus\mathrm{Y3}^{+}$	$\surd$	1	1	$\surd$	222	$\mathrm{B2}$
N54.9.312 $\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
N54.9.313 $\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}\oplus\mathrm{Y1}^{+}$	$\surd$	0	0	$\surd$	-	-
N54.9.314 $\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}\oplus\mathrm{Y1}^{-}$	$\surd$	0	0	$\surd$	-	-
N54.9.315 $\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}\oplus\mathrm{Y2}^{+}$	$\surd$	0	0	$\surd$	-	-
N54.9.316 $\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}\oplus\mathrm{Y2}^{-}$	$\surd$	0	0	$\surd$	-	-
N54.9.317 $\mathrm{GM4}^{-}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y1}^{+}$	$\surd$	1	0	$\times$	-	-
N54.9.318 $\mathrm{GM4}^{-}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y4}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N54.9.319 $\mathrm{GM4}^{-}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y1}^{-}$	$\surd$	1	1	$\times$	-	-
N54.9.320 $\mathrm{GM4}^{-}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y4}^{+}$	$\surd$	1	0	$\times$	-	-
N54.9.321 $\mathrm{GM4}^{-}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y2}^{+}$	$\surd$	1	0	$\times$	-	-
N54.9.322 $\mathrm{GM4}^{-}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\times$	-	-
N54.9.323 $\mathrm{GM4}^{-}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\times$	-	-
N54.9.324 $\mathrm{GM4}^{-}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y3}^{+}$	$\surd$	1	0	$\times$	-	-
N54.9.325 $\mathrm{GM4}^{-}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y1}^{-}$	$\surd$	1	0	$\times$	-	-
N54.9.326 $\mathrm{GM4}^{-}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y4}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N54.9.327 $\mathrm{GM4}^{-}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y2}^{+}$	$\surd$	1	1	$\times$	-	-
N54.9.328 $\mathrm{GM4}^{-}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y3}^{-}$	$\surd$	1	0	$\times$	-	-
N54.9.329 $\mathrm{GM4}^{-}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y2}^{-}$	$\surd$	1	0	$\times$	-	-
N54.9.330 $\mathrm{GM4}^{-}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y3}^{+}$	$\surd$	1	1	$\times$	-	-
N54.9.331 $\mathrm{GM4}^{-}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Y2}^{+}$	$\surd$	1	0	$\times$	-	-
N54.9.332 $\mathrm{GM4}^{-}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N54.9.333 $\mathrm{GM4}^{-}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\times$	-	-
N54.9.334 $\mathrm{GM4}^{-}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Y3}^{+}$	$\surd$	1	0	$\times$	-	-
N54.9.335 $\mathrm{GM4}^{-}\oplus\mathrm{Y2}^{-}\oplus\mathrm{Y2}^{-}$	$\surd$	1	0	$\times$	-	-
N54.9.336 $\mathrm{GM4}^{-}\oplus\mathrm{Y2}^{-}\oplus\mathrm{Y3}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N54.9.337 $\mathrm{Y1}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y1}^{+}$	$\surd$	0	0	$\surd$	-	-
N54.9.338 $\mathrm{Y1}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y4}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_u}\oplus\mathrm{B2_u}$
N54.9.339 $\mathrm{Y1}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y1}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{A_u}$
N54.9.340 $\mathrm{Y1}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y4}^{+}$	$\surd$	0	0	$\surd$	-	-
N54.9.341 $\mathrm{Y1}^{+}\oplus\mathrm{Y4}^{-}\oplus\mathrm{Y1}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B2_u}$
N54.9.342 $\mathrm{Y1}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y2}^{+}$	$\surd$	0	0	$\surd$	-	-
N54.9.343 $\mathrm{Y1}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y3}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u}\oplus\mathrm{B3_u}$
N54.9.344 $\mathrm{Y1}^{+}\oplus\mathrm{Y4}^{-}\oplus\mathrm{Y2}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u}\oplus\mathrm{B2_u}$
N54.9.345 $\mathrm{Y1}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y2}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B1_u}$
N54.9.346 $\mathrm{Y1}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y3}^{+}$	$\surd$	0	0	$\surd$	-	-
N54.9.347 $\mathrm{Y1}^{+}\oplus\mathrm{Y4}^{-}\oplus\mathrm{Y2}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B2_u}$
N54.9.348 $\mathrm{Y1}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y1}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{A_u}$
N54.9.349 $\mathrm{Y1}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y4}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B2_u}$
N54.9.350 $\mathrm{Y1}^{+}\oplus\mathrm{Y4}^{+}\oplus\mathrm{Y4}^{+}$	$\surd$	0	0	$\surd$	-	-
N54.9.351 $\mathrm{Y1}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y2}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B1_u}$

Non-coplanar SSGs with parent space group $Pcca$ (No. 54) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N54.9.352 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u}$
N54.9.353 $\mathrm{Y1}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{Y2}^+$	$\surd$	0	0	$\surd$	-	-
N54.9.354 $\mathrm{Y1}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u}$
N54.9.355 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u}$
N54.9.356 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u}$
N54.9.357 $\mathrm{Y1}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u}$
N54.9.358 $\mathrm{Y1}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{Y3}^+$	$\surd$	0	0	$\surd$	-	-
N54.9.359 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^+$	$\surd$	0	0	$\surd$	-	-
N54.9.360 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_u}$
N54.9.361 $\mathrm{Y1}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B3_u}$
N54.9.362 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u}$
N54.9.363 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^+$	$\surd$	0	0	$\surd$	-	-
N54.9.364 $\mathrm{Y1}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u}$
N54.9.365 $\mathrm{Y1}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u}$
N54.9.366 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N54.9.367 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N54.9.368 $\mathrm{Y1}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^+$	$\surd$	0	0	$\surd$	-	-
N54.9.369 $\mathrm{Y1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y1}^-$	$\surd$	0	0	$\surd$	-	-
N54.9.370 $\mathrm{Y1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_u} \oplus \mathrm{B2_u}$
N54.9.371 $\mathrm{Y1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N54.9.372 $\mathrm{Y1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y3}^-$	$\surd$	0	0	$\surd$	-	-
N54.9.373 $\mathrm{Y1}^- \oplus \mathrm{Y4}^+ \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N54.9.374 $\mathrm{Y1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y2}^-$	$\surd$	0	0	$\surd$	-	-
N54.9.375 $\mathrm{Y1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B3_u}$
N54.9.376 $\mathrm{Y1}^- \oplus \mathrm{Y4}^+ \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_u}$
N54.9.377 $\mathrm{Y1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N54.9.378 $\mathrm{Y1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N54.9.379 $\mathrm{Y1}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Y3}^-$	$\surd$	0	0	$\surd$	-	-
N54.9.380 $\mathrm{Y1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u}$
N54.9.381 $\mathrm{Y1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u}$
N54.9.382 $\mathrm{Y1}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Y2}^-$	$\surd$	0	0	$\surd$	-	-
N54.9.383 $\mathrm{Y1}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u}$
N54.9.384 $\mathrm{Y1}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y2}^-$	$\surd$	0	0	$\surd$	-	-
N54.9.385 $\mathrm{Y1}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_u}$
N54.9.386 $\mathrm{Y1}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B3_u}$
N54.9.387 $\mathrm{Y2}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^+$	$\surd$	0	0	$\surd$	-	-
N54.9.388 $\mathrm{Y2}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_u} \oplus \mathrm{B2_u}$
N54.9.389 $\mathrm{Y2}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u}$
N54.9.390 $\mathrm{Y2}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^+$	$\surd$	0	0	$\surd$	-	-
N54.9.391 $\mathrm{Y2}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B2_u}$
N54.9.392 $\mathrm{Y2}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u}$
N54.9.393 $\mathrm{Y2}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B2_u}$
N54.9.394 $\mathrm{Y2}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^+$	$\surd$	0	0	$\surd$	-	-
N54.9.395 $\mathrm{Y2}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y2}^-$	$\surd$	0	0	$\surd$	-	-
N54.9.396 $\mathrm{Y2}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_u} \oplus \mathrm{B2_u}$
N54.12.1 $\mathrm{GM1}^- \oplus \mathrm{S1}$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $Pcca$ (No. 54) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N54.12.2 GM1$^-$ ⊕ T1	√	1	1	×	-	-
N54.12.3 GM1$^-$ ⊕ X1	√	1	1	√	mmm	$\mathrm{B3_u}$
N54.12.4 GM1$^-$ ⊕ X2	√	1	1	√	mmm	$\mathrm{B3_u}$
N54.12.5 GM1$^-$ ⊕ Z1	√	1	1	√	mmm	$\mathrm{B1_u}$
N54.12.6 GM1$^-$ ⊕ Z2	√	1	1	√	mmm	$\mathrm{B1_u}$
N54.12.7 GM2$^+$ ⊕ S1	√	1	1	×	-	-
N54.12.8 GM2$^+$ ⊕ T1	√	1	1	×	-	-
N54.12.9 GM2$^+$ ⊕ X1	√	1	1	√	$mm2$	B1
N54.12.10 GM2$^+$ ⊕ X2	√	1	1	√	$mm2$	B1
N54.12.11 GM2$^+$ ⊕ Z1	√	1	1	√	222	B1
N54.12.12 GM2$^+$ ⊕ Z2	√	1	1	√	222	B1
N54.12.13 GM2$^-$ ⊕ S1	√	1	1	×	-	-
N54.12.14 GM2$^-$ ⊕ T1	√	1	1	×	-	-
N54.12.15 GM2$^-$ ⊕ X1	√	1	1	√	mmm	$\mathrm{B3_u}$
N54.12.16 GM2$^-$ ⊕ X2	√	1	1	√	mmm	$\mathrm{B3_u}$
N54.12.17 GM2$^-$ ⊕ Z1	√	1	1	√	mmm	$\mathrm{B1_u}$
N54.12.18 GM2$^-$ ⊕ Z2	√	1	1	√	mmm	$\mathrm{B1_u}$
N54.12.19 GM3$^+$ ⊕ S1	√	1	1	×	-	-
N54.12.20 GM3$^+$ ⊕ T1	√	1	1	×	-	-
N54.12.21 GM3$^+$ ⊕ X1	√	1	1	√	222	B3
N54.12.22 GM3$^+$ ⊕ X2	√	1	1	√	222	B3
N54.12.23 GM3$^+$ ⊕ Z1	√	1	1	√	$mm2$	B2
N54.12.24 GM3$^+$ ⊕ Z2	√	1	1	√	$mm2$	B2
N54.12.25 GM3$^-$ ⊕ S1	√	1	1	×	-	-
N54.12.26 GM3$^-$ ⊕ T1	√	1	1	×	-	-
N54.12.27 GM3$^-$ ⊕ X1	√	1	1	√	mmm	$\mathrm{B3_u}$
N54.12.28 GM3$^-$ ⊕ X2	√	1	1	√	mmm	$\mathrm{B3_u}$
N54.12.29 GM3$^-$ ⊕ Z1	√	1	1	√	mmm	$\mathrm{B1_u}$
N54.12.30 GM3$^-$ ⊕ Z2	√	1	1	√	mmm	$\mathrm{B1_u}$
N54.12.31 GM4$^+$ ⊕ S1	√	1	1	×	-	-
N54.12.32 GM4$^+$ ⊕ T1	√	1	1	×	-	-
N54.12.33 GM4$^+$ ⊕ X1	√	1	1	√	$mm2$	B1
N54.12.34 GM4$^+$ ⊕ X2	√	1	1	√	$mm2$	B1
N54.12.35 GM4$^+$ ⊕ Z1	√	1	1	√	$mm2$	B1
N54.12.36 GM4$^+$ ⊕ Z2	√	1	1	√	$mm2$	B1
N54.12.37 GM4$^-$ ⊕ S1	√	1	1	×	-	-
N54.12.38 GM4$^-$ ⊕ T1	√	1	1	×	-	-
N54.12.39 GM4$^-$ ⊕ X1	√	1	1	√	mmm	$\mathrm{B3_u}$
N54.12.40 GM4$^-$ ⊕ X2	√	1	1	√	mmm	$\mathrm{B3_u}$
N54.12.41 GM4$^-$ ⊕ Z1	√	1	1	√	mmm	$\mathrm{B1_u}$
N54.12.42 GM4$^-$ ⊕ Z2	√	1	1	√	mmm	$\mathrm{B1_u}$
N54.12.43 Y1$^+$ ⊕ S1	√	1	1	√	mmm	$\mathrm{B3_u}$
N54.12.44 Y1$^+$ ⊕ S2	√	1	1	√	mmm	$\mathrm{B3_u}$
N54.12.45 Y1$^+$ ⊕ T1	√	1	1	√	mmm	$\mathrm{B1_u}$
N54.12.46 Y1$^+$ ⊕ T2	√	1	1	√	mmm	$\mathrm{B1_u}$
N54.12.47 Y1$^+$ ⊕ X1	√	1	1	√	mmm	$\mathrm{B3_u}$

Non-coplanar SSGs with parent space group $Pcca$ (No. 54) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N54.12.48 $\mathrm{Y1}^{+} \oplus \mathrm{X2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N54.12.49 $\mathrm{Y1}^{+} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N54.12.50 $\mathrm{Y1}^{+} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N54.12.51 $\mathrm{Y1}^{-} \oplus \mathrm{S1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N54.12.52 $\mathrm{Y1}^{-} \oplus \mathrm{S2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N54.12.53 $\mathrm{Y1}^{-} \oplus \mathrm{T1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N54.12.54 $\mathrm{Y1}^{-} \oplus \mathrm{T2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N54.12.55 $\mathrm{Y1}^{-} \oplus \mathrm{X1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N54.12.56 $\mathrm{Y1}^{-} \oplus \mathrm{X2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N54.12.57 $\mathrm{Y1}^{-} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N54.12.58 $\mathrm{Y1}^{-} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N54.12.59 $\mathrm{Y2}^{+} \oplus \mathrm{S1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N54.12.60 $\mathrm{Y2}^{+} \oplus \mathrm{S2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N54.12.61 $\mathrm{Y2}^{+} \oplus \mathrm{T1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N54.12.62 $\mathrm{Y2}^{+} \oplus \mathrm{T2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N54.12.63 $\mathrm{Y2}^{+} \oplus \mathrm{X1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N54.12.64 $\mathrm{Y2}^{+} \oplus \mathrm{X2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N54.12.65 $\mathrm{Y2}^{+} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N54.12.66 $\mathrm{Y2}^{+} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N54.12.67 $\mathrm{Y2}^{-} \oplus \mathrm{S1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N54.12.68 $\mathrm{Y2}^{-} \oplus \mathrm{S2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N54.12.69 $\mathrm{Y2}^{-} \oplus \mathrm{T1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N54.12.70 $\mathrm{Y2}^{-} \oplus \mathrm{T2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N54.12.71 $\mathrm{Y2}^{-} \oplus \mathrm{X1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N54.12.72 $\mathrm{Y2}^{-} \oplus \mathrm{X2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N54.12.73 $\mathrm{Y2}^{-} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N54.12.74 $\mathrm{Y2}^{-} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N54.14.1 $\mathrm{GM1}^{-} \oplus \mathrm{SM1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N54.14.2 $\mathrm{GM1}^{-} \oplus \mathrm{SM2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N54.14.3 $\mathrm{GM1}^{-} \oplus \mathrm{C1}$	$\surd$	1	1	$\times$	-	-
N54.14.4 $\mathrm{GM1}^{-} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N54.14.5 $\mathrm{GM1}^{-} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N54.14.6 $\mathrm{GM1}^{-} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N54.14.7 $\mathrm{GM1}^{-} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N54.14.8 $\mathrm{GM1}^{-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N54.14.9 $\mathrm{GM1}^{-} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N54.14.10 $\mathrm{GM1}^{-} \oplus \mathrm{H1}$	$\surd$	1	1	$\times$	-	-
N54.14.11 $\mathrm{GM2}^{+} \oplus \mathrm{SM1}$	$\surd$	1	1	$\surd$	$mm2$	B1
N54.14.12 $\mathrm{GM2}^{+} \oplus \mathrm{SM2}$	$\surd$	1	1	$\surd$	$mm2$	B1
N54.14.13 $\mathrm{GM2}^{+} \oplus \mathrm{C1}$	$\surd$	1	1	$\times$	-	-
N54.14.14 $\mathrm{GM2}^{+} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	$mm2$	B2
N54.14.15 $\mathrm{GM2}^{+} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	$mm2$	B2
N54.14.16 $\mathrm{GM2}^{+} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	$mm2$	B2
N54.14.17 $\mathrm{GM2}^{+} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	$mm2$	B2
N54.14.18 $\mathrm{GM2}^{+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	222	B1
N54.14.19 $\mathrm{GM2}^{+} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	222	B1

Non-coplanar SSGs with parent space group $Pcca$ (No. 54) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N54.14.20 GM2^{+} ⊕ H1	√	1	1	×	-	-
N54.14.21 GM2^{-} ⊕ SM1	√	1	1	√	mmm	$\mathrm{B3_u}$
N54.14.22 GM2^{-} ⊕ SM2	√	1	1	√	mmm	$\mathrm{B3_u}$
N54.14.23 GM2^{-} ⊕ C1	√	1	1	×	-	-
N54.14.24 GM2^{-} ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N54.14.25 GM2^{-} ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
N54.14.26 GM2^{-} ⊕ DT3	√	1	1	√	mmm	$\mathrm{B2_u}$
N54.14.27 GM2^{-} ⊕ DT4	√	1	1	√	mmm	$\mathrm{B2_u}$
N54.14.28 GM2^{-} ⊕ LD1	√	1	1	√	mmm	$\mathrm{B1_u}$
N54.14.29 GM2^{-} ⊕ LD3	√	1	1	√	mmm	$\mathrm{B1_u}$
N54.14.30 GM2^{-} ⊕ H1	√	1	1	×	-	-
N54.14.31 GM3^{+} ⊕ SM1	√	1	1	√	222	B3
N54.14.32 GM3^{+} ⊕ SM2	√	1	1	√	222	B3
N54.14.33 GM3^{+} ⊕ C1	√	1	1	×	-	-
N54.14.34 GM3^{+} ⊕ DT1	√	1	1	√	$mm2$	B2
N54.14.35 GM3^{+} ⊕ DT2	√	1	1	√	$mm2$	B2
N54.14.36 GM3^{+} ⊕ DT3	√	1	1	√	$mm2$	B2
N54.14.37 GM3^{+} ⊕ DT4	√	1	1	√	$mm2$	B2
N54.14.38 GM3^{+} ⊕ LD1	√	1	1	√	$mm2$	B2
N54.14.39 GM3^{+} ⊕ LD3	√	1	1	√	$mm2$	B2
N54.14.40 GM3^{+} ⊕ H1	√	1	1	×	-	-
N54.14.41 GM3^{-} ⊕ SM1	√	1	1	√	mmm	$\mathrm{B3_u}$
N54.14.42 GM3^{-} ⊕ SM2	√	1	1	√	mmm	$\mathrm{B3_u}$
N54.14.43 GM3^{-} ⊕ C1	√	1	1	×	-	-
N54.14.44 GM3^{-} ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N54.14.45 GM3^{-} ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
N54.14.46 GM3^{-} ⊕ DT3	√	1	1	√	mmm	$\mathrm{B2_u}$
N54.14.47 GM3^{-} ⊕ DT4	√	1	1	√	mmm	$\mathrm{B2_u}$
N54.14.48 GM3^{-} ⊕ LD1	√	1	1	√	mmm	$\mathrm{B1_u}$
N54.14.49 GM3^{-} ⊕ LD3	√	1	1	√	mmm	$\mathrm{B1_u}$
N54.14.50 GM3^{-} ⊕ H1	√	1	1	×	-	-
N54.14.51 GM4^{+} ⊕ SM1	√	1	1	√	$mm2$	B1
N54.14.52 GM4^{+} ⊕ SM2	√	1	1	√	$mm2$	B1
N54.14.53 GM4^{+} ⊕ C1	√	1	1	×	-	-
N54.14.54 GM4^{+} ⊕ DT1	√	1	1	√	222	B2
N54.14.55 GM4^{+} ⊕ DT2	√	1	1	√	222	B2
N54.14.56 GM4^{+} ⊕ DT3	√	1	1	√	222	B2
N54.14.57 GM4^{+} ⊕ DT4	√	1	1	√	222	B2
N54.14.58 GM4^{+} ⊕ LD1	√	1	1	√	$mm2$	B1
N54.14.59 GM4^{+} ⊕ LD3	√	1	1	√	$mm2$	B1
N54.14.60 GM4^{+} ⊕ H1	√	1	1	×	-	-
N54.14.61 GM4^{-} ⊕ SM1	√	1	1	√	mmm	$\mathrm{B3_u}$
N54.14.62 GM4^{-} ⊕ SM2	√	1	1	√	mmm	$\mathrm{B3_u}$
N54.14.63 GM4^{-} ⊕ C1	√	1	1	×	-	-
N54.14.64 GM4^{-} ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N54.14.65 GM4^{-} ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$

Non-coplanar SSGs with parent space group $Pcca$ (No. 54) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N54.14.66 $\mathrm{GM4}^{-} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N54.14.67 $\mathrm{GM4}^{-} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N54.14.68 $\mathrm{GM4}^{-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N54.14.69 $\mathrm{GM4}^{-} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N54.14.70 $\mathrm{GM4}^{-} \oplus \mathrm{H1}$	$\surd$	1	1	$\times$	-	-
N54.14.71 $\mathrm{Y1}^{+} \oplus \mathrm{SM1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N54.14.72 $\mathrm{Y1}^{+} \oplus \mathrm{SM2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N54.14.73 $\mathrm{Y1}^{+} \oplus \mathrm{C1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N54.14.74 $\mathrm{Y1}^{+} \oplus \mathrm{C2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N54.14.75 $\mathrm{Y1}^{+} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N54.14.76 $\mathrm{Y1}^{+} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N54.14.77 $\mathrm{Y1}^{+} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N54.14.78 $\mathrm{Y1}^{+} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N54.14.79 $\mathrm{Y1}^{+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N54.14.80 $\mathrm{Y1}^{+} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N54.14.81 $\mathrm{Y1}^{+} \oplus \mathrm{H1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N54.14.82 $\mathrm{Y1}^{+} \oplus \mathrm{H3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N54.14.83 $\mathrm{Y1}^{-} \oplus \mathrm{SM1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N54.14.84 $\mathrm{Y1}^{-} \oplus \mathrm{SM2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N54.14.85 $\mathrm{Y1}^{-} \oplus \mathrm{C1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N54.14.86 $\mathrm{Y1}^{-} \oplus \mathrm{C2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N54.14.87 $\mathrm{Y1}^{-} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N54.14.88 $\mathrm{Y1}^{-} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N54.14.89 $\mathrm{Y1}^{-} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N54.14.90 $\mathrm{Y1}^{-} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N54.14.91 $\mathrm{Y1}^{-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N54.14.92 $\mathrm{Y1}^{-} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N54.14.93 $\mathrm{Y1}^{-} \oplus \mathrm{H1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N54.14.94 $\mathrm{Y1}^{-} \oplus \mathrm{H3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N54.14.95 $\mathrm{Y2}^{+} \oplus \mathrm{SM1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N54.14.96 $\mathrm{Y2}^{+} \oplus \mathrm{SM2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N54.14.97 $\mathrm{Y2}^{+} \oplus \mathrm{C1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N54.14.98 $\mathrm{Y2}^{+} \oplus \mathrm{C2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N54.14.99 $\mathrm{Y2}^{+} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N54.14.100 $\mathrm{Y2}^{+} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N54.14.101 $\mathrm{Y2}^{+} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N54.14.102 $\mathrm{Y2}^{+} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N54.14.103 $\mathrm{Y2}^{+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N54.14.104 $\mathrm{Y2}^{+} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N54.14.105 $\mathrm{Y2}^{+} \oplus \mathrm{H1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N54.14.106 $\mathrm{Y2}^{+} \oplus \mathrm{H3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N54.14.107 $\mathrm{Y2}^{-} \oplus \mathrm{SM1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N54.14.108 $\mathrm{Y2}^{-} \oplus \mathrm{SM2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N54.14.109 $\mathrm{Y2}^{-} \oplus \mathrm{C1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N54.14.110 $\mathrm{Y2}^{-} \oplus \mathrm{C2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N54.14.111 $\mathrm{Y2}^{-} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$

Non-coplanar SSGs with parent space group $Pcca$ (No. 54) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N54.14.112 $\mathrm{Y2}^{-} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N54.14.113 $\mathrm{Y2}^{-} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N54.14.114 $\mathrm{Y2}^{-} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N54.14.115 $\mathrm{Y2}^{-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N54.14.116 $\mathrm{Y2}^{-} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N54.14.117 $\mathrm{Y2}^{-} \oplus \mathrm{H1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N54.14.118 $\mathrm{Y2}^{-} \oplus \mathrm{H3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$

TABLE S163: Collinear SSGs with parent space group $Pbam$ (No. 55).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L55.1.1 $\mathrm{GM1}^{+}$	1	mmm	$\mathrm{A_g}$
L55.2.1 $\mathrm{GM1}^{-}$	0	-	-
L55.2.2 $\mathrm{GM2}^{+}$	1	mmm	$\mathrm{B1_g}$
L55.2.3 $\mathrm{GM2}^{-}$	0	-	-
L55.2.4 $\mathrm{GM3}^{+}$	1	mmm	$\mathrm{B3_g}$
L55.2.5 $\mathrm{GM3}^{-}$	0	-	-
L55.2.6 $\mathrm{Z1}^{+}$	0	-	-
L55.2.7 $\mathrm{Z1}^{-}$	0	-	-
L55.2.8 $\mathrm{Z3}^{+}$	0	-	-

TABLE S164: Coplanar SSGs with parent space group $Pbam$ (No. 55).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P55.1.1 $\mathrm{GM1}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
P55.2.1 $\mathrm{GM1}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
P55.2.2 $\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
P55.2.3 $\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
P55.2.4 $\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g}$
P55.2.5 $\mathrm{GM3}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u}$
P55.2.6 $\mathrm{Z1}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P55.2.7 $\mathrm{Z1}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P55.2.8 $\mathrm{Z3}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P55.3.1 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-}$	$\surd$	0	0	$\surd$	-	-
P55.3.2 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
P55.3.3 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
P55.3.4 $\mathrm{GM1}^{-} \oplus \mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u}$
P55.3.5 $\mathrm{GM1}^{-} \oplus \mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
P55.3.6 $\mathrm{GM1}^{-} \oplus \mathrm{Z1}^{+}$	$\surd$	1	1	$\times$	-	-
P55.3.7 $\mathrm{GM1}^{-} \oplus \mathrm{Z1}^{-}$	$\surd$	1	1	$\times$	-	-
P55.3.8 $\mathrm{GM1}^{-} \oplus \mathrm{Z3}^{+}$	$\surd$	1	1	$\times$	-	-
P55.3.9 $\mathrm{GM2}^{+} \oplus \mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
P55.3.10 $\mathrm{GM2}^{+} \oplus \mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
P55.3.11 $\mathrm{GM2}^{+} \oplus \mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
P55.3.12 $\mathrm{GM2}^{+} \oplus \mathrm{GM3}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$

Coplanar SSGs with parent space group $Pbam$ (No. 55) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P55.3.13 $\mathrm{GM2}^{+} \oplus \mathrm{Z1}^{+}$	$\surd$	1	0	$\times$	-	-
P55.3.14 $\mathrm{GM2}^{+} \oplus \mathrm{Z1}^{-}$	$\surd$	1	0	$\times$	-	-
P55.3.15 $\mathrm{GM2}^{+} \oplus \mathrm{Z3}^{+}$	$\surd$	1	0	$\times$	-	-
P55.3.16 $\mathrm{GM2}^{-} \oplus \mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
P55.3.17 $\mathrm{GM2}^{-} \oplus \mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
P55.3.18 $\mathrm{GM2}^{-} \oplus \mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
P55.3.19 $\mathrm{GM2}^{-} \oplus \mathrm{Z1}^{+}$	$\surd$	1	1	$\times$	-	-
P55.3.20 $\mathrm{GM2}^{-} \oplus \mathrm{Z1}^{-}$	$\surd$	1	1	$\times$	-	-
P55.3.21 $\mathrm{GM2}^{-} \oplus \mathrm{Z3}^{+}$	$\surd$	1	1	$\times$	-	-
P55.3.22 $\mathrm{GM3}^{+} \oplus \mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
P55.3.23 $\mathrm{GM3}^{+} \oplus \mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g}$
P55.3.24 $\mathrm{GM3}^{+} \oplus \mathrm{GM3}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
P55.3.25 $\mathrm{GM3}^{+} \oplus \mathrm{GM4}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
P55.3.26 $\mathrm{GM3}^{+} \oplus \mathrm{Z1}^{+}$	$\surd$	1	0	$\times$	-	-
P55.3.27 $\mathrm{GM3}^{+} \oplus \mathrm{Z1}^{-}$	$\surd$	1	0	$\times$	-	-
P55.3.28 $\mathrm{GM3}^{+} \oplus \mathrm{Z3}^{+}$	$\surd$	1	0	$\times$	-	-
P55.3.29 $\mathrm{GM3}^{+} \oplus \mathrm{Z3}^{-}$	$\surd$	1	0	$\times$	-	-
P55.3.30 $\mathrm{GM3}^{-} \oplus \mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
P55.3.31 $\mathrm{GM3}^{-} \oplus \mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
P55.3.32 $\mathrm{GM3}^{-} \oplus \mathrm{Z1}^{+}$	$\surd$	1	1	$\times$	-	-
P55.3.33 $\mathrm{GM3}^{-} \oplus \mathrm{Z1}^{-}$	$\surd$	1	1	$\times$	-	-
P55.3.34 $\mathrm{GM3}^{-} \oplus \mathrm{Z3}^{+}$	$\surd$	1	1	$\times$	-	-
P55.3.35 $\mathrm{GM3}^{-} \oplus \mathrm{Z3}^{-}$	$\surd$	1	1	$\times$	-	-
P55.3.36 $\mathrm{Z1}^{+} \oplus \mathrm{Z1}^{+}$	$\surd$	1	0	$\times$	-	-
P55.3.37 $\mathrm{Z1}^{+} \oplus \mathrm{Z2}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P55.3.38 $\mathrm{Z1}^{+} \oplus \mathrm{Z1}^{-}$	$\surd$	1	1	$\times$	-	-
P55.3.39 $\mathrm{Z1}^{+} \oplus \mathrm{Z2}^{+}$	$\surd$	1	0	$\times$	-	-
P55.3.40 $\mathrm{Z1}^{+} \oplus \mathrm{Z3}^{+}$	$\surd$	1	0	$\times$	-	-
P55.3.41 $\mathrm{Z1}^{+} \oplus \mathrm{Z3}^{-}$	$\surd$	1	1	$\times$	-	-
P55.3.42 $\mathrm{Z1}^{-} \oplus \mathrm{Z1}^{-}$	$\surd$	1	0	$\times$	-	-
P55.3.43 $\mathrm{Z1}^{-} \oplus \mathrm{Z2}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P55.3.44 $\mathrm{Z1}^{-} \oplus \mathrm{Z3}^{+}$	$\surd$	1	1	$\times$	-	-
P55.3.45 $\mathrm{Z1}^{-} \oplus \mathrm{Z3}^{-}$	$\surd$	1	0	$\times$	-	-
P55.3.46 $\mathrm{Z3}^{+} \oplus \mathrm{Z3}^{+}$	$\surd$	1	0	$\times$	-	-
P55.3.47 $\mathrm{Z3}^{+} \oplus \mathrm{Z3}^{-}$	$\surd$	1	1	$\times$	-	-
P55.3.48 $\mathrm{Z3}^{+} \oplus \mathrm{Z4}^{+}$	$\surd$	1	0	$\times$	-	-
P55.3.49 $\mathrm{Z3}^{+} \oplus \mathrm{Z4}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P55.4.1 $\mathrm{S1}^{+}\mathrm{S2}^{+}$	$\surd$	1	0	$\times$	-	-
P55.4.2 $\mathrm{S1}^{-}\mathrm{S2}^{-}$	$\surd$	1	0	$\times$	-	-
P55.4.3 $\mathrm{R1}^{+}\mathrm{R2}^{+}$	$\surd$	1	0	$\times$	-	-
P55.6.1 T1	$\surd$	1	1	$\times$	-	-
P55.6.2 X1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P55.6.3 X2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P55.8.1 DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P55.8.2 DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P55.8.3 A1	$\surd$	1	1	$\times$	-	-

Coplanar SSGs with parent space group $Pbam$ (No. 55) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P55.8.4 LD1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P55.8.5 LD2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P55.8.6 LD3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$

TABLE S165: Non-coplanar SSGs with parent space group $Pbam$ (No. 55).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N55.1.1 $\mathrm{GM1^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g \oplus A_g \oplus A_g}$
N55.2.1 $\mathrm{GM1^-}$	$\surd$	2	2	$\surd$	222	$\mathrm{A1 \oplus A1}$
N55.2.2 $\mathrm{GM2^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g \oplus A_g \oplus B1_g}$
N55.2.3 $\mathrm{GM2^-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1 \oplus A1}$
N55.2.4 $\mathrm{GM3^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g \oplus A_g \oplus B3_g}$
N55.2.5 $\mathrm{GM3^-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1 \oplus A1}$
N55.2.6 $\mathrm{Z1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g \oplus A_g}$
N55.2.7 $\mathrm{Z1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g \oplus A_g}$
N55.2.8 $\mathrm{Z3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g \oplus A_g}$
N55.3.1 $\mathrm{GM1^- \oplus GM1^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g \oplus A_u \oplus A_u}$
N55.3.2 $\mathrm{GM1^- \oplus GM2^+}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1 \oplus A2}$
N55.3.3 $\mathrm{GM1^- \oplus GM2^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g \oplus A_u \oplus B1_u}$
N55.3.4 $\mathrm{GM1^- \oplus GM3^+}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1 \oplus A2}$
N55.3.5 $\mathrm{GM1^- \oplus GM3^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g \oplus A_u \oplus B3_u}$
N55.3.6 $\mathrm{GM1^- \oplus Z1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g \oplus A_u}$
N55.3.7 $\mathrm{GM1^- \oplus Z1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g \oplus A_u}$
N55.3.8 $\mathrm{GM1^- \oplus Z3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g \oplus A_u}$
N55.3.9 $\mathrm{GM2^+ \oplus GM2^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g \oplus B1_g \oplus B1_g}$
N55.3.10 $\mathrm{GM2^+ \oplus GM2^-}$	$\surd$	2	2	$\surd$	222	$\mathrm{A1 \oplus B1}$
N55.3.11 $\mathrm{GM2^+ \oplus GM3^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g \oplus B1_g \oplus B3_g}$
N55.3.12 $\mathrm{GM2^+ \oplus GM3^-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1 \oplus B1}$
N55.3.13 $\mathrm{GM2^+ \oplus Z1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g \oplus B1_g}$
N55.3.14 $\mathrm{GM2^+ \oplus Z1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g \oplus B1_g}$
N55.3.15 $\mathrm{GM2^+ \oplus Z3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g \oplus B1_g}$
N55.3.16 $\mathrm{GM2^- \oplus GM2^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g \oplus B1_u \oplus B1_u}$
N55.3.17 $\mathrm{GM2^- \oplus GM3^+}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1 \oplus B2}$
N55.3.18 $\mathrm{GM2^- \oplus GM3^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g \oplus B1_u \oplus B3_u}$
N55.3.19 $\mathrm{GM2^- \oplus Z1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g \oplus B1_u}$
N55.3.20 $\mathrm{GM2^- \oplus Z1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g \oplus B1_u}$
N55.3.21 $\mathrm{GM2^- \oplus Z3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g \oplus B1_u}$
N55.3.22 $\mathrm{GM3^+ \oplus GM3^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g \oplus B3_g \oplus B3_g}$
N55.3.23 $\mathrm{GM3^+ \oplus GM4^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g \oplus B3_g \oplus B2_g}$
N55.3.24 $\mathrm{GM3^+ \oplus GM3^-}$	$\surd$	2	2	$\surd$	222	$\mathrm{A1 \oplus B3}$
N55.3.25 $\mathrm{GM3^+ \oplus GM4^-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1 \oplus B2}$
N55.3.26 $\mathrm{GM3^+ \oplus Z1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g \oplus B3_g}$
N55.3.27 $\mathrm{GM3^+ \oplus Z1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g \oplus B3_g}$
N55.3.28 $\mathrm{GM3^+ \oplus Z3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g \oplus B3_g}$
N55.3.29 $\mathrm{GM3^+ \oplus Z3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g \oplus B3_g}$
N55.3.30 $\mathrm{GM3^- \oplus GM3^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g \oplus B3_u \oplus B3_u}$

Non-coplanar SSGs with parent space group $Pbam$ (No. 55) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N55.3.31 $\mathrm{GM3^-} \oplus \mathrm{GM4^-}$	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N55.3.32 $\mathrm{GM3^-} \oplus \mathrm{Z1^+}$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u}$
N55.3.33 $\mathrm{GM3^-} \oplus \mathrm{Z1^-}$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u}$
N55.3.34 $\mathrm{GM3^-} \oplus \mathrm{Z3^+}$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u}$
N55.3.35 $\mathrm{GM3^-} \oplus \mathrm{Z3^-}$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u}$
N55.3.36 $\mathrm{Z1^+} \oplus \mathrm{Z1^+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N55.3.37 $\mathrm{Z1^+} \oplus \mathrm{Z2^-}$	√	1	1	√	$mm2$	A1
N55.3.38 $\mathrm{Z1^+} \oplus \mathrm{Z1^-}$	√	1	1	√	222	A1
N55.3.39 $\mathrm{Z1^+} \oplus \mathrm{Z2^+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N55.3.40 $\mathrm{Z1^+} \oplus \mathrm{Z3^+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N55.3.41 $\mathrm{Z1^+} \oplus \mathrm{Z3^-}$	√	1	1	√	$mm2$	A1
N55.3.42 $\mathrm{Z1^-} \oplus \mathrm{Z1^-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N55.3.43 $\mathrm{Z1^-} \oplus \mathrm{Z2^+}$	√	1	1	√	$mm2$	A1
N55.3.44 $\mathrm{Z1^-} \oplus \mathrm{Z3^+}$	√	1	1	√	$mm2$	A1
N55.3.45 $\mathrm{Z1^-} \oplus \mathrm{Z3^-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N55.3.46 $\mathrm{Z3^+} \oplus \mathrm{Z3^+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N55.3.47 $\mathrm{Z3^+} \oplus \mathrm{Z3^-}$	√	1	1	√	222	A1
N55.3.48 $\mathrm{Z3^+} \oplus \mathrm{Z4^+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N55.3.49 $\mathrm{Z3^+} \oplus \mathrm{Z4^-}$	√	1	1	√	$mm2$	A1
N55.4.1 $\mathrm{S1^+S2^+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N55.4.2 $\mathrm{S1^-S2^-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N55.4.3 $\mathrm{R1^+R2^+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N55.6.1 T1	√	1	1	√	$mm2$	A1
N55.6.2 X1	√	1	1	√	$mm2$	A1
N55.6.3 X2	√	1	1	√	$mm2$	A1
N55.8.1 DT1	√	1	1	√	$mm2$	A1
N55.8.2 DT2	√	1	1	√	$mm2$	A1
N55.8.3 A1	√	1	1	√	$mm2$	A1
N55.8.4 LD1	√	1	1	√	$mm2$	A1
N55.8.5 LD2	√	1	1	√	$mm2$	A1
N55.8.6 LD3	√	1	1	√	$mm2$	A1
N55.9.1 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM1^-}$	√	0	0	√	-	-
N55.9.2 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM2^+}$	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N55.9.3 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM2^-}$	√	0	0	√	-	-
N55.9.4 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM3^+}$	√	3	3	√	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N55.9.5 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM3^-}$	√	0	0	√	-	-
N55.9.6 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{Z1^+}$	√	0	0	√	-	-
N55.9.7 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{Z1^-}$	√	0	0	√	-	-
N55.9.8 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{Z3^+}$	√	0	0	√	-	-
N55.9.9 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{GM2^+}$	√	2	2	√	222	$\mathrm{B1} \oplus \mathrm{B1}$
N55.9.10 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{GM2^-}$	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N55.9.11 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{GM3^+}$	√	2	2	√	$mm2$	$\mathrm{B2} \oplus \mathrm{B1}$
N55.9.12 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{GM3^-}$	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_u}$
N55.9.13 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{Z1^+}$	√	2	2	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N55.9.14 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{Z1^-}$	√	2	2	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N55.9.15 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{Z3^+}$	√	2	2	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$

Non-coplanar SSGs with parent space group $Pbam$ (No. 55) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N55.9.16 $\mathrm{GM1^-}\oplus\mathrm{GM2^-}\oplus\mathrm{GM2^-}$	$\surd$	0	0	$\surd$	-	-
N55.9.17 $\mathrm{GM1^-}\oplus\mathrm{GM2^-}\oplus\mathrm{GM3^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_u}\oplus\mathrm{B2_u}$
N55.9.18 $\mathrm{GM1^-}\oplus\mathrm{GM2^-}\oplus\mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
N55.9.19 $\mathrm{GM1^-}\oplus\mathrm{GM2^-}\oplus\mathrm{Z1^+}$	$\surd$	0	0	$\surd$	-	-
N55.9.20 $\mathrm{GM1^-}\oplus\mathrm{GM2^-}\oplus\mathrm{Z1^-}$	$\surd$	0	0	$\surd$	-	-
N55.9.21 $\mathrm{GM1^-}\oplus\mathrm{GM2^-}\oplus\mathrm{Z3^+}$	$\surd$	0	0	$\surd$	-	-
N55.9.22 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{GM3^+}$	$\surd$	2	2	$\surd$	222	$\mathrm{B3}\oplus\mathrm{B3}$
N55.9.23 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2}\oplus\mathrm{B1}$
N55.9.24 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{GM3^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B3_g}\oplus\mathrm{B3_u}$
N55.9.25 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{GM4^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B3_g}\oplus\mathrm{B3_u}$
N55.9.26 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{Z1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_u}$
N55.9.27 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{Z1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_u}$
N55.9.28 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{Z3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_u}$
N55.9.29 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{Z3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_u}$
N55.9.30 $\mathrm{GM1^-}\oplus\mathrm{GM3^-}\oplus\mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
N55.9.31 $\mathrm{GM1^-}\oplus\mathrm{GM3^-}\oplus\mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N55.9.32 $\mathrm{GM1^-}\oplus\mathrm{GM3^-}\oplus\mathrm{Z1^+}$	$\surd$	0	0	$\surd$	-	-
N55.9.33 $\mathrm{GM1^-}\oplus\mathrm{GM3^-}\oplus\mathrm{Z1^-}$	$\surd$	0	0	$\surd$	-	-
N55.9.34 $\mathrm{GM1^-}\oplus\mathrm{GM3^-}\oplus\mathrm{Z3^+}$	$\surd$	0	0	$\surd$	-	-
N55.9.35 $\mathrm{GM1^-}\oplus\mathrm{GM3^-}\oplus\mathrm{Z3^-}$	$\surd$	0	0	$\surd$	-	-
N55.9.36 $\mathrm{GM1^-}\oplus\mathrm{Z1^+}\oplus\mathrm{Z1^+}$	$\surd$	1	0	$\times$	-	-
N55.9.37 $\mathrm{GM1^-}\oplus\mathrm{Z1^+}\oplus\mathrm{Z2^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N55.9.38 $\mathrm{GM1^-}\oplus\mathrm{Z1^+}\oplus\mathrm{Z1^-}$	$\surd$	1	1	$\times$	-	-
N55.9.39 $\mathrm{GM1^-}\oplus\mathrm{Z1^+}\oplus\mathrm{Z2^+}$	$\surd$	1	0	$\times$	-	-
N55.9.40 $\mathrm{GM1^-}\oplus\mathrm{Z1^+}\oplus\mathrm{Z3^+}$	$\surd$	1	0	$\times$	-	-
N55.9.41 $\mathrm{GM1^-}\oplus\mathrm{Z1^+}\oplus\mathrm{Z3^-}$	$\surd$	1	1	$\times$	-	-
N55.9.42 $\mathrm{GM1^-}\oplus\mathrm{Z1^-}\oplus\mathrm{Z1^-}$	$\surd$	1	0	$\times$	-	-
N55.9.43 $\mathrm{GM1^-}\oplus\mathrm{Z1^-}\oplus\mathrm{Z2^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N55.9.44 $\mathrm{GM1^-}\oplus\mathrm{Z1^-}\oplus\mathrm{Z3^+}$	$\surd$	1	1	$\times$	-	-
N55.9.45 $\mathrm{GM1^-}\oplus\mathrm{Z1^-}\oplus\mathrm{Z3^-}$	$\surd$	1	0	$\times$	-	-
N55.9.46 $\mathrm{GM1^-}\oplus\mathrm{Z3^+}\oplus\mathrm{Z3^+}$	$\surd$	1	0	$\times$	-	-
N55.9.47 $\mathrm{GM1^-}\oplus\mathrm{Z3^+}\oplus\mathrm{Z3^-}$	$\surd$	1	1	$\times$	-	-
N55.9.48 $\mathrm{GM1^-}\oplus\mathrm{Z3^+}\oplus\mathrm{Z4^+}$	$\surd$	1	0	$\times$	-	-
N55.9.49 $\mathrm{GM1^-}\oplus\mathrm{Z3^+}\oplus\mathrm{Z4^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N55.9.50 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{GM2^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B1_g}$
N55.9.51 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{GM2^-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2}\oplus\mathrm{A2}$
N55.9.52 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{GM3^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B3_g}$
N55.9.53 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{GM3^-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2}\oplus\mathrm{B2}$
N55.9.54 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{Z1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_g}$
N55.9.55 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{Z1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_g}$
N55.9.56 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{Z3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_g}$
N55.9.57 $\mathrm{GM2^+}\oplus\mathrm{GM2^-}\oplus\mathrm{GM2^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{A_u}\oplus\mathrm{B1_g}$
N55.9.58 $\mathrm{GM2^+}\oplus\mathrm{GM2^-}\oplus\mathrm{GM3^+}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2}\oplus\mathrm{B2}$
N55.9.59 $\mathrm{GM2^+}\oplus\mathrm{GM2^-}\oplus\mathrm{GM3^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B1_g}\oplus\mathrm{B2_u}$
N55.9.60 $\mathrm{GM2^+}\oplus\mathrm{GM2^-}\oplus\mathrm{Z1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B1_g}$
N55.9.61 $\mathrm{GM2^+}\oplus\mathrm{GM2^-}\oplus\mathrm{Z1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B1_g}$

Non-coplanar SSGs with parent space group $Pbam$ (No. 55) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N55.9.62 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{Z3}^+$	√	2	2	√	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
N55.9.63 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N55.9.64 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N55.9.65 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	√	2	2	√	$mm2$	$\mathrm{A2} \oplus \mathrm{B2}$
N55.9.66 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	√	2	2	√	222	$\mathrm{B1} \oplus \mathrm{B3}$
N55.9.67 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Z1}^+$	√	2	2	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N55.9.68 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Z1}^-$	√	2	2	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N55.9.69 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Z3}^+$	√	2	2	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N55.9.70 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Z3}^-$	√	2	2	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N55.9.71 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N55.9.72 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N55.9.73 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Z1}^+$	√	2	2	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N55.9.74 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Z1}^-$	√	2	2	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N55.9.75 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Z3}^+$	√	2	2	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N55.9.76 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Z3}^-$	√	2	2	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N55.9.77 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^+$	√	1	1	×	-	-
N55.9.78 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^-$	√	1	1	√	222	B1
N55.9.79 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^-$	√	1	1	×	-	-
N55.9.80 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^+$	√	1	1	×	-	-
N55.9.81 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^+$	√	1	1	×	-	-
N55.9.82 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^-$	√	1	1	×	-	-
N55.9.83 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z1}^-$	√	1	1	×	-	-
N55.9.84 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z2}^+$	√	1	1	√	222	B1
N55.9.85 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z3}^+$	√	1	1	×	-	-
N55.9.86 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z3}^-$	√	1	1	×	-	-
N55.9.87 $\mathrm{GM2}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z3}^+$	√	1	1	×	-	-
N55.9.88 $\mathrm{GM2}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z3}^-$	√	1	1	×	-	-
N55.9.89 $\mathrm{GM2}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z4}^+$	√	1	1	×	-	-
N55.9.90 $\mathrm{GM2}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z4}^-$	√	1	1	√	222	B1
N55.9.91 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	√	0	0	√	-	-
N55.9.92 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^+$	√	3	3	√	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N55.9.93 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^-$	√	0	0	√	-	-
N55.9.94 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Z1}^+$	√	0	0	√	-	-
N55.9.95 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Z1}^-$	√	0	0	√	-	-
N55.9.96 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Z3}^+$	√	0	0	√	-	-
N55.9.97 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	√	2	2	√	$mm2$	$\mathrm{B2} \oplus \mathrm{B2}$
N55.9.98 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	√	2	2	√	222	$\mathrm{B3} \oplus \mathrm{B2}$
N55.9.99 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N55.9.100 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N55.9.101 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Z1}^+$	√	2	2	√	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N55.9.102 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Z1}^-$	√	2	2	√	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N55.9.103 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Z3}^+$	√	2	2	√	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N55.9.104 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Z3}^-$	√	2	2	√	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N55.9.105 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	√	0	0	√	-	-
N55.9.106 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	√	0	0	√	-	-
N55.9.107 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Z1}^+$	√	0	0	√	-	-

Non-coplanar SSGs with parent space group $Pbam$ (No. 55) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N55.9.108 $\mathrm{GM2^-}\oplus\mathrm{GM3^-}\oplus\mathrm{Z1^-}$	$\surd$	0	0	$\surd$	-	-
N55.9.109 $\mathrm{GM2^-}\oplus\mathrm{GM3^-}\oplus\mathrm{Z3^+}$	$\surd$	0	0	$\surd$	-	-
N55.9.110 $\mathrm{GM2^-}\oplus\mathrm{GM3^-}\oplus\mathrm{Z3^-}$	$\surd$	0	0	$\surd$	-	-
N55.9.111 $\mathrm{GM2^-}\oplus\mathrm{Z1^+}\oplus\mathrm{Z1^+}$	$\surd$	1	0	$\times$	-	-
N55.9.112 $\mathrm{GM2^-}\oplus\mathrm{Z1^+}\oplus\mathrm{Z2^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N55.9.113 $\mathrm{GM2^-}\oplus\mathrm{Z1^+}\oplus\mathrm{Z1^-}$	$\surd$	1	1	$\times$	-	-
N55.9.114 $\mathrm{GM2^-}\oplus\mathrm{Z1^+}\oplus\mathrm{Z2^+}$	$\surd$	1	0	$\times$	-	-
N55.9.115 $\mathrm{GM2^-}\oplus\mathrm{Z1^+}\oplus\mathrm{Z3^+}$	$\surd$	1	0	$\times$	-	-
N55.9.116 $\mathrm{GM2^-}\oplus\mathrm{Z1^+}\oplus\mathrm{Z3^-}$	$\surd$	1	1	$\times$	-	-
N55.9.117 $\mathrm{GM2^-}\oplus\mathrm{Z1^-}\oplus\mathrm{Z1^-}$	$\surd$	1	0	$\times$	-	-
N55.9.118 $\mathrm{GM2^-}\oplus\mathrm{Z1^-}\oplus\mathrm{Z2^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N55.9.119 $\mathrm{GM2^-}\oplus\mathrm{Z1^-}\oplus\mathrm{Z3^+}$	$\surd$	1	1	$\times$	-	-
N55.9.120 $\mathrm{GM2^-}\oplus\mathrm{Z1^-}\oplus\mathrm{Z3^-}$	$\surd$	1	0	$\times$	-	-
N55.9.121 $\mathrm{GM2^-}\oplus\mathrm{Z3^+}\oplus\mathrm{Z3^+}$	$\surd$	1	0	$\times$	-	-
N55.9.122 $\mathrm{GM2^-}\oplus\mathrm{Z3^+}\oplus\mathrm{Z3^-}$	$\surd$	1	1	$\times$	-	-
N55.9.123 $\mathrm{GM2^-}\oplus\mathrm{Z3^+}\oplus\mathrm{Z4^+}$	$\surd$	1	0	$\times$	-	-
N55.9.124 $\mathrm{GM2^-}\oplus\mathrm{Z3^+}\oplus\mathrm{Z4^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N55.9.125 $\mathrm{GM3^+}\oplus\mathrm{GM3^+}\oplus\mathrm{GM3^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_g}\oplus\mathrm{B3_g}$
N55.9.126 $\mathrm{GM3^+}\oplus\mathrm{GM3^+}\oplus\mathrm{GM4^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_g}\oplus\mathrm{B2_g}$
N55.9.127 $\mathrm{GM3^+}\oplus\mathrm{GM3^+}\oplus\mathrm{GM3^-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2}\oplus\mathrm{A2}$
N55.9.128 $\mathrm{GM3^+}\oplus\mathrm{GM3^+}\oplus\mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2}\oplus\mathrm{B2}$
N55.9.129 $\mathrm{GM3^+}\oplus\mathrm{GM4^+}\oplus\mathrm{GM3^-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2}\oplus\mathrm{B2}$
N55.9.130 $\mathrm{GM3^+}\oplus\mathrm{GM3^+}\oplus\mathrm{Z1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_g}$
N55.9.131 $\mathrm{GM3^+}\oplus\mathrm{GM4^+}\oplus\mathrm{Z1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B2_g}$
N55.9.132 $\mathrm{GM3^+}\oplus\mathrm{GM3^+}\oplus\mathrm{Z1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_g}$
N55.9.133 $\mathrm{GM3^+}\oplus\mathrm{GM4^+}\oplus\mathrm{Z1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B2_g}$
N55.9.134 $\mathrm{GM3^+}\oplus\mathrm{GM3^+}\oplus\mathrm{Z3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_g}$
N55.9.135 $\mathrm{GM3^+}\oplus\mathrm{GM3^+}\oplus\mathrm{Z3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_g}$
N55.9.136 $\mathrm{GM3^+}\oplus\mathrm{GM4^+}\oplus\mathrm{Z3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B2_g}$
N55.9.137 $\mathrm{GM3^+}\oplus\mathrm{GM3^-}\oplus\mathrm{GM3^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{A_u}\oplus\mathrm{B3_g}$
N55.9.138 $\mathrm{GM3^+}\oplus\mathrm{GM3^-}\oplus\mathrm{GM4^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B1_u}\oplus\mathrm{B3_g}$
N55.9.139 $\mathrm{GM3^+}\oplus\mathrm{GM4^-}\oplus\mathrm{GM4^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B1_u}\oplus\mathrm{B3_g}$
N55.9.140 $\mathrm{GM3^+}\oplus\mathrm{GM3^-}\oplus\mathrm{Z1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B3_g}$
N55.9.141 $\mathrm{GM3^+}\oplus\mathrm{GM4^-}\oplus\mathrm{Z1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B3_g}$
N55.9.142 $\mathrm{GM3^+}\oplus\mathrm{GM3^-}\oplus\mathrm{Z1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B3_g}$
N55.9.143 $\mathrm{GM3^+}\oplus\mathrm{GM4^-}\oplus\mathrm{Z1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B3_g}$
N55.9.144 $\mathrm{GM3^+}\oplus\mathrm{GM3^-}\oplus\mathrm{Z3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B3_g}$
N55.9.145 $\mathrm{GM3^+}\oplus\mathrm{GM3^-}\oplus\mathrm{Z3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B3_g}$
N55.9.146 $\mathrm{GM3^+}\oplus\mathrm{GM4^-}\oplus\mathrm{Z3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B3_g}$
N55.9.147 $\mathrm{GM3^+}\oplus\mathrm{GM4^-}\oplus\mathrm{Z3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B3_g}$
N55.9.148 $\mathrm{GM3^+}\oplus\mathrm{Z1^+}\oplus\mathrm{Z1^+}$	$\surd$	1	1	$\times$	-	-
N55.9.149 $\mathrm{GM3^+}\oplus\mathrm{Z1^+}\oplus\mathrm{Z2^-}$	$\surd$	1	1	$\surd$	$mm2$	$\mathrm{B2}$
N55.9.150 $\mathrm{GM3^+}\oplus\mathrm{Z1^+}\oplus\mathrm{Z1^-}$	$\surd$	1	1	$\times$	-	-
N55.9.151 $\mathrm{GM3^+}\oplus\mathrm{Z1^+}\oplus\mathrm{Z2^+}$	$\surd$	1	1	$\times$	-	-
N55.9.152 $\mathrm{GM3^+}\oplus\mathrm{Z1^+}\oplus\mathrm{Z3^+}$	$\surd$	1	1	$\times$	-	-
N55.9.153 $\mathrm{GM3^+}\oplus\mathrm{Z1^+}\oplus\mathrm{Z3^-}$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $Pbam$ (No. 55) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N55.9.154 $\mathrm{GM3^+}\oplus\mathrm{Z1^+}\oplus\mathrm{Z4^+}$	$\surd$	1	1	$\times$	-	-
N55.9.155 $\mathrm{GM3^+}\oplus\mathrm{Z1^+}\oplus\mathrm{Z4^-}$	$\surd$	1	1	$\times$	-	-
N55.9.156 $\mathrm{GM3^+}\oplus\mathrm{Z1^-}\oplus\mathrm{Z1^-}$	$\surd$	1	1	$\times$	-	-
N55.9.157 $\mathrm{GM3^+}\oplus\mathrm{Z1^-}\oplus\mathrm{Z2^+}$	$\surd$	1	1	$\surd$	$mm2$	B2
N55.9.158 $\mathrm{GM3^+}\oplus\mathrm{Z1^-}\oplus\mathrm{Z3^+}$	$\surd$	1	1	$\times$	-	-
N55.9.159 $\mathrm{GM3^+}\oplus\mathrm{Z1^-}\oplus\mathrm{Z3^-}$	$\surd$	1	1	$\times$	-	-
N55.9.160 $\mathrm{GM3^+}\oplus\mathrm{Z1^-}\oplus\mathrm{Z4^+}$	$\surd$	1	1	$\times$	-	-
N55.9.161 $\mathrm{GM3^+}\oplus\mathrm{Z1^-}\oplus\mathrm{Z4^-}$	$\surd$	1	1	$\times$	-	-
N55.9.162 $\mathrm{GM3^+}\oplus\mathrm{Z3^+}\oplus\mathrm{Z3^+}$	$\surd$	1	1	$\times$	-	-
N55.9.163 $\mathrm{GM3^+}\oplus\mathrm{Z3^+}\oplus\mathrm{Z3^-}$	$\surd$	1	1	$\times$	-	-
N55.9.164 $\mathrm{GM3^+}\oplus\mathrm{Z3^+}\oplus\mathrm{Z4^+}$	$\surd$	1	1	$\times$	-	-
N55.9.165 $\mathrm{GM3^+}\oplus\mathrm{Z3^+}\oplus\mathrm{Z4^-}$	$\surd$	1	1	$\surd$	$mm2$	B2
N55.9.166 $\mathrm{GM3^+}\oplus\mathrm{Z3^-}\oplus\mathrm{Z3^-}$	$\surd$	1	1	$\times$	-	-
N55.9.167 $\mathrm{GM3^+}\oplus\mathrm{Z3^-}\oplus\mathrm{Z4^+}$	$\surd$	1	1	$\surd$	$mm2$	B2
N55.9.168 $\mathrm{GM3^-}\oplus\mathrm{GM3^-}\oplus\mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
N55.9.169 $\mathrm{GM3^-}\oplus\mathrm{GM3^-}\oplus\mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N55.9.170 $\mathrm{GM3^-}\oplus\mathrm{GM3^-}\oplus\mathrm{Z1^+}$	$\surd$	0	0	$\surd$	-	-
N55.9.171 $\mathrm{GM3^-}\oplus\mathrm{GM4^-}\oplus\mathrm{Z1^+}$	$\surd$	0	0	$\surd$	-	-
N55.9.172 $\mathrm{GM3^-}\oplus\mathrm{GM3^-}\oplus\mathrm{Z1^-}$	$\surd$	0	0	$\surd$	-	-
N55.9.173 $\mathrm{GM3^-}\oplus\mathrm{GM4^-}\oplus\mathrm{Z1^-}$	$\surd$	0	0	$\surd$	-	-
N55.9.174 $\mathrm{GM3^-}\oplus\mathrm{GM3^-}\oplus\mathrm{Z3^+}$	$\surd$	0	0	$\surd$	-	-
N55.9.175 $\mathrm{GM3^-}\oplus\mathrm{GM3^-}\oplus\mathrm{Z3^-}$	$\surd$	0	0	$\surd$	-	-
N55.9.176 $\mathrm{GM3^-}\oplus\mathrm{GM4^-}\oplus\mathrm{Z3^+}$	$\surd$	0	0	$\surd$	-	-
N55.9.177 $\mathrm{GM3^-}\oplus\mathrm{Z1^+}\oplus\mathrm{Z1^+}$	$\surd$	1	0	$\times$	-	-
N55.9.178 $\mathrm{GM3^-}\oplus\mathrm{Z1^+}\oplus\mathrm{Z2^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N55.9.179 $\mathrm{GM3^-}\oplus\mathrm{Z1^+}\oplus\mathrm{Z1^-}$	$\surd$	1	1	$\times$	-	-
N55.9.180 $\mathrm{GM3^-}\oplus\mathrm{Z1^+}\oplus\mathrm{Z2^+}$	$\surd$	1	0	$\times$	-	-
N55.9.181 $\mathrm{GM3^-}\oplus\mathrm{Z1^+}\oplus\mathrm{Z3^+}$	$\surd$	1	0	$\times$	-	-
N55.9.182 $\mathrm{GM3^-}\oplus\mathrm{Z1^+}\oplus\mathrm{Z3^-}$	$\surd$	1	1	$\times$	-	-
N55.9.183 $\mathrm{GM3^-}\oplus\mathrm{Z1^+}\oplus\mathrm{Z4^+}$	$\surd$	1	0	$\times$	-	-
N55.9.184 $\mathrm{GM3^-}\oplus\mathrm{Z1^+}\oplus\mathrm{Z4^-}$	$\surd$	1	1	$\times$	-	-
N55.9.185 $\mathrm{GM3^-}\oplus\mathrm{Z1^-}\oplus\mathrm{Z1^-}$	$\surd$	1	0	$\times$	-	-
N55.9.186 $\mathrm{GM3^-}\oplus\mathrm{Z1^-}\oplus\mathrm{Z2^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N55.9.187 $\mathrm{GM3^-}\oplus\mathrm{Z1^-}\oplus\mathrm{Z3^+}$	$\surd$	1	1	$\times$	-	-
N55.9.188 $\mathrm{GM3^-}\oplus\mathrm{Z1^-}\oplus\mathrm{Z3^-}$	$\surd$	1	0	$\times$	-	-
N55.9.189 $\mathrm{GM3^-}\oplus\mathrm{Z1^-}\oplus\mathrm{Z4^+}$	$\surd$	1	1	$\times$	-	-
N55.9.190 $\mathrm{GM3^-}\oplus\mathrm{Z1^-}\oplus\mathrm{Z4^-}$	$\surd$	1	0	$\times$	-	-
N55.9.191 $\mathrm{GM3^-}\oplus\mathrm{Z3^+}\oplus\mathrm{Z3^+}$	$\surd$	1	0	$\times$	-	-
N55.9.192 $\mathrm{GM3^-}\oplus\mathrm{Z3^+}\oplus\mathrm{Z3^-}$	$\surd$	1	1	$\times$	-	-
N55.9.193 $\mathrm{GM3^-}\oplus\mathrm{Z3^+}\oplus\mathrm{Z4^+}$	$\surd$	1	0	$\times$	-	-
N55.9.194 $\mathrm{GM3^-}\oplus\mathrm{Z3^+}\oplus\mathrm{Z4^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N55.9.195 $\mathrm{GM3^-}\oplus\mathrm{Z3^-}\oplus\mathrm{Z3^-}$	$\surd$	1	0	$\times$	-	-
N55.9.196 $\mathrm{GM3^-}\oplus\mathrm{Z3^-}\oplus\mathrm{Z4^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N55.9.197 $\mathrm{Z1^+}\oplus\mathrm{Z1^+}\oplus\mathrm{Z1^+}$	$\surd$	0	0	$\surd$	-	-
N55.9.198 $\mathrm{Z1^+}\oplus\mathrm{Z1^+}\oplus\mathrm{Z2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B1_u}$
N55.9.199 $\mathrm{Z1^+}\oplus\mathrm{Z1^+}\oplus\mathrm{Z1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{A_u}$

Non-coplanar SSGs with parent space group $Pbam$ (No. 55) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N55.9.200 $\mathrm{Z1^+}\oplus\mathrm{Z1^+}\oplus\mathrm{Z2^+}$	$\surd$	0	0	$\surd$	-	-
N55.9.201 $\mathrm{Z1^+}\oplus\mathrm{Z2^-}\oplus\mathrm{Z1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B1_u}$
N55.9.202 $\mathrm{Z1^+}\oplus\mathrm{Z1^+}\oplus\mathrm{Z3^+}$	$\surd$	0	0	$\surd$	-	-
N55.9.203 $\mathrm{Z1^+}\oplus\mathrm{Z1^+}\oplus\mathrm{Z3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u}\oplus\mathrm{B3_u}$
N55.9.204 $\mathrm{Z1^+}\oplus\mathrm{Z2^-}\oplus\mathrm{Z3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B2_u}$
N55.9.205 $\mathrm{Z1^+}\oplus\mathrm{Z1^-}\oplus\mathrm{Z1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{A_u}$
N55.9.206 $\mathrm{Z1^+}\oplus\mathrm{Z1^-}\oplus\mathrm{Z2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B1_u}$
N55.9.207 $\mathrm{Z1^+}\oplus\mathrm{Z2^+}\oplus\mathrm{Z2^+}$	$\surd$	0	0	$\surd$	-	-
N55.9.208 $\mathrm{Z1^+}\oplus\mathrm{Z1^-}\oplus\mathrm{Z3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B3_u}$
N55.9.209 $\mathrm{Z1^+}\oplus\mathrm{Z1^-}\oplus\mathrm{Z3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B3_u}$
N55.9.210 $\mathrm{Z1^+}\oplus\mathrm{Z2^+}\oplus\mathrm{Z3^+}$	$\surd$	0	0	$\surd$	-	-
N55.9.211 $\mathrm{Z1^+}\oplus\mathrm{Z2^+}\oplus\mathrm{Z3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u}\oplus\mathrm{B2_u}$
N55.9.212 $\mathrm{Z1^+}\oplus\mathrm{Z3^+}\oplus\mathrm{Z3^+}$	$\surd$	0	0	$\surd$	-	-
N55.9.213 $\mathrm{Z1^+}\oplus\mathrm{Z3^+}\oplus\mathrm{Z3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B3_u}$
N55.9.214 $\mathrm{Z1^+}\oplus\mathrm{Z3^+}\oplus\mathrm{Z4^+}$	$\surd$	0	0	$\surd$	-	-
N55.9.215 $\mathrm{Z1^+}\oplus\mathrm{Z3^+}\oplus\mathrm{Z4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B2_u}$
N55.9.216 $\mathrm{Z1^+}\oplus\mathrm{Z3^-}\oplus\mathrm{Z3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u}\oplus\mathrm{B3_u}$
N55.9.217 $\mathrm{Z1^+}\oplus\mathrm{Z3^-}\oplus\mathrm{Z4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u}\oplus\mathrm{B2_u}$
N55.9.218 $\mathrm{Z1^-}\oplus\mathrm{Z1^-}\oplus\mathrm{Z1^-}$	$\surd$	0	0	$\surd$	-	-
N55.9.219 $\mathrm{Z1^-}\oplus\mathrm{Z1^-}\oplus\mathrm{Z2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B1_u}$
N55.9.220 $\mathrm{Z1^-}\oplus\mathrm{Z1^-}\oplus\mathrm{Z3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u}\oplus\mathrm{B3_u}$
N55.9.221 $\mathrm{Z1^-}\oplus\mathrm{Z1^-}\oplus\mathrm{Z3^-}$	$\surd$	0	0	$\surd$	-	-
N55.9.222 $\mathrm{Z1^-}\oplus\mathrm{Z2^+}\oplus\mathrm{Z3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B3_u}$
N55.9.223 $\mathrm{Z1^-}\oplus\mathrm{Z3^+}\oplus\mathrm{Z3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u}\oplus\mathrm{B3_u}$
N55.9.224 $\mathrm{Z1^-}\oplus\mathrm{Z3^+}\oplus\mathrm{Z3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B3_u}$
N55.9.225 $\mathrm{Z1^-}\oplus\mathrm{Z3^+}\oplus\mathrm{Z4^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u}\oplus\mathrm{B2_u}$
N55.9.226 $\mathrm{Z1^-}\oplus\mathrm{Z3^+}\oplus\mathrm{Z4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B3_u}$
N55.9.227 $\mathrm{Z1^-}\oplus\mathrm{Z3^-}\oplus\mathrm{Z3^-}$	$\surd$	0	0	$\surd$	-	-
N55.9.228 $\mathrm{Z1^-}\oplus\mathrm{Z3^-}\oplus\mathrm{Z4^-}$	$\surd$	0	0	$\surd$	-	-
N55.9.229 $\mathrm{Z3^+}\oplus\mathrm{Z3^+}\oplus\mathrm{Z3^+}$	$\surd$	0	0	$\surd$	-	-
N55.9.230 $\mathrm{Z3^+}\oplus\mathrm{Z3^+}\oplus\mathrm{Z3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{A_u}$
N55.9.231 $\mathrm{Z3^+}\oplus\mathrm{Z3^+}\oplus\mathrm{Z4^+}$	$\surd$	0	0	$\surd$	-	-
N55.9.232 $\mathrm{Z3^+}\oplus\mathrm{Z3^+}\oplus\mathrm{Z4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B1_u}$
N55.9.233 $\mathrm{Z3^+}\oplus\mathrm{Z3^-}\oplus\mathrm{Z4^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B1_u}$
N55.10.1 $\mathrm{GM1^-}\oplus\mathrm{S1^+S2^+}$	$\surd$	1	0	$\times$	-	-
N55.10.2 $\mathrm{GM1^-}\oplus\mathrm{S1^-S2^-}$	$\surd$	1	0	$\times$	-	-
N55.10.3 $\mathrm{GM1^-}\oplus\mathrm{R1^+R2^+}$	$\surd$	1	0	$\times$	-	-
N55.10.4 $\mathrm{GM2^+}\oplus\mathrm{S1^+S2^+}$	$\surd$	1	1	$\times$	-	-
N55.10.5 $\mathrm{GM2^+}\oplus\mathrm{S1^-S2^-}$	$\surd$	1	1	$\times$	-	-
N55.10.6 $\mathrm{GM2^+}\oplus\mathrm{R1^+R2^+}$	$\surd$	1	1	$\times$	-	-
N55.10.7 $\mathrm{GM2^-}\oplus\mathrm{S1^+S2^+}$	$\surd$	1	0	$\times$	-	-
N55.10.8 $\mathrm{GM2^-}\oplus\mathrm{S1^-S2^-}$	$\surd$	1	0	$\times$	-	-
N55.10.9 $\mathrm{GM2^-}\oplus\mathrm{R1^+R2^+}$	$\surd$	1	0	$\times$	-	-
N55.10.10 $\mathrm{GM3^+}\oplus\mathrm{S1^+S2^+}$	$\surd$	1	1	$\times$	-	-
N55.10.11 $\mathrm{GM3^+}\oplus\mathrm{S1^-S2^-}$	$\surd$	1	1	$\times$	-	-
N55.10.12 $\mathrm{GM3^+}\oplus\mathrm{R1^+R2^+}$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $Pbam$ (No. 55) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N55.10.13 $\mathrm{GM3^-} \oplus \mathrm{S1^+S2^+}$	$\surd$	1	0	$\times$	-	-
N55.10.14 $\mathrm{GM3^-} \oplus \mathrm{S1^-S2^-}$	$\surd$	1	0	$\times$	-	-
N55.10.15 $\mathrm{GM3^-} \oplus \mathrm{R1^+R2^+}$	$\surd$	1	0	$\times$	-	-
N55.10.16 $\mathrm{Z1^+} \oplus \mathrm{S1^+S2^+}$	$\surd$	1	0	$\times$	-	-
N55.10.17 $\mathrm{Z1^+} \oplus \mathrm{S1^-S2^-}$	$\surd$	1	0	$\times$	-	-
N55.10.18 $\mathrm{Z1^+} \oplus \mathrm{R1^+R2^+}$	$\surd$	1	0	$\times$	-	-
N55.10.19 $\mathrm{Z1^+} \oplus \mathrm{R1^-R2^-}$	$\surd$	1	0	$\times$	-	-
N55.10.20 $\mathrm{Z1^-} \oplus \mathrm{S1^+S2^+}$	$\surd$	1	0	$\times$	-	-
N55.10.21 $\mathrm{Z1^-} \oplus \mathrm{S1^-S2^-}$	$\surd$	1	0	$\times$	-	-
N55.10.22 $\mathrm{Z1^-} \oplus \mathrm{R1^+R2^+}$	$\surd$	1	0	$\times$	-	-
N55.10.23 $\mathrm{Z1^-} \oplus \mathrm{R1^-R2^-}$	$\surd$	1	0	$\times$	-	-
N55.10.24 $\mathrm{Z3^+} \oplus \mathrm{S1^+S2^+}$	$\surd$	1	0	$\times$	-	-
N55.10.25 $\mathrm{Z3^+} \oplus \mathrm{S1^-S2^-}$	$\surd$	1	0	$\times$	-	-
N55.10.26 $\mathrm{Z3^+} \oplus \mathrm{R1^+R2^+}$	$\surd$	1	0	$\times$	-	-
N55.10.27 $\mathrm{Z3^+} \oplus \mathrm{R1^-R2^-}$	$\surd$	1	0	$\times$	-	-
N55.12.1 $\mathrm{GM1^-} \oplus \mathrm{T1}$	$\surd$	1	1	$\times$	-	-
N55.12.2 $\mathrm{GM1^-} \oplus \mathrm{X1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N55.12.3 $\mathrm{GM1^-} \oplus \mathrm{X2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N55.12.4 $\mathrm{GM2^+} \oplus \mathrm{T1}$	$\surd$	1	1	$\times$	-	-
N55.12.5 $\mathrm{GM2^+} \oplus \mathrm{X1}$	$\surd$	1	1	$\surd$	$mm2$	B1
N55.12.6 $\mathrm{GM2^+} \oplus \mathrm{X2}$	$\surd$	1	1	$\surd$	$mm2$	B1
N55.12.7 $\mathrm{GM2^-} \oplus \mathrm{T1}$	$\surd$	1	1	$\times$	-	-
N55.12.8 $\mathrm{GM2^-} \oplus \mathrm{X1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N55.12.9 $\mathrm{GM2^-} \oplus \mathrm{X2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N55.12.10 $\mathrm{GM3^+} \oplus \mathrm{T1}$	$\surd$	1	1	$\times$	-	-
N55.12.11 $\mathrm{GM3^+} \oplus \mathrm{U1}$	$\surd$	1	1	$\times$	-	-
N55.12.12 $\mathrm{GM3^+} \oplus \mathrm{X1}$	$\surd$	1	1	$\surd$	222	B3
N55.12.13 $\mathrm{GM3^+} \oplus \mathrm{Y2}$	$\surd$	1	1	$\surd$	$mm2$	B2
N55.12.14 $\mathrm{GM3^+} \oplus \mathrm{X2}$	$\surd$	1	1	$\surd$	222	B3
N55.12.15 $\mathrm{GM3^+} \oplus \mathrm{Y1}$	$\surd$	1	1	$\surd$	$mm2$	B2
N55.12.16 $\mathrm{GM3^-} \oplus \mathrm{T1}$	$\surd$	1	1	$\times$	-	-
N55.12.17 $\mathrm{GM3^-} \oplus \mathrm{U1}$	$\surd$	1	1	$\times$	-	-
N55.12.18 $\mathrm{GM3^-} \oplus \mathrm{X1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N55.12.19 $\mathrm{GM3^-} \oplus \mathrm{Y2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N55.12.20 $\mathrm{GM3^-} \oplus \mathrm{X2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N55.12.21 $\mathrm{GM3^-} \oplus \mathrm{Y1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N55.12.22 $\mathrm{Z1^+} \oplus \mathrm{T1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N55.12.23 $\mathrm{Z1^+} \oplus \mathrm{T2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N55.12.24 $\mathrm{Z1^+} \oplus \mathrm{X1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N55.12.25 $\mathrm{Z1^+} \oplus \mathrm{X2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N55.12.26 $\mathrm{Z1^-} \oplus \mathrm{T1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N55.12.27 $\mathrm{Z1^-} \oplus \mathrm{T2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N55.12.28 $\mathrm{Z1^-} \oplus \mathrm{X1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N55.12.29 $\mathrm{Z1^-} \oplus \mathrm{X2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N55.12.30 $\mathrm{Z3^+} \oplus \mathrm{T1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N55.12.31 $\mathrm{Z3^+} \oplus \mathrm{T2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$

Non-coplanar SSGs with parent space group $Pbam$ (No. 55) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N55.12.32 Z3$^+$ ⊕ U1	√	1	1	√	mmm	B3$_\mathrm{u}$
N55.12.33 Z3$^+$ ⊕ U2	√	1	1	√	mmm	B3$_\mathrm{u}$
N55.12.34 Z3$^+$ ⊕ X1	√	1	1	√	mmm	B3$_\mathrm{u}$
N55.12.35 Z3$^+$ ⊕ Y2	√	1	1	√	mmm	B2$_\mathrm{u}$
N55.12.36 Z3$^+$ ⊕ X2	√	1	1	√	mmm	B3$_\mathrm{u}$
N55.12.37 Z3$^+$ ⊕ Y1	√	1	1	√	mmm	B2$_\mathrm{u}$
N55.14.1 GM1$^-$ ⊕ DT1	√	1	1	√	mmm	B2$_\mathrm{u}$
N55.14.2 GM1$^-$ ⊕ DT2	√	1	1	√	mmm	B2$_\mathrm{u}$
N55.14.3 GM1$^-$ ⊕ A1	√	1	1	×	-	-
N55.14.4 GM1$^-$ ⊕ LD1	√	1	1	√	mmm	B1$_\mathrm{u}$
N55.14.5 GM1$^-$ ⊕ LD2	√	1	1	√	mmm	B1$_\mathrm{u}$
N55.14.6 GM1$^-$ ⊕ LD3	√	1	1	√	mmm	B1$_\mathrm{u}$
N55.14.7 GM2$^+$ ⊕ DT1	√	1	1	√	$mm2$	B2
N55.14.8 GM2$^+$ ⊕ DT2	√	1	1	√	$mm2$	B2
N55.14.9 GM2$^+$ ⊕ A1	√	1	1	×	-	-
N55.14.10 GM2$^+$ ⊕ LD1	√	1	1	√	222	B1
N55.14.11 GM2$^+$ ⊕ LD2	√	1	1	√	222	B1
N55.14.12 GM2$^+$ ⊕ LD3	√	1	1	√	222	B1
N55.14.13 GM2$^-$ ⊕ DT1	√	1	1	√	mmm	B2$_\mathrm{u}$
N55.14.14 GM2$^-$ ⊕ DT2	√	1	1	√	mmm	B2$_\mathrm{u}$
N55.14.15 GM2$^-$ ⊕ A1	√	1	1	×	-	-
N55.14.16 GM2$^-$ ⊕ LD1	√	1	1	√	mmm	B1$_\mathrm{u}$
N55.14.17 GM2$^-$ ⊕ LD2	√	1	1	√	mmm	B1$_\mathrm{u}$
N55.14.18 GM2$^-$ ⊕ LD3	√	1	1	√	mmm	B1$_\mathrm{u}$
N55.14.19 GM3$^+$ ⊕ SM1	√	1	1	√	222	B3
N55.14.20 GM3$^+$ ⊕ DT1	√	1	1	√	$mm2$	B2
N55.14.21 GM3$^+$ ⊕ SM2	√	1	1	√	222	B3
N55.14.22 GM3$^+$ ⊕ DT2	√	1	1	√	$mm2$	B2
N55.14.23 GM3$^+$ ⊕ A1	√	1	1	×	-	-
N55.14.24 GM3$^+$ ⊕ B1	√	1	1	×	-	-
N55.14.25 GM3$^+$ ⊕ LD1	√	1	1	√	$mm2$	B2
N55.14.26 GM3$^+$ ⊕ LD2	√	1	1	√	$mm2$	B2
N55.14.27 GM3$^+$ ⊕ LD3	√	1	1	√	$mm2$	B2
N55.14.28 GM3$^+$ ⊕ LD4	√	1	1	√	$mm2$	B2
N55.14.29 GM3$^-$ ⊕ SM1	√	1	1	√	mmm	B3$_\mathrm{u}$
N55.14.30 GM3$^-$ ⊕ DT1	√	1	1	√	mmm	B2$_\mathrm{u}$
N55.14.31 GM3$^-$ ⊕ SM2	√	1	1	√	mmm	B3$_\mathrm{u}$
N55.14.32 GM3$^-$ ⊕ DT2	√	1	1	√	mmm	B2$_\mathrm{u}$
N55.14.33 GM3$^-$ ⊕ A1	√	1	1	×	-	-
N55.14.34 GM3$^-$ ⊕ B1	√	1	1	×	-	-
N55.14.35 GM3$^-$ ⊕ LD1	√	1	1	√	mmm	B1$_\mathrm{u}$
N55.14.36 GM3$^-$ ⊕ LD2	√	1	1	√	mmm	B1$_\mathrm{u}$
N55.14.37 GM3$^-$ ⊕ LD3	√	1	1	√	mmm	B1$_\mathrm{u}$
N55.14.38 GM3$^-$ ⊕ LD4	√	1	1	√	mmm	B1$_\mathrm{u}$
N55.14.39 Z1$^+$ ⊕ DT1	√	1	1	√	mmm	B2$_\mathrm{u}$
N55.14.40 Z1$^+$ ⊕ DT2	√	1	1	√	mmm	B2$_\mathrm{u}$

Non-coplanar SSGs with parent space group $Pbam$ (No. 55) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N55.14.41 Z1$^+$ ⊕ A1	√	1	1	√	mmm	$\mathrm{B3_u}$
N55.14.42 Z1$^+$ ⊕ A2	√	1	1	√	mmm	$\mathrm{B3_u}$
N55.14.43 Z1$^+$ ⊕ LD1	√	1	1	√	mmm	$\mathrm{B1_u}$
N55.14.44 Z1$^+$ ⊕ LD2	√	1	1	√	mmm	$\mathrm{B1_u}$
N55.14.45 Z1$^+$ ⊕ LD3	√	1	1	√	mmm	$\mathrm{B1_u}$
N55.14.46 Z1$^-$ ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N55.14.47 Z1$^-$ ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
N55.14.48 Z1$^-$ ⊕ A1	√	1	1	√	mmm	$\mathrm{B3_u}$
N55.14.49 Z1$^-$ ⊕ A2	√	1	1	√	mmm	$\mathrm{B3_u}$
N55.14.50 Z1$^-$ ⊕ LD1	√	1	1	√	mmm	$\mathrm{B1_u}$
N55.14.51 Z1$^-$ ⊕ LD2	√	1	1	√	mmm	$\mathrm{B1_u}$
N55.14.52 Z1$^-$ ⊕ LD3	√	1	1	√	mmm	$\mathrm{B1_u}$
N55.14.53 Z3$^+$ ⊕ SM1	√	1	1	√	mmm	$\mathrm{B3_u}$
N55.14.54 Z3$^+$ ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N55.14.55 Z3$^+$ ⊕ SM2	√	1	1	√	mmm	$\mathrm{B3_u}$
N55.14.56 Z3$^+$ ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
N55.14.57 Z3$^+$ ⊕ A1	√	1	1	√	mmm	$\mathrm{B3_u}$
N55.14.58 Z3$^+$ ⊕ A2	√	1	1	√	mmm	$\mathrm{B3_u}$
N55.14.59 Z3$^+$ ⊕ B1	√	1	1	√	mmm	$\mathrm{B2_u}$
N55.14.60 Z3$^+$ ⊕ B2	√	1	1	√	mmm	$\mathrm{B2_u}$
N55.14.61 Z3$^+$ ⊕ LD1	√	1	1	√	mmm	$\mathrm{B1_u}$
N55.14.62 Z3$^+$ ⊕ LD2	√	1	1	√	mmm	$\mathrm{B1_u}$
N55.14.63 Z3$^+$ ⊕ LD3	√	1	1	√	mmm	$\mathrm{B1_u}$
N55.14.64 Z3$^+$ ⊕ LD4	√	1	1	√	mmm	$\mathrm{B1_u}$

TABLE S166: Collinear SSGs with parent space group $Pccn$ (No. 56).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L56.1.1 GM1$^+$	1	mmm	$\mathrm{A_g}$
L56.2.1 GM1$^-$	0	-	-
L56.2.2 GM2$^+$	1	mmm	$\mathrm{B1_g}$
L56.2.3 GM2$^-$	0	-	-
L56.2.4 GM3$^+$	1	mmm	$\mathrm{B3_g}$
L56.2.5 GM3$^-$	0	-	-

TABLE S167: Coplanar SSGs with parent space group $Pccn$ (No. 56).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P56.1.1 GM1$^+$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
P56.2.1 GM1$^-$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
P56.2.2 GM2$^+$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
P56.2.3 GM2$^-$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
P56.2.4 GM3$^+$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g}$
P56.2.5 GM3$^-$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u}$

Coplanar SSGs with parent space group $Pccn$ (No. 56) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P56.3.1 $\mathrm{GM1}^-\oplus\mathrm{GM1}^-$	$\surd$	0	0	$\surd$	-	-
P56.3.2 $\mathrm{GM1}^-\oplus\mathrm{GM2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_u}$
P56.3.3 $\mathrm{GM1}^-\oplus\mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
P56.3.4 $\mathrm{GM1}^-\oplus\mathrm{GM3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_u}$
P56.3.5 $\mathrm{GM1}^-\oplus\mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
P56.3.6 $\mathrm{GM2}^+\oplus\mathrm{GM2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_g}$
P56.3.7 $\mathrm{GM2}^+\oplus\mathrm{GM2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B1_g}$
P56.3.8 $\mathrm{GM2}^+\oplus\mathrm{GM3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B3_g}$
P56.3.9 $\mathrm{GM2}^+\oplus\mathrm{GM3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B2_u}$
P56.3.10 $\mathrm{GM2}^-\oplus\mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
P56.3.11 $\mathrm{GM2}^-\oplus\mathrm{GM3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B2_u}$
P56.3.12 $\mathrm{GM2}^-\oplus\mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
P56.3.13 $\mathrm{GM3}^+\oplus\mathrm{GM3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_g}$
P56.3.14 $\mathrm{GM3}^+\oplus\mathrm{GM4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B2_g}$
P56.3.15 $\mathrm{GM3}^+\oplus\mathrm{GM3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B3_g}$
P56.3.16 $\mathrm{GM3}^+\oplus\mathrm{GM4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B3_g}$
P56.3.17 $\mathrm{GM3}^-\oplus\mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
P56.3.18 $\mathrm{GM3}^-\oplus\mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
P56.4.1 $\mathrm{R1}^+\mathrm{R2}^+$	$\surd$	1	0	$\times$	-	-
P56.6.1 S1	$\surd$	1	1	$\times$	-	-
P56.6.2 X1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P56.6.3 X2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P56.6.4 Z1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P56.6.5 Z2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P56.8.1 DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P56.8.2 DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P56.8.3 LD1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P56.8.4 LD3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$

TABLE S168: Non-coplanar SSGs with parent space group $Pccn$ (No. 56).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N56.1.1 $\mathrm{GM1}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{A_g}$
N56.2.1 $\mathrm{GM1}^-$	$\surd$	2	2	$\surd$	222	$\mathrm{A1}\oplus\mathrm{A1}$
N56.2.2 $\mathrm{GM2}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{B1_g}$
N56.2.3 $\mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1}\oplus\mathrm{A1}$
N56.2.4 $\mathrm{GM3}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{B3_g}$
N56.2.5 $\mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1}\oplus\mathrm{A1}$
N56.3.1 $\mathrm{GM1}^-\oplus\mathrm{GM1}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_u}\oplus\mathrm{A_u}$
N56.3.2 $\mathrm{GM1}^-\oplus\mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1}\oplus\mathrm{A2}$
N56.3.3 $\mathrm{GM1}^-\oplus\mathrm{GM2}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_u}\oplus\mathrm{B1_u}$
N56.3.4 $\mathrm{GM1}^-\oplus\mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1}\oplus\mathrm{A2}$
N56.3.5 $\mathrm{GM1}^-\oplus\mathrm{GM3}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_u}\oplus\mathrm{B3_u}$
N56.3.6 $\mathrm{GM2}^+\oplus\mathrm{GM2}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B1_g}\oplus\mathrm{B1_g}$
N56.3.7 $\mathrm{GM2}^+\oplus\mathrm{GM2}^-$	$\surd$	2	2	$\surd$	222	$\mathrm{A1}\oplus\mathrm{B1}$
N56.3.8 $\mathrm{GM2}^+\oplus\mathrm{GM3}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B1_g}\oplus\mathrm{B3_g}$

Non-coplanar SSGs with parent space group $Pccn$ (No. 56) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N56.3.9 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{-}$	√	2	2	√	$mm2$	$\mathrm{A1}\oplus\mathrm{B1}$
N56.3.10 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}$	√	3	3	√	mmm	$\mathrm{A_g}\oplus\mathrm{B1_u}\oplus\mathrm{B1_u}$
N56.3.11 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{+}$	√	2	2	√	$mm2$	$\mathrm{A1}\oplus\mathrm{B2}$
N56.3.12 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}$	√	3	3	√	mmm	$\mathrm{A_g}\oplus\mathrm{B1_u}\oplus\mathrm{B3_u}$
N56.3.13 $\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{+}$	√	3	3	√	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}\oplus\mathrm{B3_g}$
N56.3.14 $\mathrm{GM3}^{+}\oplus\mathrm{GM4}^{+}$	√	3	3	√	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}\oplus\mathrm{B2_g}$
N56.3.15 $\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{-}$	√	2	2	√	222	$\mathrm{A1}\oplus\mathrm{B3}$
N56.3.16 $\mathrm{GM3}^{+}\oplus\mathrm{GM4}^{-}$	√	2	2	√	$mm2$	$\mathrm{A1}\oplus\mathrm{B2}$
N56.3.17 $\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}$	√	3	3	√	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}\oplus\mathrm{B3_u}$
N56.3.18 $\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{-}$	√	3	3	√	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}\oplus\mathrm{B2_u}$
N56.4.1 $\mathrm{R1}^{+}\mathrm{R2}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N56.6.1 S1	√	1	1	√	222	A1
N56.6.2 X1	√	1	1	√	$mm2$	A1
N56.6.3 X2	√	1	1	√	$mm2$	A1
N56.6.4 Z1	√	1	1	√	$mm2$	A1
N56.6.5 Z2	√	1	1	√	$mm2$	A1
N56.8.1 DT1	√	1	1	√	$mm2$	A1
N56.8.2 DT2	√	1	1	√	$mm2$	A1
N56.8.3 LD1	√	1	1	√	$mm2$	A1
N56.8.4 LD3	√	1	1	√	$mm2$	A1
N56.9.1 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}$	√	0	0	√	-	-
N56.9.2 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}$	√	3	3	√	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_u}\oplus\mathrm{B1_u}$
N56.9.3 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{-}$	√	0	0	√	-	-
N56.9.4 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}\oplus\mathrm{GM3}^{+}$	√	3	3	√	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_u}\oplus\mathrm{B3_u}$
N56.9.5 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}\oplus\mathrm{GM3}^{-}$	√	0	0	√	-	-
N56.9.6 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}$	√	2	2	√	222	$\mathrm{B1}\oplus\mathrm{B1}$
N56.9.7 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}$	√	3	3	√	mmm	$\mathrm{A_u}\oplus\mathrm{B1_g}\oplus\mathrm{B1_u}$
N56.9.8 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{+}$	√	2	2	√	$mm2$	$\mathrm{B2}\oplus\mathrm{B1}$
N56.9.9 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{-}$	√	3	3	√	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_u}\oplus\mathrm{B2_u}$
N56.9.10 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}$	√	0	0	√	-	-
N56.9.11 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{+}$	√	3	3	√	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_u}\oplus\mathrm{B2_u}$
N56.9.12 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}$	√	0	0	√	-	-
N56.9.13 $\mathrm{GM1}^{-}\oplus\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{+}$	√	2	2	√	222	$\mathrm{B3}\oplus\mathrm{B3}$
N56.9.14 $\mathrm{GM1}^{-}\oplus\mathrm{GM3}^{+}\oplus\mathrm{GM4}^{+}$	√	2	2	√	$mm2$	$\mathrm{B2}\oplus\mathrm{B1}$
N56.9.15 $\mathrm{GM1}^{-}\oplus\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{-}$	√	3	3	√	mmm	$\mathrm{A_u}\oplus\mathrm{B3_g}\oplus\mathrm{B3_u}$
N56.9.16 $\mathrm{GM1}^{-}\oplus\mathrm{GM3}^{+}\oplus\mathrm{GM4}^{-}$	√	3	3	√	mmm	$\mathrm{B1_u}\oplus\mathrm{B3_g}\oplus\mathrm{B3_u}$
N56.9.17 $\mathrm{GM1}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}$	√	0	0	√	-	-
N56.9.18 $\mathrm{GM1}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{-}$	√	0	0	√	-	-
N56.9.19 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}$	√	3	3	√	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B1_g}$
N56.9.20 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}$	√	2	2	√	$mm2$	$\mathrm{A2}\oplus\mathrm{A2}$
N56.9.21 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{+}$	√	3	3	√	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B3_g}$
N56.9.22 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{-}$	√	2	2	√	$mm2$	$\mathrm{B2}\oplus\mathrm{B2}$
N56.9.23 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}$	√	3	3	√	mmm	$\mathrm{A_u}\oplus\mathrm{A_u}\oplus\mathrm{B1_g}$
N56.9.24 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{+}$	√	2	2	√	$mm2$	$\mathrm{A2}\oplus\mathrm{B2}$
N56.9.25 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}$	√	3	3	√	mmm	$\mathrm{A_u}\oplus\mathrm{B1_g}\oplus\mathrm{B2_u}$
N56.9.26 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{+}$	√	3	3	√	mmm	$\mathrm{B1_g}\oplus\mathrm{B3_g}\oplus\mathrm{B3_g}$

Non-coplanar SSGs with parent space group $Pccn$ (No. 56) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N56.9.27 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N56.9.28 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	√	2	2	√	$mm2$	$\mathrm{A2} \oplus \mathrm{B2}$
N56.9.29 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	√	2	2	√	222	$\mathrm{B1} \oplus \mathrm{B3}$
N56.9.30 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N56.9.31 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N56.9.32 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	√	0	0	√	-	-
N56.9.33 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^+$	√	3	3	√	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N56.9.34 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^-$	√	0	0	√	-	-
N56.9.35 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	√	2	2	√	$mm2$	$\mathrm{B2} \oplus \mathrm{B2}$
N56.9.36 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	√	2	2	√	222	$\mathrm{B3} \oplus \mathrm{B2}$
N56.9.37 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N56.9.38 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N56.9.39 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	√	0	0	√	-	-
N56.9.40 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	√	0	0	√	-	-
N56.9.41 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	√	3	3	√	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N56.9.42 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	√	3	3	√	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N56.9.43 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	√	2	2	√	$mm2$	$\mathrm{A2} \oplus \mathrm{A2}$
N56.9.44 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	√	2	2	√	$mm2$	$\mathrm{B2} \oplus \mathrm{B2}$
N56.9.45 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{GM3}^-$	√	2	2	√	$mm2$	$\mathrm{A2} \oplus \mathrm{B2}$
N56.9.46 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B3_g}$
N56.9.47 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u} \oplus \mathrm{B3_g}$
N56.9.48 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B3_g}$
N56.9.49 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	√	0	0	√	-	-
N56.9.50 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	√	0	0	√	-	-
N56.10.1 $\mathrm{GM1}^- \oplus \mathrm{R1}^+\mathrm{R2}^+$	√	1	0	×	-	-
N56.10.2 $\mathrm{GM2}^+ \oplus \mathrm{R1}^+\mathrm{R2}^+$	√	1	1	×	-	-
N56.10.3 $\mathrm{GM2}^- \oplus \mathrm{R1}^+\mathrm{R2}^+$	√	1	0	×	-	-
N56.10.4 $\mathrm{GM3}^+ \oplus \mathrm{R1}^+\mathrm{R2}^+$	√	1	1	×	-	-
N56.10.5 $\mathrm{GM3}^- \oplus \mathrm{R1}^+\mathrm{R2}^+$	√	1	0	×	-	-
N56.12.1 $\mathrm{GM1}^- \oplus \mathrm{S1}$	√	1	1	×	-	-
N56.12.2 $\mathrm{GM1}^- \oplus \mathrm{X1}$	√	1	1	√	mmm	$\mathrm{B3_u}$
N56.12.3 $\mathrm{GM1}^- \oplus \mathrm{X2}$	√	1	1	√	mmm	$\mathrm{B3_u}$
N56.12.4 $\mathrm{GM1}^- \oplus \mathrm{Z1}$	√	1	1	√	mmm	$\mathrm{B1_u}$
N56.12.5 $\mathrm{GM1}^- \oplus \mathrm{Z2}$	√	1	1	√	mmm	$\mathrm{B1_u}$
N56.12.6 $\mathrm{GM2}^+ \oplus \mathrm{S1}$	√	1	1	×	-	-
N56.12.7 $\mathrm{GM2}^+ \oplus \mathrm{X1}$	√	1	1	√	$mm2$	B1
N56.12.8 $\mathrm{GM2}^+ \oplus \mathrm{X2}$	√	1	1	√	$mm2$	B1
N56.12.9 $\mathrm{GM2}^+ \oplus \mathrm{Z1}$	√	1	1	√	222	B1
N56.12.10 $\mathrm{GM2}^+ \oplus \mathrm{Z2}$	√	1	1	√	222	B1
N56.12.11 $\mathrm{GM2}^- \oplus \mathrm{S1}$	√	1	1	×	-	-
N56.12.12 $\mathrm{GM2}^- \oplus \mathrm{X1}$	√	1	1	√	mmm	$\mathrm{B3_u}$
N56.12.13 $\mathrm{GM2}^- \oplus \mathrm{X2}$	√	1	1	√	mmm	$\mathrm{B3_u}$
N56.12.14 $\mathrm{GM2}^- \oplus \mathrm{Z1}$	√	1	1	√	mmm	$\mathrm{B1_u}$
N56.12.15 $\mathrm{GM2}^- \oplus \mathrm{Z2}$	√	1	1	√	mmm	$\mathrm{B1_u}$
N56.12.16 $\mathrm{GM3}^+ \oplus \mathrm{S1}$	√	1	1	×	-	-
N56.12.17 $\mathrm{GM3}^+ \oplus \mathrm{X1}$	√	1	1	√	222	B3

Non-coplanar SSGs with parent space group $Pccn$ (No. 56) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N56.12.18 GM3$^+$ ⊕ Y1	√	1	1	√	$mm2$	B2
N56.12.19 GM3$^+$ ⊕ X2	√	1	1	√	222	B3
N56.12.20 GM3$^+$ ⊕ Y2	√	1	1	√	$mm2$	B2
N56.12.21 GM3$^+$ ⊕ Z1	√	1	1	√	$mm2$	B2
N56.12.22 GM3$^+$ ⊕ Z2	√	1	1	√	$mm2$	B2
N56.12.23 GM3$^-$ ⊕ S1	√	1	1	×	-	-
N56.12.24 GM3$^-$ ⊕ X1	√	1	1	√	mmm	$\mathrm{B3_u}$
N56.12.25 GM3$^-$ ⊕ Y1	√	1	1	√	mmm	$\mathrm{B2_u}$
N56.12.26 GM3$^-$ ⊕ X2	√	1	1	√	mmm	$\mathrm{B3_u}$
N56.12.27 GM3$^-$ ⊕ Y2	√	1	1	√	mmm	$\mathrm{B2_u}$
N56.12.28 GM3$^-$ ⊕ Z1	√	1	1	√	mmm	$\mathrm{B1_u}$
N56.12.29 GM3$^-$ ⊕ Z2	√	1	1	√	mmm	$\mathrm{B1_u}$
N56.14.1 GM1$^-$ ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N56.14.2 GM1$^-$ ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
N56.14.3 GM1$^-$ ⊕ LD1	√	1	1	√	mmm	$\mathrm{B1_u}$
N56.14.4 GM1$^-$ ⊕ LD3	√	1	1	√	mmm	$\mathrm{B1_u}$
N56.14.5 GM2$^+$ ⊕ DT1	√	1	1	√	$mm2$	B2
N56.14.6 GM2$^+$ ⊕ DT2	√	1	1	√	$mm2$	B2
N56.14.7 GM2$^+$ ⊕ LD1	√	1	1	√	222	B1
N56.14.8 GM2$^+$ ⊕ LD3	√	1	1	√	222	B1
N56.14.9 GM2$^-$ ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N56.14.10 GM2$^-$ ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
N56.14.11 GM2$^-$ ⊕ LD1	√	1	1	√	mmm	$\mathrm{B1_u}$
N56.14.12 GM2$^-$ ⊕ LD3	√	1	1	√	mmm	$\mathrm{B1_u}$
N56.14.13 GM3$^+$ ⊕ SM1	√	1	1	√	222	B3
N56.14.14 GM3$^+$ ⊕ DT1	√	1	1	√	$mm2$	B2
N56.14.15 GM3$^+$ ⊕ SM2	√	1	1	√	222	B3
N56.14.16 GM3$^+$ ⊕ DT2	√	1	1	√	$mm2$	B2
N56.14.17 GM3$^+$ ⊕ LD1	√	1	1	√	$mm2$	B2
N56.14.18 GM3$^+$ ⊕ LD3	√	1	1	√	$mm2$	B2
N56.14.19 GM3$^-$ ⊕ SM1	√	1	1	√	mmm	$\mathrm{B3_u}$
N56.14.20 GM3$^-$ ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N56.14.21 GM3$^-$ ⊕ SM2	√	1	1	√	mmm	$\mathrm{B3_u}$
N56.14.22 GM3$^-$ ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
N56.14.23 GM3$^-$ ⊕ LD1	√	1	1	√	mmm	$\mathrm{B1_u}$
N56.14.24 GM3$^-$ ⊕ LD3	√	1	1	√	mmm	$\mathrm{B1_u}$

TABLE S169: Collinear SSGs with parent space group $Pbcm$ (No. 57).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L57.1.1 GM1$^+$	1	mmm	$\mathrm{A_g}$
L57.2.1 GM1$^-$	0	-	-
L57.2.2 GM2$^+$	1	mmm	$\mathrm{B1_g}$
L57.2.3 GM2$^-$	0	-	-
L57.2.4 GM3$^+$	1	mmm	$\mathrm{B3_g}$
L57.2.5 GM3$^-$	0	-	-

Collinear SSGs with parent space group $Pbcm$ (No. 57)(continued)

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L57.2.6 $\mathrm{GM4}^{+}$	1	mmm	$\mathrm{B2_g}$
L57.2.7 $\mathrm{GM4}^{-}$	0	-	-
L57.2.8 $\mathrm{X1}^{+}$	0	-	-
L57.2.9 $\mathrm{X1}^{-}$	0	-	-
L57.2.10 $\mathrm{X2}^{+}$	0	-	-
L57.2.11 $\mathrm{X2}^{-}$	0	-	-

TABLE S170: Coplanar SSGs with parent space group $Pbcm$ (No. 57).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P57.1.1 $\mathrm{GM1}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_g}$
P57.2.1 $\mathrm{GM1}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_u}$
P57.2.2 $\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B1_g}$
P57.2.3 $\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B1_u}$
P57.2.4 $\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}$
P57.2.5 $\mathrm{GM3}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}$
P57.2.6 $\mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B2_g}$
P57.2.7 $\mathrm{GM4}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B2_u}$
P57.2.8 $\mathrm{X1}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P57.2.9 $\mathrm{X1}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P57.2.10 $\mathrm{X2}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P57.2.11 $\mathrm{X2}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P57.3.1 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}$	$\surd$	0	0	$\surd$	-	-
P57.3.2 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_u}$
P57.3.3 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
P57.3.4 $\mathrm{GM1}^{-}\oplus\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_u}$
P57.3.5 $\mathrm{GM1}^{-}\oplus\mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
P57.3.6 $\mathrm{GM1}^{-}\oplus\mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_g}\oplus\mathrm{B2_u}$
P57.3.7 $\mathrm{GM1}^{-}\oplus\mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
P57.3.8 $\mathrm{GM1}^{-}\oplus\mathrm{X1}^{+}$	$\surd$	1	1	$\times$	-	-
P57.3.9 $\mathrm{GM1}^{-}\oplus\mathrm{X1}^{-}$	$\surd$	1	1	$\times$	-	-
P57.3.10 $\mathrm{GM1}^{-}\oplus\mathrm{X2}^{+}$	$\surd$	1	1	$\times$	-	-
P57.3.11 $\mathrm{GM1}^{-}\oplus\mathrm{X2}^{-}$	$\surd$	1	1	$\times$	-	-
P57.3.12 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_g}$
P57.3.13 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B1_g}$
P57.3.14 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B3_g}$
P57.3.15 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B2_u}$
P57.3.16 $\mathrm{GM2}^{+}\oplus\mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B2_g}$
P57.3.17 $\mathrm{GM2}^{+}\oplus\mathrm{GM4}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B3_u}$
P57.3.18 $\mathrm{GM2}^{+}\oplus\mathrm{X1}^{+}$	$\surd$	1	0	$\times$	-	-
P57.3.19 $\mathrm{GM2}^{+}\oplus\mathrm{X1}^{-}$	$\surd$	1	0	$\times$	-	-
P57.3.20 $\mathrm{GM2}^{+}\oplus\mathrm{X2}^{+}$	$\surd$	1	0	$\times$	-	-
P57.3.21 $\mathrm{GM2}^{+}\oplus\mathrm{X2}^{-}$	$\surd$	1	0	$\times$	-	-
P57.3.22 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
P57.3.23 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B2_u}$
P57.3.24 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-

Coplanar SSGs with parent space group $Pbcm$ (No. 57) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P57.3.25 $\mathrm{GM2}^{-} \oplus \mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_g}$
P57.3.26 $\mathrm{GM2}^{-} \oplus \mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
P57.3.27 $\mathrm{GM2}^{-} \oplus \mathrm{X1}^{+}$	$\surd$	1	1	$\times$	-	-
P57.3.28 $\mathrm{GM2}^{-} \oplus \mathrm{X1}^{-}$	$\surd$	1	1	$\times$	-	-
P57.3.29 $\mathrm{GM2}^{-} \oplus \mathrm{X2}^{+}$	$\surd$	1	1	$\times$	-	-
P57.3.30 $\mathrm{GM2}^{-} \oplus \mathrm{X2}^{-}$	$\surd$	1	1	$\times$	-	-
P57.3.31 $\mathrm{GM3}^{+} \oplus \mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
P57.3.32 $\mathrm{GM3}^{+} \oplus \mathrm{GM3}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
P57.3.33 $\mathrm{GM3}^{+} \oplus \mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g}$
P57.3.34 $\mathrm{GM3}^{+} \oplus \mathrm{GM4}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
P57.3.35 $\mathrm{GM3}^{+} \oplus \mathrm{X1}^{+}$	$\surd$	1	0	$\times$	-	-
P57.3.36 $\mathrm{GM3}^{+} \oplus \mathrm{X1}^{-}$	$\surd$	1	0	$\times$	-	-
P57.3.37 $\mathrm{GM3}^{+} \oplus \mathrm{X2}^{+}$	$\surd$	1	0	$\times$	-	-
P57.3.38 $\mathrm{GM3}^{+} \oplus \mathrm{X2}^{-}$	$\surd$	1	0	$\times$	-	-
P57.3.39 $\mathrm{GM3}^{-} \oplus \mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
P57.3.40 $\mathrm{GM3}^{-} \oplus \mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g}$
P57.3.41 $\mathrm{GM3}^{-} \oplus \mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
P57.3.42 $\mathrm{GM3}^{-} \oplus \mathrm{X1}^{+}$	$\surd$	1	1	$\times$	-	-
P57.3.43 $\mathrm{GM3}^{-} \oplus \mathrm{X1}^{-}$	$\surd$	1	1	$\times$	-	-
P57.3.44 $\mathrm{GM3}^{-} \oplus \mathrm{X2}^{+}$	$\surd$	1	1	$\times$	-	-
P57.3.45 $\mathrm{GM3}^{-} \oplus \mathrm{X2}^{-}$	$\surd$	1	1	$\times$	-	-
P57.3.46 $\mathrm{GM4}^{+} \oplus \mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_g} \oplus \mathrm{B2_g}$
P57.3.47 $\mathrm{GM4}^{+} \oplus \mathrm{GM4}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B2_g}$
P57.3.48 $\mathrm{GM4}^{+} \oplus \mathrm{X1}^{+}$	$\surd$	1	0	$\times$	-	-
P57.3.49 $\mathrm{GM4}^{+} \oplus \mathrm{X1}^{-}$	$\surd$	1	0	$\times$	-	-
P57.3.50 $\mathrm{GM4}^{+} \oplus \mathrm{X2}^{+}$	$\surd$	1	0	$\times$	-	-
P57.3.51 $\mathrm{GM4}^{+} \oplus \mathrm{X2}^{-}$	$\surd$	1	0	$\times$	-	-
P57.3.52 $\mathrm{GM4}^{-} \oplus \mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
P57.3.53 $\mathrm{GM4}^{-} \oplus \mathrm{X1}^{+}$	$\surd$	1	1	$\times$	-	-
P57.3.54 $\mathrm{GM4}^{-} \oplus \mathrm{X1}^{-}$	$\surd$	1	1	$\times$	-	-
P57.3.55 $\mathrm{GM4}^{-} \oplus \mathrm{X2}^{+}$	$\surd$	1	1	$\times$	-	-
P57.3.56 $\mathrm{GM4}^{-} \oplus \mathrm{X2}^{-}$	$\surd$	1	1	$\times$	-	-
P57.3.57 $\mathrm{X1}^{+} \oplus \mathrm{X1}^{+}$	$\surd$	1	0	$\times$	-	-
P57.3.58 $\mathrm{X1}^{+} \oplus \mathrm{X3}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P57.3.59 $\mathrm{X1}^{+} \oplus \mathrm{X1}^{-}$	$\surd$	1	1	$\times$	-	-
P57.3.60 $\mathrm{X1}^{+} \oplus \mathrm{X3}^{+}$	$\surd$	1	0	$\times$	-	-
P57.3.61 $\mathrm{X1}^{+} \oplus \mathrm{X2}^{+}$	$\surd$	1	0	$\times$	-	-
P57.3.62 $\mathrm{X1}^{+} \oplus \mathrm{X4}^{-}$	$\surd$	1	1	$\times$	-	-
P57.3.63 $\mathrm{X1}^{+} \oplus \mathrm{X2}^{-}$	$\surd$	1	1	$\times$	-	-
P57.3.64 $\mathrm{X1}^{+} \oplus \mathrm{X4}^{+}$	$\surd$	1	0	$\times$	-	-
P57.3.65 $\mathrm{X1}^{-} \oplus \mathrm{X1}^{-}$	$\surd$	1	0	$\times$	-	-
P57.3.66 $\mathrm{X1}^{-} \oplus \mathrm{X3}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P57.3.67 $\mathrm{X1}^{-} \oplus \mathrm{X2}^{+}$	$\surd$	1	1	$\times$	-	-
P57.3.68 $\mathrm{X1}^{-} \oplus \mathrm{X4}^{-}$	$\surd$	1	0	$\times$	-	-
P57.3.69 $\mathrm{X1}^{-} \oplus \mathrm{X2}^{-}$	$\surd$	1	0	$\times$	-	-
P57.3.70 $\mathrm{X1}^{-} \oplus \mathrm{X4}^{+}$	$\surd$	1	1	$\times$	-	-

Coplanar SSGs with parent space group $Pbcm$ (No. 57) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P57.3.71 $\mathrm{X2}^+ \oplus \mathrm{X2}^+$	$\surd$	1	0	$\times$	-	-
P57.3.72 $\mathrm{X2}^+ \oplus \mathrm{X4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P57.3.73 $\mathrm{X2}^+ \oplus \mathrm{X2}^-$	$\surd$	1	1	$\times$	-	-
P57.3.74 $\mathrm{X2}^+ \oplus \mathrm{X4}^+$	$\surd$	1	0	$\times$	-	-
P57.3.75 $\mathrm{X2}^- \oplus \mathrm{X2}^-$	$\surd$	1	0	$\times$	-	-
P57.3.76 $\mathrm{X2}^- \oplus \mathrm{X4}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P57.6.1 S1	$\surd$	1	1	$\times$	-	-
P57.6.2 S2	$\surd$	1	1	$\times$	-	-
P57.6.3 U1	$\surd$	1	1	$\times$	-	-
P57.6.4 Y1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P57.6.5 Y2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P57.6.6 Z1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P57.6.7 Z2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P57.8.1 SM1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P57.8.2 SM2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P57.8.3 SM3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P57.8.4 SM4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P57.8.5 DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P57.8.6 DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P57.8.7 D1	$\surd$	1	1	$\times$	-	-
P57.8.8 D2	$\surd$	1	1	$\times$	-	-
P57.8.9 LD1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P57.8.10 LD2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P57.8.11 G1	$\surd$	1	1	$\times$	-	-

TABLE S171: Non-coplanar SSGs with parent space group $Pbcm$ (No. 57).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N57.1.1 $\mathrm{GM1}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{A_g}$
N57.2.1 $\mathrm{GM1}^-$	$\surd$	2	2	$\surd$	222	$\mathrm{A1} \oplus \mathrm{A1}$
N57.2.2 $\mathrm{GM2}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B1_g}$
N57.2.3 $\mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{A1}$
N57.2.4 $\mathrm{GM3}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B3_g}$
N57.2.5 $\mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{A1}$
N57.2.6 $\mathrm{GM4}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B2_g}$
N57.2.7 $\mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{A1}$
N57.2.8 $\mathrm{X1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
N57.2.9 $\mathrm{X1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
N57.2.10 $\mathrm{X2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
N57.2.11 $\mathrm{X2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
N57.3.1 $\mathrm{GM1}^- \oplus \mathrm{GM1}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{A_u}$
N57.3.2 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{A2}$
N57.3.3 $\mathrm{GM1}^- \oplus \mathrm{GM2}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N57.3.4 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{A2}$
N57.3.5 $\mathrm{GM1}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B3_u}$
N57.3.6 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{A2}$

Non-coplanar SSGs with parent space group $Pbcm$ (No. 57) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N57.3.7 $\mathrm{GM1}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B2_u}$
N57.3.8 $\mathrm{GM1}^- \oplus \mathrm{X1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
N57.3.9 $\mathrm{GM1}^- \oplus \mathrm{X1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
N57.3.10 $\mathrm{GM1}^- \oplus \mathrm{X2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
N57.3.11 $\mathrm{GM1}^- \oplus \mathrm{X2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
N57.3.12 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N57.3.13 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	2	2	$\surd$	222	$\mathrm{A1} \oplus \mathrm{B1}$
N57.3.14 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g} \oplus \mathrm{B3_g}$
N57.3.15 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{B1}$
N57.3.16 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g} \oplus \mathrm{B2_g}$
N57.3.17 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{B2}$
N57.3.18 $\mathrm{GM2}^+ \oplus \mathrm{X1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
N57.3.19 $\mathrm{GM2}^+ \oplus \mathrm{X1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
N57.3.20 $\mathrm{GM2}^+ \oplus \mathrm{X2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
N57.3.21 $\mathrm{GM2}^+ \oplus \mathrm{X2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
N57.3.22 $\mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N57.3.23 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{B2}$
N57.3.24 $\mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u} \oplus \mathrm{B3_u}$
N57.3.25 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{B1}$
N57.3.26 $\mathrm{GM2}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_u}$
N57.3.27 $\mathrm{GM2}^- \oplus \mathrm{X1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
N57.3.28 $\mathrm{GM2}^- \oplus \mathrm{X1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
N57.3.29 $\mathrm{GM2}^- \oplus \mathrm{X2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
N57.3.30 $\mathrm{GM2}^- \oplus \mathrm{X2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
N57.3.31 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N57.3.32 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	222	$\mathrm{A1} \oplus \mathrm{B3}$
N57.3.33 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N57.3.34 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{B2}$
N57.3.35 $\mathrm{GM3}^+ \oplus \mathrm{X1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g}$
N57.3.36 $\mathrm{GM3}^+ \oplus \mathrm{X1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g}$
N57.3.37 $\mathrm{GM3}^+ \oplus \mathrm{X2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g}$
N57.3.38 $\mathrm{GM3}^+ \oplus \mathrm{X2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g}$
N57.3.39 $\mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N57.3.40 $\mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{B1}$
N57.3.41 $\mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N57.3.42 $\mathrm{GM3}^- \oplus \mathrm{X1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u}$
N57.3.43 $\mathrm{GM3}^- \oplus \mathrm{X1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u}$
N57.3.44 $\mathrm{GM3}^- \oplus \mathrm{X2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u}$
N57.3.45 $\mathrm{GM3}^- \oplus \mathrm{X2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u}$
N57.3.46 $\mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N57.3.47 $\mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	222	$\mathrm{A1} \oplus \mathrm{B2}$
N57.3.48 $\mathrm{GM4}^+ \oplus \mathrm{X1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B2_g}$
N57.3.49 $\mathrm{GM4}^+ \oplus \mathrm{X1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B2_g}$
N57.3.50 $\mathrm{GM4}^+ \oplus \mathrm{X2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B2_g}$
N57.3.51 $\mathrm{GM4}^+ \oplus \mathrm{X2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B2_g}$
N57.3.52 $\mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$

Non-coplanar SSGs with parent space group $Pbcm$ (No. 57) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N57.3.53 $\mathrm{GM4^-} \oplus \mathrm{X1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B2_u}$
N57.3.54 $\mathrm{GM4^-} \oplus \mathrm{X1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B2_u}$
N57.3.55 $\mathrm{GM4^-} \oplus \mathrm{X2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B2_u}$
N57.3.56 $\mathrm{GM4^-} \oplus \mathrm{X2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B2_u}$
N57.3.57 $\mathrm{X1^+} \oplus \mathrm{X1^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N57.3.58 $\mathrm{X1^+} \oplus \mathrm{X3^-}$	$\surd$	1	1	$\surd$	$mm2$	A1
N57.3.59 $\mathrm{X1^+} \oplus \mathrm{X1^-}$	$\surd$	1	1	$\surd$	222	A1
N57.3.60 $\mathrm{X1^+} \oplus \mathrm{X3^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N57.3.61 $\mathrm{X1^+} \oplus \mathrm{X2^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N57.3.62 $\mathrm{X1^+} \oplus \mathrm{X4^-}$	$\surd$	1	1	$\surd$	$mm2$	A1
N57.3.63 $\mathrm{X1^+} \oplus \mathrm{X2^-}$	$\surd$	1	1	$\surd$	$mm2$	A1
N57.3.64 $\mathrm{X1^+} \oplus \mathrm{X4^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N57.3.65 $\mathrm{X1^-} \oplus \mathrm{X1^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N57.3.66 $\mathrm{X1^-} \oplus \mathrm{X3^+}$	$\surd$	1	1	$\surd$	$mm2$	A1
N57.3.67 $\mathrm{X1^-} \oplus \mathrm{X2^+}$	$\surd$	1	1	$\surd$	$mm2$	A1
N57.3.68 $\mathrm{X1^-} \oplus \mathrm{X4^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N57.3.69 $\mathrm{X1^-} \oplus \mathrm{X2^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N57.3.70 $\mathrm{X1^-} \oplus \mathrm{X4^+}$	$\surd$	1	1	$\surd$	$mm2$	A1
N57.3.71 $\mathrm{X2^+} \oplus \mathrm{X2^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N57.3.72 $\mathrm{X2^+} \oplus \mathrm{X4^-}$	$\surd$	1	1	$\surd$	$mm2$	A1
N57.3.73 $\mathrm{X2^+} \oplus \mathrm{X2^-}$	$\surd$	1	1	$\surd$	222	A1
N57.3.74 $\mathrm{X2^+} \oplus \mathrm{X4^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N57.3.75 $\mathrm{X2^-} \oplus \mathrm{X2^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N57.3.76 $\mathrm{X2^-} \oplus \mathrm{X4^+}$	$\surd$	1	1	$\surd$	$mm2$	A1
N57.6.1 S1	$\surd$	1	1	$\surd$	$mm2$	A1
N57.6.2 S2	$\surd$	1	1	$\surd$	$mm2$	A1
N57.6.3 U1	$\surd$	1	1	$\surd$	$mm2$	A1
N57.6.4 Y1	$\surd$	1	1	$\surd$	$mm2$	A1
N57.6.5 Y2	$\surd$	1	1	$\surd$	$mm2$	A1
N57.6.6 Z1	$\surd$	1	1	$\surd$	$mm2$	A1
N57.6.7 Z2	$\surd$	1	1	$\surd$	$mm2$	A1
N57.8.1 SM1	$\surd$	1	1	$\surd$	$mm2$	A1
N57.8.2 SM2	$\surd$	1	1	$\surd$	$mm2$	A1
N57.8.3 SM3	$\surd$	1	1	$\surd$	$mm2$	A1
N57.8.4 SM4	$\surd$	1	1	$\surd$	$mm2$	A1
N57.8.5 DT1	$\surd$	1	1	$\surd$	$mm2$	A1
N57.8.6 DT2	$\surd$	1	1	$\surd$	$mm2$	A1
N57.8.7 D1	$\surd$	1	1	$\surd$	$mm2$	A1
N57.8.8 D2	$\surd$	1	1	$\surd$	$mm2$	A1
N57.8.9 LD1	$\surd$	1	1	$\surd$	$mm2$	A1
N57.8.10 LD2	$\surd$	1	1	$\surd$	$mm2$	A1
N57.8.11 G1	$\surd$	1	1	$\surd$	$mm2$	A1
N57.9.1 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM1^-}$	$\surd$	0	0	$\surd$	-	-
N57.9.2 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM2^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N57.9.3 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM2^-}$	$\surd$	0	0	$\surd$	-	-
N57.9.4 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM3^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$

Non-coplanar SSGs with parent space group $Pbcm$ (No. 57) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N57.9.5 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N57.9.6 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B2_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N57.9.7 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N57.9.8 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{X1}^+$	$\surd$	0	0	$\surd$	-	-
N57.9.9 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{X1}^-$	$\surd$	0	0	$\surd$	-	-
N57.9.10 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{X2}^+$	$\surd$	0	0	$\surd$	-	-
N57.9.11 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{X2}^-$	$\surd$	0	0	$\surd$	-	-
N57.9.12 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	2	2	$\surd$	222	$\mathrm{B1} \oplus \mathrm{B1}$
N57.9.13 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N57.9.14 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2} \oplus \mathrm{B1}$
N57.9.15 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_u}$
N57.9.16 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2} \oplus \mathrm{B1}$
N57.9.17 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B3_u}$
N57.9.18 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{X1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N57.9.19 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{X1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N57.9.20 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{X2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N57.9.21 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{X2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N57.9.22 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
N57.9.23 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N57.9.24 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N57.9.25 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N57.9.26 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N57.9.27 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{X1}^+$	$\surd$	0	0	$\surd$	-	-
N57.9.28 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{X1}^-$	$\surd$	0	0	$\surd$	-	-
N57.9.29 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{X2}^+$	$\surd$	0	0	$\surd$	-	-
N57.9.30 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{X2}^-$	$\surd$	0	0	$\surd$	-	-
N57.9.31 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	222	$\mathrm{B3} \oplus \mathrm{B3}$
N57.9.32 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N57.9.33 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2} \oplus \mathrm{B1}$
N57.9.34 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N57.9.35 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{X1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u}$
N57.9.36 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{X1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u}$
N57.9.37 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{X2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u}$
N57.9.38 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{X2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u}$
N57.9.39 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N57.9.40 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N57.9.41 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N57.9.42 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{X1}^+$	$\surd$	0	0	$\surd$	-	-
N57.9.43 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{X1}^-$	$\surd$	0	0	$\surd$	-	-
N57.9.44 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{X2}^+$	$\surd$	0	0	$\surd$	-	-
N57.9.45 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{X2}^-$	$\surd$	0	0	$\surd$	-	-
N57.9.46 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	222	$\mathrm{B2} \oplus \mathrm{B2}$
N57.9.47 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N57.9.48 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{X1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_g} \oplus \mathrm{B2_u}$
N57.9.49 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{X1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_g} \oplus \mathrm{B2_u}$
N57.9.50 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{X2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_g} \oplus \mathrm{B2_u}$

Non-coplanar SSGs with parent space group $Pbcm$ (No. 57) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N57.9.51 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{X2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_g} \oplus \mathrm{B2_u}$
N57.9.52 $\mathrm{GM1}^- \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N57.9.53 $\mathrm{GM1}^- \oplus \mathrm{GM4}^- \oplus \mathrm{X1}^+$	$\surd$	0	0	$\surd$	-	-
N57.9.54 $\mathrm{GM1}^- \oplus \mathrm{GM4}^- \oplus \mathrm{X1}^-$	$\surd$	0	0	$\surd$	-	-
N57.9.55 $\mathrm{GM1}^- \oplus \mathrm{GM4}^- \oplus \mathrm{X2}^+$	$\surd$	0	0	$\surd$	-	-
N57.9.56 $\mathrm{GM1}^- \oplus \mathrm{GM4}^- \oplus \mathrm{X2}^-$	$\surd$	0	0	$\surd$	-	-
N57.9.57 $\mathrm{GM1}^- \oplus \mathrm{X1}^+ \oplus \mathrm{X1}^+$	$\surd$	1	0	$\times$	-	-
N57.9.58 $\mathrm{GM1}^- \oplus \mathrm{X1}^+ \oplus \mathrm{X3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N57.9.59 $\mathrm{GM1}^- \oplus \mathrm{X1}^+ \oplus \mathrm{X1}^-$	$\surd$	1	1	$\times$	-	-
N57.9.60 $\mathrm{GM1}^- \oplus \mathrm{X1}^+ \oplus \mathrm{X3}^+$	$\surd$	1	0	$\times$	-	-
N57.9.61 $\mathrm{GM1}^- \oplus \mathrm{X1}^+ \oplus \mathrm{X2}^+$	$\surd$	1	0	$\times$	-	-
N57.9.62 $\mathrm{GM1}^- \oplus \mathrm{X1}^+ \oplus \mathrm{X4}^-$	$\surd$	1	1	$\times$	-	-
N57.9.63 $\mathrm{GM1}^- \oplus \mathrm{X1}^+ \oplus \mathrm{X2}^-$	$\surd$	1	1	$\times$	-	-
N57.9.64 $\mathrm{GM1}^- \oplus \mathrm{X1}^+ \oplus \mathrm{X4}^+$	$\surd$	1	0	$\times$	-	-
N57.9.65 $\mathrm{GM1}^- \oplus \mathrm{X1}^- \oplus \mathrm{X1}^-$	$\surd$	1	0	$\times$	-	-
N57.9.66 $\mathrm{GM1}^- \oplus \mathrm{X1}^- \oplus \mathrm{X3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N57.9.67 $\mathrm{GM1}^- \oplus \mathrm{X1}^- \oplus \mathrm{X2}^+$	$\surd$	1	1	$\times$	-	-
N57.9.68 $\mathrm{GM1}^- \oplus \mathrm{X1}^- \oplus \mathrm{X4}^-$	$\surd$	1	0	$\times$	-	-
N57.9.69 $\mathrm{GM1}^- \oplus \mathrm{X1}^- \oplus \mathrm{X2}^-$	$\surd$	1	0	$\times$	-	-
N57.9.70 $\mathrm{GM1}^- \oplus \mathrm{X1}^- \oplus \mathrm{X4}^+$	$\surd$	1	1	$\times$	-	-
N57.9.71 $\mathrm{GM1}^- \oplus \mathrm{X2}^+ \oplus \mathrm{X2}^+$	$\surd$	1	0	$\times$	-	-
N57.9.72 $\mathrm{GM1}^- \oplus \mathrm{X2}^+ \oplus \mathrm{X4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N57.9.73 $\mathrm{GM1}^- \oplus \mathrm{X2}^+ \oplus \mathrm{X2}^-$	$\surd$	1	1	$\times$	-	-
N57.9.74 $\mathrm{GM1}^- \oplus \mathrm{X2}^+ \oplus \mathrm{X4}^+$	$\surd$	1	0	$\times$	-	-
N57.9.75 $\mathrm{GM1}^- \oplus \mathrm{X2}^- \oplus \mathrm{X2}^-$	$\surd$	1	0	$\times$	-	-
N57.9.76 $\mathrm{GM1}^- \oplus \mathrm{X2}^- \oplus \mathrm{X4}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N57.9.77 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N57.9.78 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{A2}$
N57.9.79 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B3_g}$
N57.9.80 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2} \oplus \mathrm{B2}$
N57.9.81 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B2_g}$
N57.9.82 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B1} \oplus \mathrm{B1}$
N57.9.83 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{X1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N57.9.84 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{X1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N57.9.85 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{X2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N57.9.86 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{X2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N57.9.87 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$
N57.9.88 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{B2}$
N57.9.89 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g} \oplus \mathrm{B2_u}$
N57.9.90 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{B1}$
N57.9.91 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g} \oplus \mathrm{B3_u}$
N57.9.92 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{X1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
N57.9.93 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{X1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
N57.9.94 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{X2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
N57.9.95 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{X2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
N57.9.96 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$

Non-coplanar SSGs with parent space group $Pbcm$ (No. 57) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N57.9.97 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{B2}$
N57.9.98 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N57.9.99 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	222	$\mathrm{B1} \oplus \mathrm{B3}$
N57.9.100 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{X1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N57.9.101 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{X1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N57.9.102 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{X2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N57.9.103 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{X2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N57.9.104 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N57.9.105 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	222	$\mathrm{B1} \oplus \mathrm{B2}$
N57.9.106 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N57.9.107 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{X1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N57.9.108 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{X1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N57.9.109 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{X2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N57.9.110 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{X2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N57.9.111 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N57.9.112 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{B1}$
N57.9.113 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{X1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
N57.9.114 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{X1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
N57.9.115 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{X2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
N57.9.116 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{X2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
N57.9.117 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N57.9.118 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{X1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_u}$
N57.9.119 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{X1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_u}$
N57.9.120 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{X2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_u}$
N57.9.121 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{X2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_u}$
N57.9.122 $\mathrm{GM2}^+ \oplus \mathrm{X1}^+ \oplus \mathrm{X1}^+$	$\surd$	1	1	$\times$	-	-
N57.9.123 $\mathrm{GM2}^+ \oplus \mathrm{X1}^+ \oplus \mathrm{X3}^-$	$\surd$	1	1	$\surd$	$mm2$	B1
N57.9.124 $\mathrm{GM2}^+ \oplus \mathrm{X1}^+ \oplus \mathrm{X1}^-$	$\surd$	1	1	$\times$	-	-
N57.9.125 $\mathrm{GM2}^+ \oplus \mathrm{X1}^+ \oplus \mathrm{X3}^+$	$\surd$	1	1	$\times$	-	-
N57.9.126 $\mathrm{GM2}^+ \oplus \mathrm{X1}^+ \oplus \mathrm{X2}^+$	$\surd$	1	1	$\times$	-	-
N57.9.127 $\mathrm{GM2}^+ \oplus \mathrm{X1}^+ \oplus \mathrm{X4}^-$	$\surd$	1	1	$\times$	-	-
N57.9.128 $\mathrm{GM2}^+ \oplus \mathrm{X1}^+ \oplus \mathrm{X2}^-$	$\surd$	1	1	$\times$	-	-
N57.9.129 $\mathrm{GM2}^+ \oplus \mathrm{X1}^+ \oplus \mathrm{X4}^+$	$\surd$	1	1	$\times$	-	-
N57.9.130 $\mathrm{GM2}^+ \oplus \mathrm{X1}^- \oplus \mathrm{X1}^-$	$\surd$	1	1	$\times$	-	-
N57.9.131 $\mathrm{GM2}^+ \oplus \mathrm{X1}^- \oplus \mathrm{X3}^+$	$\surd$	1	1	$\surd$	$mm2$	B1
N57.9.132 $\mathrm{GM2}^+ \oplus \mathrm{X1}^- \oplus \mathrm{X2}^+$	$\surd$	1	1	$\times$	-	-
N57.9.133 $\mathrm{GM2}^+ \oplus \mathrm{X1}^- \oplus \mathrm{X4}^-$	$\surd$	1	1	$\times$	-	-
N57.9.134 $\mathrm{GM2}^+ \oplus \mathrm{X1}^- \oplus \mathrm{X2}^-$	$\surd$	1	1	$\times$	-	-
N57.9.135 $\mathrm{GM2}^+ \oplus \mathrm{X1}^- \oplus \mathrm{X4}^+$	$\surd$	1	1	$\times$	-	-
N57.9.136 $\mathrm{GM2}^+ \oplus \mathrm{X2}^+ \oplus \mathrm{X2}^+$	$\surd$	1	1	$\times$	-	-
N57.9.137 $\mathrm{GM2}^+ \oplus \mathrm{X2}^+ \oplus \mathrm{X4}^-$	$\surd$	1	1	$\surd$	$mm2$	B1
N57.9.138 $\mathrm{GM2}^+ \oplus \mathrm{X2}^+ \oplus \mathrm{X2}^-$	$\surd$	1	1	$\times$	-	-
N57.9.139 $\mathrm{GM2}^+ \oplus \mathrm{X2}^+ \oplus \mathrm{X4}^+$	$\surd$	1	1	$\times$	-	-
N57.9.140 $\mathrm{GM2}^+ \oplus \mathrm{X2}^- \oplus \mathrm{X2}^-$	$\surd$	1	1	$\times$	-	-
N57.9.141 $\mathrm{GM2}^+ \oplus \mathrm{X2}^- \oplus \mathrm{X4}^+$	$\surd$	1	1	$\surd$	$mm2$	B1
N57.9.142 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-

Non-coplanar SSGs with parent space group $Pbcm$ (No. 57) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N57.9.143 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N57.9.144 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N57.9.145 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_g}$
N57.9.146 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N57.9.147 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{X1}^+$	$\surd$	0	0	$\surd$	-	-
N57.9.148 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{X1}^-$	$\surd$	0	0	$\surd$	-	-
N57.9.149 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{X2}^+$	$\surd$	0	0	$\surd$	-	-
N57.9.150 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{X2}^-$	$\surd$	0	0	$\surd$	-	-
N57.9.151 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2} \oplus \mathrm{B2}$
N57.9.152 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N57.9.153 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	222	$\mathrm{B3} \oplus \mathrm{B2}$
N57.9.154 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N57.9.155 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{X1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N57.9.156 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{X1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N57.9.157 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{X2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N57.9.158 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{X2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N57.9.159 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N57.9.160 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_g}$
N57.9.161 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N57.9.162 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{X1}^+$	$\surd$	0	0	$\surd$	-	-
N57.9.163 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{X1}^-$	$\surd$	0	0	$\surd$	-	-
N57.9.164 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{X2}^+$	$\surd$	0	0	$\surd$	-	-
N57.9.165 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{X2}^-$	$\surd$	0	0	$\surd$	-	-
N57.9.166 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B1} \oplus \mathrm{B1}$
N57.9.167 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_g}$
N57.9.168 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{X1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_g}$
N57.9.169 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{X1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_g}$
N57.9.170 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{X2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_g}$
N57.9.171 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{X2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_g}$
N57.9.172 $\mathrm{GM2}^- \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N57.9.173 $\mathrm{GM2}^- \oplus \mathrm{GM4}^- \oplus \mathrm{X1}^+$	$\surd$	0	0	$\surd$	-	-
N57.9.174 $\mathrm{GM2}^- \oplus \mathrm{GM4}^- \oplus \mathrm{X1}^-$	$\surd$	0	0	$\surd$	-	-
N57.9.175 $\mathrm{GM2}^- \oplus \mathrm{GM4}^- \oplus \mathrm{X2}^+$	$\surd$	0	0	$\surd$	-	-
N57.9.176 $\mathrm{GM2}^- \oplus \mathrm{GM4}^- \oplus \mathrm{X2}^-$	$\surd$	0	0	$\surd$	-	-
N57.9.177 $\mathrm{GM2}^- \oplus \mathrm{X1}^+ \oplus \mathrm{X1}^+$	$\surd$	1	0	$\times$	-	-
N57.9.178 $\mathrm{GM2}^- \oplus \mathrm{X1}^+ \oplus \mathrm{X3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N57.9.179 $\mathrm{GM2}^- \oplus \mathrm{X1}^+ \oplus \mathrm{X1}^-$	$\surd$	1	1	$\times$	-	-
N57.9.180 $\mathrm{GM2}^- \oplus \mathrm{X1}^+ \oplus \mathrm{X3}^+$	$\surd$	1	0	$\times$	-	-
N57.9.181 $\mathrm{GM2}^- \oplus \mathrm{X1}^+ \oplus \mathrm{X2}^+$	$\surd$	1	0	$\times$	-	-
N57.9.182 $\mathrm{GM2}^- \oplus \mathrm{X1}^+ \oplus \mathrm{X4}^-$	$\surd$	1	1	$\times$	-	-
N57.9.183 $\mathrm{GM2}^- \oplus \mathrm{X1}^+ \oplus \mathrm{X2}^-$	$\surd$	1	1	$\times$	-	-
N57.9.184 $\mathrm{GM2}^- \oplus \mathrm{X1}^+ \oplus \mathrm{X4}^+$	$\surd$	1	0	$\times$	-	-
N57.9.185 $\mathrm{GM2}^- \oplus \mathrm{X1}^- \oplus \mathrm{X1}^-$	$\surd$	1	0	$\times$	-	-
N57.9.186 $\mathrm{GM2}^- \oplus \mathrm{X1}^- \oplus \mathrm{X3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N57.9.187 $\mathrm{GM2}^- \oplus \mathrm{X1}^- \oplus \mathrm{X2}^+$	$\surd$	1	1	$\times$	-	-
N57.9.188 $\mathrm{GM2}^- \oplus \mathrm{X1}^- \oplus \mathrm{X4}^-$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $Pbcm$ (No. 57) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N57.9.189 $\mathrm{GM2^-}\oplus\mathrm{X1^-}\oplus\mathrm{X2^-}$	$\surd$	1	0	$\times$	-	-
N57.9.190 $\mathrm{GM2^-}\oplus\mathrm{X1^-}\oplus\mathrm{X4^+}$	$\surd$	1	1	$\times$	-	-
N57.9.191 $\mathrm{GM2^-}\oplus\mathrm{X2^+}\oplus\mathrm{X2^+}$	$\surd$	1	0	$\times$	-	-
N57.9.192 $\mathrm{GM2^-}\oplus\mathrm{X2^+}\oplus\mathrm{X4^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N57.9.193 $\mathrm{GM2^-}\oplus\mathrm{X2^+}\oplus\mathrm{X2^-}$	$\surd$	1	1	$\times$	-	-
N57.9.194 $\mathrm{GM2^-}\oplus\mathrm{X2^+}\oplus\mathrm{X4^+}$	$\surd$	1	0	$\times$	-	-
N57.9.195 $\mathrm{GM2^-}\oplus\mathrm{X2^-}\oplus\mathrm{X2^-}$	$\surd$	1	0	$\times$	-	-
N57.9.196 $\mathrm{GM2^-}\oplus\mathrm{X2^-}\oplus\mathrm{X4^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N57.9.197 $\mathrm{GM3^+}\oplus\mathrm{GM3^+}\oplus\mathrm{GM3^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_g}\oplus\mathrm{B3_g}$
N57.9.198 $\mathrm{GM3^+}\oplus\mathrm{GM3^+}\oplus\mathrm{GM3^-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2}\oplus\mathrm{A2}$
N57.9.199 $\mathrm{GM3^+}\oplus\mathrm{GM3^+}\oplus\mathrm{GM4^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_g}\oplus\mathrm{B2_g}$
N57.9.200 $\mathrm{GM3^+}\oplus\mathrm{GM3^+}\oplus\mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2}\oplus\mathrm{B2}$
N57.9.201 $\mathrm{GM3^+}\oplus\mathrm{GM3^+}\oplus\mathrm{X1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_g}$
N57.9.202 $\mathrm{GM3^+}\oplus\mathrm{GM3^+}\oplus\mathrm{X1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_g}$
N57.9.203 $\mathrm{GM3^+}\oplus\mathrm{GM3^+}\oplus\mathrm{X2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_g}$
N57.9.204 $\mathrm{GM3^+}\oplus\mathrm{GM3^+}\oplus\mathrm{X2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_g}$
N57.9.205 $\mathrm{GM3^+}\oplus\mathrm{GM3^-}\oplus\mathrm{GM3^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{A_u}\oplus\mathrm{B3_g}$
N57.9.206 $\mathrm{GM3^+}\oplus\mathrm{GM3^-}\oplus\mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2}\oplus\mathrm{B2}$
N57.9.207 $\mathrm{GM3^+}\oplus\mathrm{GM3^-}\oplus\mathrm{GM4^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B1_u}\oplus\mathrm{B3_g}$
N57.9.208 $\mathrm{GM3^+}\oplus\mathrm{GM3^-}\oplus\mathrm{X1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B3_g}$
N57.9.209 $\mathrm{GM3^+}\oplus\mathrm{GM3^-}\oplus\mathrm{X1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B3_g}$
N57.9.210 $\mathrm{GM3^+}\oplus\mathrm{GM3^-}\oplus\mathrm{X2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B3_g}$
N57.9.211 $\mathrm{GM3^+}\oplus\mathrm{GM3^-}\oplus\mathrm{X2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B3_g}$
N57.9.212 $\mathrm{GM3^+}\oplus\mathrm{GM4^+}\oplus\mathrm{GM4^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B2_g}\oplus\mathrm{B2_g}$
N57.9.213 $\mathrm{GM3^+}\oplus\mathrm{GM4^+}\oplus\mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2}\oplus\mathrm{B1}$
N57.9.214 $\mathrm{GM3^+}\oplus\mathrm{GM4^+}\oplus\mathrm{X1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B2_g}$
N57.9.215 $\mathrm{GM3^+}\oplus\mathrm{GM4^+}\oplus\mathrm{X1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B2_g}$
N57.9.216 $\mathrm{GM3^+}\oplus\mathrm{GM4^+}\oplus\mathrm{X2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B2_g}$
N57.9.217 $\mathrm{GM3^+}\oplus\mathrm{GM4^+}\oplus\mathrm{X2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B2_g}$
N57.9.218 $\mathrm{GM3^+}\oplus\mathrm{GM4^-}\oplus\mathrm{GM4^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B1_u}\oplus\mathrm{B3_g}$
N57.9.219 $\mathrm{GM3^+}\oplus\mathrm{GM4^-}\oplus\mathrm{X1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B3_g}$
N57.9.220 $\mathrm{GM3^+}\oplus\mathrm{GM4^-}\oplus\mathrm{X1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B3_g}$
N57.9.221 $\mathrm{GM3^+}\oplus\mathrm{GM4^-}\oplus\mathrm{X2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B3_g}$
N57.9.222 $\mathrm{GM3^+}\oplus\mathrm{GM4^-}\oplus\mathrm{X2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B3_g}$
N57.9.223 $\mathrm{GM3^+}\oplus\mathrm{X1^+}\oplus\mathrm{X1^+}$	$\surd$	1	1	$\times$	-	-
N57.9.224 $\mathrm{GM3^+}\oplus\mathrm{X1^+}\oplus\mathrm{X3^-}$	$\surd$	1	1	$\surd$	222	B3
N57.9.225 $\mathrm{GM3^+}\oplus\mathrm{X1^+}\oplus\mathrm{X1^-}$	$\surd$	1	1	$\times$	-	-
N57.9.226 $\mathrm{GM3^+}\oplus\mathrm{X1^+}\oplus\mathrm{X3^+}$	$\surd$	1	1	$\times$	-	-
N57.9.227 $\mathrm{GM3^+}\oplus\mathrm{X1^+}\oplus\mathrm{X2^+}$	$\surd$	1	1	$\times$	-	-
N57.9.228 $\mathrm{GM3^+}\oplus\mathrm{X1^+}\oplus\mathrm{X4^-}$	$\surd$	1	1	$\times$	-	-
N57.9.229 $\mathrm{GM3^+}\oplus\mathrm{X1^+}\oplus\mathrm{X2^-}$	$\surd$	1	1	$\times$	-	-
N57.9.230 $\mathrm{GM3^+}\oplus\mathrm{X1^+}\oplus\mathrm{X4^+}$	$\surd$	1	1	$\times$	-	-
N57.9.231 $\mathrm{GM3^+}\oplus\mathrm{X1^-}\oplus\mathrm{X1^-}$	$\surd$	1	1	$\times$	-	-
N57.9.232 $\mathrm{GM3^+}\oplus\mathrm{X1^-}\oplus\mathrm{X3^+}$	$\surd$	1	1	$\surd$	222	B3
N57.9.233 $\mathrm{GM3^+}\oplus\mathrm{X1^-}\oplus\mathrm{X2^+}$	$\surd$	1	1	$\times$	-	-
N57.9.234 $\mathrm{GM3^+}\oplus\mathrm{X1^-}\oplus\mathrm{X4^-}$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $Pbcm$ (No. 57) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N57.9.235 $\mathrm{GM3}^+ \oplus \mathrm{X1}^- \oplus \mathrm{X2}^-$	$\surd$	1	1	$\times$	-	-
N57.9.236 $\mathrm{GM3}^+ \oplus \mathrm{X1}^- \oplus \mathrm{X4}^+$	$\surd$	1	1	$\times$	-	-
N57.9.237 $\mathrm{GM3}^+ \oplus \mathrm{X2}^+ \oplus \mathrm{X2}^+$	$\surd$	1	1	$\times$	-	-
N57.9.238 $\mathrm{GM3}^+ \oplus \mathrm{X2}^+ \oplus \mathrm{X4}^-$	$\surd$	1	1	$\surd$	222	B3
N57.9.239 $\mathrm{GM3}^+ \oplus \mathrm{X2}^+ \oplus \mathrm{X2}^-$	$\surd$	1	1	$\times$	-	-
N57.9.240 $\mathrm{GM3}^+ \oplus \mathrm{X2}^+ \oplus \mathrm{X4}^+$	$\surd$	1	1	$\times$	-	-
N57.9.241 $\mathrm{GM3}^+ \oplus \mathrm{X2}^- \oplus \mathrm{X2}^-$	$\surd$	1	1	$\times$	-	-
N57.9.242 $\mathrm{GM3}^+ \oplus \mathrm{X2}^- \oplus \mathrm{X4}^+$	$\surd$	1	1	$\surd$	222	B3
N57.9.243 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N57.9.244 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B2_g}$
N57.9.245 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N57.9.246 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{X1}^+$	$\surd$	0	0	$\surd$	-	-
N57.9.247 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{X1}^-$	$\surd$	0	0	$\surd$	-	-
N57.9.248 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{X2}^+$	$\surd$	0	0	$\surd$	-	-
N57.9.249 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{X2}^-$	$\surd$	0	0	$\surd$	-	-
N57.9.250 $\mathrm{GM3}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B1} \oplus \mathrm{B1}$
N57.9.251 $\mathrm{GM3}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u} \oplus \mathrm{B2_g}$
N57.9.252 $\mathrm{GM3}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{X1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g}$
N57.9.253 $\mathrm{GM3}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{X1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g}$
N57.9.254 $\mathrm{GM3}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{X2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g}$
N57.9.255 $\mathrm{GM3}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{X2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g}$
N57.9.256 $\mathrm{GM3}^- \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N57.9.257 $\mathrm{GM3}^- \oplus \mathrm{GM4}^- \oplus \mathrm{X1}^+$	$\surd$	0	0	$\surd$	-	-
N57.9.258 $\mathrm{GM3}^- \oplus \mathrm{GM4}^- \oplus \mathrm{X1}^-$	$\surd$	0	0	$\surd$	-	-
N57.9.259 $\mathrm{GM3}^- \oplus \mathrm{GM4}^- \oplus \mathrm{X2}^+$	$\surd$	0	0	$\surd$	-	-
N57.9.260 $\mathrm{GM3}^- \oplus \mathrm{GM4}^- \oplus \mathrm{X2}^-$	$\surd$	0	0	$\surd$	-	-
N57.9.261 $\mathrm{GM3}^- \oplus \mathrm{X1}^+ \oplus \mathrm{X1}^+$	$\surd$	1	0	$\times$	-	-
N57.9.262 $\mathrm{GM3}^- \oplus \mathrm{X1}^+ \oplus \mathrm{X3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N57.9.263 $\mathrm{GM3}^- \oplus \mathrm{X1}^+ \oplus \mathrm{X1}^-$	$\surd$	1	1	$\times$	-	-
N57.9.264 $\mathrm{GM3}^- \oplus \mathrm{X1}^+ \oplus \mathrm{X3}^+$	$\surd$	1	0	$\times$	-	-
N57.9.265 $\mathrm{GM3}^- \oplus \mathrm{X1}^+ \oplus \mathrm{X2}^+$	$\surd$	1	0	$\times$	-	-
N57.9.266 $\mathrm{GM3}^- \oplus \mathrm{X1}^+ \oplus \mathrm{X4}^-$	$\surd$	1	1	$\times$	-	-
N57.9.267 $\mathrm{GM3}^- \oplus \mathrm{X1}^+ \oplus \mathrm{X2}^-$	$\surd$	1	1	$\times$	-	-
N57.9.268 $\mathrm{GM3}^- \oplus \mathrm{X1}^+ \oplus \mathrm{X4}^+$	$\surd$	1	0	$\times$	-	-
N57.9.269 $\mathrm{GM3}^- \oplus \mathrm{X1}^- \oplus \mathrm{X1}^-$	$\surd$	1	0	$\times$	-	-
N57.9.270 $\mathrm{GM3}^- \oplus \mathrm{X1}^- \oplus \mathrm{X3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N57.9.271 $\mathrm{GM3}^- \oplus \mathrm{X1}^- \oplus \mathrm{X2}^+$	$\surd$	1	1	$\times$	-	-
N57.9.272 $\mathrm{GM3}^- \oplus \mathrm{X1}^- \oplus \mathrm{X4}^-$	$\surd$	1	0	$\times$	-	-
N57.9.273 $\mathrm{GM3}^- \oplus \mathrm{X1}^- \oplus \mathrm{X2}^-$	$\surd$	1	0	$\times$	-	-
N57.9.274 $\mathrm{GM3}^- \oplus \mathrm{X1}^- \oplus \mathrm{X4}^+$	$\surd$	1	1	$\times$	-	-
N57.9.275 $\mathrm{GM3}^- \oplus \mathrm{X2}^+ \oplus \mathrm{X2}^+$	$\surd$	1	0	$\times$	-	-
N57.9.276 $\mathrm{GM3}^- \oplus \mathrm{X2}^+ \oplus \mathrm{X4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N57.9.277 $\mathrm{GM3}^- \oplus \mathrm{X2}^+ \oplus \mathrm{X2}^-$	$\surd$	1	1	$\times$	-	-
N57.9.278 $\mathrm{GM3}^- \oplus \mathrm{X2}^+ \oplus \mathrm{X4}^+$	$\surd$	1	0	$\times$	-	-
N57.9.279 $\mathrm{GM3}^- \oplus \mathrm{X2}^- \oplus \mathrm{X2}^-$	$\surd$	1	0	$\times$	-	-
N57.9.280 $\mathrm{GM3}^- \oplus \mathrm{X2}^- \oplus \mathrm{X4}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$

Non-coplanar SSGs with parent space group $Pbcm$ (No. 57) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N57.9.281 $\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B2_g}\oplus\mathrm{B2_g}\oplus\mathrm{B2_g}$
N57.9.282 $\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2}\oplus\mathrm{A2}$
N57.9.283 $\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{+}\oplus\mathrm{X1}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_g}\oplus\mathrm{B2_g}$
N57.9.284 $\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{+}\oplus\mathrm{X1}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_g}\oplus\mathrm{B2_g}$
N57.9.285 $\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{+}\oplus\mathrm{X2}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_g}\oplus\mathrm{B2_g}$
N57.9.286 $\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{+}\oplus\mathrm{X2}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_g}\oplus\mathrm{B2_g}$
N57.9.287 $\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{A_u}\oplus\mathrm{B2_g}$
N57.9.288 $\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{-}\oplus\mathrm{X1}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B2_g}$
N57.9.289 $\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{-}\oplus\mathrm{X1}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B2_g}$
N57.9.290 $\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{-}\oplus\mathrm{X2}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B2_g}$
N57.9.291 $\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{-}\oplus\mathrm{X2}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B2_g}$
N57.9.292 $\mathrm{GM4}^{+}\oplus\mathrm{X1}^{+}\oplus\mathrm{X1}^{+}$	$\surd$	1	1	$\times$	-	-
N57.9.293 $\mathrm{GM4}^{+}\oplus\mathrm{X1}^{+}\oplus\mathrm{X3}^{-}$	$\surd$	1	1	$\surd$	$mm2$	B1
N57.9.294 $\mathrm{GM4}^{+}\oplus\mathrm{X1}^{+}\oplus\mathrm{X1}^{-}$	$\surd$	1	1	$\times$	-	-
N57.9.295 $\mathrm{GM4}^{+}\oplus\mathrm{X1}^{+}\oplus\mathrm{X3}^{+}$	$\surd$	1	1	$\times$	-	-
N57.9.296 $\mathrm{GM4}^{+}\oplus\mathrm{X1}^{+}\oplus\mathrm{X2}^{+}$	$\surd$	1	1	$\times$	-	-
N57.9.297 $\mathrm{GM4}^{+}\oplus\mathrm{X1}^{+}\oplus\mathrm{X4}^{-}$	$\surd$	1	1	$\times$	-	-
N57.9.298 $\mathrm{GM4}^{+}\oplus\mathrm{X1}^{+}\oplus\mathrm{X2}^{-}$	$\surd$	1	1	$\times$	-	-
N57.9.299 $\mathrm{GM4}^{+}\oplus\mathrm{X1}^{+}\oplus\mathrm{X4}^{+}$	$\surd$	1	1	$\times$	-	-
N57.9.300 $\mathrm{GM4}^{+}\oplus\mathrm{X1}^{-}\oplus\mathrm{X1}^{-}$	$\surd$	1	1	$\times$	-	-
N57.9.301 $\mathrm{GM4}^{+}\oplus\mathrm{X1}^{-}\oplus\mathrm{X3}^{+}$	$\surd$	1	1	$\surd$	$mm2$	B1
N57.9.302 $\mathrm{GM4}^{+}\oplus\mathrm{X1}^{-}\oplus\mathrm{X2}^{+}$	$\surd$	1	1	$\times$	-	-
N57.9.303 $\mathrm{GM4}^{+}\oplus\mathrm{X1}^{-}\oplus\mathrm{X4}^{-}$	$\surd$	1	1	$\times$	-	-
N57.9.304 $\mathrm{GM4}^{+}\oplus\mathrm{X1}^{-}\oplus\mathrm{X2}^{-}$	$\surd$	1	1	$\times$	-	-
N57.9.305 $\mathrm{GM4}^{+}\oplus\mathrm{X1}^{-}\oplus\mathrm{X4}^{+}$	$\surd$	1	1	$\times$	-	-
N57.9.306 $\mathrm{GM4}^{+}\oplus\mathrm{X2}^{+}\oplus\mathrm{X2}^{+}$	$\surd$	1	1	$\times$	-	-
N57.9.307 $\mathrm{GM4}^{+}\oplus\mathrm{X2}^{+}\oplus\mathrm{X4}^{-}$	$\surd$	1	1	$\surd$	$mm2$	B1
N57.9.308 $\mathrm{GM4}^{+}\oplus\mathrm{X2}^{+}\oplus\mathrm{X2}^{-}$	$\surd$	1	1	$\times$	-	-
N57.9.309 $\mathrm{GM4}^{+}\oplus\mathrm{X2}^{+}\oplus\mathrm{X4}^{+}$	$\surd$	1	1	$\times$	-	-
N57.9.310 $\mathrm{GM4}^{+}\oplus\mathrm{X2}^{-}\oplus\mathrm{X2}^{-}$	$\surd$	1	1	$\times$	-	-
N57.9.311 $\mathrm{GM4}^{+}\oplus\mathrm{X2}^{-}\oplus\mathrm{X4}^{+}$	$\surd$	1	1	$\surd$	$mm2$	B1
N57.9.312 $\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
N57.9.313 $\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}\oplus\mathrm{X1}^{+}$	$\surd$	0	0	$\surd$	-	-
N57.9.314 $\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}\oplus\mathrm{X1}^{-}$	$\surd$	0	0	$\surd$	-	-
N57.9.315 $\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}\oplus\mathrm{X2}^{+}$	$\surd$	0	0	$\surd$	-	-
N57.9.316 $\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}\oplus\mathrm{X2}^{-}$	$\surd$	0	0	$\surd$	-	-
N57.9.317 $\mathrm{GM4}^{-}\oplus\mathrm{X1}^{+}\oplus\mathrm{X1}^{+}$	$\surd$	1	0	$\times$	-	-
N57.9.318 $\mathrm{GM4}^{-}\oplus\mathrm{X1}^{+}\oplus\mathrm{X3}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N57.9.319 $\mathrm{GM4}^{-}\oplus\mathrm{X1}^{+}\oplus\mathrm{X1}^{-}$	$\surd$	1	1	$\times$	-	-
N57.9.320 $\mathrm{GM4}^{-}\oplus\mathrm{X1}^{+}\oplus\mathrm{X3}^{+}$	$\surd$	1	0	$\times$	-	-
N57.9.321 $\mathrm{GM4}^{-}\oplus\mathrm{X1}^{+}\oplus\mathrm{X2}^{+}$	$\surd$	1	0	$\times$	-	-
N57.9.322 $\mathrm{GM4}^{-}\oplus\mathrm{X1}^{+}\oplus\mathrm{X4}^{-}$	$\surd$	1	1	$\times$	-	-
N57.9.323 $\mathrm{GM4}^{-}\oplus\mathrm{X1}^{+}\oplus\mathrm{X2}^{-}$	$\surd$	1	1	$\times$	-	-
N57.9.324 $\mathrm{GM4}^{-}\oplus\mathrm{X1}^{+}\oplus\mathrm{X4}^{+}$	$\surd$	1	0	$\times$	-	-
N57.9.325 $\mathrm{GM4}^{-}\oplus\mathrm{X1}^{-}\oplus\mathrm{X1}^{-}$	$\surd$	1	0	$\times$	-	-
N57.9.326 $\mathrm{GM4}^{-}\oplus\mathrm{X1}^{-}\oplus\mathrm{X3}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$

Non-coplanar SSGs with parent space group $Pbcm$ (No. 57) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N57.9.327 $\mathrm{GM4}^- \oplus \mathrm{X1}^- \oplus \mathrm{X2}^+$	$\surd$	1	1	$\times$	-	-
N57.9.328 $\mathrm{GM4}^- \oplus \mathrm{X1}^- \oplus \mathrm{X4}^-$	$\surd$	1	0	$\times$	-	-
N57.9.329 $\mathrm{GM4}^- \oplus \mathrm{X1}^- \oplus \mathrm{X2}^-$	$\surd$	1	0	$\times$	-	-
N57.9.330 $\mathrm{GM4}^- \oplus \mathrm{X1}^- \oplus \mathrm{X4}^+$	$\surd$	1	1	$\times$	-	-
N57.9.331 $\mathrm{GM4}^- \oplus \mathrm{X2}^+ \oplus \mathrm{X2}^+$	$\surd$	1	0	$\times$	-	-
N57.9.332 $\mathrm{GM4}^- \oplus \mathrm{X2}^+ \oplus \mathrm{X4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N57.9.333 $\mathrm{GM4}^- \oplus \mathrm{X2}^+ \oplus \mathrm{X2}^-$	$\surd$	1	1	$\times$	-	-
N57.9.334 $\mathrm{GM4}^- \oplus \mathrm{X2}^+ \oplus \mathrm{X4}^+$	$\surd$	1	0	$\times$	-	-
N57.9.335 $\mathrm{GM4}^- \oplus \mathrm{X2}^- \oplus \mathrm{X2}^-$	$\surd$	1	0	$\times$	-	-
N57.9.336 $\mathrm{GM4}^- \oplus \mathrm{X2}^- \oplus \mathrm{X4}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N57.9.337 $\mathrm{X1}^+ \oplus \mathrm{X1}^+ \oplus \mathrm{X1}^+$	$\surd$	0	0	$\surd$	-	-
N57.9.338 $\mathrm{X1}^+ \oplus \mathrm{X1}^+ \oplus \mathrm{X3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B3_u}$
N57.9.339 $\mathrm{X1}^+ \oplus \mathrm{X1}^+ \oplus \mathrm{X1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u}$
N57.9.340 $\mathrm{X1}^+ \oplus \mathrm{X1}^+ \oplus \mathrm{X3}^+$	$\surd$	0	0	$\surd$	-	-
N57.9.341 $\mathrm{X1}^+ \oplus \mathrm{X3}^- \oplus \mathrm{X1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u}$
N57.9.342 $\mathrm{X1}^+ \oplus \mathrm{X1}^+ \oplus \mathrm{X2}^+$	$\surd$	0	0	$\surd$	-	-
N57.9.343 $\mathrm{X1}^+ \oplus \mathrm{X1}^+ \oplus \mathrm{X4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_u} \oplus \mathrm{B2_u}$
N57.9.344 $\mathrm{X1}^+ \oplus \mathrm{X3}^- \oplus \mathrm{X2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_u}$
N57.9.345 $\mathrm{X1}^+ \oplus \mathrm{X1}^+ \oplus \mathrm{X2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N57.9.346 $\mathrm{X1}^+ \oplus \mathrm{X1}^+ \oplus \mathrm{X4}^+$	$\surd$	0	0	$\surd$	-	-
N57.9.347 $\mathrm{X1}^+ \oplus \mathrm{X3}^- \oplus \mathrm{X2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u}$
N57.9.348 $\mathrm{X1}^+ \oplus \mathrm{X1}^- \oplus \mathrm{X1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u}$
N57.9.349 $\mathrm{X1}^+ \oplus \mathrm{X1}^- \oplus \mathrm{X3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u}$
N57.9.350 $\mathrm{X1}^+ \oplus \mathrm{X3}^+ \oplus \mathrm{X3}^+$	$\surd$	0	0	$\surd$	-	-
N57.9.351 $\mathrm{X1}^+ \oplus \mathrm{X1}^- \oplus \mathrm{X2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u}$
N57.9.352 $\mathrm{X1}^+ \oplus \mathrm{X1}^- \oplus \mathrm{X4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B2_u}$
N57.9.353 $\mathrm{X1}^+ \oplus \mathrm{X3}^+ \oplus \mathrm{X2}^+$	$\surd$	0	0	$\surd$	-	-
N57.9.354 $\mathrm{X1}^+ \oplus \mathrm{X3}^+ \oplus \mathrm{X4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N57.9.355 $\mathrm{X1}^+ \oplus \mathrm{X1}^- \oplus \mathrm{X2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u}$
N57.9.356 $\mathrm{X1}^+ \oplus \mathrm{X1}^- \oplus \mathrm{X4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B2_u}$
N57.9.357 $\mathrm{X1}^+ \oplus \mathrm{X3}^+ \oplus \mathrm{X2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N57.9.358 $\mathrm{X1}^+ \oplus \mathrm{X3}^+ \oplus \mathrm{X4}^+$	$\surd$	0	0	$\surd$	-	-
N57.9.359 $\mathrm{X1}^+ \oplus \mathrm{X2}^+ \oplus \mathrm{X2}^+$	$\surd$	0	0	$\surd$	-	-
N57.9.360 $\mathrm{X1}^+ \oplus \mathrm{X2}^+ \oplus \mathrm{X4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_u}$
N57.9.361 $\mathrm{X1}^+ \oplus \mathrm{X4}^- \oplus \mathrm{X4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_u} \oplus \mathrm{B2_u}$
N57.9.362 $\mathrm{X1}^+ \oplus \mathrm{X2}^+ \oplus \mathrm{X2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u}$
N57.9.363 $\mathrm{X1}^+ \oplus \mathrm{X2}^+ \oplus \mathrm{X4}^+$	$\surd$	0	0	$\surd$	-	-
N57.9.364 $\mathrm{X1}^+ \oplus \mathrm{X4}^- \oplus \mathrm{X2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N57.9.365 $\mathrm{X1}^+ \oplus \mathrm{X4}^- \oplus \mathrm{X4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B2_u}$
N57.9.366 $\mathrm{X1}^+ \oplus \mathrm{X2}^- \oplus \mathrm{X2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N57.9.367 $\mathrm{X1}^+ \oplus \mathrm{X2}^- \oplus \mathrm{X4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u}$
N57.9.368 $\mathrm{X1}^+ \oplus \mathrm{X4}^+ \oplus \mathrm{X4}^+$	$\surd$	0	0	$\surd$	-	-
N57.9.369 $\mathrm{X1}^- \oplus \mathrm{X1}^- \oplus \mathrm{X1}^-$	$\surd$	0	0	$\surd$	-	-
N57.9.370 $\mathrm{X1}^- \oplus \mathrm{X1}^- \oplus \mathrm{X3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B3_u}$
N57.9.371 $\mathrm{X1}^- \oplus \mathrm{X1}^- \oplus \mathrm{X2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N57.9.372 $\mathrm{X1}^- \oplus \mathrm{X1}^- \oplus \mathrm{X4}^-$	$\surd$	0	0	$\surd$	-	-

Non-coplanar SSGs with parent space group $Pbcm$ (No. 57) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N57.9.373 $\mathrm{X1^-}\oplus\mathrm{X3^+}\oplus\mathrm{X2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B3_u}$
N57.9.374 $\mathrm{X1^-}\oplus\mathrm{X1^-}\oplus\mathrm{X2^-}$	$\surd$	0	0	$\surd$	-	-
N57.9.375 $\mathrm{X1^-}\oplus\mathrm{X1^-}\oplus\mathrm{X4^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_u}\oplus\mathrm{B2_u}$
N57.9.376 $\mathrm{X1^-}\oplus\mathrm{X3^+}\oplus\mathrm{X2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u}\oplus\mathrm{B2_u}$
N57.9.377 $\mathrm{X1^-}\oplus\mathrm{X2^+}\oplus\mathrm{X2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B1_u}$
N57.9.378 $\mathrm{X1^-}\oplus\mathrm{X2^+}\oplus\mathrm{X4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B3_u}$
N57.9.379 $\mathrm{X1^-}\oplus\mathrm{X4^-}\oplus\mathrm{X4^-}$	$\surd$	0	0	$\surd$	-	-
N57.9.380 $\mathrm{X1^-}\oplus\mathrm{X2^+}\oplus\mathrm{X2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B1_u}$
N57.9.381 $\mathrm{X1^-}\oplus\mathrm{X2^+}\oplus\mathrm{X4^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B2_u}$
N57.9.382 $\mathrm{X1^-}\oplus\mathrm{X4^-}\oplus\mathrm{X2^-}$	$\surd$	0	0	$\surd$	-	-
N57.9.383 $\mathrm{X1^-}\oplus\mathrm{X4^-}\oplus\mathrm{X4^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B2_u}$
N57.9.384 $\mathrm{X1^-}\oplus\mathrm{X2^-}\oplus\mathrm{X2^-}$	$\surd$	0	0	$\surd$	-	-
N57.9.385 $\mathrm{X1^-}\oplus\mathrm{X2^-}\oplus\mathrm{X4^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u}\oplus\mathrm{B2_u}$
N57.9.386 $\mathrm{X1^-}\oplus\mathrm{X4^+}\oplus\mathrm{X4^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_u}\oplus\mathrm{B2_u}$
N57.9.387 $\mathrm{X2^+}\oplus\mathrm{X2^+}\oplus\mathrm{X2^+}$	$\surd$	0	0	$\surd$	-	-
N57.9.388 $\mathrm{X2^+}\oplus\mathrm{X2^+}\oplus\mathrm{X4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u}\oplus\mathrm{B3_u}$
N57.9.389 $\mathrm{X2^+}\oplus\mathrm{X2^+}\oplus\mathrm{X2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{A_u}$
N57.9.390 $\mathrm{X2^+}\oplus\mathrm{X2^+}\oplus\mathrm{X4^+}$	$\surd$	0	0	$\surd$	-	-
N57.9.391 $\mathrm{X2^+}\oplus\mathrm{X4^-}\oplus\mathrm{X2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B3_u}$
N57.9.392 $\mathrm{X2^+}\oplus\mathrm{X2^-}\oplus\mathrm{X2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{A_u}$
N57.9.393 $\mathrm{X2^+}\oplus\mathrm{X2^-}\oplus\mathrm{X4^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B3_u}$
N57.9.394 $\mathrm{X2^+}\oplus\mathrm{X4^+}\oplus\mathrm{X4^+}$	$\surd$	0	0	$\surd$	-	-
N57.9.395 $\mathrm{X2^-}\oplus\mathrm{X2^-}\oplus\mathrm{X2^-}$	$\surd$	0	0	$\surd$	-	-
N57.9.396 $\mathrm{X2^-}\oplus\mathrm{X2^-}\oplus\mathrm{X4^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u}\oplus\mathrm{B3_u}$
N57.12.1 $\mathrm{GM1^-}\oplus\mathrm{S1}$	$\surd$	1	1	$\times$	-	-
N57.12.2 $\mathrm{GM1^-}\oplus\mathrm{S2}$	$\surd$	1	1	$\times$	-	-
N57.12.3 $\mathrm{GM1^-}\oplus\mathrm{U1}$	$\surd$	1	1	$\times$	-	-
N57.12.4 $\mathrm{GM1^-}\oplus\mathrm{Y1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N57.12.5 $\mathrm{GM1^-}\oplus\mathrm{Y2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N57.12.6 $\mathrm{GM1^-}\oplus\mathrm{Z1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N57.12.7 $\mathrm{GM1^-}\oplus\mathrm{Z2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N57.12.8 $\mathrm{GM2^+}\oplus\mathrm{S1}$	$\surd$	1	1	$\times$	-	-
N57.12.9 $\mathrm{GM2^+}\oplus\mathrm{S2}$	$\surd$	1	1	$\times$	-	-
N57.12.10 $\mathrm{GM2^+}\oplus\mathrm{U1}$	$\surd$	1	1	$\times$	-	-
N57.12.11 $\mathrm{GM2^+}\oplus\mathrm{Y1}$	$\surd$	1	1	$\surd$	$mm2$	B2
N57.12.12 $\mathrm{GM2^+}\oplus\mathrm{Y2}$	$\surd$	1	1	$\surd$	$mm2$	B2
N57.12.13 $\mathrm{GM2^+}\oplus\mathrm{Z1}$	$\surd$	1	1	$\surd$	222	B1
N57.12.14 $\mathrm{GM2^+}\oplus\mathrm{Z2}$	$\surd$	1	1	$\surd$	222	B1
N57.12.15 $\mathrm{GM2^-}\oplus\mathrm{S1}$	$\surd$	1	1	$\times$	-	-
N57.12.16 $\mathrm{GM2^-}\oplus\mathrm{S2}$	$\surd$	1	1	$\times$	-	-
N57.12.17 $\mathrm{GM2^-}\oplus\mathrm{U1}$	$\surd$	1	1	$\times$	-	-
N57.12.18 $\mathrm{GM2^-}\oplus\mathrm{Y1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N57.12.19 $\mathrm{GM2^-}\oplus\mathrm{Y2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N57.12.20 $\mathrm{GM2^-}\oplus\mathrm{Z1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N57.12.21 $\mathrm{GM2^-}\oplus\mathrm{Z2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N57.12.22 $\mathrm{GM3^+}\oplus\mathrm{S1}$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $Pbcm$ (No. 57) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N57.12.23 $\mathrm{GM3}^{+}\oplus\mathrm{S2}$	$\surd$	1	1	$\times$	-	-
N57.12.24 $\mathrm{GM3}^{+}\oplus\mathrm{U1}$	$\surd$	1	1	$\times$	-	-
N57.12.25 $\mathrm{GM3}^{+}\oplus\mathrm{Y1}$	$\surd$	1	1	$\surd$	$mm2$	$\mathrm{B2}$
N57.12.26 $\mathrm{GM3}^{+}\oplus\mathrm{Y2}$	$\surd$	1	1	$\surd$	$mm2$	$\mathrm{B2}$
N57.12.27 $\mathrm{GM3}^{+}\oplus\mathrm{Z1}$	$\surd$	1	1	$\surd$	$mm2$	$\mathrm{B2}$
N57.12.28 $\mathrm{GM3}^{+}\oplus\mathrm{Z2}$	$\surd$	1	1	$\surd$	$mm2$	$\mathrm{B2}$
N57.12.29 $\mathrm{GM3}^{-}\oplus\mathrm{S1}$	$\surd$	1	1	$\times$	-	-
N57.12.30 $\mathrm{GM3}^{-}\oplus\mathrm{S2}$	$\surd$	1	1	$\times$	-	-
N57.12.31 $\mathrm{GM3}^{-}\oplus\mathrm{U1}$	$\surd$	1	1	$\times$	-	-
N57.12.32 $\mathrm{GM3}^{-}\oplus\mathrm{Y1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N57.12.33 $\mathrm{GM3}^{-}\oplus\mathrm{Y2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N57.12.34 $\mathrm{GM3}^{-}\oplus\mathrm{Z1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N57.12.35 $\mathrm{GM3}^{-}\oplus\mathrm{Z2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N57.12.36 $\mathrm{GM4}^{+}\oplus\mathrm{S1}$	$\surd$	1	1	$\times$	-	-
N57.12.37 $\mathrm{GM4}^{+}\oplus\mathrm{S2}$	$\surd$	1	1	$\times$	-	-
N57.12.38 $\mathrm{GM4}^{+}\oplus\mathrm{U1}$	$\surd$	1	1	$\times$	-	-
N57.12.39 $\mathrm{GM4}^{+}\oplus\mathrm{Y1}$	$\surd$	1	1	$\surd$	222	$\mathrm{B2}$
N57.12.40 $\mathrm{GM4}^{+}\oplus\mathrm{Y2}$	$\surd$	1	1	$\surd$	222	$\mathrm{B2}$
N57.12.41 $\mathrm{GM4}^{+}\oplus\mathrm{Z1}$	$\surd$	1	1	$\surd$	$mm2$	$\mathrm{B1}$
N57.12.42 $\mathrm{GM4}^{+}\oplus\mathrm{Z2}$	$\surd$	1	1	$\surd$	$mm2$	$\mathrm{B1}$
N57.12.43 $\mathrm{GM4}^{-}\oplus\mathrm{S1}$	$\surd$	1	1	$\times$	-	-
N57.12.44 $\mathrm{GM4}^{-}\oplus\mathrm{S2}$	$\surd$	1	1	$\times$	-	-
N57.12.45 $\mathrm{GM4}^{-}\oplus\mathrm{U1}$	$\surd$	1	1	$\times$	-	-
N57.12.46 $\mathrm{GM4}^{-}\oplus\mathrm{Y1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N57.12.47 $\mathrm{GM4}^{-}\oplus\mathrm{Y2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N57.12.48 $\mathrm{GM4}^{-}\oplus\mathrm{Z1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N57.12.49 $\mathrm{GM4}^{-}\oplus\mathrm{Z2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N57.12.50 $\mathrm{X1}^{+}\oplus\mathrm{S1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N57.12.51 $\mathrm{X1}^{+}\oplus\mathrm{S2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N57.12.52 $\mathrm{X1}^{+}\oplus\mathrm{U1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N57.12.53 $\mathrm{X1}^{+}\oplus\mathrm{U2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N57.12.54 $\mathrm{X1}^{+}\oplus\mathrm{Y1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N57.12.55 $\mathrm{X1}^{+}\oplus\mathrm{Y2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N57.12.56 $\mathrm{X1}^{+}\oplus\mathrm{Z1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N57.12.57 $\mathrm{X1}^{+}\oplus\mathrm{Z2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N57.12.58 $\mathrm{X1}^{-}\oplus\mathrm{S1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N57.12.59 $\mathrm{X1}^{-}\oplus\mathrm{S2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N57.12.60 $\mathrm{X1}^{-}\oplus\mathrm{U1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N57.12.61 $\mathrm{X1}^{-}\oplus\mathrm{U2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N57.12.62 $\mathrm{X1}^{-}\oplus\mathrm{Y1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N57.12.63 $\mathrm{X1}^{-}\oplus\mathrm{Y2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N57.12.64 $\mathrm{X1}^{-}\oplus\mathrm{Z1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N57.12.65 $\mathrm{X1}^{-}\oplus\mathrm{Z2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N57.12.66 $\mathrm{X2}^{+}\oplus\mathrm{S1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N57.12.67 $\mathrm{X2}^{+}\oplus\mathrm{S2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N57.12.68 $\mathrm{X2}^{+}\oplus\mathrm{U1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$

Non-coplanar SSGs with parent space group $Pbcm$ (No. 57) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N57.12.69 $\mathrm{X2}^{+} \oplus \mathrm{U2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N57.12.70 $\mathrm{X2}^{+} \oplus \mathrm{Y1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N57.12.71 $\mathrm{X2}^{+} \oplus \mathrm{Y2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N57.12.72 $\mathrm{X2}^{+} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N57.12.73 $\mathrm{X2}^{+} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N57.12.74 $\mathrm{X2}^{-} \oplus \mathrm{S1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N57.12.75 $\mathrm{X2}^{-} \oplus \mathrm{S2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N57.12.76 $\mathrm{X2}^{-} \oplus \mathrm{U1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N57.12.77 $\mathrm{X2}^{-} \oplus \mathrm{U2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N57.12.78 $\mathrm{X2}^{-} \oplus \mathrm{Y1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N57.12.79 $\mathrm{X2}^{-} \oplus \mathrm{Y2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N57.12.80 $\mathrm{X2}^{-} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N57.12.81 $\mathrm{X2}^{-} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N57.14.1 $\mathrm{GM1}^{-} \oplus \mathrm{SM1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N57.14.2 $\mathrm{GM1}^{-} \oplus \mathrm{SM2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N57.14.3 $\mathrm{GM1}^{-} \oplus \mathrm{SM3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N57.14.4 $\mathrm{GM1}^{-} \oplus \mathrm{SM4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N57.14.5 $\mathrm{GM1}^{-} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N57.14.6 $\mathrm{GM1}^{-} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N57.14.7 $\mathrm{GM1}^{-} \oplus \mathrm{D1}$	$\surd$	1	1	$\times$	-	-
N57.14.8 $\mathrm{GM1}^{-} \oplus \mathrm{D2}$	$\surd$	1	1	$\times$	-	-
N57.14.9 $\mathrm{GM1}^{-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N57.14.10 $\mathrm{GM1}^{-} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N57.14.11 $\mathrm{GM1}^{-} \oplus \mathrm{G1}$	$\surd$	1	1	$\times$	-	-
N57.14.12 $\mathrm{GM2}^{+} \oplus \mathrm{SM1}$	$\surd$	1	1	$\surd$	$mm2$	B1
N57.14.13 $\mathrm{GM2}^{+} \oplus \mathrm{SM2}$	$\surd$	1	1	$\surd$	$mm2$	B1
N57.14.14 $\mathrm{GM2}^{+} \oplus \mathrm{SM3}$	$\surd$	1	1	$\surd$	$mm2$	B1
N57.14.15 $\mathrm{GM2}^{+} \oplus \mathrm{SM4}$	$\surd$	1	1	$\surd$	$mm2$	B1
N57.14.16 $\mathrm{GM2}^{+} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	$mm2$	B2
N57.14.17 $\mathrm{GM2}^{+} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	$mm2$	B2
N57.14.18 $\mathrm{GM2}^{+} \oplus \mathrm{D1}$	$\surd$	1	1	$\times$	-	-
N57.14.19 $\mathrm{GM2}^{+} \oplus \mathrm{D2}$	$\surd$	1	1	$\times$	-	-
N57.14.20 $\mathrm{GM2}^{+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	222	B1
N57.14.21 $\mathrm{GM2}^{+} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	222	B1
N57.14.22 $\mathrm{GM2}^{+} \oplus \mathrm{G1}$	$\surd$	1	1	$\times$	-	-
N57.14.23 $\mathrm{GM2}^{-} \oplus \mathrm{SM1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N57.14.24 $\mathrm{GM2}^{-} \oplus \mathrm{SM2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N57.14.25 $\mathrm{GM2}^{-} \oplus \mathrm{SM3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N57.14.26 $\mathrm{GM2}^{-} \oplus \mathrm{SM4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N57.14.27 $\mathrm{GM2}^{-} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N57.14.28 $\mathrm{GM2}^{-} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N57.14.29 $\mathrm{GM2}^{-} \oplus \mathrm{D1}$	$\surd$	1	1	$\times$	-	-
N57.14.30 $\mathrm{GM2}^{-} \oplus \mathrm{D2}$	$\surd$	1	1	$\times$	-	-
N57.14.31 $\mathrm{GM2}^{-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N57.14.32 $\mathrm{GM2}^{-} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N57.14.33 $\mathrm{GM2}^{-} \oplus \mathrm{G1}$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $Pbcm$ (No. 57) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N57.14.34 GM3$^+$ ⊕ SM1	√	1	1	√	222	B3
N57.14.35 GM3$^+$ ⊕ SM2	√	1	1	√	222	B3
N57.14.36 GM3$^+$ ⊕ SM3	√	1	1	√	222	B3
N57.14.37 GM3$^+$ ⊕ SM4	√	1	1	√	222	B3
N57.14.38 GM3$^+$ ⊕ DT1	√	1	1	√	$mm2$	B2
N57.14.39 GM3$^+$ ⊕ DT2	√	1	1	√	$mm2$	B2
N57.14.40 GM3$^+$ ⊕ D1	√	1	1	×	-	-
N57.14.41 GM3$^+$ ⊕ D2	√	1	1	×	-	-
N57.14.42 GM3$^+$ ⊕ LD1	√	1	1	√	$mm2$	B2
N57.14.43 GM3$^+$ ⊕ LD2	√	1	1	√	$mm2$	B2
N57.14.44 GM3$^+$ ⊕ G1	√	1	1	×	-	-
N57.14.45 GM3$^-$ ⊕ SM1	√	1	1	√	mmm	B3$_{\mathrm{u}}$
N57.14.46 GM3$^-$ ⊕ SM2	√	1	1	√	mmm	B3$_{\mathrm{u}}$
N57.14.47 GM3$^-$ ⊕ SM3	√	1	1	√	mmm	B3$_{\mathrm{u}}$
N57.14.48 GM3$^-$ ⊕ SM4	√	1	1	√	mmm	B3$_{\mathrm{u}}$
N57.14.49 GM3$^-$ ⊕ DT1	√	1	1	√	mmm	B2$_{\mathrm{u}}$
N57.14.50 GM3$^-$ ⊕ DT2	√	1	1	√	mmm	B2$_{\mathrm{u}}$
N57.14.51 GM3$^-$ ⊕ D1	√	1	1	×	-	-
N57.14.52 GM3$^-$ ⊕ D2	√	1	1	×	-	-
N57.14.53 GM3$^-$ ⊕ LD1	√	1	1	√	mmm	B1$_{\mathrm{u}}$
N57.14.54 GM3$^-$ ⊕ LD2	√	1	1	√	mmm	B1$_{\mathrm{u}}$
N57.14.55 GM3$^-$ ⊕ G1	√	1	1	×	-	-
N57.14.56 GM4$^+$ ⊕ SM1	√	1	1	√	$mm2$	B1
N57.14.57 GM4$^+$ ⊕ SM2	√	1	1	√	$mm2$	B1
N57.14.58 GM4$^+$ ⊕ SM3	√	1	1	√	$mm2$	B1
N57.14.59 GM4$^+$ ⊕ SM4	√	1	1	√	$mm2$	B1
N57.14.60 GM4$^+$ ⊕ DT1	√	1	1	√	222	B2
N57.14.61 GM4$^+$ ⊕ DT2	√	1	1	√	222	B2
N57.14.62 GM4$^+$ ⊕ D1	√	1	1	×	-	-
N57.14.63 GM4$^+$ ⊕ D2	√	1	1	×	-	-
N57.14.64 GM4$^+$ ⊕ LD1	√	1	1	√	$mm2$	B1
N57.14.65 GM4$^+$ ⊕ LD2	√	1	1	√	$mm2$	B1
N57.14.66 GM4$^+$ ⊕ G1	√	1	1	×	-	-
N57.14.67 GM4$^-$ ⊕ SM1	√	1	1	√	mmm	B3$_{\mathrm{u}}$
N57.14.68 GM4$^-$ ⊕ SM2	√	1	1	√	mmm	B3$_{\mathrm{u}}$
N57.14.69 GM4$^-$ ⊕ SM3	√	1	1	√	mmm	B3$_{\mathrm{u}}$
N57.14.70 GM4$^-$ ⊕ SM4	√	1	1	√	mmm	B3$_{\mathrm{u}}$
N57.14.71 GM4$^-$ ⊕ DT1	√	1	1	√	mmm	B2$_{\mathrm{u}}$
N57.14.72 GM4$^-$ ⊕ DT2	√	1	1	√	mmm	B2$_{\mathrm{u}}$
N57.14.73 GM4$^-$ ⊕ D1	√	1	1	×	-	-
N57.14.74 GM4$^-$ ⊕ D2	√	1	1	×	-	-
N57.14.75 GM4$^-$ ⊕ LD1	√	1	1	√	mmm	B1$_{\mathrm{u}}$
N57.14.76 GM4$^-$ ⊕ LD2	√	1	1	√	mmm	B1$_{\mathrm{u}}$
N57.14.77 GM4$^-$ ⊕ G1	√	1	1	×	-	-
N57.14.78 X1$^+$ ⊕ SM1	√	1	1	√	mmm	B3$_{\mathrm{u}}$
N57.14.79 X1$^+$ ⊕ SM2	√	1	1	√	mmm	B3$_{\mathrm{u}}$

Non-coplanar SSGs with parent space group $Pbcm$ (No. 57) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N57.14.80 $\mathrm{X1}^{+} \oplus \mathrm{SM3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N57.14.81 $\mathrm{X1}^{+} \oplus \mathrm{SM4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N57.14.82 $\mathrm{X1}^{+} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N57.14.83 $\mathrm{X1}^{+} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N57.14.84 $\mathrm{X1}^{+} \oplus \mathrm{D1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N57.14.85 $\mathrm{X1}^{+} \oplus \mathrm{D2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N57.14.86 $\mathrm{X1}^{+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N57.14.87 $\mathrm{X1}^{+} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N57.14.88 $\mathrm{X1}^{+} \oplus \mathrm{G1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N57.14.89 $\mathrm{X1}^{+} \oplus \mathrm{G2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N57.14.90 $\mathrm{X1}^{-} \oplus \mathrm{SM1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N57.14.91 $\mathrm{X1}^{-} \oplus \mathrm{SM2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N57.14.92 $\mathrm{X1}^{-} \oplus \mathrm{SM3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N57.14.93 $\mathrm{X1}^{-} \oplus \mathrm{SM4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N57.14.94 $\mathrm{X1}^{-} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N57.14.95 $\mathrm{X1}^{-} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N57.14.96 $\mathrm{X1}^{-} \oplus \mathrm{D1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N57.14.97 $\mathrm{X1}^{-} \oplus \mathrm{D2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N57.14.98 $\mathrm{X1}^{-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N57.14.99 $\mathrm{X1}^{-} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N57.14.100 $\mathrm{X1}^{-} \oplus \mathrm{G1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N57.14.101 $\mathrm{X1}^{-} \oplus \mathrm{G2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N57.14.102 $\mathrm{X2}^{+} \oplus \mathrm{SM1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N57.14.103 $\mathrm{X2}^{+} \oplus \mathrm{SM2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N57.14.104 $\mathrm{X2}^{+} \oplus \mathrm{SM3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N57.14.105 $\mathrm{X2}^{+} \oplus \mathrm{SM4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N57.14.106 $\mathrm{X2}^{+} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N57.14.107 $\mathrm{X2}^{+} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N57.14.108 $\mathrm{X2}^{+} \oplus \mathrm{D1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N57.14.109 $\mathrm{X2}^{+} \oplus \mathrm{D2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N57.14.110 $\mathrm{X2}^{+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N57.14.111 $\mathrm{X2}^{+} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N57.14.112 $\mathrm{X2}^{+} \oplus \mathrm{G1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N57.14.113 $\mathrm{X2}^{+} \oplus \mathrm{G2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N57.14.114 $\mathrm{X2}^{-} \oplus \mathrm{SM1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N57.14.115 $\mathrm{X2}^{-} \oplus \mathrm{SM2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N57.14.116 $\mathrm{X2}^{-} \oplus \mathrm{SM3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N57.14.117 $\mathrm{X2}^{-} \oplus \mathrm{SM4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N57.14.118 $\mathrm{X2}^{-} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N57.14.119 $\mathrm{X2}^{-} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N57.14.120 $\mathrm{X2}^{-} \oplus \mathrm{D1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N57.14.121 $\mathrm{X2}^{-} \oplus \mathrm{D2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N57.14.122 $\mathrm{X2}^{-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N57.14.123 $\mathrm{X2}^{-} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N57.14.124 $\mathrm{X2}^{-} \oplus \mathrm{G1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N57.14.125 $\mathrm{X2}^{-} \oplus \mathrm{G2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$

Collinear SSGs with parent space group $Pnnm$ (No. 58)(continued)

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation

TABLE S172: Collinear SSGs with parent space group $Pnnm$ (No. 58).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L58.1.1 $\mathrm{GM1}^{+}$	1	mmm	$\mathrm{A_g}$
L58.2.1 $\mathrm{GM1}^{-}$	0	-	-
L58.2.2 $\mathrm{GM2}^{+}$	1	mmm	$\mathrm{B1_g}$
L58.2.3 $\mathrm{GM2}^{-}$	0	-	-
L58.2.4 $\mathrm{GM3}^{+}$	1	mmm	$\mathrm{B3_g}$
L58.2.5 $\mathrm{GM3}^{-}$	0	-	-

TABLE S173: Coplanar SSGs with parent space group $Pnnm$ (No. 58).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P58.1.1 $\mathrm{GM1}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_g}$
P58.2.1 $\mathrm{GM1}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_u}$
P58.2.2 $\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B1_g}$
P58.2.3 $\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B1_u}$
P58.2.4 $\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}$
P58.2.5 $\mathrm{GM3}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}$
P58.3.1 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}$	$\surd$	0	0	$\surd$	-	-
P58.3.2 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_u}$
P58.3.3 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
P58.3.4 $\mathrm{GM1}^{-}\oplus\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_u}$
P58.3.5 $\mathrm{GM1}^{-}\oplus\mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
P58.3.6 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_g}$
P58.3.7 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B1_g}$
P58.3.8 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B3_g}$
P58.3.9 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B2_u}$
P58.3.10 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
P58.3.11 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B2_u}$
P58.3.12 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
P58.3.13 $\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_g}$
P58.3.14 $\mathrm{GM3}^{+}\oplus\mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B2_g}$
P58.3.15 $\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B3_g}$
P58.3.16 $\mathrm{GM3}^{+}\oplus\mathrm{GM4}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B3_g}$
P58.3.17 $\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
P58.3.18 $\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
P58.4.1 $\mathrm{S1}^{+}\mathrm{S2}^{+}$	$\surd$	1	0	$\times$	-	-
P58.4.2 $\mathrm{S1}^{-}\mathrm{S2}^{-}$	$\surd$	1	0	$\times$	-	-
P58.6.1 R1	$\surd$	1	1	$\times$	-	-
P58.6.2 $\mathrm{T1}^{+}$	$\surd$	1	0	$\times$	-	-
P58.6.3 X1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P58.6.4 X2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P58.6.5 Z1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P58.6.6 Z2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$

Coplanar SSGs with parent space group $Pnnm$ (No. 58) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P58.8.1 DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
P58.8.2 DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
P58.8.3 LD1	√	1	1	√	mmm	$\mathrm{B1_u}$
P58.8.4 LD3	√	1	1	√	mmm	$\mathrm{B1_u}$

TABLE S174: Non-coplanar SSGs with parent space group $Pnnm$ (No. 58).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N58.1.1 $\mathrm{GM1^+}$	√	3	3	√	mmm	$\mathrm{A_g \oplus A_g \oplus A_g}$
N58.2.1 $\mathrm{GM1^-}$	√	2	2	√	222	$\mathrm{A1 \oplus A1}$
N58.2.2 $\mathrm{GM2^+}$	√	3	3	√	mmm	$\mathrm{A_g \oplus A_g \oplus B1_g}$
N58.2.3 $\mathrm{GM2^-}$	√	2	2	√	$mm2$	$\mathrm{A1 \oplus A1}$
N58.2.4 $\mathrm{GM3^+}$	√	3	3	√	mmm	$\mathrm{A_g \oplus A_g \oplus B3_g}$
N58.2.5 $\mathrm{GM3^-}$	√	2	2	√	$mm2$	$\mathrm{A1 \oplus A1}$
N58.3.1 $\mathrm{GM1^- \oplus GM1^-}$	√	3	3	√	mmm	$\mathrm{A_g \oplus A_u \oplus A_u}$
N58.3.2 $\mathrm{GM1^- \oplus GM2^+}$	√	2	2	√	$mm2$	$\mathrm{A1 \oplus A2}$
N58.3.3 $\mathrm{GM1^- \oplus GM2^-}$	√	3	3	√	mmm	$\mathrm{A_g \oplus A_u \oplus B1_u}$
N58.3.4 $\mathrm{GM1^- \oplus GM3^+}$	√	2	2	√	$mm2$	$\mathrm{A1 \oplus A2}$
N58.3.5 $\mathrm{GM1^- \oplus GM3^-}$	√	3	3	√	mmm	$\mathrm{A_g \oplus A_u \oplus B3_u}$
N58.3.6 $\mathrm{GM2^+ \oplus GM2^+}$	√	3	3	√	mmm	$\mathrm{A_g \oplus B1_g \oplus B1_g}$
N58.3.7 $\mathrm{GM2^+ \oplus GM2^-}$	√	2	2	√	222	$\mathrm{A1 \oplus B1}$
N58.3.8 $\mathrm{GM2^+ \oplus GM3^+}$	√	3	3	√	mmm	$\mathrm{A_g \oplus B1_g \oplus B3_g}$
N58.3.9 $\mathrm{GM2^+ \oplus GM3^-}$	√	2	2	√	$mm2$	$\mathrm{A1 \oplus B1}$
N58.3.10 $\mathrm{GM2^- \oplus GM2^-}$	√	3	3	√	mmm	$\mathrm{A_g \oplus B1_u \oplus B1_u}$
N58.3.11 $\mathrm{GM2^- \oplus GM3^+}$	√	2	2	√	$mm2$	$\mathrm{A1 \oplus B2}$
N58.3.12 $\mathrm{GM2^- \oplus GM3^-}$	√	3	3	√	mmm	$\mathrm{A_g \oplus B1_u \oplus B3_u}$
N58.3.13 $\mathrm{GM3^+ \oplus GM3^+}$	√	3	3	√	mmm	$\mathrm{A_g \oplus B3_g \oplus B3_g}$
N58.3.14 $\mathrm{GM3^+ \oplus GM4^+}$	√	3	3	√	mmm	$\mathrm{A_g \oplus B3_g \oplus B2_g}$
N58.3.15 $\mathrm{GM3^+ \oplus GM3^-}$	√	2	2	√	222	$\mathrm{A1 \oplus B3}$
N58.3.16 $\mathrm{GM3^+ \oplus GM4^-}$	√	2	2	√	$mm2$	$\mathrm{A1 \oplus B2}$
N58.3.17 $\mathrm{GM3^- \oplus GM3^-}$	√	3	3	√	mmm	$\mathrm{A_g \oplus B3_u \oplus B3_u}$
N58.3.18 $\mathrm{GM3^- \oplus GM4^-}$	√	3	3	√	mmm	$\mathrm{A_g \oplus B3_u \oplus B2_u}$
N58.4.1 $\mathrm{S1^+S2^+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N58.4.2 $\mathrm{S1^-S2^-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N58.6.1 R1	√	1	1	√	222	A1
N58.6.2 $\mathrm{T1^+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N58.6.3 X1	√	1	1	√	$mm2$	A1
N58.6.4 X2	√	1	1	√	$mm2$	A1
N58.6.5 Z1	√	1	1	√	$mm2$	A1
N58.6.6 Z2	√	1	1	√	$mm2$	A1
N58.8.1 DT1	√	1	1	√	$mm2$	A1
N58.8.2 DT2	√	1	1	√	$mm2$	A1
N58.8.3 LD1	√	1	1	√	$mm2$	A1
N58.8.4 LD3	√	1	1	√	$mm2$	A1
N58.9.1 $\mathrm{GM1^- \oplus GM1^- \oplus GM1^-}$	√	0	0	√	-	-
N58.9.2 $\mathrm{GM1^- \oplus GM1^- \oplus GM2^+}$	√	3	3	√	mmm	$\mathrm{B1_g \oplus B1_u \oplus B1_u}$

Non-coplanar SSGs with parent space group $Pnnm$ (No. 58) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N58.9.3 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
N58.9.4 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N58.9.5 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N58.9.6 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	2	2	$\surd$	222	$\mathrm{B1} \oplus \mathrm{B1}$
N58.9.7 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N58.9.8 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2} \oplus \mathrm{B1}$
N58.9.9 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_u}$
N58.9.10 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
N58.9.11 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N58.9.12 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N58.9.13 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	222	$\mathrm{B3} \oplus \mathrm{B3}$
N58.9.14 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2} \oplus \mathrm{B1}$
N58.9.15 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N58.9.16 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N58.9.17 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N58.9.18 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N58.9.19 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N58.9.20 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{A2}$
N58.9.21 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B3_g}$
N58.9.22 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2} \oplus \mathrm{B2}$
N58.9.23 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$
N58.9.24 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{B2}$
N58.9.25 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g} \oplus \mathrm{B2_u}$
N58.9.26 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N58.9.27 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N58.9.28 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{B2}$
N58.9.29 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	222	$\mathrm{B1} \oplus \mathrm{B3}$
N58.9.30 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N58.9.31 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N58.9.32 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
N58.9.33 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N58.9.34 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N58.9.35 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2} \oplus \mathrm{B2}$
N58.9.36 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	222	$\mathrm{B3} \oplus \mathrm{B2}$
N58.9.37 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N58.9.38 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N58.9.39 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N58.9.40 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N58.9.41 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N58.9.42 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N58.9.43 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{A2}$
N58.9.44 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2} \oplus \mathrm{B2}$
N58.9.45 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{B2}$
N58.9.46 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B3_g}$
N58.9.47 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u} \oplus \mathrm{B3_g}$
N58.9.48 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B3_g}$

Non-coplanar SSGs with parent space group $Pnnm$ (No. 58) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N58.9.49 $\mathrm{GM3^-}\oplus\mathrm{GM3^-}\oplus\mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
N58.9.50 $\mathrm{GM3^-}\oplus\mathrm{GM3^-}\oplus\mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N58.10.1 $\mathrm{GM1^-}\oplus\mathrm{S1^+S2^+}$	$\surd$	1	0	$\times$	-	-
N58.10.2 $\mathrm{GM1^-}\oplus\mathrm{S1^-S2^-}$	$\surd$	1	0	$\times$	-	-
N58.10.3 $\mathrm{GM2^+}\oplus\mathrm{S1^+S2^+}$	$\surd$	1	1	$\times$	-	-
N58.10.4 $\mathrm{GM2^+}\oplus\mathrm{S1^-S2^-}$	$\surd$	1	1	$\times$	-	-
N58.10.5 $\mathrm{GM2^-}\oplus\mathrm{S1^+S2^+}$	$\surd$	1	0	$\times$	-	-
N58.10.6 $\mathrm{GM2^-}\oplus\mathrm{S1^-S2^-}$	$\surd$	1	0	$\times$	-	-
N58.10.7 $\mathrm{GM3^+}\oplus\mathrm{S1^+S2^+}$	$\surd$	1	1	$\times$	-	-
N58.10.8 $\mathrm{GM3^+}\oplus\mathrm{S1^-S2^-}$	$\surd$	1	1	$\times$	-	-
N58.10.9 $\mathrm{GM3^-}\oplus\mathrm{S1^+S2^+}$	$\surd$	1	0	$\times$	-	-
N58.10.10 $\mathrm{GM3^-}\oplus\mathrm{S1^-S2^-}$	$\surd$	1	0	$\times$	-	-
N58.12.1 $\mathrm{GM1^-}\oplus\mathrm{R1}$	$\surd$	1	1	$\times$	-	-
N58.12.2 $\mathrm{GM1^-}\oplus\mathrm{T1^+}$	$\surd$	1	0	$\times$	-	-
N58.12.3 $\mathrm{GM1^-}\oplus\mathrm{X1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N58.12.4 $\mathrm{GM1^-}\oplus\mathrm{X2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N58.12.5 $\mathrm{GM1^-}\oplus\mathrm{Z1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N58.12.6 $\mathrm{GM1^-}\oplus\mathrm{Z2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N58.12.7 $\mathrm{GM2^+}\oplus\mathrm{R1}$	$\surd$	1	1	$\times$	-	-
N58.12.8 $\mathrm{GM2^+}\oplus\mathrm{T1^+}$	$\surd$	1	1	$\times$	-	-
N58.12.9 $\mathrm{GM2^+}\oplus\mathrm{X1}$	$\surd$	1	1	$\surd$	$mm2$	B1
N58.12.10 $\mathrm{GM2^+}\oplus\mathrm{X2}$	$\surd$	1	1	$\surd$	$mm2$	B1
N58.12.11 $\mathrm{GM2^+}\oplus\mathrm{Z1}$	$\surd$	1	1	$\surd$	222	B1
N58.12.12 $\mathrm{GM2^+}\oplus\mathrm{Z2}$	$\surd$	1	1	$\surd$	222	B1
N58.12.13 $\mathrm{GM2^-}\oplus\mathrm{R1}$	$\surd$	1	1	$\times$	-	-
N58.12.14 $\mathrm{GM2^-}\oplus\mathrm{T1^+}$	$\surd$	1	0	$\times$	-	-
N58.12.15 $\mathrm{GM2^-}\oplus\mathrm{X1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N58.12.16 $\mathrm{GM2^-}\oplus\mathrm{X2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N58.12.17 $\mathrm{GM2^-}\oplus\mathrm{Z1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N58.12.18 $\mathrm{GM2^-}\oplus\mathrm{Z2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N58.12.19 $\mathrm{GM3^+}\oplus\mathrm{R1}$	$\surd$	1	1	$\times$	-	-
N58.12.20 $\mathrm{GM3^+}\oplus\mathrm{T1^+}$	$\surd$	1	1	$\times$	-	-
N58.12.21 $\mathrm{GM3^+}\oplus\mathrm{U1^+}$	$\surd$	1	1	$\times$	-	-
N58.12.22 $\mathrm{GM3^+}\oplus\mathrm{X1}$	$\surd$	1	1	$\surd$	222	B3
N58.12.23 $\mathrm{GM3^+}\oplus\mathrm{Y2}$	$\surd$	1	1	$\surd$	$mm2$	B2
N58.12.24 $\mathrm{GM3^+}\oplus\mathrm{X2}$	$\surd$	1	1	$\surd$	222	B3
N58.12.25 $\mathrm{GM3^+}\oplus\mathrm{Y1}$	$\surd$	1	1	$\surd$	$mm2$	B2
N58.12.26 $\mathrm{GM3^+}\oplus\mathrm{Z1}$	$\surd$	1	1	$\surd$	$mm2$	B2
N58.12.27 $\mathrm{GM3^+}\oplus\mathrm{Z2}$	$\surd$	1	1	$\surd$	$mm2$	B2
N58.12.28 $\mathrm{GM3^-}\oplus\mathrm{R1}$	$\surd$	1	1	$\times$	-	-
N58.12.29 $\mathrm{GM3^-}\oplus\mathrm{T1^+}$	$\surd$	1	0	$\times$	-	-
N58.12.30 $\mathrm{GM3^-}\oplus\mathrm{U1^+}$	$\surd$	1	0	$\times$	-	-
N58.12.31 $\mathrm{GM3^-}\oplus\mathrm{X1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N58.12.32 $\mathrm{GM3^-}\oplus\mathrm{Y2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N58.12.33 $\mathrm{GM3^-}\oplus\mathrm{X2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N58.12.34 $\mathrm{GM3^-}\oplus\mathrm{Y1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$

Non-coplanar SSGs with parent space group $Pnnm$ (No. 58) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N58.12.35 GM3$^-$ $\oplus$ Z1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N58.12.36 GM3$^-$ $\oplus$ Z2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N58.14.1 GM1$^-$ $\oplus$ DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N58.14.2 GM1$^-$ $\oplus$ DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N58.14.3 GM1$^-$ $\oplus$ LD1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N58.14.4 GM1$^-$ $\oplus$ LD3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N58.14.5 GM2$^+$ $\oplus$ DT1	$\surd$	1	1	$\surd$	$mm2$	B2
N58.14.6 GM2$^+$ $\oplus$ DT2	$\surd$	1	1	$\surd$	$mm2$	B2
N58.14.7 GM2$^+$ $\oplus$ LD1	$\surd$	1	1	$\surd$	222	B1
N58.14.8 GM2$^+$ $\oplus$ LD3	$\surd$	1	1	$\surd$	222	B1
N58.14.9 GM2$^-$ $\oplus$ DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N58.14.10 GM2$^-$ $\oplus$ DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N58.14.11 GM2$^-$ $\oplus$ LD1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N58.14.12 GM2$^-$ $\oplus$ LD3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N58.14.13 GM3$^+$ $\oplus$ SM1	$\surd$	1	1	$\surd$	222	B3
N58.14.14 GM3$^+$ $\oplus$ DT1	$\surd$	1	1	$\surd$	$mm2$	B2
N58.14.15 GM3$^+$ $\oplus$ SM2	$\surd$	1	1	$\surd$	222	B3
N58.14.16 GM3$^+$ $\oplus$ DT2	$\surd$	1	1	$\surd$	$mm2$	B2
N58.14.17 GM3$^+$ $\oplus$ LD1	$\surd$	1	1	$\surd$	$mm2$	B2
N58.14.18 GM3$^+$ $\oplus$ LD3	$\surd$	1	1	$\surd$	$mm2$	B2
N58.14.19 GM3$^-$ $\oplus$ SM1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N58.14.20 GM3$^-$ $\oplus$ DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N58.14.21 GM3$^-$ $\oplus$ SM2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N58.14.22 GM3$^-$ $\oplus$ DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N58.14.23 GM3$^-$ $\oplus$ LD1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N58.14.24 GM3$^-$ $\oplus$ LD3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$

TABLE S175: Collinear SSGs with parent space group $Pmmn$ (No. 59).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L59.1.1 GM1$^+$	1	mmm	$\mathrm{A_g}$
L59.2.1 GM1$^-$	0	-	-
L59.2.2 GM2$^+$	1	mmm	$\mathrm{B1_g}$
L59.2.3 GM2$^-$	0	-	-
L59.2.4 GM3$^+$	1	mmm	$\mathrm{B3_g}$
L59.2.5 GM3$^-$	0	-	-
L59.2.6 Z1$^+$	0	-	-
L59.2.7 Z1$^-$	0	-	-
L59.2.8 Z3$^+$	0	-	-

TABLE S176: Coplanar SSGs with parent space group $Pmmn$ (No. 59).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P59.1.1 GM1$^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$

Coplanar SSGs with parent space group $Pmmn$ (No. 59) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P59.2.1 $\mathrm{GM1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
P59.2.2 $\mathrm{GM2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
P59.2.3 $\mathrm{GM2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
P59.2.4 $\mathrm{GM3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g}$
P59.2.5 $\mathrm{GM3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u}$
P59.2.6 $\mathrm{Z1}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P59.2.7 $\mathrm{Z1}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P59.2.8 $\mathrm{Z3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P59.3.1 $\mathrm{GM1}^- \oplus \mathrm{GM1}^-$	$\surd$	0	0	$\surd$	-	-
P59.3.2 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
P59.3.3 $\mathrm{GM1}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
P59.3.4 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u}$
P59.3.5 $\mathrm{GM1}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
P59.3.6 $\mathrm{GM1}^- \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\times$	-	-
P59.3.7 $\mathrm{GM1}^- \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
P59.3.8 $\mathrm{GM1}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
P59.3.9 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
P59.3.10 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
P59.3.11 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
P59.3.12 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
P59.3.13 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
P59.3.14 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
P59.3.15 $\mathrm{GM2}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
P59.3.16 $\mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
P59.3.17 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
P59.3.18 $\mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
P59.3.19 $\mathrm{GM2}^- \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\times$	-	-
P59.3.20 $\mathrm{GM2}^- \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
P59.3.21 $\mathrm{GM2}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
P59.3.22 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
P59.3.23 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g}$
P59.3.24 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
P59.3.25 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
P59.3.26 $\mathrm{GM3}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
P59.3.27 $\mathrm{GM3}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
P59.3.28 $\mathrm{GM3}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
P59.3.29 $\mathrm{GM3}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
P59.3.30 $\mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
P59.3.31 $\mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
P59.3.32 $\mathrm{GM3}^- \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\times$	-	-
P59.3.33 $\mathrm{GM3}^- \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
P59.3.34 $\mathrm{GM3}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
P59.3.35 $\mathrm{GM3}^- \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
P59.3.36 $\mathrm{Z1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
P59.3.37 $\mathrm{Z1}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P59.3.38 $\mathrm{Z1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-

Coplanar SSGs with parent space group $Pmmn$ (No. 59) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P59.3.39 $\mathrm{Z1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
P59.3.40 $\mathrm{Z1}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
P59.3.41 $\mathrm{Z1}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
P59.3.42 $\mathrm{Z1}^- \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
P59.3.43 $\mathrm{Z1}^- \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P59.3.44 $\mathrm{Z1}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
P59.3.45 $\mathrm{Z1}^- \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
P59.3.46 $\mathrm{Z3}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
P59.3.47 $\mathrm{Z3}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
P59.3.48 $\mathrm{Z3}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
P59.3.49 $\mathrm{Z3}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P59.6.1 R1	$\surd$	1	1	$\times$	-	-
P59.6.2 S1	$\surd$	1	1	$\times$	-	-
P59.6.3 T1	$\surd$	1	1	$\times$	-	-
P59.6.4 T2	$\surd$	1	1	$\times$	-	-
P59.6.5 X1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P59.6.6 X2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P59.8.1 DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P59.8.2 DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P59.8.3 A1	$\surd$	1	1	$\times$	-	-
P59.8.4 A2	$\surd$	1	1	$\times$	-	-
P59.8.5 LD1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P59.8.6 LD2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P59.8.7 LD3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$

TABLE S177: Non-coplanar SSGs with parent space group $Pmmn$ (No. 59).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N59.1.1 $\mathrm{GM1}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{A_g}$
N59.2.1 $\mathrm{GM1}^-$	$\surd$	2	2	$\surd$	222	$\mathrm{A1} \oplus \mathrm{A1}$
N59.2.2 $\mathrm{GM2}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B1_g}$
N59.2.3 $\mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{A1}$
N59.2.4 $\mathrm{GM3}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B3_g}$
N59.2.5 $\mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{A1}$
N59.2.6 $\mathrm{Z1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
N59.2.7 $\mathrm{Z1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
N59.2.8 $\mathrm{Z3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
N59.3.1 $\mathrm{GM1}^- \oplus \mathrm{GM1}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{A_u}$
N59.3.2 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{A2}$
N59.3.3 $\mathrm{GM1}^- \oplus \mathrm{GM2}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N59.3.4 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{A2}$
N59.3.5 $\mathrm{GM1}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B3_u}$
N59.3.6 $\mathrm{GM1}^- \oplus \mathrm{Z1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
N59.3.7 $\mathrm{GM1}^- \oplus \mathrm{Z1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
N59.3.8 $\mathrm{GM1}^- \oplus \mathrm{Z3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
N59.3.9 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$

Non-coplanar SSGs with parent space group $Pmmn$ (No. 59) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N59.3.10 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	2	2	$\surd$	222	$\mathrm{A1} \oplus \mathrm{B1}$
N59.3.11 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g} \oplus \mathrm{B3_g}$
N59.3.12 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{B1}$
N59.3.13 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
N59.3.14 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
N59.3.15 $\mathrm{GM2}^+ \oplus \mathrm{Z3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
N59.3.16 $\mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N59.3.17 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{B2}$
N59.3.18 $\mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u} \oplus \mathrm{B3_u}$
N59.3.19 $\mathrm{GM2}^- \oplus \mathrm{Z1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
N59.3.20 $\mathrm{GM2}^- \oplus \mathrm{Z1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
N59.3.21 $\mathrm{GM2}^- \oplus \mathrm{Z3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
N59.3.22 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N59.3.23 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N59.3.24 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	222	$\mathrm{A1} \oplus \mathrm{B3}$
N59.3.25 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{B2}$
N59.3.26 $\mathrm{GM3}^+ \oplus \mathrm{Z1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g}$
N59.3.27 $\mathrm{GM3}^+ \oplus \mathrm{Z1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g}$
N59.3.28 $\mathrm{GM3}^+ \oplus \mathrm{Z3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g}$
N59.3.29 $\mathrm{GM3}^+ \oplus \mathrm{Z3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g}$
N59.3.30 $\mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N59.3.31 $\mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N59.3.32 $\mathrm{GM3}^- \oplus \mathrm{Z1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u}$
N59.3.33 $\mathrm{GM3}^- \oplus \mathrm{Z1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u}$
N59.3.34 $\mathrm{GM3}^- \oplus \mathrm{Z3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u}$
N59.3.35 $\mathrm{GM3}^- \oplus \mathrm{Z3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u}$
N59.3.36 $\mathrm{Z1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N59.3.37 $\mathrm{Z1}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\surd$	$mm2$	A1
N59.3.38 $\mathrm{Z1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\surd$	222	A1
N59.3.39 $\mathrm{Z1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N59.3.40 $\mathrm{Z1}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N59.3.41 $\mathrm{Z1}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\surd$	$mm2$	A1
N59.3.42 $\mathrm{Z1}^- \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N59.3.43 $\mathrm{Z1}^- \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\surd$	$mm2$	A1
N59.3.44 $\mathrm{Z1}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\surd$	$mm2$	A1
N59.3.45 $\mathrm{Z1}^- \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N59.3.46 $\mathrm{Z3}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N59.3.47 $\mathrm{Z3}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\surd$	222	A1
N59.3.48 $\mathrm{Z3}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N59.3.49 $\mathrm{Z3}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\surd$	$mm2$	A1
N59.6.1 R1	$\surd$	1	1	$\surd$	222	A1
N59.6.2 S1	$\surd$	1	1	$\surd$	222	A1
N59.6.3 T1	$\surd$	1	1	$\surd$	$mm2$	A1
N59.6.4 T2	$\surd$	1	1	$\surd$	$mm2$	A1
N59.6.5 X1	$\surd$	1	1	$\surd$	$mm2$	A1
N59.6.6 X2	$\surd$	1	1	$\surd$	$mm2$	A1

Non-coplanar SSGs with parent space group $Pmmn$ (No. 59) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N59.8.1 DT1	√	1	1	√	$mm2$	A1
N59.8.2 DT2	√	1	1	√	$mm2$	A1
N59.8.3 A1	√	1	1	√	$mm2$	A1
N59.8.4 A2	√	1	1	√	$mm2$	A1
N59.8.5 LD1	√	1	1	√	$mm2$	A1
N59.8.6 LD2	√	1	1	√	$mm2$	A1
N59.8.7 LD3	√	1	1	√	$mm2$	A1
N59.9.1 $\mathrm{GM1^-}\oplus\mathrm{GM1^-}\oplus\mathrm{GM1^-}$	√	0	0	√	-	-
N59.9.2 $\mathrm{GM1^-}\oplus\mathrm{GM1^-}\oplus\mathrm{GM2^+}$	√	3	3	√	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_u}\oplus\mathrm{B1_u}$
N59.9.3 $\mathrm{GM1^-}\oplus\mathrm{GM1^-}\oplus\mathrm{GM2^-}$	√	0	0	√	-	-
N59.9.4 $\mathrm{GM1^-}\oplus\mathrm{GM1^-}\oplus\mathrm{GM3^+}$	√	3	3	√	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_u}\oplus\mathrm{B3_u}$
N59.9.5 $\mathrm{GM1^-}\oplus\mathrm{GM1^-}\oplus\mathrm{GM3^-}$	√	0	0	√	-	-
N59.9.6 $\mathrm{GM1^-}\oplus\mathrm{GM1^-}\oplus\mathrm{Z1^+}$	√	0	0	√	-	-
N59.9.7 $\mathrm{GM1^-}\oplus\mathrm{GM1^-}\oplus\mathrm{Z1^-}$	√	0	0	√	-	-
N59.9.8 $\mathrm{GM1^-}\oplus\mathrm{GM1^-}\oplus\mathrm{Z3^+}$	√	0	0	√	-	-
N59.9.9 $\mathrm{GM1^-}\oplus\mathrm{GM2^+}\oplus\mathrm{GM2^+}$	√	2	2	√	222	$\mathrm{B1}\oplus\mathrm{B1}$
N59.9.10 $\mathrm{GM1^-}\oplus\mathrm{GM2^+}\oplus\mathrm{GM2^-}$	√	3	3	√	mmm	$\mathrm{A_u}\oplus\mathrm{B1_g}\oplus\mathrm{B1_u}$
N59.9.11 $\mathrm{GM1^-}\oplus\mathrm{GM2^+}\oplus\mathrm{GM3^+}$	√	2	2	√	$mm2$	$\mathrm{B2}\oplus\mathrm{B1}$
N59.9.12 $\mathrm{GM1^-}\oplus\mathrm{GM2^+}\oplus\mathrm{GM3^-}$	√	3	3	√	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_u}\oplus\mathrm{B2_u}$
N59.9.13 $\mathrm{GM1^-}\oplus\mathrm{GM2^+}\oplus\mathrm{Z1^+}$	√	2	2	√	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_u}$
N59.9.14 $\mathrm{GM1^-}\oplus\mathrm{GM2^+}\oplus\mathrm{Z1^-}$	√	2	2	√	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_u}$
N59.9.15 $\mathrm{GM1^-}\oplus\mathrm{GM2^+}\oplus\mathrm{Z3^+}$	√	2	2	√	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_u}$
N59.9.16 $\mathrm{GM1^-}\oplus\mathrm{GM2^-}\oplus\mathrm{GM2^-}$	√	0	0	√	-	-
N59.9.17 $\mathrm{GM1^-}\oplus\mathrm{GM2^-}\oplus\mathrm{GM3^+}$	√	3	3	√	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_u}\oplus\mathrm{B2_u}$
N59.9.18 $\mathrm{GM1^-}\oplus\mathrm{GM2^-}\oplus\mathrm{GM3^-}$	√	0	0	√	-	-
N59.9.19 $\mathrm{GM1^-}\oplus\mathrm{GM2^-}\oplus\mathrm{Z1^+}$	√	0	0	√	-	-
N59.9.20 $\mathrm{GM1^-}\oplus\mathrm{GM2^-}\oplus\mathrm{Z1^-}$	√	0	0	√	-	-
N59.9.21 $\mathrm{GM1^-}\oplus\mathrm{GM2^-}\oplus\mathrm{Z3^+}$	√	0	0	√	-	-
N59.9.22 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{GM3^+}$	√	2	2	√	222	$\mathrm{B3}\oplus\mathrm{B3}$
N59.9.23 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{GM4^+}$	√	2	2	√	$mm2$	$\mathrm{B2}\oplus\mathrm{B1}$
N59.9.24 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{GM3^-}$	√	3	3	√	mmm	$\mathrm{A_u}\oplus\mathrm{B3_g}\oplus\mathrm{B3_u}$
N59.9.25 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{GM4^-}$	√	3	3	√	mmm	$\mathrm{B1_u}\oplus\mathrm{B3_g}\oplus\mathrm{B3_u}$
N59.9.26 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{Z1^+}$	√	2	2	√	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_u}$
N59.9.27 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{Z1^-}$	√	2	2	√	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_u}$
N59.9.28 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{Z3^+}$	√	2	2	√	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_u}$
N59.9.29 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{Z3^-}$	√	2	2	√	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_u}$
N59.9.30 $\mathrm{GM1^-}\oplus\mathrm{GM3^-}\oplus\mathrm{GM3^-}$	√	0	0	√	-	-
N59.9.31 $\mathrm{GM1^-}\oplus\mathrm{GM3^-}\oplus\mathrm{GM4^-}$	√	0	0	√	-	-
N59.9.32 $\mathrm{GM1^-}\oplus\mathrm{GM3^-}\oplus\mathrm{Z1^+}$	√	0	0	√	-	-
N59.9.33 $\mathrm{GM1^-}\oplus\mathrm{GM3^-}\oplus\mathrm{Z1^-}$	√	0	0	√	-	-
N59.9.34 $\mathrm{GM1^-}\oplus\mathrm{GM3^-}\oplus\mathrm{Z3^+}$	√	0	0	√	-	-
N59.9.35 $\mathrm{GM1^-}\oplus\mathrm{GM3^-}\oplus\mathrm{Z3^-}$	√	0	0	√	-	-
N59.9.36 $\mathrm{GM1^-}\oplus\mathrm{Z1^+}\oplus\mathrm{Z1^+}$	√	1	0	×	-	-
N59.9.37 $\mathrm{GM1^-}\oplus\mathrm{Z1^+}\oplus\mathrm{Z2^-}$	√	1	1	√	mmm	$\mathrm{B1_u}$
N59.9.38 $\mathrm{GM1^-}\oplus\mathrm{Z1^+}\oplus\mathrm{Z1^-}$	√	1	1	×	-	-
N59.9.39 $\mathrm{GM1^-}\oplus\mathrm{Z1^+}\oplus\mathrm{Z2^+}$	√	1	0	×	-	-

Non-coplanar SSGs with parent space group $Pmmn$ (No. 59) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N59.9.40 $\mathrm{GM1}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N59.9.41 $\mathrm{GM1}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N59.9.42 $\mathrm{GM1}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N59.9.43 $\mathrm{GM1}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N59.9.44 $\mathrm{GM1}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
N59.9.45 $\mathrm{GM1}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N59.9.46 $\mathrm{GM1}^- \oplus \mathrm{Z3}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N59.9.47 $\mathrm{GM1}^- \oplus \mathrm{Z3}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N59.9.48 $\mathrm{GM1}^- \oplus \mathrm{Z3}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N59.9.49 $\mathrm{GM1}^- \oplus \mathrm{Z3}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N59.9.50 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N59.9.51 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{A2}$
N59.9.52 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B3_g}$
N59.9.53 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2} \oplus \mathrm{B2}$
N59.9.54 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{Z1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N59.9.55 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{Z1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N59.9.56 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{Z3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N59.9.57 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$
N59.9.58 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{B2}$
N59.9.59 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g} \oplus \mathrm{B2_u}$
N59.9.60 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{Z1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
N59.9.61 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{Z1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
N59.9.62 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{Z3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
N59.9.63 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N59.9.64 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N59.9.65 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{B2}$
N59.9.66 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	222	$\mathrm{B1} \oplus \mathrm{B3}$
N59.9.67 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Z1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N59.9.68 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Z1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N59.9.69 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Z3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N59.9.70 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Z3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N59.9.71 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N59.9.72 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N59.9.73 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Z1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N59.9.74 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Z1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N59.9.75 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Z3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N59.9.76 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Z3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N59.9.77 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\times$	-	-
N59.9.78 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\surd$	222	B1
N59.9.79 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
N59.9.80 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\times$	-	-
N59.9.81 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
N59.9.82 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N59.9.83 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
N59.9.84 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\surd$	222	B1
N59.9.85 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $Pmmn$ (No. 59) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N59.9.86 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N59.9.87 $\mathrm{GM2}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
N59.9.88 $\mathrm{GM2}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N59.9.89 $\mathrm{GM2}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\times$	-	-
N59.9.90 $\mathrm{GM2}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\surd$	222	B1
N59.9.91 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
N59.9.92 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N59.9.93 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N59.9.94 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Z1}^+$	$\surd$	0	0	$\surd$	-	-
N59.9.95 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Z1}^-$	$\surd$	0	0	$\surd$	-	-
N59.9.96 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Z3}^+$	$\surd$	0	0	$\surd$	-	-
N59.9.97 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2} \oplus \mathrm{B2}$
N59.9.98 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	222	$\mathrm{B3} \oplus \mathrm{B2}$
N59.9.99 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N59.9.100 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N59.9.101 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Z1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N59.9.102 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Z1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N59.9.103 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Z3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N59.9.104 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Z3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N59.9.105 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N59.9.106 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N59.9.107 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Z1}^+$	$\surd$	0	0	$\surd$	-	-
N59.9.108 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Z1}^-$	$\surd$	0	0	$\surd$	-	-
N59.9.109 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Z3}^+$	$\surd$	0	0	$\surd$	-	-
N59.9.110 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Z3}^-$	$\surd$	0	0	$\surd$	-	-
N59.9.111 $\mathrm{GM2}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N59.9.112 $\mathrm{GM2}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N59.9.113 $\mathrm{GM2}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
N59.9.114 $\mathrm{GM2}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N59.9.115 $\mathrm{GM2}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N59.9.116 $\mathrm{GM2}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N59.9.117 $\mathrm{GM2}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N59.9.118 $\mathrm{GM2}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N59.9.119 $\mathrm{GM2}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
N59.9.120 $\mathrm{GM2}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N59.9.121 $\mathrm{GM2}^- \oplus \mathrm{Z3}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N59.9.122 $\mathrm{GM2}^- \oplus \mathrm{Z3}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N59.9.123 $\mathrm{GM2}^- \oplus \mathrm{Z3}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N59.9.124 $\mathrm{GM2}^- \oplus \mathrm{Z3}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N59.9.125 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N59.9.126 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N59.9.127 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{A2}$
N59.9.128 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2} \oplus \mathrm{B2}$
N59.9.129 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{B2}$
N59.9.130 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Z1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
N59.9.131 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{Z1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g}$

Non-coplanar SSGs with parent space group $Pmmn$ (No. 59) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N59.9.132 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Z1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
N59.9.133 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{Z1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g}$
N59.9.134 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Z3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
N59.9.135 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Z3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
N59.9.136 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{Z3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g}$
N59.9.137 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B3_g}$
N59.9.138 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u} \oplus \mathrm{B3_g}$
N59.9.139 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B3_g}$
N59.9.140 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Z1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N59.9.141 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{Z1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N59.9.142 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Z1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N59.9.143 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{Z1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N59.9.144 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Z3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N59.9.145 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Z3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N59.9.146 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{Z3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N59.9.147 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{Z3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N59.9.148 $\mathrm{GM3}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\times$	-	-
N59.9.149 $\mathrm{GM3}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\surd$	$mm2$	B2
N59.9.150 $\mathrm{GM3}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
N59.9.151 $\mathrm{GM3}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\times$	-	-
N59.9.152 $\mathrm{GM3}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
N59.9.153 $\mathrm{GM3}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N59.9.154 $\mathrm{GM3}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\times$	-	-
N59.9.155 $\mathrm{GM3}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\times$	-	-
N59.9.156 $\mathrm{GM3}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
N59.9.157 $\mathrm{GM3}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\surd$	$mm2$	B2
N59.9.158 $\mathrm{GM3}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
N59.9.159 $\mathrm{GM3}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N59.9.160 $\mathrm{GM3}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\times$	-	-
N59.9.161 $\mathrm{GM3}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\times$	-	-
N59.9.162 $\mathrm{GM3}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
N59.9.163 $\mathrm{GM3}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N59.9.164 $\mathrm{GM3}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\times$	-	-
N59.9.165 $\mathrm{GM3}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\surd$	$mm2$	B2
N59.9.166 $\mathrm{GM3}^+ \oplus \mathrm{Z3}^- \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N59.9.167 $\mathrm{GM3}^+ \oplus \mathrm{Z3}^- \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\surd$	$mm2$	B2
N59.9.168 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N59.9.169 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N59.9.170 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Z1}^+$	$\surd$	0	0	$\surd$	-	-
N59.9.171 $\mathrm{GM3}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Z1}^+$	$\surd$	0	0	$\surd$	-	-
N59.9.172 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Z1}^-$	$\surd$	0	0	$\surd$	-	-
N59.9.173 $\mathrm{GM3}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Z1}^-$	$\surd$	0	0	$\surd$	-	-
N59.9.174 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Z3}^+$	$\surd$	0	0	$\surd$	-	-
N59.9.175 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Z3}^-$	$\surd$	0	0	$\surd$	-	-
N59.9.176 $\mathrm{GM3}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Z3}^+$	$\surd$	0	0	$\surd$	-	-
N59.9.177 $\mathrm{GM3}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $Pmmn$ (No. 59) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N59.9.178 $\mathrm{GM3^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N59.9.179 $\mathrm{GM3^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z1^-}$	$\surd$	1	1	$\times$	-	-
N59.9.180 $\mathrm{GM3^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z2^+}$	$\surd$	1	0	$\times$	-	-
N59.9.181 $\mathrm{GM3^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z3^+}$	$\surd$	1	0	$\times$	-	-
N59.9.182 $\mathrm{GM3^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z3^-}$	$\surd$	1	1	$\times$	-	-
N59.9.183 $\mathrm{GM3^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z4^+}$	$\surd$	1	0	$\times$	-	-
N59.9.184 $\mathrm{GM3^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z4^-}$	$\surd$	1	1	$\times$	-	-
N59.9.185 $\mathrm{GM3^-} \oplus \mathrm{Z1^-} \oplus \mathrm{Z1^-}$	$\surd$	1	0	$\times$	-	-
N59.9.186 $\mathrm{GM3^-} \oplus \mathrm{Z1^-} \oplus \mathrm{Z2^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N59.9.187 $\mathrm{GM3^-} \oplus \mathrm{Z1^-} \oplus \mathrm{Z3^+}$	$\surd$	1	1	$\times$	-	-
N59.9.188 $\mathrm{GM3^-} \oplus \mathrm{Z1^-} \oplus \mathrm{Z3^-}$	$\surd$	1	0	$\times$	-	-
N59.9.189 $\mathrm{GM3^-} \oplus \mathrm{Z1^-} \oplus \mathrm{Z4^+}$	$\surd$	1	1	$\times$	-	-
N59.9.190 $\mathrm{GM3^-} \oplus \mathrm{Z1^-} \oplus \mathrm{Z4^-}$	$\surd$	1	0	$\times$	-	-
N59.9.191 $\mathrm{GM3^-} \oplus \mathrm{Z3^+} \oplus \mathrm{Z3^+}$	$\surd$	1	0	$\times$	-	-
N59.9.192 $\mathrm{GM3^-} \oplus \mathrm{Z3^+} \oplus \mathrm{Z3^-}$	$\surd$	1	1	$\times$	-	-
N59.9.193 $\mathrm{GM3^-} \oplus \mathrm{Z3^+} \oplus \mathrm{Z4^+}$	$\surd$	1	0	$\times$	-	-
N59.9.194 $\mathrm{GM3^-} \oplus \mathrm{Z3^+} \oplus \mathrm{Z4^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N59.9.195 $\mathrm{GM3^-} \oplus \mathrm{Z3^-} \oplus \mathrm{Z3^-}$	$\surd$	1	0	$\times$	-	-
N59.9.196 $\mathrm{GM3^-} \oplus \mathrm{Z3^-} \oplus \mathrm{Z4^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N59.9.197 $\mathrm{Z1^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z1^+}$	$\surd$	0	0	$\surd$	-	-
N59.9.198 $\mathrm{Z1^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N59.9.199 $\mathrm{Z1^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u}$
N59.9.200 $\mathrm{Z1^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z2^+}$	$\surd$	0	0	$\surd$	-	-
N59.9.201 $\mathrm{Z1^+} \oplus \mathrm{Z2^-} \oplus \mathrm{Z1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u}$
N59.9.202 $\mathrm{Z1^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z3^+}$	$\surd$	0	0	$\surd$	-	-
N59.9.203 $\mathrm{Z1^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B3_u}$
N59.9.204 $\mathrm{Z1^+} \oplus \mathrm{Z2^-} \oplus \mathrm{Z3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N59.9.205 $\mathrm{Z1^+} \oplus \mathrm{Z1^-} \oplus \mathrm{Z1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u}$
N59.9.206 $\mathrm{Z1^+} \oplus \mathrm{Z1^-} \oplus \mathrm{Z2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u}$
N59.9.207 $\mathrm{Z1^+} \oplus \mathrm{Z2^+} \oplus \mathrm{Z2^+}$	$\surd$	0	0	$\surd$	-	-
N59.9.208 $\mathrm{Z1^+} \oplus \mathrm{Z1^-} \oplus \mathrm{Z3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u}$
N59.9.209 $\mathrm{Z1^+} \oplus \mathrm{Z1^-} \oplus \mathrm{Z3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u}$
N59.9.210 $\mathrm{Z1^+} \oplus \mathrm{Z2^+} \oplus \mathrm{Z3^+}$	$\surd$	0	0	$\surd$	-	-
N59.9.211 $\mathrm{Z1^+} \oplus \mathrm{Z2^+} \oplus \mathrm{Z3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_u}$
N59.9.212 $\mathrm{Z1^+} \oplus \mathrm{Z3^+} \oplus \mathrm{Z3^+}$	$\surd$	0	0	$\surd$	-	-
N59.9.213 $\mathrm{Z1^+} \oplus \mathrm{Z3^+} \oplus \mathrm{Z3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u}$
N59.9.214 $\mathrm{Z1^+} \oplus \mathrm{Z3^+} \oplus \mathrm{Z4^+}$	$\surd$	0	0	$\surd$	-	-
N59.9.215 $\mathrm{Z1^+} \oplus \mathrm{Z3^+} \oplus \mathrm{Z4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N59.9.216 $\mathrm{Z1^+} \oplus \mathrm{Z3^-} \oplus \mathrm{Z3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B3_u}$
N59.9.217 $\mathrm{Z1^+} \oplus \mathrm{Z3^-} \oplus \mathrm{Z4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_u}$
N59.9.218 $\mathrm{Z1^-} \oplus \mathrm{Z1^-} \oplus \mathrm{Z1^-}$	$\surd$	0	0	$\surd$	-	-
N59.9.219 $\mathrm{Z1^-} \oplus \mathrm{Z1^-} \oplus \mathrm{Z2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N59.9.220 $\mathrm{Z1^-} \oplus \mathrm{Z1^-} \oplus \mathrm{Z3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B3_u}$
N59.9.221 $\mathrm{Z1^-} \oplus \mathrm{Z1^-} \oplus \mathrm{Z3^-}$	$\surd$	0	0	$\surd$	-	-
N59.9.222 $\mathrm{Z1^-} \oplus \mathrm{Z2^+} \oplus \mathrm{Z3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u}$
N59.9.223 $\mathrm{Z1^-} \oplus \mathrm{Z3^+} \oplus \mathrm{Z3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B3_u}$

Non-coplanar SSGs with parent space group $Pmmn$ (No. 59) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N59.9.224 $\mathrm{Z1}^{-}\oplus\mathrm{Z3}^{+}\oplus\mathrm{Z3}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B3_u}$
N59.9.225 $\mathrm{Z1}^{-}\oplus\mathrm{Z3}^{+}\oplus\mathrm{Z4}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u}\oplus\mathrm{B2_u}$
N59.9.226 $\mathrm{Z1}^{-}\oplus\mathrm{Z3}^{+}\oplus\mathrm{Z4}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B3_u}$
N59.9.227 $\mathrm{Z1}^{-}\oplus\mathrm{Z3}^{-}\oplus\mathrm{Z3}^{-}$	$\surd$	0	0	$\surd$	-	-
N59.9.228 $\mathrm{Z1}^{-}\oplus\mathrm{Z3}^{-}\oplus\mathrm{Z4}^{-}$	$\surd$	0	0	$\surd$	-	-
N59.9.229 $\mathrm{Z3}^{+}\oplus\mathrm{Z3}^{+}\oplus\mathrm{Z3}^{+}$	$\surd$	0	0	$\surd$	-	-
N59.9.230 $\mathrm{Z3}^{+}\oplus\mathrm{Z3}^{+}\oplus\mathrm{Z3}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{A_u}$
N59.9.231 $\mathrm{Z3}^{+}\oplus\mathrm{Z3}^{+}\oplus\mathrm{Z4}^{+}$	$\surd$	0	0	$\surd$	-	-
N59.9.232 $\mathrm{Z3}^{+}\oplus\mathrm{Z3}^{+}\oplus\mathrm{Z4}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B1_u}$
N59.9.233 $\mathrm{Z3}^{+}\oplus\mathrm{Z3}^{-}\oplus\mathrm{Z4}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B1_u}$
N59.12.1 $\mathrm{GM1}^{-}\oplus\mathrm{R1}$	$\surd$	1	1	$\times$	-	-
N59.12.2 $\mathrm{GM1}^{-}\oplus\mathrm{S1}$	$\surd$	1	1	$\times$	-	-
N59.12.3 $\mathrm{GM1}^{-}\oplus\mathrm{T1}$	$\surd$	1	1	$\times$	-	-
N59.12.4 $\mathrm{GM1}^{-}\oplus\mathrm{T2}$	$\surd$	1	1	$\times$	-	-
N59.12.5 $\mathrm{GM1}^{-}\oplus\mathrm{X1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N59.12.6 $\mathrm{GM1}^{-}\oplus\mathrm{X2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N59.12.7 $\mathrm{GM2}^{+}\oplus\mathrm{R1}$	$\surd$	1	1	$\times$	-	-
N59.12.8 $\mathrm{GM2}^{+}\oplus\mathrm{S1}$	$\surd$	1	1	$\times$	-	-
N59.12.9 $\mathrm{GM2}^{+}\oplus\mathrm{T1}$	$\surd$	1	1	$\times$	-	-
N59.12.10 $\mathrm{GM2}^{+}\oplus\mathrm{T2}$	$\surd$	1	1	$\times$	-	-
N59.12.11 $\mathrm{GM2}^{+}\oplus\mathrm{X1}$	$\surd$	1	1	$\surd$	$mm2$	B1
N59.12.12 $\mathrm{GM2}^{+}\oplus\mathrm{X2}$	$\surd$	1	1	$\surd$	$mm2$	B1
N59.12.13 $\mathrm{GM2}^{-}\oplus\mathrm{R1}$	$\surd$	1	1	$\times$	-	-
N59.12.14 $\mathrm{GM2}^{-}\oplus\mathrm{S1}$	$\surd$	1	1	$\times$	-	-
N59.12.15 $\mathrm{GM2}^{-}\oplus\mathrm{T1}$	$\surd$	1	1	$\times$	-	-
N59.12.16 $\mathrm{GM2}^{-}\oplus\mathrm{T2}$	$\surd$	1	1	$\times$	-	-
N59.12.17 $\mathrm{GM2}^{-}\oplus\mathrm{X1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N59.12.18 $\mathrm{GM2}^{-}\oplus\mathrm{X2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N59.12.19 $\mathrm{GM3}^{+}\oplus\mathrm{R1}$	$\surd$	1	1	$\times$	-	-
N59.12.20 $\mathrm{GM3}^{+}\oplus\mathrm{S1}$	$\surd$	1	1	$\times$	-	-
N59.12.21 $\mathrm{GM3}^{+}\oplus\mathrm{T1}$	$\surd$	1	1	$\times$	-	-
N59.12.22 $\mathrm{GM3}^{+}\oplus\mathrm{U1}$	$\surd$	1	1	$\times$	-	-
N59.12.23 $\mathrm{GM3}^{+}\oplus\mathrm{T2}$	$\surd$	1	1	$\times$	-	-
N59.12.24 $\mathrm{GM3}^{+}\oplus\mathrm{U2}$	$\surd$	1	1	$\times$	-	-
N59.12.25 $\mathrm{GM3}^{+}\oplus\mathrm{X1}$	$\surd$	1	1	$\surd$	222	B3
N59.12.26 $\mathrm{GM3}^{+}\oplus\mathrm{Y1}$	$\surd$	1	1	$\surd$	$mm2$	B2
N59.12.27 $\mathrm{GM3}^{+}\oplus\mathrm{X2}$	$\surd$	1	1	$\surd$	222	B3
N59.12.28 $\mathrm{GM3}^{+}\oplus\mathrm{Y2}$	$\surd$	1	1	$\surd$	$mm2$	B2
N59.12.29 $\mathrm{GM3}^{-}\oplus\mathrm{R1}$	$\surd$	1	1	$\times$	-	-
N59.12.30 $\mathrm{GM3}^{-}\oplus\mathrm{S1}$	$\surd$	1	1	$\times$	-	-
N59.12.31 $\mathrm{GM3}^{-}\oplus\mathrm{T1}$	$\surd$	1	1	$\times$	-	-
N59.12.32 $\mathrm{GM3}^{-}\oplus\mathrm{U1}$	$\surd$	1	1	$\times$	-	-
N59.12.33 $\mathrm{GM3}^{-}\oplus\mathrm{T2}$	$\surd$	1	1	$\times$	-	-
N59.12.34 $\mathrm{GM3}^{-}\oplus\mathrm{U2}$	$\surd$	1	1	$\times$	-	-
N59.12.35 $\mathrm{GM3}^{-}\oplus\mathrm{X1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N59.12.36 $\mathrm{GM3}^{-}\oplus\mathrm{Y1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$

Non-coplanar SSGs with parent space group $Pmmn$ (No. 59) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N59.12.37 GM3$^-$ ⊕ X2	√	1	1	√	mmm	$\mathrm{B3_u}$
N59.12.38 GM3$^-$ ⊕ Y2	√	1	1	√	mmm	$\mathrm{B2_u}$
N59.12.39 Z1$^+$ ⊕ R1	√	1	1	×	-	-
N59.12.40 Z1$^+$ ⊕ S1	√	1	1	×	-	-
N59.12.41 Z1$^+$ ⊕ T1	√	1	1	√	mmm	$\mathrm{B2_u}$
N59.12.42 Z1$^+$ ⊕ T2	√	1	1	√	mmm	$\mathrm{B2_u}$
N59.12.43 Z1$^+$ ⊕ X1	√	1	1	√	mmm	$\mathrm{B3_u}$
N59.12.44 Z1$^+$ ⊕ X2	√	1	1	√	mmm	$\mathrm{B3_u}$
N59.12.45 Z1$^-$ ⊕ R1	√	1	1	×	-	-
N59.12.46 Z1$^-$ ⊕ S1	√	1	1	×	-	-
N59.12.47 Z1$^-$ ⊕ T1	√	1	1	√	mmm	$\mathrm{B2_u}$
N59.12.48 Z1$^-$ ⊕ T2	√	1	1	√	mmm	$\mathrm{B2_u}$
N59.12.49 Z1$^-$ ⊕ X1	√	1	1	√	mmm	$\mathrm{B3_u}$
N59.12.50 Z1$^-$ ⊕ X2	√	1	1	√	mmm	$\mathrm{B3_u}$
N59.12.51 Z3$^+$ ⊕ R1	√	1	1	×	-	-
N59.12.52 Z3$^+$ ⊕ S1	√	1	1	×	-	-
N59.12.53 Z3$^+$ ⊕ T1	√	1	1	√	mmm	$\mathrm{B2_u}$
N59.12.54 Z3$^+$ ⊕ U1	√	1	1	√	mmm	$\mathrm{B3_u}$
N59.12.55 Z3$^+$ ⊕ T2	√	1	1	√	mmm	$\mathrm{B2_u}$
N59.12.56 Z3$^+$ ⊕ U2	√	1	1	√	mmm	$\mathrm{B3_u}$
N59.12.57 Z3$^+$ ⊕ X1	√	1	1	√	mmm	$\mathrm{B3_u}$
N59.12.58 Z3$^+$ ⊕ Y1	√	1	1	√	mmm	$\mathrm{B2_u}$
N59.12.59 Z3$^+$ ⊕ X2	√	1	1	√	mmm	$\mathrm{B3_u}$
N59.12.60 Z3$^+$ ⊕ Y2	√	1	1	√	mmm	$\mathrm{B2_u}$
N59.14.1 GM1$^-$ ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N59.14.2 GM1$^-$ ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
N59.14.3 GM1$^-$ ⊕ A1	√	1	1	×	-	-
N59.14.4 GM1$^-$ ⊕ A2	√	1	1	×	-	-
N59.14.5 GM1$^-$ ⊕ LD1	√	1	1	√	mmm	$\mathrm{B1_u}$
N59.14.6 GM1$^-$ ⊕ LD2	√	1	1	√	mmm	$\mathrm{B1_u}$
N59.14.7 GM1$^-$ ⊕ LD3	√	1	1	√	mmm	$\mathrm{B1_u}$
N59.14.8 GM2$^+$ ⊕ DT1	√	1	1	√	$mm2$	B2
N59.14.9 GM2$^+$ ⊕ DT2	√	1	1	√	$mm2$	B2
N59.14.10 GM2$^+$ ⊕ A1	√	1	1	×	-	-
N59.14.11 GM2$^+$ ⊕ A2	√	1	1	×	-	-
N59.14.12 GM2$^+$ ⊕ LD1	√	1	1	√	222	B1
N59.14.13 GM2$^+$ ⊕ LD2	√	1	1	√	222	B1
N59.14.14 GM2$^+$ ⊕ LD3	√	1	1	√	222	B1
N59.14.15 GM2$^-$ ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N59.14.16 GM2$^-$ ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
N59.14.17 GM2$^-$ ⊕ A1	√	1	1	×	-	-
N59.14.18 GM2$^-$ ⊕ A2	√	1	1	×	-	-
N59.14.19 GM2$^-$ ⊕ LD1	√	1	1	√	mmm	$\mathrm{B1_u}$
N59.14.20 GM2$^-$ ⊕ LD2	√	1	1	√	mmm	$\mathrm{B1_u}$
N59.14.21 GM2$^-$ ⊕ LD3	√	1	1	√	mmm	$\mathrm{B1_u}$
N59.14.22 GM3$^+$ ⊕ SM1	√	1	1	√	222	B3

Non-coplanar SSGs with parent space group $Pmmn$ (No. 59) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N59.14.23 GM3$^+$ ⊕ DT1	√	1	1	√	$mm2$	B2
N59.14.24 GM3$^+$ ⊕ SM2	√	1	1	√	222	B3
N59.14.25 GM3$^+$ ⊕ DT2	√	1	1	√	$mm2$	B2
N59.14.26 GM3$^+$ ⊕ A1	√	1	1	×	-	-
N59.14.27 GM3$^+$ ⊕ B1	√	1	1	×	-	-
N59.14.28 GM3$^+$ ⊕ A2	√	1	1	×	-	-
N59.14.29 GM3$^+$ ⊕ B2	√	1	1	×	-	-
N59.14.30 GM3$^+$ ⊕ LD1	√	1	1	√	$mm2$	B2
N59.14.31 GM3$^+$ ⊕ LD2	√	1	1	√	$mm2$	B2
N59.14.32 GM3$^+$ ⊕ LD3	√	1	1	√	$mm2$	B2
N59.14.33 GM3$^+$ ⊕ LD4	√	1	1	√	$mm2$	B2
N59.14.34 GM3$^-$ ⊕ SM1	√	1	1	√	mmm	$\mathrm{B3_u}$
N59.14.35 GM3$^-$ ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N59.14.36 GM3$^-$ ⊕ SM2	√	1	1	√	mmm	$\mathrm{B3_u}$
N59.14.37 GM3$^-$ ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
N59.14.38 GM3$^-$ ⊕ A1	√	1	1	×	-	-
N59.14.39 GM3$^-$ ⊕ B1	√	1	1	×	-	-
N59.14.40 GM3$^-$ ⊕ A2	√	1	1	×	-	-
N59.14.41 GM3$^-$ ⊕ B2	√	1	1	×	-	-
N59.14.42 GM3$^-$ ⊕ LD1	√	1	1	√	mmm	$\mathrm{B1_u}$
N59.14.43 GM3$^-$ ⊕ LD2	√	1	1	√	mmm	$\mathrm{B1_u}$
N59.14.44 GM3$^-$ ⊕ LD3	√	1	1	√	mmm	$\mathrm{B1_u}$
N59.14.45 GM3$^-$ ⊕ LD4	√	1	1	√	mmm	$\mathrm{B1_u}$
N59.14.46 Z1$^+$ ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N59.14.47 Z1$^+$ ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
N59.14.48 Z1$^+$ ⊕ A1	√	1	1	√	mmm	$\mathrm{B3_u}$
N59.14.49 Z1$^+$ ⊕ A2	√	1	1	√	mmm	$\mathrm{B3_u}$
N59.14.50 Z1$^+$ ⊕ LD1	√	1	1	√	mmm	$\mathrm{B1_u}$
N59.14.51 Z1$^+$ ⊕ LD2	√	1	1	√	mmm	$\mathrm{B1_u}$
N59.14.52 Z1$^+$ ⊕ LD3	√	1	1	√	mmm	$\mathrm{B1_u}$
N59.14.53 Z1$^-$ ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N59.14.54 Z1$^-$ ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
N59.14.55 Z1$^-$ ⊕ A1	√	1	1	√	mmm	$\mathrm{B3_u}$
N59.14.56 Z1$^-$ ⊕ A2	√	1	1	√	mmm	$\mathrm{B3_u}$
N59.14.57 Z1$^-$ ⊕ LD1	√	1	1	√	mmm	$\mathrm{B1_u}$
N59.14.58 Z1$^-$ ⊕ LD2	√	1	1	√	mmm	$\mathrm{B1_u}$
N59.14.59 Z1$^-$ ⊕ LD3	√	1	1	√	mmm	$\mathrm{B1_u}$
N59.14.60 Z3$^+$ ⊕ SM1	√	1	1	√	mmm	$\mathrm{B3_u}$
N59.14.61 Z3$^+$ ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N59.14.62 Z3$^+$ ⊕ SM2	√	1	1	√	mmm	$\mathrm{B3_u}$
N59.14.63 Z3$^+$ ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
N59.14.64 Z3$^+$ ⊕ A1	√	1	1	√	mmm	$\mathrm{B3_u}$
N59.14.65 Z3$^+$ ⊕ B1	√	1	1	√	mmm	$\mathrm{B2_u}$
N59.14.66 Z3$^+$ ⊕ A2	√	1	1	√	mmm	$\mathrm{B3_u}$
N59.14.67 Z3$^+$ ⊕ B2	√	1	1	√	mmm	$\mathrm{B2_u}$
N59.14.68 Z3$^+$ ⊕ LD1	√	1	1	√	mmm	$\mathrm{B1_u}$

Non-coplanar SSGs with parent space group $Pmmn$ (No. 59) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N59.14.69 $\mathrm{Z3}^{+} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N59.14.70 $\mathrm{Z3}^{+} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N59.14.71 $\mathrm{Z3}^{+} \oplus \mathrm{LD4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$

TABLE S178: Collinear SSGs with parent space group $Pbcn$ (No. 60).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L60.1.1 $\mathrm{GM1}^{+}$	1	mmm	$\mathrm{A_g}$
L60.2.1 $\mathrm{GM1}^{-}$	0	-	-
L60.2.2 $\mathrm{GM2}^{+}$	1	mmm	$\mathrm{B1_g}$
L60.2.3 $\mathrm{GM2}^{-}$	0	-	-
L60.2.4 $\mathrm{GM3}^{+}$	1	mmm	$\mathrm{B3_g}$
L60.2.5 $\mathrm{GM3}^{-}$	0	-	-
L60.2.6 $\mathrm{GM4}^{+}$	1	mmm	$\mathrm{B2_g}$
L60.2.7 $\mathrm{GM4}^{-}$	0	-	-

TABLE S179: Coplanar SSGs with parent space group $Pbcn$ (No. 60).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P60.1.1 $\mathrm{GM1}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
P60.2.1 $\mathrm{GM1}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
P60.2.2 $\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
P60.2.3 $\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
P60.2.4 $\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g}$
P60.2.5 $\mathrm{GM3}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u}$
P60.2.6 $\mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B2_g}$
P60.2.7 $\mathrm{GM4}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B2_u}$
P60.3.1 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-}$	$\surd$	0	0	$\surd$	-	-
P60.3.2 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
P60.3.3 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
P60.3.4 $\mathrm{GM1}^{-} \oplus \mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u}$
P60.3.5 $\mathrm{GM1}^{-} \oplus \mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
P60.3.6 $\mathrm{GM1}^{-} \oplus \mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_g} \oplus \mathrm{B2_u}$
P60.3.7 $\mathrm{GM1}^{-} \oplus \mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
P60.3.8 $\mathrm{GM2}^{+} \oplus \mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
P60.3.9 $\mathrm{GM2}^{+} \oplus \mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
P60.3.10 $\mathrm{GM2}^{+} \oplus \mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
P60.3.11 $\mathrm{GM2}^{+} \oplus \mathrm{GM3}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
P60.3.12 $\mathrm{GM2}^{+} \oplus \mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
P60.3.13 $\mathrm{GM2}^{+} \oplus \mathrm{GM4}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_u}$
P60.3.14 $\mathrm{GM2}^{-} \oplus \mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
P60.3.15 $\mathrm{GM2}^{-} \oplus \mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
P60.3.16 $\mathrm{GM2}^{-} \oplus \mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
P60.3.17 $\mathrm{GM2}^{-} \oplus \mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_g}$
P60.3.18 $\mathrm{GM2}^{-} \oplus \mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-

Coplanar SSGs with parent space group $Pbcn$ (No. 60) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P60.3.19 $\mathrm{GM3^+ \oplus GM3^+}$	√	2	2	√	mmm	$\mathrm{B3_g \oplus B3_g}$
P60.3.20 $\mathrm{GM3^+ \oplus GM3^-}$	√	2	2	√	mmm	$\mathrm{A_u \oplus B3_g}$
P60.3.21 $\mathrm{GM3^+ \oplus GM4^+}$	√	2	2	√	mmm	$\mathrm{B3_g \oplus B2_g}$
P60.3.22 $\mathrm{GM3^+ \oplus GM4^-}$	√	2	2	√	mmm	$\mathrm{B1_u \oplus B3_g}$
P60.3.23 $\mathrm{GM3^- \oplus GM3^-}$	√	0	0	√	-	-
P60.3.24 $\mathrm{GM3^- \oplus GM4^+}$	√	2	2	√	mmm	$\mathrm{B1_u \oplus B2_g}$
P60.3.25 $\mathrm{GM3^- \oplus GM4^-}$	√	0	0	√	-	-
P60.3.26 $\mathrm{GM4^+ \oplus GM4^+}$	√	2	2	√	mmm	$\mathrm{B2_g \oplus B2_g}$
P60.3.27 $\mathrm{GM4^+ \oplus GM4^-}$	√	2	2	√	mmm	$\mathrm{A_u \oplus B2_g}$
P60.3.28 $\mathrm{GM4^- \oplus GM4^-}$	√	0	0	√	-	-
P60.6.1 $\mathrm{S1^+}$	√	1	0	×	-	-
P60.6.2 X1	√	1	1	√	mmm	$\mathrm{B3_u}$
P60.6.3 X2	√	1	1	√	mmm	$\mathrm{B3_u}$
P60.6.4 Y1	√	1	1	√	mmm	$\mathrm{B2_u}$
P60.6.5 Y2	√	1	1	√	mmm	$\mathrm{B2_u}$
P60.6.6 Z1	√	1	1	√	mmm	$\mathrm{B1_u}$
P60.6.7 Z2	√	1	1	√	mmm	$\mathrm{B1_u}$
P60.8.1 SM1	√	1	1	√	mmm	$\mathrm{B3_u}$
P60.8.2 SM2	√	1	1	√	mmm	$\mathrm{B3_u}$
P60.8.3 DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
P60.8.4 DT3	√	1	1	√	mmm	$\mathrm{B2_u}$
P60.8.5 LD1	√	1	1	√	mmm	$\mathrm{B1_u}$
P60.8.6 LD2	√	1	1	√	mmm	$\mathrm{B1_u}$

TABLE S180: Non-coplanar SSGs with parent space group $Pbcn$ (No. 60).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N60.1.1 $\mathrm{GM1^+}$	√	3	3	√	mmm	$\mathrm{A_g \oplus A_g \oplus A_g}$
N60.2.1 $\mathrm{GM1^-}$	√	2	2	√	222	$\mathrm{A1 \oplus A1}$
N60.2.2 $\mathrm{GM2^+}$	√	3	3	√	mmm	$\mathrm{A_g \oplus A_g \oplus B1_g}$
N60.2.3 $\mathrm{GM2^-}$	√	2	2	√	$mm2$	$\mathrm{A1 \oplus A1}$
N60.2.4 $\mathrm{GM3^+}$	√	3	3	√	mmm	$\mathrm{A_g \oplus A_g \oplus B3_g}$
N60.2.5 $\mathrm{GM3^-}$	√	2	2	√	$mm2$	$\mathrm{A1 \oplus A1}$
N60.2.6 $\mathrm{GM4^+}$	√	3	3	√	mmm	$\mathrm{A_g \oplus A_g \oplus B2_g}$
N60.2.7 $\mathrm{GM4^-}$	√	2	2	√	$mm2$	$\mathrm{A1 \oplus A1}$
N60.3.1 $\mathrm{GM1^- \oplus GM1^-}$	√	3	3	√	mmm	$\mathrm{A_g \oplus A_u \oplus A_u}$
N60.3.2 $\mathrm{GM1^- \oplus GM2^+}$	√	2	2	√	$mm2$	$\mathrm{A1 \oplus A2}$
N60.3.3 $\mathrm{GM1^- \oplus GM2^-}$	√	3	3	√	mmm	$\mathrm{A_g \oplus A_u \oplus B1_u}$
N60.3.4 $\mathrm{GM1^- \oplus GM3^+}$	√	2	2	√	$mm2$	$\mathrm{A1 \oplus A2}$
N60.3.5 $\mathrm{GM1^- \oplus GM3^-}$	√	3	3	√	mmm	$\mathrm{A_g \oplus A_u \oplus B3_u}$
N60.3.6 $\mathrm{GM1^- \oplus GM4^+}$	√	2	2	√	$mm2$	$\mathrm{A1 \oplus A2}$
N60.3.7 $\mathrm{GM1^- \oplus GM4^-}$	√	3	3	√	mmm	$\mathrm{A_g \oplus A_u \oplus B2_u}$
N60.3.8 $\mathrm{GM2^+ \oplus GM2^+}$	√	3	3	√	mmm	$\mathrm{A_g \oplus B1_g \oplus B1_g}$
N60.3.9 $\mathrm{GM2^+ \oplus GM2^-}$	√	2	2	√	222	$\mathrm{A1 \oplus B1}$
N60.3.10 $\mathrm{GM2^+ \oplus GM3^+}$	√	3	3	√	mmm	$\mathrm{A_g \oplus B1_g \oplus B3_g}$
N60.3.11 $\mathrm{GM2^+ \oplus GM3^-}$	√	2	2	√	$mm2$	$\mathrm{A1 \oplus B1}$

Non-coplanar SSGs with parent space group $Pbcn$ (No. 60) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N60.3.12 $\mathrm{GM2^+} \oplus \mathrm{GM4^+}$	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g} \oplus \mathrm{B2_g}$
N60.3.13 $\mathrm{GM2^+} \oplus \mathrm{GM4^-}$	√	2	2	√	$mm2$	$\mathrm{A1} \oplus \mathrm{B2}$
N60.3.14 $\mathrm{GM2^-} \oplus \mathrm{GM2^-}$	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N60.3.15 $\mathrm{GM2^-} \oplus \mathrm{GM3^+}$	√	2	2	√	$mm2$	$\mathrm{A1} \oplus \mathrm{B2}$
N60.3.16 $\mathrm{GM2^-} \oplus \mathrm{GM3^-}$	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u} \oplus \mathrm{B3_u}$
N60.3.17 $\mathrm{GM2^-} \oplus \mathrm{GM4^+}$	√	2	2	√	$mm2$	$\mathrm{A1} \oplus \mathrm{B1}$
N60.3.18 $\mathrm{GM2^-} \oplus \mathrm{GM4^-}$	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_u}$
N60.3.19 $\mathrm{GM3^+} \oplus \mathrm{GM3^+}$	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N60.3.20 $\mathrm{GM3^+} \oplus \mathrm{GM3^-}$	√	2	2	√	222	$\mathrm{A1} \oplus \mathrm{B3}$
N60.3.21 $\mathrm{GM3^+} \oplus \mathrm{GM4^+}$	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N60.3.22 $\mathrm{GM3^+} \oplus \mathrm{GM4^-}$	√	2	2	√	$mm2$	$\mathrm{A1} \oplus \mathrm{B2}$
N60.3.23 $\mathrm{GM3^-} \oplus \mathrm{GM3^-}$	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N60.3.24 $\mathrm{GM3^-} \oplus \mathrm{GM4^+}$	√	2	2	√	$mm2$	$\mathrm{A1} \oplus \mathrm{B1}$
N60.3.25 $\mathrm{GM3^-} \oplus \mathrm{GM4^-}$	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N60.3.26 $\mathrm{GM4^+} \oplus \mathrm{GM4^+}$	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N60.3.27 $\mathrm{GM4^+} \oplus \mathrm{GM4^-}$	√	2	2	√	222	$\mathrm{A1} \oplus \mathrm{B2}$
N60.3.28 $\mathrm{GM4^-} \oplus \mathrm{GM4^-}$	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N60.6.1 $\mathrm{S1^+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N60.6.2 X1	√	1	1	√	$mm2$	A1
N60.6.3 X2	√	1	1	√	$mm2$	A1
N60.6.4 Y1	√	1	1	√	$mm2$	A1
N60.6.5 Y2	√	1	1	√	$mm2$	A1
N60.6.6 Z1	√	1	1	√	$mm2$	A1
N60.6.7 Z2	√	1	1	√	$mm2$	A1
N60.8.1 SM1	√	1	1	√	$mm2$	A1
N60.8.2 SM2	√	1	1	√	$mm2$	A1
N60.8.3 DT1	√	1	1	√	$mm2$	A1
N60.8.4 DT3	√	1	1	√	$mm2$	A1
N60.8.5 LD1	√	1	1	√	$mm2$	A1
N60.8.6 LD2	√	1	1	√	$mm2$	A1
N60.9.1 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM1^-}$	√	0	0	√	-	-
N60.9.2 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM2^+}$	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N60.9.3 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM2^-}$	√	0	0	√	-	-
N60.9.4 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM3^+}$	√	3	3	√	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N60.9.5 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM3^-}$	√	0	0	√	-	-
N60.9.6 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM4^+}$	√	3	3	√	mmm	$\mathrm{B2_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N60.9.7 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM4^-}$	√	0	0	√	-	-
N60.9.8 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{GM2^+}$	√	2	2	√	222	$\mathrm{B1} \oplus \mathrm{B1}$
N60.9.9 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{GM2^-}$	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N60.9.10 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{GM3^+}$	√	2	2	√	$mm2$	$\mathrm{B2} \oplus \mathrm{B1}$
N60.9.11 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{GM3^-}$	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_u}$
N60.9.12 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{GM4^+}$	√	2	2	√	$mm2$	$\mathrm{B2} \oplus \mathrm{B1}$
N60.9.13 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{GM4^-}$	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B3_u}$
N60.9.14 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{GM2^-}$	√	0	0	√	-	-
N60.9.15 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{GM3^+}$	√	3	3	√	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N60.9.16 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{GM3^-}$	√	0	0	√	-	-

Non-coplanar SSGs with parent space group $Pbcn$ (No. 60) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N60.9.17 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N60.9.18 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N60.9.19 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	222	$\mathrm{B3} \oplus \mathrm{B3}$
N60.9.20 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N60.9.21 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2} \oplus \mathrm{B1}$
N60.9.22 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N60.9.23 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N60.9.24 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N60.9.25 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N60.9.26 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	222	$\mathrm{B2} \oplus \mathrm{B2}$
N60.9.27 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N60.9.28 $\mathrm{GM1}^- \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N60.9.29 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N60.9.30 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{A2}$
N60.9.31 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B3_g}$
N60.9.32 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2} \oplus \mathrm{B2}$
N60.9.33 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B2_g}$
N60.9.34 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B1} \oplus \mathrm{B1}$
N60.9.35 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$
N60.9.36 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{B2}$
N60.9.37 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g} \oplus \mathrm{B2_u}$
N60.9.38 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{B1}$
N60.9.39 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g} \oplus \mathrm{B3_u}$
N60.9.40 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N60.9.41 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{B2}$
N60.9.42 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N60.9.43 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	222	$\mathrm{B1} \oplus \mathrm{B3}$
N60.9.44 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N60.9.45 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	222	$\mathrm{B1} \oplus \mathrm{B2}$
N60.9.46 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N60.9.47 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N60.9.48 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{B1}$
N60.9.49 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N60.9.50 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
N60.9.51 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N60.9.52 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N60.9.53 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_g}$
N60.9.54 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N60.9.55 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2} \oplus \mathrm{B2}$
N60.9.56 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N60.9.57 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	222	$\mathrm{B3} \oplus \mathrm{B2}$
N60.9.58 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N60.9.59 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N60.9.60 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_g}$
N60.9.61 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N60.9.62 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B1} \oplus \mathrm{B1}$

Non-coplanar SSGs with parent space group $Pbcn$ (No. 60) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N60.9.63 $\mathrm{GM2}^{-}\oplus\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{-}$	√	3	3	√	mmm	$\mathrm{A_u}\oplus\mathrm{B3_u}\oplus\mathrm{B2_g}$
N60.9.64 $\mathrm{GM2}^{-}\oplus\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}$	√	0	0	√	-	-
N60.9.65 $\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{+}$	√	3	3	√	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_g}\oplus\mathrm{B3_g}$
N60.9.66 $\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{-}$	√	2	2	√	$mm2$	$\mathrm{A2}\oplus\mathrm{A2}$
N60.9.67 $\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{+}\oplus\mathrm{GM4}^{+}$	√	3	3	√	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_g}\oplus\mathrm{B2_g}$
N60.9.68 $\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{+}\oplus\mathrm{GM4}^{-}$	√	2	2	√	$mm2$	$\mathrm{B2}\oplus\mathrm{B2}$
N60.9.69 $\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}$	√	3	3	√	mmm	$\mathrm{A_u}\oplus\mathrm{A_u}\oplus\mathrm{B3_g}$
N60.9.70 $\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{+}$	√	2	2	√	$mm2$	$\mathrm{A2}\oplus\mathrm{B2}$
N60.9.71 $\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{-}$	√	3	3	√	mmm	$\mathrm{A_u}\oplus\mathrm{B1_u}\oplus\mathrm{B3_g}$
N60.9.72 $\mathrm{GM3}^{+}\oplus\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{+}$	√	3	3	√	mmm	$\mathrm{B3_g}\oplus\mathrm{B2_g}\oplus\mathrm{B2_g}$
N60.9.73 $\mathrm{GM3}^{+}\oplus\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{-}$	√	2	2	√	$mm2$	$\mathrm{A2}\oplus\mathrm{B1}$
N60.9.74 $\mathrm{GM3}^{+}\oplus\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}$	√	3	3	√	mmm	$\mathrm{B1_u}\oplus\mathrm{B1_u}\oplus\mathrm{B3_g}$
N60.9.75 $\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}$	√	0	0	√	-	-
N60.9.76 $\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{+}$	√	3	3	√	mmm	$\mathrm{B1_u}\oplus\mathrm{B1_u}\oplus\mathrm{B2_g}$
N60.9.77 $\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{-}$	√	0	0	√	-	-
N60.9.78 $\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{+}$	√	2	2	√	$mm2$	$\mathrm{B1}\oplus\mathrm{B1}$
N60.9.79 $\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{-}$	√	3	3	√	mmm	$\mathrm{A_u}\oplus\mathrm{B1_u}\oplus\mathrm{B2_g}$
N60.9.80 $\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}$	√	0	0	√	-	-
N60.9.81 $\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{+}$	√	3	3	√	mmm	$\mathrm{B2_g}\oplus\mathrm{B2_g}\oplus\mathrm{B2_g}$
N60.9.82 $\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{-}$	√	2	2	√	$mm2$	$\mathrm{A2}\oplus\mathrm{A2}$
N60.9.83 $\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}$	√	3	3	√	mmm	$\mathrm{A_u}\oplus\mathrm{A_u}\oplus\mathrm{B2_g}$
N60.9.84 $\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}$	√	0	0	√	-	-
N60.12.1 $\mathrm{GM1}^{-}\oplus\mathrm{S1}^{+}$	√	1	0	×	-	-
N60.12.2 $\mathrm{GM1}^{-}\oplus\mathrm{X1}$	√	1	1	√	mmm	$\mathrm{B3_u}$
N60.12.3 $\mathrm{GM1}^{-}\oplus\mathrm{X2}$	√	1	1	√	mmm	$\mathrm{B3_u}$
N60.12.4 $\mathrm{GM1}^{-}\oplus\mathrm{Y1}$	√	1	1	√	mmm	$\mathrm{B2_u}$
N60.12.5 $\mathrm{GM1}^{-}\oplus\mathrm{Y2}$	√	1	1	√	mmm	$\mathrm{B2_u}$
N60.12.6 $\mathrm{GM1}^{-}\oplus\mathrm{Z1}$	√	1	1	√	mmm	$\mathrm{B1_u}$
N60.12.7 $\mathrm{GM1}^{-}\oplus\mathrm{Z2}$	√	1	1	√	mmm	$\mathrm{B1_u}$
N60.12.8 $\mathrm{GM2}^{+}\oplus\mathrm{S1}^{+}$	√	1	1	×	-	-
N60.12.9 $\mathrm{GM2}^{+}\oplus\mathrm{X1}$	√	1	1	√	$mm2$	$\mathrm{B1}$
N60.12.10 $\mathrm{GM2}^{+}\oplus\mathrm{X2}$	√	1	1	√	$mm2$	$\mathrm{B1}$
N60.12.11 $\mathrm{GM2}^{+}\oplus\mathrm{Y1}$	√	1	1	√	$mm2$	$\mathrm{B2}$
N60.12.12 $\mathrm{GM2}^{+}\oplus\mathrm{Y2}$	√	1	1	√	$mm2$	$\mathrm{B2}$
N60.12.13 $\mathrm{GM2}^{+}\oplus\mathrm{Z1}$	√	1	1	√	222	$\mathrm{B1}$
N60.12.14 $\mathrm{GM2}^{+}\oplus\mathrm{Z2}$	√	1	1	√	222	$\mathrm{B1}$
N60.12.15 $\mathrm{GM2}^{-}\oplus\mathrm{S1}^{+}$	√	1	0	×	-	-
N60.12.16 $\mathrm{GM2}^{-}\oplus\mathrm{X1}$	√	1	1	√	mmm	$\mathrm{B3_u}$
N60.12.17 $\mathrm{GM2}^{-}\oplus\mathrm{X2}$	√	1	1	√	mmm	$\mathrm{B3_u}$
N60.12.18 $\mathrm{GM2}^{-}\oplus\mathrm{Y1}$	√	1	1	√	mmm	$\mathrm{B2_u}$
N60.12.19 $\mathrm{GM2}^{-}\oplus\mathrm{Y2}$	√	1	1	√	mmm	$\mathrm{B2_u}$
N60.12.20 $\mathrm{GM2}^{-}\oplus\mathrm{Z1}$	√	1	1	√	mmm	$\mathrm{B1_u}$
N60.12.21 $\mathrm{GM2}^{-}\oplus\mathrm{Z2}$	√	1	1	√	mmm	$\mathrm{B1_u}$
N60.12.22 $\mathrm{GM3}^{+}\oplus\mathrm{S1}^{+}$	√	1	1	×	-	-
N60.12.23 $\mathrm{GM3}^{+}\oplus\mathrm{X1}$	√	1	1	√	222	$\mathrm{B3}$
N60.12.24 $\mathrm{GM3}^{+}\oplus\mathrm{X2}$	√	1	1	√	222	$\mathrm{B3}$

Non-coplanar SSGs with parent space group $Pbcn$ (No. 60) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N60.12.25 $\mathrm{GM3^+} \oplus \mathrm{Y1}$	$\surd$	1	1	$\surd$	$mm2$	B2
N60.12.26 $\mathrm{GM3^+} \oplus \mathrm{Y2}$	$\surd$	1	1	$\surd$	$mm2$	B2
N60.12.27 $\mathrm{GM3^+} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$mm2$	B2
N60.12.28 $\mathrm{GM3^+} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	$mm2$	B2
N60.12.29 $\mathrm{GM3^-} \oplus \mathrm{S1^+}$	$\surd$	1	0	$\times$	-	-
N60.12.30 $\mathrm{GM3^-} \oplus \mathrm{X1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N60.12.31 $\mathrm{GM3^-} \oplus \mathrm{X2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N60.12.32 $\mathrm{GM3^-} \oplus \mathrm{Y1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N60.12.33 $\mathrm{GM3^-} \oplus \mathrm{Y2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N60.12.34 $\mathrm{GM3^-} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N60.12.35 $\mathrm{GM3^-} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N60.12.36 $\mathrm{GM4^+} \oplus \mathrm{S1^+}$	$\surd$	1	1	$\times$	-	-
N60.12.37 $\mathrm{GM4^+} \oplus \mathrm{X1}$	$\surd$	1	1	$\surd$	$mm2$	B1
N60.12.38 $\mathrm{GM4^+} \oplus \mathrm{X2}$	$\surd$	1	1	$\surd$	$mm2$	B1
N60.12.39 $\mathrm{GM4^+} \oplus \mathrm{Y1}$	$\surd$	1	1	$\surd$	222	B2
N60.12.40 $\mathrm{GM4^+} \oplus \mathrm{Y2}$	$\surd$	1	1	$\surd$	222	B2
N60.12.41 $\mathrm{GM4^+} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$mm2$	B1
N60.12.42 $\mathrm{GM4^+} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	$mm2$	B1
N60.12.43 $\mathrm{GM4^-} \oplus \mathrm{S1^+}$	$\surd$	1	0	$\times$	-	-
N60.12.44 $\mathrm{GM4^-} \oplus \mathrm{X1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N60.12.45 $\mathrm{GM4^-} \oplus \mathrm{X2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N60.12.46 $\mathrm{GM4^-} \oplus \mathrm{Y1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N60.12.47 $\mathrm{GM4^-} \oplus \mathrm{Y2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N60.12.48 $\mathrm{GM4^-} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N60.12.49 $\mathrm{GM4^-} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N60.14.1 $\mathrm{GM1^-} \oplus \mathrm{SM1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N60.14.2 $\mathrm{GM1^-} \oplus \mathrm{SM2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N60.14.3 $\mathrm{GM1^-} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N60.14.4 $\mathrm{GM1^-} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N60.14.5 $\mathrm{GM1^-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N60.14.6 $\mathrm{GM1^-} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N60.14.7 $\mathrm{GM2^+} \oplus \mathrm{SM1}$	$\surd$	1	1	$\surd$	$mm2$	B1
N60.14.8 $\mathrm{GM2^+} \oplus \mathrm{SM2}$	$\surd$	1	1	$\surd$	$mm2$	B1
N60.14.9 $\mathrm{GM2^+} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	$mm2$	B2
N60.14.10 $\mathrm{GM2^+} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	$mm2$	B2
N60.14.11 $\mathrm{GM2^+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	222	B1
N60.14.12 $\mathrm{GM2^+} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	222	B1
N60.14.13 $\mathrm{GM2^-} \oplus \mathrm{SM1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N60.14.14 $\mathrm{GM2^-} \oplus \mathrm{SM2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N60.14.15 $\mathrm{GM2^-} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N60.14.16 $\mathrm{GM2^-} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N60.14.17 $\mathrm{GM2^-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N60.14.18 $\mathrm{GM2^-} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N60.14.19 $\mathrm{GM3^+} \oplus \mathrm{SM1}$	$\surd$	1	1	$\surd$	222	B3
N60.14.20 $\mathrm{GM3^+} \oplus \mathrm{SM2}$	$\surd$	1	1	$\surd$	222	B3
N60.14.21 $\mathrm{GM3^+} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	$mm2$	B2

Non-coplanar SSGs with parent space group $Pbcn$ (No. 60) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N60.14.22 $\mathrm{GM3}^{+} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	$mm2$	$\mathrm{B2}$
N60.14.23 $\mathrm{GM3}^{+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$mm2$	$\mathrm{B2}$
N60.14.24 $\mathrm{GM3}^{+} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	$mm2$	$\mathrm{B2}$
N60.14.25 $\mathrm{GM3}^{-} \oplus \mathrm{SM1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N60.14.26 $\mathrm{GM3}^{-} \oplus \mathrm{SM2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N60.14.27 $\mathrm{GM3}^{-} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N60.14.28 $\mathrm{GM3}^{-} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N60.14.29 $\mathrm{GM3}^{-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N60.14.30 $\mathrm{GM3}^{-} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N60.14.31 $\mathrm{GM4}^{+} \oplus \mathrm{SM1}$	$\surd$	1	1	$\surd$	$mm2$	$\mathrm{B1}$
N60.14.32 $\mathrm{GM4}^{+} \oplus \mathrm{SM2}$	$\surd$	1	1	$\surd$	$mm2$	$\mathrm{B1}$
N60.14.33 $\mathrm{GM4}^{+} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	222	$\mathrm{B2}$
N60.14.34 $\mathrm{GM4}^{+} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	222	$\mathrm{B2}$
N60.14.35 $\mathrm{GM4}^{+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$mm2$	$\mathrm{B1}$
N60.14.36 $\mathrm{GM4}^{+} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	$mm2$	$\mathrm{B1}$
N60.14.37 $\mathrm{GM4}^{-} \oplus \mathrm{SM1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N60.14.38 $\mathrm{GM4}^{-} \oplus \mathrm{SM2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N60.14.39 $\mathrm{GM4}^{-} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N60.14.40 $\mathrm{GM4}^{-} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N60.14.41 $\mathrm{GM4}^{-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N60.14.42 $\mathrm{GM4}^{-} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$

TABLE S181: Collinear SSGs with parent space group $Pbca$ (No. 61).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L61.1.1 $\mathrm{GM1}^{+}$	1	mmm	$\mathrm{A_g}$
L61.2.1 $\mathrm{GM1}^{-}$	0	-	-
L61.2.2 $\mathrm{GM2}^{+}$	1	mmm	$\mathrm{B1_g}$
L61.2.3 $\mathrm{GM2}^{-}$	0	-	-

TABLE S182: Coplanar SSGs with parent space group $Pbca$ (No. 61).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P61.1.1 $\mathrm{GM1}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
P61.2.1 $\mathrm{GM1}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
P61.2.2 $\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
P61.2.3 $\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
P61.3.1 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-}$	$\surd$	0	0	$\surd$	-	-
P61.3.2 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
P61.3.3 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
P61.3.4 $\mathrm{GM2}^{+} \oplus \mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
P61.3.5 $\mathrm{GM2}^{+} \oplus \mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
P61.3.6 $\mathrm{GM2}^{+} \oplus \mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
P61.3.7 $\mathrm{GM2}^{+} \oplus \mathrm{GM3}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
P61.3.8 $\mathrm{GM2}^{+} \oplus \mathrm{GM4}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_u}$

Coplanar SSGs with parent space group $Pbca$ (No. 61) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P61.3.9 $\mathrm{GM2}^{-} \oplus \mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
P61.3.10 $\mathrm{GM2}^{-} \oplus \mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
P61.6.1 X1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P61.6.2 X2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P61.8.1 DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P61.8.2 DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$

TABLE S183: Non-coplanar SSGs with parent space group $Pbca$ (No. 61).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N61.1.1 $\mathrm{GM1}^{+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{A_g}$
N61.2.1 $\mathrm{GM1}^{-}$	$\surd$	2	2	$\surd$	222	$\mathrm{A1} \oplus \mathrm{A1}$
N61.2.2 $\mathrm{GM2}^{+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B1_g}$
N61.2.3 $\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{A1}$
N61.3.1 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{A_u}$
N61.3.2 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{A2}$
N61.3.3 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N61.3.4 $\mathrm{GM2}^{+} \oplus \mathrm{GM2}^{+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N61.3.5 $\mathrm{GM2}^{+} \oplus \mathrm{GM3}^{+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g} \oplus \mathrm{B3_g}$
N61.3.6 $\mathrm{GM2}^{+} \oplus \mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	222	$\mathrm{A1} \oplus \mathrm{B1}$
N61.3.7 $\mathrm{GM2}^{+} \oplus \mathrm{GM3}^{-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{B1}$
N61.3.8 $\mathrm{GM2}^{+} \oplus \mathrm{GM4}^{-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{B2}$
N61.3.9 $\mathrm{GM2}^{-} \oplus \mathrm{GM2}^{-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N61.3.10 $\mathrm{GM2}^{-} \oplus \mathrm{GM3}^{-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u} \oplus \mathrm{B3_u}$
N61.6.1 X1	$\surd$	1	1	$\surd$	$mm2$	A1
N61.6.2 X2	$\surd$	1	1	$\surd$	$mm2$	A1
N61.8.1 DT1	$\surd$	1	1	$\surd$	$mm2$	A1
N61.8.2 DT2	$\surd$	1	1	$\surd$	$mm2$	A1
N61.9.1 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-}$	$\surd$	0	0	$\surd$	-	-
N61.9.2 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-} \oplus \mathrm{GM2}^{+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N61.9.3 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-} \oplus \mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
N61.9.4 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{+} \oplus \mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	222	$\mathrm{B1} \oplus \mathrm{B1}$
N61.9.5 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{+} \oplus \mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2} \oplus \mathrm{B1}$
N61.9.6 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{+} \oplus \mathrm{GM2}^{-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N61.9.7 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{+} \oplus \mathrm{GM3}^{-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_u}$
N61.9.8 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{+} \oplus \mathrm{GM4}^{-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B3_u}$
N61.9.9 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{-} \oplus \mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
N61.9.10 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{-} \oplus \mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
N61.9.11 $\mathrm{GM2}^{+} \oplus \mathrm{GM2}^{+} \oplus \mathrm{GM2}^{+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N61.9.12 $\mathrm{GM2}^{+} \oplus \mathrm{GM2}^{+} \oplus \mathrm{GM3}^{+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B3_g}$
N61.9.13 $\mathrm{GM2}^{+} \oplus \mathrm{GM2}^{+} \oplus \mathrm{GM4}^{+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B2_g}$
N61.9.14 $\mathrm{GM2}^{+} \oplus \mathrm{GM3}^{+} \oplus \mathrm{GM4}^{+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N61.9.15 $\mathrm{GM2}^{+} \oplus \mathrm{GM2}^{+} \oplus \mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{A2}$
N61.9.16 $\mathrm{GM2}^{+} \oplus \mathrm{GM2}^{+} \oplus \mathrm{GM3}^{-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2} \oplus \mathrm{B2}$
N61.9.17 $\mathrm{GM2}^{+} \oplus \mathrm{GM2}^{+} \oplus \mathrm{GM4}^{-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B1} \oplus \mathrm{B1}$
N61.9.18 $\mathrm{GM2}^{+} \oplus \mathrm{GM3}^{+} \oplus \mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{B2}$

Non-coplanar SSGs with parent space group $Pbca$ (No. 61) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N61.9.19 $\mathrm{GM2^+} \oplus \mathrm{GM3^+} \oplus \mathrm{GM3^-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{B2}$
N61.9.20 $\mathrm{GM2^+} \oplus \mathrm{GM3^+} \oplus \mathrm{GM4^-}$	$\surd$	2	2	$\surd$	222	$\mathrm{B1} \oplus \mathrm{B3}$
N61.9.21 $\mathrm{GM2^+} \oplus \mathrm{GM2^-} \oplus \mathrm{GM2^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$
N61.9.22 $\mathrm{GM2^+} \oplus \mathrm{GM2^-} \oplus \mathrm{GM3^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g} \oplus \mathrm{B2_u}$
N61.9.23 $\mathrm{GM2^+} \oplus \mathrm{GM2^-} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g} \oplus \mathrm{B3_u}$
N61.9.24 $\mathrm{GM2^+} \oplus \mathrm{GM3^-} \oplus \mathrm{GM3^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N61.9.25 $\mathrm{GM2^+} \oplus \mathrm{GM3^-} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N61.9.26 $\mathrm{GM2^+} \oplus \mathrm{GM4^-} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N61.9.27 $\mathrm{GM2^-} \oplus \mathrm{GM2^-} \oplus \mathrm{GM2^-}$	$\surd$	0	0	$\surd$	-	-
N61.9.28 $\mathrm{GM2^-} \oplus \mathrm{GM2^-} \oplus \mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
N61.9.29 $\mathrm{GM2^-} \oplus \mathrm{GM2^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N61.9.30 $\mathrm{GM2^-} \oplus \mathrm{GM3^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N61.12.1 $\mathrm{GM1^-} \oplus \mathrm{X1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N61.12.2 $\mathrm{GM1^-} \oplus \mathrm{X2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N61.12.3 $\mathrm{GM2^+} \oplus \mathrm{X1}$	$\surd$	1	1	$\surd$	$mm2$	B1
N61.12.4 $\mathrm{GM2^+} \oplus \mathrm{Y2}$	$\surd$	1	1	$\surd$	$mm2$	B2
N61.12.5 $\mathrm{GM2^+} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	222	B1
N61.12.6 $\mathrm{GM2^+} \oplus \mathrm{X2}$	$\surd$	1	1	$\surd$	$mm2$	B1
N61.12.7 $\mathrm{GM2^+} \oplus \mathrm{Y1}$	$\surd$	1	1	$\surd$	$mm2$	B2
N61.12.8 $\mathrm{GM2^+} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	222	B1
N61.12.9 $\mathrm{GM2^-} \oplus \mathrm{X1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N61.12.10 $\mathrm{GM2^-} \oplus \mathrm{Y2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N61.12.11 $\mathrm{GM2^-} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N61.12.12 $\mathrm{GM2^-} \oplus \mathrm{X2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N61.12.13 $\mathrm{GM2^-} \oplus \mathrm{Y1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N61.12.14 $\mathrm{GM2^-} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N61.14.1 $\mathrm{GM1^-} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N61.14.2 $\mathrm{GM1^-} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N61.14.3 $\mathrm{GM2^+} \oplus \mathrm{SM1}$	$\surd$	1	1	$\surd$	$mm2$	B1
N61.14.4 $\mathrm{GM2^+} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	$mm2$	B2
N61.14.5 $\mathrm{GM2^+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	222	B1
N61.14.6 $\mathrm{GM2^+} \oplus \mathrm{SM2}$	$\surd$	1	1	$\surd$	$mm2$	B1
N61.14.7 $\mathrm{GM2^+} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	$mm2$	B2
N61.14.8 $\mathrm{GM2^+} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	222	B1
N61.14.9 $\mathrm{GM2^-} \oplus \mathrm{SM1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N61.14.10 $\mathrm{GM2^-} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N61.14.11 $\mathrm{GM2^-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N61.14.12 $\mathrm{GM2^-} \oplus \mathrm{SM2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N61.14.13 $\mathrm{GM2^-} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N61.14.14 $\mathrm{GM2^-} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$

TABLE S184: Collinear SSGs with parent space group $Pnma$ (No. 62).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L62.1.1 $\mathrm{GM1^+}$	1	mmm	$\mathrm{A_g}$
L62.2.1 $\mathrm{GM1^-}$	0	-	-

Collinear SSGs with parent space group $Pnma$ (No. 62)(continued)

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L62.2.2 $\mathrm{GM2}^{+}$	1	mmm	$\mathrm{B1_g}$
L62.2.3 $\mathrm{GM2}^{-}$	0	-	-
L62.2.4 $\mathrm{GM3}^{+}$	1	mmm	$\mathrm{B3_g}$
L62.2.5 $\mathrm{GM3}^{-}$	0	-	-
L62.2.6 $\mathrm{GM4}^{+}$	1	mmm	$\mathrm{B2_g}$
L62.2.7 $\mathrm{GM4}^{-}$	0	-	-

TABLE S185: Coplanar SSGs with parent space group $Pnma$ (No. 62).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P62.1.1 $\mathrm{GM1}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_g}$
P62.2.1 $\mathrm{GM1}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_u}$
P62.2.2 $\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B1_g}$
P62.2.3 $\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B1_u}$
P62.2.4 $\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}$
P62.2.5 $\mathrm{GM3}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}$
P62.2.6 $\mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B2_g}$
P62.2.7 $\mathrm{GM4}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B2_u}$
P62.3.1 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}$	$\surd$	0	0	$\surd$	-	-
P62.3.2 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_u}$
P62.3.3 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
P62.3.4 $\mathrm{GM1}^{-}\oplus\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_u}$
P62.3.5 $\mathrm{GM1}^{-}\oplus\mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
P62.3.6 $\mathrm{GM1}^{-}\oplus\mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_g}\oplus\mathrm{B2_u}$
P62.3.7 $\mathrm{GM1}^{-}\oplus\mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
P62.3.8 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_g}$
P62.3.9 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B1_g}$
P62.3.10 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B3_g}$
P62.3.11 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B2_u}$
P62.3.12 $\mathrm{GM2}^{+}\oplus\mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B2_g}$
P62.3.13 $\mathrm{GM2}^{+}\oplus\mathrm{GM4}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B3_u}$
P62.3.14 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
P62.3.15 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B2_u}$
P62.3.16 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
P62.3.17 $\mathrm{GM2}^{-}\oplus\mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u}\oplus\mathrm{B2_g}$
P62.3.18 $\mathrm{GM2}^{-}\oplus\mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
P62.3.19 $\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_g}$
P62.3.20 $\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B3_g}$
P62.3.21 $\mathrm{GM3}^{+}\oplus\mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B2_g}$
P62.3.22 $\mathrm{GM3}^{+}\oplus\mathrm{GM4}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B3_g}$
P62.3.23 $\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
P62.3.24 $\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B2_g}$
P62.3.25 $\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
P62.3.26 $\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_g}\oplus\mathrm{B2_g}$
P62.3.27 $\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B2_g}$
P62.3.28 $\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-

Coplanar SSGs with parent space group $Pnma$ (No. 62) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P62.4.1 $\mathrm{U1^+U4^+}$	$\surd$	1	0	$\times$	-	-
P62.4.2 $\mathrm{U1^-U4^-}$	$\surd$	1	0	$\times$	-	-
P62.6.1 T1	$\surd$	1	1	$\times$	-	-
P62.6.2 X1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P62.6.3 X2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P62.6.4 Y1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P62.6.5 Y2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P62.6.6 Z1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P62.6.7 Z2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P62.8.1 SM1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P62.8.2 SM2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P62.8.3 DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P62.8.4 DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P62.8.5 LD1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P62.8.6 LD2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$

TABLE S186: Non-coplanar SSGs with parent space group $Pnma$ (No. 62).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N62.1.1 $\mathrm{GM1^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g \oplus A_g \oplus A_g}$
N62.2.1 $\mathrm{GM1^-}$	$\surd$	2	2	$\surd$	222	$\mathrm{A1 \oplus A1}$
N62.2.2 $\mathrm{GM2^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g \oplus A_g \oplus B1_g}$
N62.2.3 $\mathrm{GM2^-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1 \oplus A1}$
N62.2.4 $\mathrm{GM3^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g \oplus A_g \oplus B3_g}$
N62.2.5 $\mathrm{GM3^-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1 \oplus A1}$
N62.2.6 $\mathrm{GM4^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g \oplus A_g \oplus B2_g}$
N62.2.7 $\mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1 \oplus A1}$
N62.3.1 $\mathrm{GM1^- \oplus GM1^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g \oplus A_u \oplus A_u}$
N62.3.2 $\mathrm{GM1^- \oplus GM2^+}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1 \oplus A2}$
N62.3.3 $\mathrm{GM1^- \oplus GM2^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g \oplus A_u \oplus B1_u}$
N62.3.4 $\mathrm{GM1^- \oplus GM3^+}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1 \oplus A2}$
N62.3.5 $\mathrm{GM1^- \oplus GM3^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g \oplus A_u \oplus B3_u}$
N62.3.6 $\mathrm{GM1^- \oplus GM4^+}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1 \oplus A2}$
N62.3.7 $\mathrm{GM1^- \oplus GM4^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g \oplus A_u \oplus B2_u}$
N62.3.8 $\mathrm{GM2^+ \oplus GM2^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g \oplus B1_g \oplus B1_g}$
N62.3.9 $\mathrm{GM2^+ \oplus GM2^-}$	$\surd$	2	2	$\surd$	222	$\mathrm{A1 \oplus B1}$
N62.3.10 $\mathrm{GM2^+ \oplus GM3^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g \oplus B1_g \oplus B3_g}$
N62.3.11 $\mathrm{GM2^+ \oplus GM3^-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1 \oplus B1}$
N62.3.12 $\mathrm{GM2^+ \oplus GM4^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g \oplus B1_g \oplus B2_g}$
N62.3.13 $\mathrm{GM2^+ \oplus GM4^-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1 \oplus B2}$
N62.3.14 $\mathrm{GM2^- \oplus GM2^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g \oplus B1_u \oplus B1_u}$
N62.3.15 $\mathrm{GM2^- \oplus GM3^+}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1 \oplus B2}$
N62.3.16 $\mathrm{GM2^- \oplus GM3^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g \oplus B1_u \oplus B3_u}$
N62.3.17 $\mathrm{GM2^- \oplus GM4^+}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1 \oplus B1}$
N62.3.18 $\mathrm{GM2^- \oplus GM4^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g \oplus B1_u \oplus B2_u}$
N62.3.19 $\mathrm{GM3^+ \oplus GM3^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g \oplus B3_g \oplus B3_g}$

Non-coplanar SSGs with parent space group $Pnma$ (No. 62) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N62.3.20 $\mathrm{GM3^+} \oplus \mathrm{GM3^-}$	$\surd$	2	2	$\surd$	222	$\mathrm{A1} \oplus \mathrm{B3}$
N62.3.21 $\mathrm{GM3^+} \oplus \mathrm{GM4^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N62.3.22 $\mathrm{GM3^+} \oplus \mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{B2}$
N62.3.23 $\mathrm{GM3^-} \oplus \mathrm{GM3^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N62.3.24 $\mathrm{GM3^-} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{B1}$
N62.3.25 $\mathrm{GM3^-} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N62.3.26 $\mathrm{GM4^+} \oplus \mathrm{GM4^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N62.3.27 $\mathrm{GM4^+} \oplus \mathrm{GM4^-}$	$\surd$	2	2	$\surd$	222	$\mathrm{A1} \oplus \mathrm{B2}$
N62.3.28 $\mathrm{GM4^-} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N62.4.1 $\mathrm{U1^+U4^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N62.4.2 $\mathrm{U1^-U4^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N62.6.1 T1	$\surd$	1	1	$\surd$	222	A1
N62.6.2 X1	$\surd$	1	1	$\surd$	$mm2$	A1
N62.6.3 X2	$\surd$	1	1	$\surd$	$mm2$	A1
N62.6.4 Y1	$\surd$	1	1	$\surd$	$mm2$	A1
N62.6.5 Y2	$\surd$	1	1	$\surd$	$mm2$	A1
N62.6.6 Z1	$\surd$	1	1	$\surd$	$mm2$	A1
N62.6.7 Z2	$\surd$	1	1	$\surd$	$mm2$	A1
N62.8.1 SM1	$\surd$	1	1	$\surd$	$mm2$	A1
N62.8.2 SM2	$\surd$	1	1	$\surd$	$mm2$	A1
N62.8.3 DT1	$\surd$	1	1	$\surd$	$mm2$	A1
N62.8.4 DT2	$\surd$	1	1	$\surd$	$mm2$	A1
N62.8.5 LD1	$\surd$	1	1	$\surd$	$mm2$	A1
N62.8.6 LD2	$\surd$	1	1	$\surd$	$mm2$	A1
N62.9.1 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM1^-}$	$\surd$	0	0	$\surd$	-	-
N62.9.2 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM2^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N62.9.3 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM2^-}$	$\surd$	0	0	$\surd$	-	-
N62.9.4 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM3^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N62.9.5 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
N62.9.6 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM4^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B2_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N62.9.7 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N62.9.8 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{GM2^+}$	$\surd$	2	2	$\surd$	222	$\mathrm{B1} \oplus \mathrm{B1}$
N62.9.9 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{GM2^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N62.9.10 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{GM3^+}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2} \oplus \mathrm{B1}$
N62.9.11 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{GM3^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_u}$
N62.9.12 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2} \oplus \mathrm{B1}$
N62.9.13 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B3_u}$
N62.9.14 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{GM2^-}$	$\surd$	0	0	$\surd$	-	-
N62.9.15 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{GM3^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N62.9.16 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
N62.9.17 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{GM4^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N62.9.18 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N62.9.19 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{GM3^+}$	$\surd$	2	2	$\surd$	222	$\mathrm{B3} \oplus \mathrm{B3}$
N62.9.20 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{GM3^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N62.9.21 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2} \oplus \mathrm{B1}$
N62.9.22 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$

Non-coplanar SSGs with parent space group $Pnma$ (No. 62) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N62.9.23 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N62.9.24 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N62.9.25 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N62.9.26 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	222	$\mathrm{B2} \oplus \mathrm{B2}$
N62.9.27 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N62.9.28 $\mathrm{GM1}^- \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N62.9.29 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N62.9.30 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{A2}$
N62.9.31 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B3_g}$
N62.9.32 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2} \oplus \mathrm{B2}$
N62.9.33 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B2_g}$
N62.9.34 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B1} \oplus \mathrm{B1}$
N62.9.35 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$
N62.9.36 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{B2}$
N62.9.37 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g} \oplus \mathrm{B2_u}$
N62.9.38 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{B1}$
N62.9.39 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g} \oplus \mathrm{B3_u}$
N62.9.40 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N62.9.41 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{B2}$
N62.9.42 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N62.9.43 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	222	$\mathrm{B1} \oplus \mathrm{B3}$
N62.9.44 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N62.9.45 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	222	$\mathrm{B1} \oplus \mathrm{B2}$
N62.9.46 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N62.9.47 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N62.9.48 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{B1}$
N62.9.49 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N62.9.50 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
N62.9.51 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N62.9.52 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N62.9.53 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_g}$
N62.9.54 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N62.9.55 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2} \oplus \mathrm{B2}$
N62.9.56 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N62.9.57 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	222	$\mathrm{B3} \oplus \mathrm{B2}$
N62.9.58 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N62.9.59 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N62.9.60 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_g}$
N62.9.61 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N62.9.62 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B1} \oplus \mathrm{B1}$
N62.9.63 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_g}$
N62.9.64 $\mathrm{GM2}^- \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N62.9.65 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N62.9.66 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{A2}$
N62.9.67 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N62.9.68 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2} \oplus \mathrm{B2}$

Non-coplanar SSGs with parent space group $Pnma$ (No. 62) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N62.9.69 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{GM3^-}$	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B3_g}$
N62.9.70 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{GM4^+}$	√	2	2	√	$mm2$	$\mathrm{A2} \oplus \mathrm{B2}$
N62.9.71 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{GM4^-}$	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u} \oplus \mathrm{B3_g}$
N62.9.72 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{GM4^+}$	√	3	3	√	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N62.9.73 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{GM4^-}$	√	2	2	√	$mm2$	$\mathrm{A2} \oplus \mathrm{B1}$
N62.9.74 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{GM4^-}$	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B3_g}$
N62.9.75 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{GM3^-}$	√	0	0	√	-	-
N62.9.76 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{GM4^+}$	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B2_g}$
N62.9.77 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{GM4^-}$	√	0	0	√	-	-
N62.9.78 $\mathrm{GM3^-} \oplus \mathrm{GM4^+} \oplus \mathrm{GM4^+}$	√	2	2	√	$mm2$	$\mathrm{B1} \oplus \mathrm{B1}$
N62.9.79 $\mathrm{GM3^-} \oplus \mathrm{GM4^+} \oplus \mathrm{GM4^-}$	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u} \oplus \mathrm{B2_g}$
N62.9.80 $\mathrm{GM3^-} \oplus \mathrm{GM4^-} \oplus \mathrm{GM4^-}$	√	0	0	√	-	-
N62.9.81 $\mathrm{GM4^+} \oplus \mathrm{GM4^+} \oplus \mathrm{GM4^+}$	√	3	3	√	mmm	$\mathrm{B2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N62.9.82 $\mathrm{GM4^+} \oplus \mathrm{GM4^+} \oplus \mathrm{GM4^-}$	√	2	2	√	$mm2$	$\mathrm{A2} \oplus \mathrm{A2}$
N62.9.83 $\mathrm{GM4^+} \oplus \mathrm{GM4^-} \oplus \mathrm{GM4^-}$	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B2_g}$
N62.9.84 $\mathrm{GM4^-} \oplus \mathrm{GM4^-} \oplus \mathrm{GM4^-}$	√	0	0	√	-	-
N62.10.1 $\mathrm{GM1^-} \oplus \mathrm{U1^+U4^+}$	√	1	0	×	-	-
N62.10.2 $\mathrm{GM1^-} \oplus \mathrm{U1^-U4^-}$	√	1	0	×	-	-
N62.10.3 $\mathrm{GM2^+} \oplus \mathrm{U1^+U4^+}$	√	1	1	×	-	-
N62.10.4 $\mathrm{GM2^+} \oplus \mathrm{U1^-U4^-}$	√	1	1	×	-	-
N62.10.5 $\mathrm{GM2^-} \oplus \mathrm{U1^+U4^+}$	√	1	0	×	-	-
N62.10.6 $\mathrm{GM2^-} \oplus \mathrm{U1^-U4^-}$	√	1	0	×	-	-
N62.10.7 $\mathrm{GM3^+} \oplus \mathrm{U1^+U4^+}$	√	1	1	×	-	-
N62.10.8 $\mathrm{GM3^+} \oplus \mathrm{U1^-U4^-}$	√	1	1	×	-	-
N62.10.9 $\mathrm{GM3^-} \oplus \mathrm{U1^+U4^+}$	√	1	0	×	-	-
N62.10.10 $\mathrm{GM3^-} \oplus \mathrm{U1^-U4^-}$	√	1	0	×	-	-
N62.10.11 $\mathrm{GM4^+} \oplus \mathrm{U1^+U4^+}$	√	1	1	×	-	-
N62.10.12 $\mathrm{GM4^+} \oplus \mathrm{U1^-U4^-}$	√	1	1	×	-	-
N62.10.13 $\mathrm{GM4^-} \oplus \mathrm{U1^+U4^+}$	√	1	0	×	-	-
N62.10.14 $\mathrm{GM4^-} \oplus \mathrm{U1^-U4^-}$	√	1	0	×	-	-
N62.12.1 $\mathrm{GM1^-} \oplus \mathrm{T1}$	√	1	1	×	-	-
N62.12.2 $\mathrm{GM1^-} \oplus \mathrm{X1}$	√	1	1	√	mmm	$\mathrm{B3_u}$
N62.12.3 $\mathrm{GM1^-} \oplus \mathrm{X2}$	√	1	1	√	mmm	$\mathrm{B3_u}$
N62.12.4 $\mathrm{GM1^-} \oplus \mathrm{Y1}$	√	1	1	√	mmm	$\mathrm{B2_u}$
N62.12.5 $\mathrm{GM1^-} \oplus \mathrm{Y2}$	√	1	1	√	mmm	$\mathrm{B2_u}$
N62.12.6 $\mathrm{GM1^-} \oplus \mathrm{Z1}$	√	1	1	√	mmm	$\mathrm{B1_u}$
N62.12.7 $\mathrm{GM1^-} \oplus \mathrm{Z2}$	√	1	1	√	mmm	$\mathrm{B1_u}$
N62.12.8 $\mathrm{GM2^+} \oplus \mathrm{T1}$	√	1	1	×	-	-
N62.12.9 $\mathrm{GM2^+} \oplus \mathrm{X1}$	√	1	1	√	$mm2$	B1
N62.12.10 $\mathrm{GM2^+} \oplus \mathrm{X2}$	√	1	1	√	$mm2$	B1
N62.12.11 $\mathrm{GM2^+} \oplus \mathrm{Y1}$	√	1	1	√	$mm2$	B2
N62.12.12 $\mathrm{GM2^+} \oplus \mathrm{Y2}$	√	1	1	√	$mm2$	B2
N62.12.13 $\mathrm{GM2^+} \oplus \mathrm{Z1}$	√	1	1	√	222	B1
N62.12.14 $\mathrm{GM2^+} \oplus \mathrm{Z2}$	√	1	1	√	222	B1
N62.12.15 $\mathrm{GM2^-} \oplus \mathrm{T1}$	√	1	1	×	-	-
N62.12.16 $\mathrm{GM2^-} \oplus \mathrm{X1}$	√	1	1	√	mmm	$\mathrm{B3_u}$

Non-coplanar SSGs with parent space group $Pnma$ (No. 62) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N62.12.17 GM2$^-$ ⊕ X2	√	1	1	√	mmm	B3$_\mathrm{u}$
N62.12.18 GM2$^-$ ⊕ Y1	√	1	1	√	mmm	B2$_\mathrm{u}$
N62.12.19 GM2$^-$ ⊕ Y2	√	1	1	√	mmm	B2$_\mathrm{u}$
N62.12.20 GM2$^-$ ⊕ Z1	√	1	1	√	mmm	B1$_\mathrm{u}$
N62.12.21 GM2$^-$ ⊕ Z2	√	1	1	√	mmm	B1$_\mathrm{u}$
N62.12.22 GM3$^+$ ⊕ T1	√	1	1	×	-	-
N62.12.23 GM3$^+$ ⊕ X1	√	1	1	√	222	B3
N62.12.24 GM3$^+$ ⊕ X2	√	1	1	√	222	B3
N62.12.25 GM3$^+$ ⊕ Y1	√	1	1	√	$mm2$	B2
N62.12.26 GM3$^+$ ⊕ Y2	√	1	1	√	$mm2$	B2
N62.12.27 GM3$^+$ ⊕ Z1	√	1	1	√	$mm2$	B2
N62.12.28 GM3$^+$ ⊕ Z2	√	1	1	√	$mm2$	B2
N62.12.29 GM3$^-$ ⊕ T1	√	1	1	×	-	-
N62.12.30 GM3$^-$ ⊕ X1	√	1	1	√	mmm	B3$_\mathrm{u}$
N62.12.31 GM3$^-$ ⊕ X2	√	1	1	√	mmm	B3$_\mathrm{u}$
N62.12.32 GM3$^-$ ⊕ Y1	√	1	1	√	mmm	B2$_\mathrm{u}$
N62.12.33 GM3$^-$ ⊕ Y2	√	1	1	√	mmm	B2$_\mathrm{u}$
N62.12.34 GM3$^-$ ⊕ Z1	√	1	1	√	mmm	B1$_\mathrm{u}$
N62.12.35 GM3$^-$ ⊕ Z2	√	1	1	√	mmm	B1$_\mathrm{u}$
N62.12.36 GM4$^+$ ⊕ T1	√	1	1	×	-	-
N62.12.37 GM4$^+$ ⊕ X1	√	1	1	√	$mm2$	B1
N62.12.38 GM4$^+$ ⊕ X2	√	1	1	√	$mm2$	B1
N62.12.39 GM4$^+$ ⊕ Y1	√	1	1	√	222	B2
N62.12.40 GM4$^+$ ⊕ Y2	√	1	1	√	222	B2
N62.12.41 GM4$^+$ ⊕ Z1	√	1	1	√	$mm2$	B1
N62.12.42 GM4$^+$ ⊕ Z2	√	1	1	√	$mm2$	B1
N62.12.43 GM4$^-$ ⊕ T1	√	1	1	×	-	-
N62.12.44 GM4$^-$ ⊕ X1	√	1	1	√	mmm	B3$_\mathrm{u}$
N62.12.45 GM4$^-$ ⊕ X2	√	1	1	√	mmm	B3$_\mathrm{u}$
N62.12.46 GM4$^-$ ⊕ Y1	√	1	1	√	mmm	B2$_\mathrm{u}$
N62.12.47 GM4$^-$ ⊕ Y2	√	1	1	√	mmm	B2$_\mathrm{u}$
N62.12.48 GM4$^-$ ⊕ Z1	√	1	1	√	mmm	B1$_\mathrm{u}$
N62.12.49 GM4$^-$ ⊕ Z2	√	1	1	√	mmm	B1$_\mathrm{u}$
N62.14.1 GM1$^-$ ⊕ SM1	√	1	1	√	mmm	B3$_\mathrm{u}$
N62.14.2 GM1$^-$ ⊕ SM2	√	1	1	√	mmm	B3$_\mathrm{u}$
N62.14.3 GM1$^-$ ⊕ DT1	√	1	1	√	mmm	B2$_\mathrm{u}$
N62.14.4 GM1$^-$ ⊕ DT2	√	1	1	√	mmm	B2$_\mathrm{u}$
N62.14.5 GM1$^-$ ⊕ LD1	√	1	1	√	mmm	B1$_\mathrm{u}$
N62.14.6 GM1$^-$ ⊕ LD2	√	1	1	√	mmm	B1$_\mathrm{u}$
N62.14.7 GM2$^+$ ⊕ SM1	√	1	1	√	$mm2$	B1
N62.14.8 GM2$^+$ ⊕ SM2	√	1	1	√	$mm2$	B1
N62.14.9 GM2$^+$ ⊕ DT1	√	1	1	√	$mm2$	B2
N62.14.10 GM2$^+$ ⊕ DT2	√	1	1	√	$mm2$	B2
N62.14.11 GM2$^+$ ⊕ LD1	√	1	1	√	222	B1
N62.14.12 GM2$^+$ ⊕ LD2	√	1	1	√	222	B1
N62.14.13 GM2$^-$ ⊕ SM1	√	1	1	√	mmm	B3$_\mathrm{u}$

Non-coplanar SSGs with parent space group $Pnma$ (No. 62) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N62.14.14 $\mathrm{GM2}^{-} \oplus \mathrm{SM2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N62.14.15 $\mathrm{GM2}^{-} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N62.14.16 $\mathrm{GM2}^{-} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N62.14.17 $\mathrm{GM2}^{-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N62.14.18 $\mathrm{GM2}^{-} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N62.14.19 $\mathrm{GM3}^{+} \oplus \mathrm{SM1}$	$\surd$	1	1	$\surd$	222	B3
N62.14.20 $\mathrm{GM3}^{+} \oplus \mathrm{SM2}$	$\surd$	1	1	$\surd$	222	B3
N62.14.21 $\mathrm{GM3}^{+} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	$mm2$	B2
N62.14.22 $\mathrm{GM3}^{+} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	$mm2$	B2
N62.14.23 $\mathrm{GM3}^{+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$mm2$	B2
N62.14.24 $\mathrm{GM3}^{+} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	$mm2$	B2
N62.14.25 $\mathrm{GM3}^{-} \oplus \mathrm{SM1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N62.14.26 $\mathrm{GM3}^{-} \oplus \mathrm{SM2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N62.14.27 $\mathrm{GM3}^{-} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N62.14.28 $\mathrm{GM3}^{-} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N62.14.29 $\mathrm{GM3}^{-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N62.14.30 $\mathrm{GM3}^{-} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N62.14.31 $\mathrm{GM4}^{+} \oplus \mathrm{SM1}$	$\surd$	1	1	$\surd$	$mm2$	B1
N62.14.32 $\mathrm{GM4}^{+} \oplus \mathrm{SM2}$	$\surd$	1	1	$\surd$	$mm2$	B1
N62.14.33 $\mathrm{GM4}^{+} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	222	B2
N62.14.34 $\mathrm{GM4}^{+} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	222	B2
N62.14.35 $\mathrm{GM4}^{+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$mm2$	B1
N62.14.36 $\mathrm{GM4}^{+} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	$mm2$	B1
N62.14.37 $\mathrm{GM4}^{-} \oplus \mathrm{SM1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N62.14.38 $\mathrm{GM4}^{-} \oplus \mathrm{SM2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N62.14.39 $\mathrm{GM4}^{-} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N62.14.40 $\mathrm{GM4}^{-} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N62.14.41 $\mathrm{GM4}^{-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N62.14.42 $\mathrm{GM4}^{-} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$

TABLE S187: Collinear SSGs with parent space group $Cmcm$ (No. 63).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L63.1.1 $\mathrm{GM1}^{+}$	1	mmm	$\mathrm{A_g}$
L63.2.1 $\mathrm{GM1}^{-}$	0	-	-
L63.2.2 $\mathrm{GM2}^{+}$	1	mmm	$\mathrm{B1_g}$
L63.2.3 $\mathrm{GM2}^{-}$	0	-	-
L63.2.4 $\mathrm{GM3}^{+}$	1	mmm	$\mathrm{B3_g}$
L63.2.5 $\mathrm{GM3}^{-}$	0	-	-
L63.2.6 $\mathrm{GM4}^{+}$	1	mmm	$\mathrm{B2_g}$
L63.2.7 $\mathrm{GM4}^{-}$	0	-	-
L63.2.8 $\mathrm{Y1}^{+}$	0	-	-
L63.2.9 $\mathrm{Y1}^{-}$	0	-	-
L63.2.10 $\mathrm{Y2}^{+}$	0	-	-
L63.2.11 $\mathrm{Y2}^{-}$	0	-	-
L63.2.12 $\mathrm{Y3}^{+}$	0	-	-

Collinear SSGs with parent space group $Cmcm$ (No. 63)(continued)

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L63.2.13 $\mathrm{Y3}^{-}$	0	-	-
L63.2.14 $\mathrm{Y4}^{+}$	0	-	-
L63.2.15 $\mathrm{Y4}^{-}$	0	-	-

TABLE S188: Coplanar SSGs with parent space group $Cmcm$ (No. 63).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P63.1.1 $\mathrm{GM1}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_g}$
P63.2.1 $\mathrm{GM1}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_u}$
P63.2.2 $\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B1_g}$
P63.2.3 $\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B1_u}$
P63.2.4 $\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}$
P63.2.5 $\mathrm{GM3}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}$
P63.2.6 $\mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B2_g}$
P63.2.7 $\mathrm{GM4}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B2_u}$
P63.2.8 $\mathrm{Y1}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P63.2.9 $\mathrm{Y1}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P63.2.10 $\mathrm{Y2}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P63.2.11 $\mathrm{Y2}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P63.2.12 $\mathrm{Y3}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P63.2.13 $\mathrm{Y3}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P63.2.14 $\mathrm{Y4}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P63.2.15 $\mathrm{Y4}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P63.3.1 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}$	$\surd$	0	0	$\surd$	-	-
P63.3.2 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_u}$
P63.3.3 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
P63.3.4 $\mathrm{GM1}^{-}\oplus\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_u}$
P63.3.5 $\mathrm{GM1}^{-}\oplus\mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
P63.3.6 $\mathrm{GM1}^{-}\oplus\mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_g}\oplus\mathrm{B2_u}$
P63.3.7 $\mathrm{GM1}^{-}\oplus\mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
P63.3.8 $\mathrm{GM1}^{-}\oplus\mathrm{Y1}^{+}$	$\surd$	1	1	$\times$	-	-
P63.3.9 $\mathrm{GM1}^{-}\oplus\mathrm{Y1}^{-}$	$\surd$	1	1	$\times$	-	-
P63.3.10 $\mathrm{GM1}^{-}\oplus\mathrm{Y2}^{+}$	$\surd$	1	1	$\times$	-	-
P63.3.11 $\mathrm{GM1}^{-}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\times$	-	-
P63.3.12 $\mathrm{GM1}^{-}\oplus\mathrm{Y3}^{+}$	$\surd$	1	1	$\times$	-	-
P63.3.13 $\mathrm{GM1}^{-}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\times$	-	-
P63.3.14 $\mathrm{GM1}^{-}\oplus\mathrm{Y4}^{+}$	$\surd$	1	1	$\times$	-	-
P63.3.15 $\mathrm{GM1}^{-}\oplus\mathrm{Y4}^{-}$	$\surd$	1	1	$\times$	-	-
P63.3.16 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_g}$
P63.3.17 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B1_g}$
P63.3.18 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B3_g}$
P63.3.19 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B2_u}$
P63.3.20 $\mathrm{GM2}^{+}\oplus\mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B2_g}$
P63.3.21 $\mathrm{GM2}^{+}\oplus\mathrm{GM4}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B3_u}$
P63.3.22 $\mathrm{GM2}^{+}\oplus\mathrm{Y1}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
P63.3.23 $\mathrm{GM2}^{+}\oplus\mathrm{Y1}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$

Coplanar SSGs with parent space group $Cmcm$ (No. 63) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P63.3.24 $\mathrm{GM2^+} \oplus \mathrm{Y2^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
P63.3.25 $\mathrm{GM2^+} \oplus \mathrm{Y2^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
P63.3.26 $\mathrm{GM2^+} \oplus \mathrm{Y3^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
P63.3.27 $\mathrm{GM2^+} \oplus \mathrm{Y3^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
P63.3.28 $\mathrm{GM2^+} \oplus \mathrm{Y4^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
P63.3.29 $\mathrm{GM2^+} \oplus \mathrm{Y4^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
P63.3.30 $\mathrm{GM2^-} \oplus \mathrm{GM2^-}$	$\surd$	0	0	$\surd$	-	-
P63.3.31 $\mathrm{GM2^-} \oplus \mathrm{GM3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
P63.3.32 $\mathrm{GM2^-} \oplus \mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
P63.3.33 $\mathrm{GM2^-} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_g}$
P63.3.34 $\mathrm{GM2^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
P63.3.35 $\mathrm{GM2^-} \oplus \mathrm{Y1^+}$	$\surd$	1	1	$\times$	-	-
P63.3.36 $\mathrm{GM2^-} \oplus \mathrm{Y1^-}$	$\surd$	1	1	$\times$	-	-
P63.3.37 $\mathrm{GM2^-} \oplus \mathrm{Y2^+}$	$\surd$	1	1	$\times$	-	-
P63.3.38 $\mathrm{GM2^-} \oplus \mathrm{Y2^-}$	$\surd$	1	1	$\times$	-	-
P63.3.39 $\mathrm{GM2^-} \oplus \mathrm{Y3^+}$	$\surd$	1	1	$\times$	-	-
P63.3.40 $\mathrm{GM2^-} \oplus \mathrm{Y3^-}$	$\surd$	1	1	$\times$	-	-
P63.3.41 $\mathrm{GM2^-} \oplus \mathrm{Y4^+}$	$\surd$	1	1	$\times$	-	-
P63.3.42 $\mathrm{GM2^-} \oplus \mathrm{Y4^-}$	$\surd$	1	1	$\times$	-	-
P63.3.43 $\mathrm{GM3^+} \oplus \mathrm{GM3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
P63.3.44 $\mathrm{GM3^+} \oplus \mathrm{GM3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
P63.3.45 $\mathrm{GM3^+} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g}$
P63.3.46 $\mathrm{GM3^+} \oplus \mathrm{GM4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
P63.3.47 $\mathrm{GM3^+} \oplus \mathrm{Y1^+}$	$\surd$	1	0	$\times$	-	-
P63.3.48 $\mathrm{GM3^+} \oplus \mathrm{Y1^-}$	$\surd$	1	0	$\times$	-	-
P63.3.49 $\mathrm{GM3^+} \oplus \mathrm{Y2^+}$	$\surd$	1	0	$\times$	-	-
P63.3.50 $\mathrm{GM3^+} \oplus \mathrm{Y2^-}$	$\surd$	1	0	$\times$	-	-
P63.3.51 $\mathrm{GM3^+} \oplus \mathrm{Y3^+}$	$\surd$	1	0	$\times$	-	-
P63.3.52 $\mathrm{GM3^+} \oplus \mathrm{Y3^-}$	$\surd$	1	0	$\times$	-	-
P63.3.53 $\mathrm{GM3^+} \oplus \mathrm{Y4^+}$	$\surd$	1	0	$\times$	-	-
P63.3.54 $\mathrm{GM3^+} \oplus \mathrm{Y4^-}$	$\surd$	1	0	$\times$	-	-
P63.3.55 $\mathrm{GM3^-} \oplus \mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
P63.3.56 $\mathrm{GM3^-} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g}$
P63.3.57 $\mathrm{GM3^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
P63.3.58 $\mathrm{GM3^-} \oplus \mathrm{Y1^+}$	$\surd$	1	1	$\times$	-	-
P63.3.59 $\mathrm{GM3^-} \oplus \mathrm{Y1^-}$	$\surd$	1	1	$\times$	-	-
P63.3.60 $\mathrm{GM3^-} \oplus \mathrm{Y2^+}$	$\surd$	1	1	$\times$	-	-
P63.3.61 $\mathrm{GM3^-} \oplus \mathrm{Y2^-}$	$\surd$	1	1	$\times$	-	-
P63.3.62 $\mathrm{GM3^-} \oplus \mathrm{Y3^+}$	$\surd$	1	1	$\times$	-	-
P63.3.63 $\mathrm{GM3^-} \oplus \mathrm{Y3^-}$	$\surd$	1	1	$\times$	-	-
P63.3.64 $\mathrm{GM3^-} \oplus \mathrm{Y4^+}$	$\surd$	1	1	$\times$	-	-
P63.3.65 $\mathrm{GM3^-} \oplus \mathrm{Y4^-}$	$\surd$	1	1	$\times$	-	-
P63.3.66 $\mathrm{GM4^+} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_g} \oplus \mathrm{B2_g}$
P63.3.67 $\mathrm{GM4^+} \oplus \mathrm{GM4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B2_g}$
P63.3.68 $\mathrm{GM4^+} \oplus \mathrm{Y1^+}$	$\surd$	1	0	$\times$	-	-
P63.3.69 $\mathrm{GM4^+} \oplus \mathrm{Y1^-}$	$\surd$	1	0	$\times$	-	-

Coplanar SSGs with parent space group $Cmcm$ (No. 63) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P63.3.70 $\mathrm{GM4^+} \oplus \mathrm{Y2^+}$	$\surd$	1	0	$\times$	-	-
P63.3.71 $\mathrm{GM4^+} \oplus \mathrm{Y2^-}$	$\surd$	1	0	$\times$	-	-
P63.3.72 $\mathrm{GM4^+} \oplus \mathrm{Y3^+}$	$\surd$	1	0	$\times$	-	-
P63.3.73 $\mathrm{GM4^+} \oplus \mathrm{Y3^-}$	$\surd$	1	0	$\times$	-	-
P63.3.74 $\mathrm{GM4^+} \oplus \mathrm{Y4^+}$	$\surd$	1	0	$\times$	-	-
P63.3.75 $\mathrm{GM4^+} \oplus \mathrm{Y4^-}$	$\surd$	1	0	$\times$	-	-
P63.3.76 $\mathrm{GM4^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
P63.3.77 $\mathrm{GM4^-} \oplus \mathrm{Y1^+}$	$\surd$	1	1	$\times$	-	-
P63.3.78 $\mathrm{GM4^-} \oplus \mathrm{Y1^-}$	$\surd$	1	1	$\times$	-	-
P63.3.79 $\mathrm{GM4^-} \oplus \mathrm{Y2^+}$	$\surd$	1	1	$\times$	-	-
P63.3.80 $\mathrm{GM4^-} \oplus \mathrm{Y2^-}$	$\surd$	1	1	$\times$	-	-
P63.3.81 $\mathrm{GM4^-} \oplus \mathrm{Y3^+}$	$\surd$	1	1	$\times$	-	-
P63.3.82 $\mathrm{GM4^-} \oplus \mathrm{Y3^-}$	$\surd$	1	1	$\times$	-	-
P63.3.83 $\mathrm{GM4^-} \oplus \mathrm{Y4^+}$	$\surd$	1	1	$\times$	-	-
P63.3.84 $\mathrm{GM4^-} \oplus \mathrm{Y4^-}$	$\surd$	1	1	$\times$	-	-
P63.3.85 $\mathrm{Y1^+} \oplus \mathrm{Y1^+}$	$\surd$	1	0	$\times$	-	-
P63.3.86 $\mathrm{Y1^+} \oplus \mathrm{Y1^-}$	$\surd$	1	1	$\times$	-	-
P63.3.87 $\mathrm{Y1^+} \oplus \mathrm{Y2^+}$	$\surd$	1	0	$\times$	-	-
P63.3.88 $\mathrm{Y1^+} \oplus \mathrm{Y2^-}$	$\surd$	1	1	$\times$	-	-
P63.3.89 $\mathrm{Y1^+} \oplus \mathrm{Y3^+}$	$\surd$	1	0	$\times$	-	-
P63.3.90 $\mathrm{Y1^+} \oplus \mathrm{Y3^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P63.3.91 $\mathrm{Y1^+} \oplus \mathrm{Y4^+}$	$\surd$	1	0	$\times$	-	-
P63.3.92 $\mathrm{Y1^+} \oplus \mathrm{Y4^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P63.3.93 $\mathrm{Y1^-} \oplus \mathrm{Y1^-}$	$\surd$	1	0	$\times$	-	-
P63.3.94 $\mathrm{Y1^-} \oplus \mathrm{Y2^+}$	$\surd$	1	1	$\times$	-	-
P63.3.95 $\mathrm{Y1^-} \oplus \mathrm{Y2^-}$	$\surd$	1	0	$\times$	-	-
P63.3.96 $\mathrm{Y1^-} \oplus \mathrm{Y3^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P63.3.97 $\mathrm{Y1^-} \oplus \mathrm{Y3^-}$	$\surd$	1	0	$\times$	-	-
P63.3.98 $\mathrm{Y1^-} \oplus \mathrm{Y4^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P63.3.99 $\mathrm{Y1^-} \oplus \mathrm{Y4^-}$	$\surd$	1	0	$\times$	-	-
P63.3.100 $\mathrm{Y2^+} \oplus \mathrm{Y2^+}$	$\surd$	1	0	$\times$	-	-
P63.3.101 $\mathrm{Y2^+} \oplus \mathrm{Y2^-}$	$\surd$	1	1	$\times$	-	-
P63.3.102 $\mathrm{Y2^+} \oplus \mathrm{Y3^+}$	$\surd$	1	0	$\times$	-	-
P63.3.103 $\mathrm{Y2^+} \oplus \mathrm{Y3^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P63.3.104 $\mathrm{Y2^+} \oplus \mathrm{Y4^+}$	$\surd$	1	0	$\times$	-	-
P63.3.105 $\mathrm{Y2^+} \oplus \mathrm{Y4^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P63.3.106 $\mathrm{Y2^-} \oplus \mathrm{Y2^-}$	$\surd$	1	0	$\times$	-	-
P63.3.107 $\mathrm{Y2^-} \oplus \mathrm{Y3^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P63.3.108 $\mathrm{Y2^-} \oplus \mathrm{Y3^-}$	$\surd$	1	0	$\times$	-	-
P63.3.109 $\mathrm{Y2^-} \oplus \mathrm{Y4^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P63.3.110 $\mathrm{Y2^-} \oplus \mathrm{Y4^-}$	$\surd$	1	0	$\times$	-	-
P63.3.111 $\mathrm{Y3^+} \oplus \mathrm{Y3^+}$	$\surd$	1	0	$\times$	-	-
P63.3.112 $\mathrm{Y3^+} \oplus \mathrm{Y3^-}$	$\surd$	1	1	$\times$	-	-
P63.3.113 $\mathrm{Y3^+} \oplus \mathrm{Y4^+}$	$\surd$	1	0	$\times$	-	-
P63.3.114 $\mathrm{Y3^+} \oplus \mathrm{Y4^-}$	$\surd$	1	1	$\times$	-	-
P63.3.115 $\mathrm{Y3^-} \oplus \mathrm{Y3^-}$	$\surd$	1	0	$\times$	-	-

Coplanar SSGs with parent space group $Cmcm$ (No. 63) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P63.3.116 $\mathrm{Y3}^{-} \oplus \mathrm{Y4}^{+}$	$\surd$	1	1	$\times$	-	-
P63.3.117 $\mathrm{Y3}^{-} \oplus \mathrm{Y4}^{-}$	$\surd$	1	0	$\times$	-	-
P63.3.118 $\mathrm{Y4}^{+} \oplus \mathrm{Y4}^{+}$	$\surd$	1	0	$\times$	-	-
P63.3.119 $\mathrm{Y4}^{+} \oplus \mathrm{Y4}^{-}$	$\surd$	1	1	$\times$	-	-
P63.3.120 $\mathrm{Y4}^{-} \oplus \mathrm{Y4}^{-}$	$\surd$	1	0	$\times$	-	-
P63.6.1 T1	$\surd$	1	1	$\times$	-	-
P63.6.2 T2	$\surd$	1	1	$\times$	-	-
P63.6.3 Z1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P63.6.4 Z2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P63.7.1 $\mathrm{S1}^{+}$	$\times$	-	-	-	-	-
P63.7.2 $\mathrm{S1}^{-}$	$\times$	-	-	-	-	-
P63.8.1 SM1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P63.8.2 SM2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P63.8.3 SM3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P63.8.4 SM4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P63.8.5 DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P63.8.6 DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P63.8.7 DT3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P63.8.8 DT4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P63.8.9 LD1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P63.8.10 LD2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P63.8.11 H1	$\surd$	1	1	$\times$	-	-
P63.8.12 H2	$\surd$	1	1	$\times$	-	-

TABLE S189: Non-coplanar SSGs with parent space group $Cmcm$ (No. 63).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N63.1.1 $\mathrm{GM1}^{+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{A_g}$
N63.2.1 $\mathrm{GM1}^{-}$	$\surd$	2	2	$\surd$	222	$\mathrm{A1} \oplus \mathrm{A1}$
N63.2.2 $\mathrm{GM2}^{+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B1_g}$
N63.2.3 $\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{A1}$
N63.2.4 $\mathrm{GM3}^{+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B3_g}$
N63.2.5 $\mathrm{GM3}^{-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{A1}$
N63.2.6 $\mathrm{GM4}^{+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B2_g}$
N63.2.7 $\mathrm{GM4}^{-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{A1}$
N63.2.8 $\mathrm{Y1}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
N63.2.9 $\mathrm{Y1}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
N63.2.10 $\mathrm{Y2}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
N63.2.11 $\mathrm{Y2}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
N63.2.12 $\mathrm{Y3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
N63.2.13 $\mathrm{Y3}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
N63.2.14 $\mathrm{Y4}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
N63.2.15 $\mathrm{Y4}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
N63.3.1 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{A_u}$
N63.3.2 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{A2}$
N63.3.3 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$

Non-coplanar SSGs with parent space group $Cmcm$ (No. 63) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N63.3.4 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{A2}$
N63.3.5 $\mathrm{GM1}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B3_u}$
N63.3.6 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{A2}$
N63.3.7 $\mathrm{GM1}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B2_u}$
N63.3.8 $\mathrm{GM1}^- \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
N63.3.9 $\mathrm{GM1}^- \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
N63.3.10 $\mathrm{GM1}^- \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
N63.3.11 $\mathrm{GM1}^- \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
N63.3.12 $\mathrm{GM1}^- \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
N63.3.13 $\mathrm{GM1}^- \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
N63.3.14 $\mathrm{GM1}^- \oplus \mathrm{Y4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
N63.3.15 $\mathrm{GM1}^- \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
N63.3.16 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N63.3.17 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	2	2	$\surd$	222	$\mathrm{A1} \oplus \mathrm{B1}$
N63.3.18 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g} \oplus \mathrm{B3_g}$
N63.3.19 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{B1}$
N63.3.20 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g} \oplus \mathrm{B2_g}$
N63.3.21 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{B2}$
N63.3.22 $\mathrm{GM2}^+ \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
N63.3.23 $\mathrm{GM2}^+ \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
N63.3.24 $\mathrm{GM2}^+ \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
N63.3.25 $\mathrm{GM2}^+ \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
N63.3.26 $\mathrm{GM2}^+ \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
N63.3.27 $\mathrm{GM2}^+ \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
N63.3.28 $\mathrm{GM2}^+ \oplus \mathrm{Y4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
N63.3.29 $\mathrm{GM2}^+ \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
N63.3.30 $\mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N63.3.31 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{B2}$
N63.3.32 $\mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u} \oplus \mathrm{B3_u}$
N63.3.33 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{B1}$
N63.3.34 $\mathrm{GM2}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_u}$
N63.3.35 $\mathrm{GM2}^- \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
N63.3.36 $\mathrm{GM2}^- \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
N63.3.37 $\mathrm{GM2}^- \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
N63.3.38 $\mathrm{GM2}^- \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
N63.3.39 $\mathrm{GM2}^- \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
N63.3.40 $\mathrm{GM2}^- \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
N63.3.41 $\mathrm{GM2}^- \oplus \mathrm{Y4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
N63.3.42 $\mathrm{GM2}^- \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
N63.3.43 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N63.3.44 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	222	$\mathrm{A1} \oplus \mathrm{B3}$
N63.3.45 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N63.3.46 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{B2}$
N63.3.47 $\mathrm{GM3}^+ \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g}$
N63.3.48 $\mathrm{GM3}^+ \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g}$
N63.3.49 $\mathrm{GM3}^+ \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g}$

Non-coplanar SSGs with parent space group $Cmcm$ (No. 63) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N63.3.50 $\mathrm{GM3}^{+}\oplus\mathrm{Y2}^{-}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}$
N63.3.51 $\mathrm{GM3}^{+}\oplus\mathrm{Y3}^{+}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}$
N63.3.52 $\mathrm{GM3}^{+}\oplus\mathrm{Y3}^{-}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}$
N63.3.53 $\mathrm{GM3}^{+}\oplus\mathrm{Y4}^{+}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}$
N63.3.54 $\mathrm{GM3}^{+}\oplus\mathrm{Y4}^{-}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}$
N63.3.55 $\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}$	√	3	3	√	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}\oplus\mathrm{B3_u}$
N63.3.56 $\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{+}$	√	2	2	√	$mm2$	$\mathrm{A1}\oplus\mathrm{B1}$
N63.3.57 $\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{-}$	√	3	3	√	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}\oplus\mathrm{B2_u}$
N63.3.58 $\mathrm{GM3}^{-}\oplus\mathrm{Y1}^{+}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}$
N63.3.59 $\mathrm{GM3}^{-}\oplus\mathrm{Y1}^{-}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}$
N63.3.60 $\mathrm{GM3}^{-}\oplus\mathrm{Y2}^{+}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}$
N63.3.61 $\mathrm{GM3}^{-}\oplus\mathrm{Y2}^{-}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}$
N63.3.62 $\mathrm{GM3}^{-}\oplus\mathrm{Y3}^{+}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}$
N63.3.63 $\mathrm{GM3}^{-}\oplus\mathrm{Y3}^{-}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}$
N63.3.64 $\mathrm{GM3}^{-}\oplus\mathrm{Y4}^{+}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}$
N63.3.65 $\mathrm{GM3}^{-}\oplus\mathrm{Y4}^{-}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}$
N63.3.66 $\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{+}$	√	3	3	√	mmm	$\mathrm{A_g}\oplus\mathrm{B2_g}\oplus\mathrm{B2_g}$
N63.3.67 $\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{-}$	√	2	2	√	222	$\mathrm{A1}\oplus\mathrm{B2}$
N63.3.68 $\mathrm{GM4}^{+}\oplus\mathrm{Y1}^{+}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B2_g}$
N63.3.69 $\mathrm{GM4}^{+}\oplus\mathrm{Y1}^{-}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B2_g}$
N63.3.70 $\mathrm{GM4}^{+}\oplus\mathrm{Y2}^{+}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B2_g}$
N63.3.71 $\mathrm{GM4}^{+}\oplus\mathrm{Y2}^{-}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B2_g}$
N63.3.72 $\mathrm{GM4}^{+}\oplus\mathrm{Y3}^{+}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B2_g}$
N63.3.73 $\mathrm{GM4}^{+}\oplus\mathrm{Y3}^{-}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B2_g}$
N63.3.74 $\mathrm{GM4}^{+}\oplus\mathrm{Y4}^{+}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B2_g}$
N63.3.75 $\mathrm{GM4}^{+}\oplus\mathrm{Y4}^{-}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B2_g}$
N63.3.76 $\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}$	√	3	3	√	mmm	$\mathrm{A_g}\oplus\mathrm{B2_u}\oplus\mathrm{B2_u}$
N63.3.77 $\mathrm{GM4}^{-}\oplus\mathrm{Y1}^{+}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B2_u}$
N63.3.78 $\mathrm{GM4}^{-}\oplus\mathrm{Y1}^{-}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B2_u}$
N63.3.79 $\mathrm{GM4}^{-}\oplus\mathrm{Y2}^{+}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B2_u}$
N63.3.80 $\mathrm{GM4}^{-}\oplus\mathrm{Y2}^{-}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B2_u}$
N63.3.81 $\mathrm{GM4}^{-}\oplus\mathrm{Y3}^{+}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B2_u}$
N63.3.82 $\mathrm{GM4}^{-}\oplus\mathrm{Y3}^{-}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B2_u}$
N63.3.83 $\mathrm{GM4}^{-}\oplus\mathrm{Y4}^{+}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B2_u}$
N63.3.84 $\mathrm{GM4}^{-}\oplus\mathrm{Y4}^{-}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B2_u}$
N63.3.85 $\mathrm{Y1}^{+}\oplus\mathrm{Y1}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N63.3.86 $\mathrm{Y1}^{+}\oplus\mathrm{Y1}^{-}$	√	1	1	√	222	A1
N63.3.87 $\mathrm{Y1}^{+}\oplus\mathrm{Y2}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N63.3.88 $\mathrm{Y1}^{+}\oplus\mathrm{Y2}^{-}$	√	1	1	√	$mm2$	A1
N63.3.89 $\mathrm{Y1}^{+}\oplus\mathrm{Y3}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N63.3.90 $\mathrm{Y1}^{+}\oplus\mathrm{Y3}^{-}$	√	1	1	√	$mm2$	A1
N63.3.91 $\mathrm{Y1}^{+}\oplus\mathrm{Y4}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N63.3.92 $\mathrm{Y1}^{+}\oplus\mathrm{Y4}^{-}$	√	1	1	√	$mm2$	A1
N63.3.93 $\mathrm{Y1}^{-}\oplus\mathrm{Y1}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N63.3.94 $\mathrm{Y1}^{-}\oplus\mathrm{Y2}^{+}$	√	1	1	√	$mm2$	A1
N63.3.95 $\mathrm{Y1}^{-}\oplus\mathrm{Y2}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$

Non-coplanar SSGs with parent space group $Cmcm$ (No. 63) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N63.3.96 $\mathrm{Y1}^- \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\surd$	$mm2$	A1
N63.3.97 $\mathrm{Y1}^- \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N63.3.98 $\mathrm{Y1}^- \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\surd$	$mm2$	A1
N63.3.99 $\mathrm{Y1}^- \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N63.3.100 $\mathrm{Y2}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N63.3.101 $\mathrm{Y2}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\surd$	222	A1
N63.3.102 $\mathrm{Y2}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N63.3.103 $\mathrm{Y2}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\surd$	$mm2$	A1
N63.3.104 $\mathrm{Y2}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N63.3.105 $\mathrm{Y2}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\surd$	$mm2$	A1
N63.3.106 $\mathrm{Y2}^- \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N63.3.107 $\mathrm{Y2}^- \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\surd$	$mm2$	A1
N63.3.108 $\mathrm{Y2}^- \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N63.3.109 $\mathrm{Y2}^- \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\surd$	$mm2$	A1
N63.3.110 $\mathrm{Y2}^- \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N63.3.111 $\mathrm{Y3}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N63.3.112 $\mathrm{Y3}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\surd$	222	A1
N63.3.113 $\mathrm{Y3}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N63.3.114 $\mathrm{Y3}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\surd$	$mm2$	A1
N63.3.115 $\mathrm{Y3}^- \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N63.3.116 $\mathrm{Y3}^- \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\surd$	$mm2$	A1
N63.3.117 $\mathrm{Y3}^- \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N63.3.118 $\mathrm{Y4}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N63.3.119 $\mathrm{Y4}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\surd$	222	A1
N63.3.120 $\mathrm{Y4}^- \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N63.6.1 T1	$\surd$	1	1	$\surd$	$mm2$	A1
N63.6.2 T2	$\surd$	1	1	$\surd$	$mm2$	A1
N63.6.3 Z1	$\surd$	1	1	$\surd$	$mm2$	A1
N63.6.4 Z2	$\surd$	1	1	$\surd$	$mm2$	A1
N63.7.1 $\mathrm{S1}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N63.7.2 $\mathrm{S1}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N63.8.1 SM1	$\surd$	1	1	$\surd$	$mm2$	A1
N63.8.2 SM2	$\surd$	1	1	$\surd$	$mm2$	A1
N63.8.3 SM3	$\surd$	1	1	$\surd$	$mm2$	A1
N63.8.4 SM4	$\surd$	1	1	$\surd$	$mm2$	A1
N63.8.5 DT1	$\surd$	1	1	$\surd$	$mm2$	A1
N63.8.6 DT2	$\surd$	1	1	$\surd$	$mm2$	A1
N63.8.7 DT3	$\surd$	1	1	$\surd$	$mm2$	A1
N63.8.8 DT4	$\surd$	1	1	$\surd$	$mm2$	A1
N63.8.9 LD1	$\surd$	1	1	$\surd$	$mm2$	A1
N63.8.10 LD2	$\surd$	1	1	$\surd$	$mm2$	A1
N63.8.11 H1	$\surd$	1	1	$\surd$	$mm2$	A1
N63.8.12 H2	$\surd$	1	1	$\surd$	$mm2$	A1
N63.9.1 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{GM1}^-$	$\surd$	0	0	$\surd$	-	-
N63.9.2 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{GM2}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N63.9.3 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-

Non-coplanar SSGs with parent space group $Cmcm$ (No. 63) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N63.9.4 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N63.9.5 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N63.9.6 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B2_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N63.9.7 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N63.9.8 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{Y1}^+$	$\surd$	0	0	$\surd$	-	-
N63.9.9 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{Y1}^-$	$\surd$	0	0	$\surd$	-	-
N63.9.10 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{Y2}^+$	$\surd$	0	0	$\surd$	-	-
N63.9.11 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{Y2}^-$	$\surd$	0	0	$\surd$	-	-
N63.9.12 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{Y3}^+$	$\surd$	0	0	$\surd$	-	-
N63.9.13 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{Y3}^-$	$\surd$	0	0	$\surd$	-	-
N63.9.14 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{Y4}^+$	$\surd$	0	0	$\surd$	-	-
N63.9.15 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{Y4}^-$	$\surd$	0	0	$\surd$	-	-
N63.9.16 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	2	2	$\surd$	222	$\mathrm{B1} \oplus \mathrm{B1}$
N63.9.17 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N63.9.18 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2} \oplus \mathrm{B1}$
N63.9.19 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_u}$
N63.9.20 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2} \oplus \mathrm{B1}$
N63.9.21 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B3_u}$
N63.9.22 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N63.9.23 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N63.9.24 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N63.9.25 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N63.9.26 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N63.9.27 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N63.9.28 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{Y4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N63.9.29 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N63.9.30 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
N63.9.31 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N63.9.32 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N63.9.33 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N63.9.34 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N63.9.35 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Y1}^+$	$\surd$	0	0	$\surd$	-	-
N63.9.36 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Y1}^-$	$\surd$	0	0	$\surd$	-	-
N63.9.37 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Y2}^+$	$\surd$	0	0	$\surd$	-	-
N63.9.38 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Y2}^-$	$\surd$	0	0	$\surd$	-	-
N63.9.39 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Y3}^+$	$\surd$	0	0	$\surd$	-	-
N63.9.40 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Y3}^-$	$\surd$	0	0	$\surd$	-	-
N63.9.41 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Y4}^+$	$\surd$	0	0	$\surd$	-	-
N63.9.42 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Y4}^-$	$\surd$	0	0	$\surd$	-	-
N63.9.43 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	222	$\mathrm{B3} \oplus \mathrm{B3}$
N63.9.44 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N63.9.45 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2} \oplus \mathrm{B1}$
N63.9.46 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N63.9.47 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u}$
N63.9.48 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u}$
N63.9.49 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u}$

Non-coplanar SSGs with parent space group $Cmcm$ (No. 63) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N63.9.50 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{Y2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_u}$
N63.9.51 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{Y3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_u}$
N63.9.52 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{Y3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_u}$
N63.9.53 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{Y4^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_u}$
N63.9.54 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{Y4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_u}$
N63.9.55 $\mathrm{GM1^-}\oplus\mathrm{GM3^-}\oplus\mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
N63.9.56 $\mathrm{GM1^-}\oplus\mathrm{GM3^-}\oplus\mathrm{GM4^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B2_g}\oplus\mathrm{B2_u}$
N63.9.57 $\mathrm{GM1^-}\oplus\mathrm{GM3^-}\oplus\mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N63.9.58 $\mathrm{GM1^-}\oplus\mathrm{GM3^-}\oplus\mathrm{Y1^+}$	$\surd$	0	0	$\surd$	-	-
N63.9.59 $\mathrm{GM1^-}\oplus\mathrm{GM3^-}\oplus\mathrm{Y1^-}$	$\surd$	0	0	$\surd$	-	-
N63.9.60 $\mathrm{GM1^-}\oplus\mathrm{GM3^-}\oplus\mathrm{Y2^+}$	$\surd$	0	0	$\surd$	-	-
N63.9.61 $\mathrm{GM1^-}\oplus\mathrm{GM3^-}\oplus\mathrm{Y2^-}$	$\surd$	0	0	$\surd$	-	-
N63.9.62 $\mathrm{GM1^-}\oplus\mathrm{GM3^-}\oplus\mathrm{Y3^+}$	$\surd$	0	0	$\surd$	-	-
N63.9.63 $\mathrm{GM1^-}\oplus\mathrm{GM3^-}\oplus\mathrm{Y3^-}$	$\surd$	0	0	$\surd$	-	-
N63.9.64 $\mathrm{GM1^-}\oplus\mathrm{GM3^-}\oplus\mathrm{Y4^+}$	$\surd$	0	0	$\surd$	-	-
N63.9.65 $\mathrm{GM1^-}\oplus\mathrm{GM3^-}\oplus\mathrm{Y4^-}$	$\surd$	0	0	$\surd$	-	-
N63.9.66 $\mathrm{GM1^-}\oplus\mathrm{GM4^+}\oplus\mathrm{GM4^+}$	$\surd$	2	2	$\surd$	222	$\mathrm{B2}\oplus\mathrm{B2}$
N63.9.67 $\mathrm{GM1^-}\oplus\mathrm{GM4^+}\oplus\mathrm{GM4^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B2_g}\oplus\mathrm{B2_u}$
N63.9.68 $\mathrm{GM1^-}\oplus\mathrm{GM4^+}\oplus\mathrm{Y1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_g}\oplus\mathrm{B2_u}$
N63.9.69 $\mathrm{GM1^-}\oplus\mathrm{GM4^+}\oplus\mathrm{Y1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_g}\oplus\mathrm{B2_u}$
N63.9.70 $\mathrm{GM1^-}\oplus\mathrm{GM4^+}\oplus\mathrm{Y2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_g}\oplus\mathrm{B2_u}$
N63.9.71 $\mathrm{GM1^-}\oplus\mathrm{GM4^+}\oplus\mathrm{Y2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_g}\oplus\mathrm{B2_u}$
N63.9.72 $\mathrm{GM1^-}\oplus\mathrm{GM4^+}\oplus\mathrm{Y3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_g}\oplus\mathrm{B2_u}$
N63.9.73 $\mathrm{GM1^-}\oplus\mathrm{GM4^+}\oplus\mathrm{Y3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_g}\oplus\mathrm{B2_u}$
N63.9.74 $\mathrm{GM1^-}\oplus\mathrm{GM4^+}\oplus\mathrm{Y4^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_g}\oplus\mathrm{B2_u}$
N63.9.75 $\mathrm{GM1^-}\oplus\mathrm{GM4^+}\oplus\mathrm{Y4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_g}\oplus\mathrm{B2_u}$
N63.9.76 $\mathrm{GM1^-}\oplus\mathrm{GM4^-}\oplus\mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N63.9.77 $\mathrm{GM1^-}\oplus\mathrm{GM4^-}\oplus\mathrm{Y1^+}$	$\surd$	0	0	$\surd$	-	-
N63.9.78 $\mathrm{GM1^-}\oplus\mathrm{GM4^-}\oplus\mathrm{Y1^-}$	$\surd$	0	0	$\surd$	-	-
N63.9.79 $\mathrm{GM1^-}\oplus\mathrm{GM4^-}\oplus\mathrm{Y2^+}$	$\surd$	0	0	$\surd$	-	-
N63.9.80 $\mathrm{GM1^-}\oplus\mathrm{GM4^-}\oplus\mathrm{Y2^-}$	$\surd$	0	0	$\surd$	-	-
N63.9.81 $\mathrm{GM1^-}\oplus\mathrm{GM4^-}\oplus\mathrm{Y3^+}$	$\surd$	0	0	$\surd$	-	-
N63.9.82 $\mathrm{GM1^-}\oplus\mathrm{GM4^-}\oplus\mathrm{Y3^-}$	$\surd$	0	0	$\surd$	-	-
N63.9.83 $\mathrm{GM1^-}\oplus\mathrm{GM4^-}\oplus\mathrm{Y4^+}$	$\surd$	0	0	$\surd$	-	-
N63.9.84 $\mathrm{GM1^-}\oplus\mathrm{GM4^-}\oplus\mathrm{Y4^-}$	$\surd$	0	0	$\surd$	-	-
N63.9.85 $\mathrm{GM1^-}\oplus\mathrm{Y1^+}\oplus\mathrm{Y1^+}$	$\surd$	1	0	$\times$	-	-
N63.9.86 $\mathrm{GM1^-}\oplus\mathrm{Y1^+}\oplus\mathrm{Y1^-}$	$\surd$	1	1	$\times$	-	-
N63.9.87 $\mathrm{GM1^-}\oplus\mathrm{Y1^+}\oplus\mathrm{Y2^+}$	$\surd$	1	0	$\times$	-	-
N63.9.88 $\mathrm{GM1^-}\oplus\mathrm{Y1^+}\oplus\mathrm{Y2^-}$	$\surd$	1	1	$\times$	-	-
N63.9.89 $\mathrm{GM1^-}\oplus\mathrm{Y1^+}\oplus\mathrm{Y3^+}$	$\surd$	1	0	$\times$	-	-
N63.9.90 $\mathrm{GM1^-}\oplus\mathrm{Y1^+}\oplus\mathrm{Y3^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N63.9.91 $\mathrm{GM1^-}\oplus\mathrm{Y1^+}\oplus\mathrm{Y4^+}$	$\surd$	1	0	$\times$	-	-
N63.9.92 $\mathrm{GM1^-}\oplus\mathrm{Y1^+}\oplus\mathrm{Y4^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N63.9.93 $\mathrm{GM1^-}\oplus\mathrm{Y1^-}\oplus\mathrm{Y1^-}$	$\surd$	1	0	$\times$	-	-
N63.9.94 $\mathrm{GM1^-}\oplus\mathrm{Y1^-}\oplus\mathrm{Y2^+}$	$\surd$	1	1	$\times$	-	-
N63.9.95 $\mathrm{GM1^-}\oplus\mathrm{Y1^-}\oplus\mathrm{Y2^-}$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $Cmcm$ (No. 63) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N63.9.96 $\mathrm{GM1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N63.9.97 $\mathrm{GM1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N63.9.98 $\mathrm{GM1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N63.9.99 $\mathrm{GM1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y4}^-$	$\surd$	1	0	$\times$	-	-
N63.9.100 $\mathrm{GM1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N63.9.101 $\mathrm{GM1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\times$	-	-
N63.9.102 $\mathrm{GM1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N63.9.103 $\mathrm{GM1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N63.9.104 $\mathrm{GM1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
N63.9.105 $\mathrm{GM1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N63.9.106 $\mathrm{GM1}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N63.9.107 $\mathrm{GM1}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N63.9.108 $\mathrm{GM1}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N63.9.109 $\mathrm{GM1}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N63.9.110 $\mathrm{GM1}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y4}^-$	$\surd$	1	0	$\times$	-	-
N63.9.111 $\mathrm{GM1}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N63.9.112 $\mathrm{GM1}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\times$	-	-
N63.9.113 $\mathrm{GM1}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
N63.9.114 $\mathrm{GM1}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\times$	-	-
N63.9.115 $\mathrm{GM1}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N63.9.116 $\mathrm{GM1}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\times$	-	-
N63.9.117 $\mathrm{GM1}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Y4}^-$	$\surd$	1	0	$\times$	-	-
N63.9.118 $\mathrm{GM1}^- \oplus \mathrm{Y4}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
N63.9.119 $\mathrm{GM1}^- \oplus \mathrm{Y4}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\times$	-	-
N63.9.120 $\mathrm{GM1}^- \oplus \mathrm{Y4}^- \oplus \mathrm{Y4}^-$	$\surd$	1	0	$\times$	-	-
N63.9.121 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N63.9.122 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{A2}$
N63.9.123 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B3_g}$
N63.9.124 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2} \oplus \mathrm{B2}$
N63.9.125 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B2_g}$
N63.9.126 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B1} \oplus \mathrm{B1}$
N63.9.127 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N63.9.128 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N63.9.129 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N63.9.130 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N63.9.131 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N63.9.132 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N63.9.133 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{Y4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N63.9.134 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N63.9.135 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$
N63.9.136 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{B2}$
N63.9.137 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g} \oplus \mathrm{B2_u}$
N63.9.138 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{B1}$
N63.9.139 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g} \oplus \mathrm{B3_u}$
N63.9.140 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
N63.9.141 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$

Non-coplanar SSGs with parent space group $Cmcm$ (No. 63) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N63.9.142 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
N63.9.143 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
N63.9.144 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
N63.9.145 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
N63.9.146 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{Y4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
N63.9.147 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
N63.9.148 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N63.9.149 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{B2}$
N63.9.150 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N63.9.151 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	222	$\mathrm{B1} \oplus \mathrm{B3}$
N63.9.152 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N63.9.153 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N63.9.154 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N63.9.155 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N63.9.156 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N63.9.157 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N63.9.158 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Y4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N63.9.159 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N63.9.160 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N63.9.161 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	222	$\mathrm{B1} \oplus \mathrm{B2}$
N63.9.162 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N63.9.163 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N63.9.164 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N63.9.165 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N63.9.166 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N63.9.167 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N63.9.168 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N63.9.169 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Y4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N63.9.170 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N63.9.171 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N63.9.172 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{B1}$
N63.9.173 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
N63.9.174 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
N63.9.175 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
N63.9.176 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
N63.9.177 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
N63.9.178 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
N63.9.179 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{Y4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
N63.9.180 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
N63.9.181 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N63.9.182 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_u}$
N63.9.183 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_u}$
N63.9.184 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_u}$
N63.9.185 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_u}$
N63.9.186 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_u}$
N63.9.187 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_u}$

Non-coplanar SSGs with parent space group $Cmcm$ (No. 63) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N63.9.188 $\mathrm{GM2}^{+}\oplus\mathrm{GM4}^{-}\oplus\mathrm{Y4}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B3_u}$
N63.9.189 $\mathrm{GM2}^{+}\oplus\mathrm{GM4}^{-}\oplus\mathrm{Y4}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B3_u}$
N63.9.190 $\mathrm{GM2}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y1}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N63.9.191 $\mathrm{GM2}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y1}^{-}$	$\surd$	1	1	$\surd$	$mm2$	A2
N63.9.192 $\mathrm{GM2}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y2}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N63.9.193 $\mathrm{GM2}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\surd$	222	B1
N63.9.194 $\mathrm{GM2}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y3}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N63.9.195 $\mathrm{GM2}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\surd$	$mm2$	B1
N63.9.196 $\mathrm{GM2}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y4}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N63.9.197 $\mathrm{GM2}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y4}^{-}$	$\surd$	1	1	$\surd$	$mm2$	B2
N63.9.198 $\mathrm{GM2}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y1}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N63.9.199 $\mathrm{GM2}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y2}^{+}$	$\surd$	1	1	$\surd$	222	B1
N63.9.200 $\mathrm{GM2}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N63.9.201 $\mathrm{GM2}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y3}^{+}$	$\surd$	1	1	$\surd$	$mm2$	B1
N63.9.202 $\mathrm{GM2}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N63.9.203 $\mathrm{GM2}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y4}^{+}$	$\surd$	1	1	$\surd$	$mm2$	B2
N63.9.204 $\mathrm{GM2}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y4}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N63.9.205 $\mathrm{GM2}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Y2}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N63.9.206 $\mathrm{GM2}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\surd$	$mm2$	A2
N63.9.207 $\mathrm{GM2}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Y3}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N63.9.208 $\mathrm{GM2}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\surd$	$mm2$	B2
N63.9.209 $\mathrm{GM2}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Y4}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N63.9.210 $\mathrm{GM2}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Y4}^{-}$	$\surd$	1	1	$\surd$	$mm2$	B1
N63.9.211 $\mathrm{GM2}^{+}\oplus\mathrm{Y2}^{-}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N63.9.212 $\mathrm{GM2}^{+}\oplus\mathrm{Y2}^{-}\oplus\mathrm{Y3}^{+}$	$\surd$	1	1	$\surd$	$mm2$	B2
N63.9.213 $\mathrm{GM2}^{+}\oplus\mathrm{Y2}^{-}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N63.9.214 $\mathrm{GM2}^{+}\oplus\mathrm{Y2}^{-}\oplus\mathrm{Y4}^{+}$	$\surd$	1	1	$\surd$	$mm2$	B1
N63.9.215 $\mathrm{GM2}^{+}\oplus\mathrm{Y2}^{-}\oplus\mathrm{Y4}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N63.9.216 $\mathrm{GM2}^{+}\oplus\mathrm{Y3}^{+}\oplus\mathrm{Y3}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N63.9.217 $\mathrm{GM2}^{+}\oplus\mathrm{Y3}^{+}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\surd$	$mm2$	A2
N63.9.218 $\mathrm{GM2}^{+}\oplus\mathrm{Y3}^{+}\oplus\mathrm{Y4}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N63.9.219 $\mathrm{GM2}^{+}\oplus\mathrm{Y3}^{+}\oplus\mathrm{Y4}^{-}$	$\surd$	1	1	$\surd$	222	B1
N63.9.220 $\mathrm{GM2}^{+}\oplus\mathrm{Y3}^{-}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N63.9.221 $\mathrm{GM2}^{+}\oplus\mathrm{Y3}^{-}\oplus\mathrm{Y4}^{+}$	$\surd$	1	1	$\surd$	222	B1
N63.9.222 $\mathrm{GM2}^{+}\oplus\mathrm{Y3}^{-}\oplus\mathrm{Y4}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N63.9.223 $\mathrm{GM2}^{+}\oplus\mathrm{Y4}^{+}\oplus\mathrm{Y4}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N63.9.224 $\mathrm{GM2}^{+}\oplus\mathrm{Y4}^{+}\oplus\mathrm{Y4}^{-}$	$\surd$	1	1	$\surd$	$mm2$	A2
N63.9.225 $\mathrm{GM2}^{+}\oplus\mathrm{Y4}^{-}\oplus\mathrm{Y4}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N63.9.226 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
N63.9.227 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B2_u}\oplus\mathrm{B2_u}$
N63.9.228 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
N63.9.229 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{GM4}^{+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_u}\oplus\mathrm{B3_u}\oplus\mathrm{B2_g}$
N63.9.230 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
N63.9.231 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{Y1}^{+}$	$\surd$	0	0	$\surd$	-	-
N63.9.232 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{Y1}^{-}$	$\surd$	0	0	$\surd$	-	-
N63.9.233 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{Y2}^{+}$	$\surd$	0	0	$\surd$	-	-

Non-coplanar SSGs with parent space group $Cmcm$ (No. 63) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N63.9.234 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Y2}^-$	$\surd$	0	0	$\surd$	-	-
N63.9.235 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Y3}^+$	$\surd$	0	0	$\surd$	-	-
N63.9.236 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Y3}^-$	$\surd$	0	0	$\surd$	-	-
N63.9.237 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Y4}^+$	$\surd$	0	0	$\surd$	-	-
N63.9.238 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Y4}^-$	$\surd$	0	0	$\surd$	-	-
N63.9.239 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2} \oplus \mathrm{B2}$
N63.9.240 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N63.9.241 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	222	$\mathrm{B3} \oplus \mathrm{B2}$
N63.9.242 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N63.9.243 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N63.9.244 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N63.9.245 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N63.9.246 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N63.9.247 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N63.9.248 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N63.9.249 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Y4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N63.9.250 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N63.9.251 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N63.9.252 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_g}$
N63.9.253 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N63.9.254 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y1}^+$	$\surd$	0	0	$\surd$	-	-
N63.9.255 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y1}^-$	$\surd$	0	0	$\surd$	-	-
N63.9.256 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y2}^+$	$\surd$	0	0	$\surd$	-	-
N63.9.257 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y2}^-$	$\surd$	0	0	$\surd$	-	-
N63.9.258 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y3}^+$	$\surd$	0	0	$\surd$	-	-
N63.9.259 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y3}^-$	$\surd$	0	0	$\surd$	-	-
N63.9.260 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y4}^+$	$\surd$	0	0	$\surd$	-	-
N63.9.261 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y4}^-$	$\surd$	0	0	$\surd$	-	-
N63.9.262 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B1} \oplus \mathrm{B1}$
N63.9.263 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_g}$
N63.9.264 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_g}$
N63.9.265 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_g}$
N63.9.266 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_g}$
N63.9.267 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_g}$
N63.9.268 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_g}$
N63.9.269 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_g}$
N63.9.270 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{Y4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_g}$
N63.9.271 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_g}$
N63.9.272 $\mathrm{GM2}^- \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N63.9.273 $\mathrm{GM2}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Y1}^+$	$\surd$	0	0	$\surd$	-	-
N63.9.274 $\mathrm{GM2}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Y1}^-$	$\surd$	0	0	$\surd$	-	-
N63.9.275 $\mathrm{GM2}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Y2}^+$	$\surd$	0	0	$\surd$	-	-
N63.9.276 $\mathrm{GM2}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Y2}^-$	$\surd$	0	0	$\surd$	-	-
N63.9.277 $\mathrm{GM2}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Y3}^+$	$\surd$	0	0	$\surd$	-	-
N63.9.278 $\mathrm{GM2}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Y3}^-$	$\surd$	0	0	$\surd$	-	-
N63.9.279 $\mathrm{GM2}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Y4}^+$	$\surd$	0	0	$\surd$	-	-

Non-coplanar SSGs with parent space group $Cmcm$ (No. 63) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N63.9.280 $\mathrm{GM2^-}\oplus\mathrm{GM4^-}\oplus\mathrm{Y4^-}$	$\surd$	0	0	$\surd$	-	-
N63.9.281 $\mathrm{GM2^-}\oplus\mathrm{Y1^+}\oplus\mathrm{Y1^+}$	$\surd$	1	0	$\times$	-	-
N63.9.282 $\mathrm{GM2^-}\oplus\mathrm{Y1^+}\oplus\mathrm{Y1^-}$	$\surd$	1	1	$\times$	-	-
N63.9.283 $\mathrm{GM2^-}\oplus\mathrm{Y1^+}\oplus\mathrm{Y2^+}$	$\surd$	1	0	$\times$	-	-
N63.9.284 $\mathrm{GM2^-}\oplus\mathrm{Y1^+}\oplus\mathrm{Y2^-}$	$\surd$	1	1	$\times$	-	-
N63.9.285 $\mathrm{GM2^-}\oplus\mathrm{Y1^+}\oplus\mathrm{Y3^+}$	$\surd$	1	0	$\times$	-	-
N63.9.286 $\mathrm{GM2^-}\oplus\mathrm{Y1^+}\oplus\mathrm{Y3^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N63.9.287 $\mathrm{GM2^-}\oplus\mathrm{Y1^+}\oplus\mathrm{Y4^+}$	$\surd$	1	0	$\times$	-	-
N63.9.288 $\mathrm{GM2^-}\oplus\mathrm{Y1^+}\oplus\mathrm{Y4^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N63.9.289 $\mathrm{GM2^-}\oplus\mathrm{Y1^-}\oplus\mathrm{Y1^-}$	$\surd$	1	0	$\times$	-	-
N63.9.290 $\mathrm{GM2^-}\oplus\mathrm{Y1^-}\oplus\mathrm{Y2^+}$	$\surd$	1	1	$\times$	-	-
N63.9.291 $\mathrm{GM2^-}\oplus\mathrm{Y1^-}\oplus\mathrm{Y2^-}$	$\surd$	1	0	$\times$	-	-
N63.9.292 $\mathrm{GM2^-}\oplus\mathrm{Y1^-}\oplus\mathrm{Y3^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N63.9.293 $\mathrm{GM2^-}\oplus\mathrm{Y1^-}\oplus\mathrm{Y3^-}$	$\surd$	1	0	$\times$	-	-
N63.9.294 $\mathrm{GM2^-}\oplus\mathrm{Y1^-}\oplus\mathrm{Y4^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N63.9.295 $\mathrm{GM2^-}\oplus\mathrm{Y1^-}\oplus\mathrm{Y4^-}$	$\surd$	1	0	$\times$	-	-
N63.9.296 $\mathrm{GM2^-}\oplus\mathrm{Y2^+}\oplus\mathrm{Y2^+}$	$\surd$	1	0	$\times$	-	-
N63.9.297 $\mathrm{GM2^-}\oplus\mathrm{Y2^+}\oplus\mathrm{Y2^-}$	$\surd$	1	1	$\times$	-	-
N63.9.298 $\mathrm{GM2^-}\oplus\mathrm{Y2^+}\oplus\mathrm{Y3^+}$	$\surd$	1	0	$\times$	-	-
N63.9.299 $\mathrm{GM2^-}\oplus\mathrm{Y2^+}\oplus\mathrm{Y3^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N63.9.300 $\mathrm{GM2^-}\oplus\mathrm{Y2^+}\oplus\mathrm{Y4^+}$	$\surd$	1	0	$\times$	-	-
N63.9.301 $\mathrm{GM2^-}\oplus\mathrm{Y2^+}\oplus\mathrm{Y4^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N63.9.302 $\mathrm{GM2^-}\oplus\mathrm{Y2^-}\oplus\mathrm{Y2^-}$	$\surd$	1	0	$\times$	-	-
N63.9.303 $\mathrm{GM2^-}\oplus\mathrm{Y2^-}\oplus\mathrm{Y3^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N63.9.304 $\mathrm{GM2^-}\oplus\mathrm{Y2^-}\oplus\mathrm{Y3^-}$	$\surd$	1	0	$\times$	-	-
N63.9.305 $\mathrm{GM2^-}\oplus\mathrm{Y2^-}\oplus\mathrm{Y4^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N63.9.306 $\mathrm{GM2^-}\oplus\mathrm{Y2^-}\oplus\mathrm{Y4^-}$	$\surd$	1	0	$\times$	-	-
N63.9.307 $\mathrm{GM2^-}\oplus\mathrm{Y3^+}\oplus\mathrm{Y3^+}$	$\surd$	1	0	$\times$	-	-
N63.9.308 $\mathrm{GM2^-}\oplus\mathrm{Y3^+}\oplus\mathrm{Y3^-}$	$\surd$	1	1	$\times$	-	-
N63.9.309 $\mathrm{GM2^-}\oplus\mathrm{Y3^+}\oplus\mathrm{Y4^+}$	$\surd$	1	0	$\times$	-	-
N63.9.310 $\mathrm{GM2^-}\oplus\mathrm{Y3^+}\oplus\mathrm{Y4^-}$	$\surd$	1	1	$\times$	-	-
N63.9.311 $\mathrm{GM2^-}\oplus\mathrm{Y3^-}\oplus\mathrm{Y3^-}$	$\surd$	1	0	$\times$	-	-
N63.9.312 $\mathrm{GM2^-}\oplus\mathrm{Y3^-}\oplus\mathrm{Y4^+}$	$\surd$	1	1	$\times$	-	-
N63.9.313 $\mathrm{GM2^-}\oplus\mathrm{Y3^-}\oplus\mathrm{Y4^-}$	$\surd$	1	0	$\times$	-	-
N63.9.314 $\mathrm{GM2^-}\oplus\mathrm{Y4^+}\oplus\mathrm{Y4^+}$	$\surd$	1	0	$\times$	-	-
N63.9.315 $\mathrm{GM2^-}\oplus\mathrm{Y4^+}\oplus\mathrm{Y4^-}$	$\surd$	1	1	$\times$	-	-
N63.9.316 $\mathrm{GM2^-}\oplus\mathrm{Y4^-}\oplus\mathrm{Y4^-}$	$\surd$	1	0	$\times$	-	-
N63.9.317 $\mathrm{GM3^+}\oplus\mathrm{GM3^+}\oplus\mathrm{GM3^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_g}\oplus\mathrm{B3_g}$
N63.9.318 $\mathrm{GM3^+}\oplus\mathrm{GM3^+}\oplus\mathrm{GM3^-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2}\oplus\mathrm{A2}$
N63.9.319 $\mathrm{GM3^+}\oplus\mathrm{GM3^+}\oplus\mathrm{GM4^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_g}\oplus\mathrm{B2_g}$
N63.9.320 $\mathrm{GM3^+}\oplus\mathrm{GM3^+}\oplus\mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2}\oplus\mathrm{B2}$
N63.9.321 $\mathrm{GM3^+}\oplus\mathrm{GM3^+}\oplus\mathrm{Y1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_g}$
N63.9.322 $\mathrm{GM3^+}\oplus\mathrm{GM3^+}\oplus\mathrm{Y1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_g}$
N63.9.323 $\mathrm{GM3^+}\oplus\mathrm{GM3^+}\oplus\mathrm{Y2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_g}$
N63.9.324 $\mathrm{GM3^+}\oplus\mathrm{GM3^+}\oplus\mathrm{Y2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_g}$
N63.9.325 $\mathrm{GM3^+}\oplus\mathrm{GM3^+}\oplus\mathrm{Y3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_g}$

Non-coplanar SSGs with parent space group $Cmcm$ (No. 63) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N63.9.326 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
N63.9.327 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Y4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
N63.9.328 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
N63.9.329 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B3_g}$
N63.9.330 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{B2}$
N63.9.331 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u} \oplus \mathrm{B3_g}$
N63.9.332 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N63.9.333 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N63.9.334 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N63.9.335 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N63.9.336 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N63.9.337 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N63.9.338 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Y4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N63.9.339 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N63.9.340 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N63.9.341 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{B1}$
N63.9.342 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g}$
N63.9.343 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g}$
N63.9.344 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g}$
N63.9.345 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g}$
N63.9.346 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g}$
N63.9.347 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g}$
N63.9.348 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{Y4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g}$
N63.9.349 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g}$
N63.9.350 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B3_g}$
N63.9.351 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N63.9.352 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N63.9.353 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N63.9.354 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N63.9.355 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N63.9.356 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N63.9.357 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{Y4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N63.9.358 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N63.9.359 $\mathrm{GM3}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	1	$\times$	-	-
N63.9.360 $\mathrm{GM3}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^-$	$\surd$	1	1	$\times$	-	-
N63.9.361 $\mathrm{GM3}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\times$	-	-
N63.9.362 $\mathrm{GM3}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\times$	-	-
N63.9.363 $\mathrm{GM3}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\times$	-	-
N63.9.364 $\mathrm{GM3}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\surd$	222	B3
N63.9.365 $\mathrm{GM3}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\times$	-	-
N63.9.366 $\mathrm{GM3}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\surd$	$mm2$	B2
N63.9.367 $\mathrm{GM3}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y1}^-$	$\surd$	1	1	$\times$	-	-
N63.9.368 $\mathrm{GM3}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\times$	-	-
N63.9.369 $\mathrm{GM3}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\times$	-	-
N63.9.370 $\mathrm{GM3}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\surd$	222	B3
N63.9.371 $\mathrm{GM3}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $Cmcm$ (No. 63) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N63.9.372 $\mathrm{GM3}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y4}^{+}$	$\surd$	1	1	$\surd$	$mm2$	B2
N63.9.373 $\mathrm{GM3}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y4}^{-}$	$\surd$	1	1	$\times$	-	-
N63.9.374 $\mathrm{GM3}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Y2}^{+}$	$\surd$	1	1	$\times$	-	-
N63.9.375 $\mathrm{GM3}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\times$	-	-
N63.9.376 $\mathrm{GM3}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Y3}^{+}$	$\surd$	1	1	$\times$	-	-
N63.9.377 $\mathrm{GM3}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\surd$	$mm2$	B2
N63.9.378 $\mathrm{GM3}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Y4}^{+}$	$\surd$	1	1	$\times$	-	-
N63.9.379 $\mathrm{GM3}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Y4}^{-}$	$\surd$	1	1	$\surd$	222	B3
N63.9.380 $\mathrm{GM3}^{+}\oplus\mathrm{Y2}^{-}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\times$	-	-
N63.9.381 $\mathrm{GM3}^{+}\oplus\mathrm{Y2}^{-}\oplus\mathrm{Y3}^{+}$	$\surd$	1	1	$\surd$	$mm2$	B2
N63.9.382 $\mathrm{GM3}^{+}\oplus\mathrm{Y2}^{-}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\times$	-	-
N63.9.383 $\mathrm{GM3}^{+}\oplus\mathrm{Y2}^{-}\oplus\mathrm{Y4}^{+}$	$\surd$	1	1	$\surd$	222	B3
N63.9.384 $\mathrm{GM3}^{+}\oplus\mathrm{Y2}^{-}\oplus\mathrm{Y4}^{-}$	$\surd$	1	1	$\times$	-	-
N63.9.385 $\mathrm{GM3}^{+}\oplus\mathrm{Y3}^{+}\oplus\mathrm{Y3}^{+}$	$\surd$	1	1	$\times$	-	-
N63.9.386 $\mathrm{GM3}^{+}\oplus\mathrm{Y3}^{+}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\times$	-	-
N63.9.387 $\mathrm{GM3}^{+}\oplus\mathrm{Y3}^{+}\oplus\mathrm{Y4}^{+}$	$\surd$	1	1	$\times$	-	-
N63.9.388 $\mathrm{GM3}^{+}\oplus\mathrm{Y3}^{+}\oplus\mathrm{Y4}^{-}$	$\surd$	1	1	$\times$	-	-
N63.9.389 $\mathrm{GM3}^{+}\oplus\mathrm{Y3}^{-}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\times$	-	-
N63.9.390 $\mathrm{GM3}^{+}\oplus\mathrm{Y3}^{-}\oplus\mathrm{Y4}^{+}$	$\surd$	1	1	$\times$	-	-
N63.9.391 $\mathrm{GM3}^{+}\oplus\mathrm{Y3}^{-}\oplus\mathrm{Y4}^{-}$	$\surd$	1	1	$\times$	-	-
N63.9.392 $\mathrm{GM3}^{+}\oplus\mathrm{Y4}^{+}\oplus\mathrm{Y4}^{+}$	$\surd$	1	1	$\times$	-	-
N63.9.393 $\mathrm{GM3}^{+}\oplus\mathrm{Y4}^{+}\oplus\mathrm{Y4}^{-}$	$\surd$	1	1	$\times$	-	-
N63.9.394 $\mathrm{GM3}^{+}\oplus\mathrm{Y4}^{-}\oplus\mathrm{Y4}^{-}$	$\surd$	1	1	$\times$	-	-
N63.9.395 $\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
N63.9.396 $\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B1_u}\oplus\mathrm{B2_g}$
N63.9.397 $\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
N63.9.398 $\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{Y1}^{+}$	$\surd$	0	0	$\surd$	-	-
N63.9.399 $\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{Y1}^{-}$	$\surd$	0	0	$\surd$	-	-
N63.9.400 $\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{Y2}^{+}$	$\surd$	0	0	$\surd$	-	-
N63.9.401 $\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{Y2}^{-}$	$\surd$	0	0	$\surd$	-	-
N63.9.402 $\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{Y3}^{+}$	$\surd$	0	0	$\surd$	-	-
N63.9.403 $\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{Y3}^{-}$	$\surd$	0	0	$\surd$	-	-
N63.9.404 $\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{Y4}^{+}$	$\surd$	0	0	$\surd$	-	-
N63.9.405 $\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{Y4}^{-}$	$\surd$	0	0	$\surd$	-	-
N63.9.406 $\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B1}\oplus\mathrm{B1}$
N63.9.407 $\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B1_u}\oplus\mathrm{B2_g}$
N63.9.408 $\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{+}\oplus\mathrm{Y1}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B2_g}$
N63.9.409 $\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{+}\oplus\mathrm{Y1}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B2_g}$
N63.9.410 $\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{+}\oplus\mathrm{Y2}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B2_g}$
N63.9.411 $\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{+}\oplus\mathrm{Y2}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B2_g}$
N63.9.412 $\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{+}\oplus\mathrm{Y3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B2_g}$
N63.9.413 $\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{+}\oplus\mathrm{Y3}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B2_g}$
N63.9.414 $\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{+}\oplus\mathrm{Y4}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B2_g}$
N63.9.415 $\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{+}\oplus\mathrm{Y4}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B2_g}$
N63.9.416 $\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
N63.9.417 $\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{-}\oplus\mathrm{Y1}^{+}$	$\surd$	0	0	$\surd$	-	-

Non-coplanar SSGs with parent space group $Cmcm$ (No. 63) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N63.9.418 $\mathrm{GM3^-}\oplus\mathrm{GM4^-}\oplus\mathrm{Y1^-}$	$\surd$	0	0	$\surd$	-	-
N63.9.419 $\mathrm{GM3^-}\oplus\mathrm{GM4^-}\oplus\mathrm{Y2^+}$	$\surd$	0	0	$\surd$	-	-
N63.9.420 $\mathrm{GM3^-}\oplus\mathrm{GM4^-}\oplus\mathrm{Y2^-}$	$\surd$	0	0	$\surd$	-	-
N63.9.421 $\mathrm{GM3^-}\oplus\mathrm{GM4^-}\oplus\mathrm{Y3^+}$	$\surd$	0	0	$\surd$	-	-
N63.9.422 $\mathrm{GM3^-}\oplus\mathrm{GM4^-}\oplus\mathrm{Y3^-}$	$\surd$	0	0	$\surd$	-	-
N63.9.423 $\mathrm{GM3^-}\oplus\mathrm{GM4^-}\oplus\mathrm{Y4^+}$	$\surd$	0	0	$\surd$	-	-
N63.9.424 $\mathrm{GM3^-}\oplus\mathrm{GM4^-}\oplus\mathrm{Y4^-}$	$\surd$	0	0	$\surd$	-	-
N63.9.425 $\mathrm{GM3^-}\oplus\mathrm{Y1^+}\oplus\mathrm{Y1^+}$	$\surd$	1	0	$\times$	-	-
N63.9.426 $\mathrm{GM3^-}\oplus\mathrm{Y1^+}\oplus\mathrm{Y1^-}$	$\surd$	1	1	$\times$	-	-
N63.9.427 $\mathrm{GM3^-}\oplus\mathrm{Y1^+}\oplus\mathrm{Y2^+}$	$\surd$	1	0	$\times$	-	-
N63.9.428 $\mathrm{GM3^-}\oplus\mathrm{Y1^+}\oplus\mathrm{Y2^-}$	$\surd$	1	1	$\times$	-	-
N63.9.429 $\mathrm{GM3^-}\oplus\mathrm{Y1^+}\oplus\mathrm{Y3^+}$	$\surd$	1	0	$\times$	-	-
N63.9.430 $\mathrm{GM3^-}\oplus\mathrm{Y1^+}\oplus\mathrm{Y3^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N63.9.431 $\mathrm{GM3^-}\oplus\mathrm{Y1^+}\oplus\mathrm{Y4^+}$	$\surd$	1	0	$\times$	-	-
N63.9.432 $\mathrm{GM3^-}\oplus\mathrm{Y1^+}\oplus\mathrm{Y4^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N63.9.433 $\mathrm{GM3^-}\oplus\mathrm{Y1^-}\oplus\mathrm{Y1^-}$	$\surd$	1	0	$\times$	-	-
N63.9.434 $\mathrm{GM3^-}\oplus\mathrm{Y1^-}\oplus\mathrm{Y2^+}$	$\surd$	1	1	$\times$	-	-
N63.9.435 $\mathrm{GM3^-}\oplus\mathrm{Y1^-}\oplus\mathrm{Y2^-}$	$\surd$	1	0	$\times$	-	-
N63.9.436 $\mathrm{GM3^-}\oplus\mathrm{Y1^-}\oplus\mathrm{Y3^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N63.9.437 $\mathrm{GM3^-}\oplus\mathrm{Y1^-}\oplus\mathrm{Y3^-}$	$\surd$	1	0	$\times$	-	-
N63.9.438 $\mathrm{GM3^-}\oplus\mathrm{Y1^-}\oplus\mathrm{Y4^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N63.9.439 $\mathrm{GM3^-}\oplus\mathrm{Y1^-}\oplus\mathrm{Y4^-}$	$\surd$	1	0	$\times$	-	-
N63.9.440 $\mathrm{GM3^-}\oplus\mathrm{Y2^+}\oplus\mathrm{Y2^+}$	$\surd$	1	0	$\times$	-	-
N63.9.441 $\mathrm{GM3^-}\oplus\mathrm{Y2^+}\oplus\mathrm{Y2^-}$	$\surd$	1	1	$\times$	-	-
N63.9.442 $\mathrm{GM3^-}\oplus\mathrm{Y2^+}\oplus\mathrm{Y3^+}$	$\surd$	1	0	$\times$	-	-
N63.9.443 $\mathrm{GM3^-}\oplus\mathrm{Y2^+}\oplus\mathrm{Y3^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N63.9.444 $\mathrm{GM3^-}\oplus\mathrm{Y2^+}\oplus\mathrm{Y4^+}$	$\surd$	1	0	$\times$	-	-
N63.9.445 $\mathrm{GM3^-}\oplus\mathrm{Y2^+}\oplus\mathrm{Y4^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N63.9.446 $\mathrm{GM3^-}\oplus\mathrm{Y2^-}\oplus\mathrm{Y2^-}$	$\surd$	1	0	$\times$	-	-
N63.9.447 $\mathrm{GM3^-}\oplus\mathrm{Y2^-}\oplus\mathrm{Y3^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N63.9.448 $\mathrm{GM3^-}\oplus\mathrm{Y2^-}\oplus\mathrm{Y3^-}$	$\surd$	1	0	$\times$	-	-
N63.9.449 $\mathrm{GM3^-}\oplus\mathrm{Y2^-}\oplus\mathrm{Y4^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N63.9.450 $\mathrm{GM3^-}\oplus\mathrm{Y2^-}\oplus\mathrm{Y4^-}$	$\surd$	1	0	$\times$	-	-
N63.9.451 $\mathrm{GM3^-}\oplus\mathrm{Y3^+}\oplus\mathrm{Y3^+}$	$\surd$	1	0	$\times$	-	-
N63.9.452 $\mathrm{GM3^-}\oplus\mathrm{Y3^+}\oplus\mathrm{Y3^-}$	$\surd$	1	1	$\times$	-	-
N63.9.453 $\mathrm{GM3^-}\oplus\mathrm{Y3^+}\oplus\mathrm{Y4^+}$	$\surd$	1	0	$\times$	-	-
N63.9.454 $\mathrm{GM3^-}\oplus\mathrm{Y3^+}\oplus\mathrm{Y4^-}$	$\surd$	1	1	$\times$	-	-
N63.9.455 $\mathrm{GM3^-}\oplus\mathrm{Y3^-}\oplus\mathrm{Y3^-}$	$\surd$	1	0	$\times$	-	-
N63.9.456 $\mathrm{GM3^-}\oplus\mathrm{Y3^-}\oplus\mathrm{Y4^+}$	$\surd$	1	1	$\times$	-	-
N63.9.457 $\mathrm{GM3^-}\oplus\mathrm{Y3^-}\oplus\mathrm{Y4^-}$	$\surd$	1	0	$\times$	-	-
N63.9.458 $\mathrm{GM3^-}\oplus\mathrm{Y4^+}\oplus\mathrm{Y4^+}$	$\surd$	1	0	$\times$	-	-
N63.9.459 $\mathrm{GM3^-}\oplus\mathrm{Y4^+}\oplus\mathrm{Y4^-}$	$\surd$	1	1	$\times$	-	-
N63.9.460 $\mathrm{GM3^-}\oplus\mathrm{Y4^-}\oplus\mathrm{Y4^-}$	$\surd$	1	0	$\times$	-	-
N63.9.461 $\mathrm{GM4^+}\oplus\mathrm{GM4^+}\oplus\mathrm{GM4^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B2_g}\oplus\mathrm{B2_g}\oplus\mathrm{B2_g}$
N63.9.462 $\mathrm{GM4^+}\oplus\mathrm{GM4^+}\oplus\mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2}\oplus\mathrm{A2}$
N63.9.463 $\mathrm{GM4^+}\oplus\mathrm{GM4^+}\oplus\mathrm{Y1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_g}\oplus\mathrm{B2_g}$

Non-coplanar SSGs with parent space group $Cmcm$ (No. 63) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N63.9.464 $\mathrm{GM4^+} \oplus \mathrm{GM4^+} \oplus \mathrm{Y1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_g} \oplus \mathrm{B2_g}$
N63.9.465 $\mathrm{GM4^+} \oplus \mathrm{GM4^+} \oplus \mathrm{Y2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_g} \oplus \mathrm{B2_g}$
N63.9.466 $\mathrm{GM4^+} \oplus \mathrm{GM4^+} \oplus \mathrm{Y2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_g} \oplus \mathrm{B2_g}$
N63.9.467 $\mathrm{GM4^+} \oplus \mathrm{GM4^+} \oplus \mathrm{Y3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_g} \oplus \mathrm{B2_g}$
N63.9.468 $\mathrm{GM4^+} \oplus \mathrm{GM4^+} \oplus \mathrm{Y3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_g} \oplus \mathrm{B2_g}$
N63.9.469 $\mathrm{GM4^+} \oplus \mathrm{GM4^+} \oplus \mathrm{Y4^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_g} \oplus \mathrm{B2_g}$
N63.9.470 $\mathrm{GM4^+} \oplus \mathrm{GM4^+} \oplus \mathrm{Y4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_g} \oplus \mathrm{B2_g}$
N63.9.471 $\mathrm{GM4^+} \oplus \mathrm{GM4^-} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B2_g}$
N63.9.472 $\mathrm{GM4^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Y1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B2_g}$
N63.9.473 $\mathrm{GM4^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Y1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B2_g}$
N63.9.474 $\mathrm{GM4^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Y2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B2_g}$
N63.9.475 $\mathrm{GM4^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Y2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B2_g}$
N63.9.476 $\mathrm{GM4^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Y3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B2_g}$
N63.9.477 $\mathrm{GM4^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Y3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B2_g}$
N63.9.478 $\mathrm{GM4^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Y4^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B2_g}$
N63.9.479 $\mathrm{GM4^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Y4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B2_g}$
N63.9.480 $\mathrm{GM4^+} \oplus \mathrm{Y1^+} \oplus \mathrm{Y1^+}$	$\surd$	1	1	$\times$	-	-
N63.9.481 $\mathrm{GM4^+} \oplus \mathrm{Y1^+} \oplus \mathrm{Y1^-}$	$\surd$	1	1	$\times$	-	-
N63.9.482 $\mathrm{GM4^+} \oplus \mathrm{Y1^+} \oplus \mathrm{Y2^+}$	$\surd$	1	1	$\times$	-	-
N63.9.483 $\mathrm{GM4^+} \oplus \mathrm{Y1^+} \oplus \mathrm{Y2^-}$	$\surd$	1	1	$\times$	-	-
N63.9.484 $\mathrm{GM4^+} \oplus \mathrm{Y1^+} \oplus \mathrm{Y3^+}$	$\surd$	1	1	$\times$	-	-
N63.9.485 $\mathrm{GM4^+} \oplus \mathrm{Y1^+} \oplus \mathrm{Y3^-}$	$\surd$	1	1	$\surd$	$mm2$	B1
N63.9.486 $\mathrm{GM4^+} \oplus \mathrm{Y1^+} \oplus \mathrm{Y4^+}$	$\surd$	1	1	$\times$	-	-
N63.9.487 $\mathrm{GM4^+} \oplus \mathrm{Y1^+} \oplus \mathrm{Y4^-}$	$\surd$	1	1	$\surd$	222	B2
N63.9.488 $\mathrm{GM4^+} \oplus \mathrm{Y1^-} \oplus \mathrm{Y1^-}$	$\surd$	1	1	$\times$	-	-
N63.9.489 $\mathrm{GM4^+} \oplus \mathrm{Y1^-} \oplus \mathrm{Y2^+}$	$\surd$	1	1	$\times$	-	-
N63.9.490 $\mathrm{GM4^+} \oplus \mathrm{Y1^-} \oplus \mathrm{Y2^-}$	$\surd$	1	1	$\times$	-	-
N63.9.491 $\mathrm{GM4^+} \oplus \mathrm{Y1^-} \oplus \mathrm{Y3^+}$	$\surd$	1	1	$\surd$	$mm2$	B1
N63.9.492 $\mathrm{GM4^+} \oplus \mathrm{Y1^-} \oplus \mathrm{Y3^-}$	$\surd$	1	1	$\times$	-	-
N63.9.493 $\mathrm{GM4^+} \oplus \mathrm{Y1^-} \oplus \mathrm{Y4^+}$	$\surd$	1	1	$\surd$	222	B2
N63.9.494 $\mathrm{GM4^+} \oplus \mathrm{Y1^-} \oplus \mathrm{Y4^-}$	$\surd$	1	1	$\times$	-	-
N63.9.495 $\mathrm{GM4^+} \oplus \mathrm{Y2^+} \oplus \mathrm{Y2^+}$	$\surd$	1	1	$\times$	-	-
N63.9.496 $\mathrm{GM4^+} \oplus \mathrm{Y2^+} \oplus \mathrm{Y2^-}$	$\surd$	1	1	$\times$	-	-
N63.9.497 $\mathrm{GM4^+} \oplus \mathrm{Y2^+} \oplus \mathrm{Y3^+}$	$\surd$	1	1	$\times$	-	-
N63.9.498 $\mathrm{GM4^+} \oplus \mathrm{Y2^+} \oplus \mathrm{Y3^-}$	$\surd$	1	1	$\surd$	222	B2
N63.9.499 $\mathrm{GM4^+} \oplus \mathrm{Y2^+} \oplus \mathrm{Y4^+}$	$\surd$	1	1	$\times$	-	-
N63.9.500 $\mathrm{GM4^+} \oplus \mathrm{Y2^+} \oplus \mathrm{Y4^-}$	$\surd$	1	1	$\surd$	$mm2$	B1
N63.9.501 $\mathrm{GM4^+} \oplus \mathrm{Y2^-} \oplus \mathrm{Y2^-}$	$\surd$	1	1	$\times$	-	-
N63.9.502 $\mathrm{GM4^+} \oplus \mathrm{Y2^-} \oplus \mathrm{Y3^+}$	$\surd$	1	1	$\surd$	222	B2
N63.9.503 $\mathrm{GM4^+} \oplus \mathrm{Y2^-} \oplus \mathrm{Y3^-}$	$\surd$	1	1	$\times$	-	-
N63.9.504 $\mathrm{GM4^+} \oplus \mathrm{Y2^-} \oplus \mathrm{Y4^+}$	$\surd$	1	1	$\surd$	$mm2$	B1
N63.9.505 $\mathrm{GM4^+} \oplus \mathrm{Y2^-} \oplus \mathrm{Y4^-}$	$\surd$	1	1	$\times$	-	-
N63.9.506 $\mathrm{GM4^+} \oplus \mathrm{Y3^+} \oplus \mathrm{Y3^+}$	$\surd$	1	1	$\times$	-	-
N63.9.507 $\mathrm{GM4^+} \oplus \mathrm{Y3^+} \oplus \mathrm{Y3^-}$	$\surd$	1	1	$\times$	-	-
N63.9.508 $\mathrm{GM4^+} \oplus \mathrm{Y3^+} \oplus \mathrm{Y4^+}$	$\surd$	1	1	$\times$	-	-
N63.9.509 $\mathrm{GM4^+} \oplus \mathrm{Y3^+} \oplus \mathrm{Y4^-}$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $Cmcm$ (No. 63) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N63.9.510 $\mathrm{GM4}^{+}\oplus\mathrm{Y3}^{-}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\times$	-	-
N63.9.511 $\mathrm{GM4}^{+}\oplus\mathrm{Y3}^{-}\oplus\mathrm{Y4}^{+}$	$\surd$	1	1	$\times$	-	-
N63.9.512 $\mathrm{GM4}^{+}\oplus\mathrm{Y3}^{-}\oplus\mathrm{Y4}^{-}$	$\surd$	1	1	$\times$	-	-
N63.9.513 $\mathrm{GM4}^{+}\oplus\mathrm{Y4}^{+}\oplus\mathrm{Y4}^{+}$	$\surd$	1	1	$\times$	-	-
N63.9.514 $\mathrm{GM4}^{+}\oplus\mathrm{Y4}^{+}\oplus\mathrm{Y4}^{-}$	$\surd$	1	1	$\times$	-	-
N63.9.515 $\mathrm{GM4}^{+}\oplus\mathrm{Y4}^{-}\oplus\mathrm{Y4}^{-}$	$\surd$	1	1	$\times$	-	-
N63.9.516 $\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
N63.9.517 $\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}\oplus\mathrm{Y1}^{+}$	$\surd$	0	0	$\surd$	-	-
N63.9.518 $\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}\oplus\mathrm{Y1}^{-}$	$\surd$	0	0	$\surd$	-	-
N63.9.519 $\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}\oplus\mathrm{Y2}^{+}$	$\surd$	0	0	$\surd$	-	-
N63.9.520 $\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}\oplus\mathrm{Y2}^{-}$	$\surd$	0	0	$\surd$	-	-
N63.9.521 $\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}\oplus\mathrm{Y3}^{+}$	$\surd$	0	0	$\surd$	-	-
N63.9.522 $\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}\oplus\mathrm{Y3}^{-}$	$\surd$	0	0	$\surd$	-	-
N63.9.523 $\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}\oplus\mathrm{Y4}^{+}$	$\surd$	0	0	$\surd$	-	-
N63.9.524 $\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}\oplus\mathrm{Y4}^{-}$	$\surd$	0	0	$\surd$	-	-
N63.9.525 $\mathrm{GM4}^{-}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y1}^{+}$	$\surd$	1	0	$\times$	-	-
N63.9.526 $\mathrm{GM4}^{-}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y1}^{-}$	$\surd$	1	1	$\times$	-	-
N63.9.527 $\mathrm{GM4}^{-}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y2}^{+}$	$\surd$	1	0	$\times$	-	-
N63.9.528 $\mathrm{GM4}^{-}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\times$	-	-
N63.9.529 $\mathrm{GM4}^{-}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y3}^{+}$	$\surd$	1	0	$\times$	-	-
N63.9.530 $\mathrm{GM4}^{-}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N63.9.531 $\mathrm{GM4}^{-}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y4}^{+}$	$\surd$	1	0	$\times$	-	-
N63.9.532 $\mathrm{GM4}^{-}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y4}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N63.9.533 $\mathrm{GM4}^{-}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y1}^{-}$	$\surd$	1	0	$\times$	-	-
N63.9.534 $\mathrm{GM4}^{-}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y2}^{+}$	$\surd$	1	1	$\times$	-	-
N63.9.535 $\mathrm{GM4}^{-}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y2}^{-}$	$\surd$	1	0	$\times$	-	-
N63.9.536 $\mathrm{GM4}^{-}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y3}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N63.9.537 $\mathrm{GM4}^{-}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y3}^{-}$	$\surd$	1	0	$\times$	-	-
N63.9.538 $\mathrm{GM4}^{-}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y4}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N63.9.539 $\mathrm{GM4}^{-}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y4}^{-}$	$\surd$	1	0	$\times$	-	-
N63.9.540 $\mathrm{GM4}^{-}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Y2}^{+}$	$\surd$	1	0	$\times$	-	-
N63.9.541 $\mathrm{GM4}^{-}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\times$	-	-
N63.9.542 $\mathrm{GM4}^{-}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Y3}^{+}$	$\surd$	1	0	$\times$	-	-
N63.9.543 $\mathrm{GM4}^{-}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N63.9.544 $\mathrm{GM4}^{-}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Y4}^{+}$	$\surd$	1	0	$\times$	-	-
N63.9.545 $\mathrm{GM4}^{-}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Y4}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N63.9.546 $\mathrm{GM4}^{-}\oplus\mathrm{Y2}^{-}\oplus\mathrm{Y2}^{-}$	$\surd$	1	0	$\times$	-	-
N63.9.547 $\mathrm{GM4}^{-}\oplus\mathrm{Y2}^{-}\oplus\mathrm{Y3}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N63.9.548 $\mathrm{GM4}^{-}\oplus\mathrm{Y2}^{-}\oplus\mathrm{Y3}^{-}$	$\surd$	1	0	$\times$	-	-
N63.9.549 $\mathrm{GM4}^{-}\oplus\mathrm{Y2}^{-}\oplus\mathrm{Y4}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N63.9.550 $\mathrm{GM4}^{-}\oplus\mathrm{Y2}^{-}\oplus\mathrm{Y4}^{-}$	$\surd$	1	0	$\times$	-	-
N63.9.551 $\mathrm{GM4}^{-}\oplus\mathrm{Y3}^{+}\oplus\mathrm{Y3}^{+}$	$\surd$	1	0	$\times$	-	-
N63.9.552 $\mathrm{GM4}^{-}\oplus\mathrm{Y3}^{+}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\times$	-	-
N63.9.553 $\mathrm{GM4}^{-}\oplus\mathrm{Y3}^{+}\oplus\mathrm{Y4}^{+}$	$\surd$	1	0	$\times$	-	-
N63.9.554 $\mathrm{GM4}^{-}\oplus\mathrm{Y3}^{+}\oplus\mathrm{Y4}^{-}$	$\surd$	1	1	$\times$	-	-
N63.9.555 $\mathrm{GM4}^{-}\oplus\mathrm{Y3}^{-}\oplus\mathrm{Y3}^{-}$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $Cmcm$ (No. 63) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N63.9.556 $\mathrm{GM4}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\times$	-	-
N63.9.557 $\mathrm{GM4}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Y4}^-$	$\surd$	1	0	$\times$	-	-
N63.9.558 $\mathrm{GM4}^- \oplus \mathrm{Y4}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
N63.9.559 $\mathrm{GM4}^- \oplus \mathrm{Y4}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\times$	-	-
N63.9.560 $\mathrm{GM4}^- \oplus \mathrm{Y4}^- \oplus \mathrm{Y4}^-$	$\surd$	1	0	$\times$	-	-
N63.9.561 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^+$	$\surd$	0	0	$\surd$	-	-
N63.9.562 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u}$
N63.9.563 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^+$	$\surd$	0	0	$\surd$	-	-
N63.9.564 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N63.9.565 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y3}^+$	$\surd$	0	0	$\surd$	-	-
N63.9.566 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B3_u}$
N63.9.567 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y4}^+$	$\surd$	0	0	$\surd$	-	-
N63.9.568 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_u} \oplus \mathrm{B2_u}$
N63.9.569 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u}$
N63.9.570 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u}$
N63.9.571 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u}$
N63.9.572 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u}$
N63.9.573 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u}$
N63.9.574 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B2_u}$
N63.9.575 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B2_u}$
N63.9.576 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^+$	$\surd$	0	0	$\surd$	-	-
N63.9.577 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u}$
N63.9.578 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^+$	$\surd$	0	0	$\surd$	-	-
N63.9.579 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_u}$
N63.9.580 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y4}^+$	$\surd$	0	0	$\surd$	-	-
N63.9.581 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_u}$
N63.9.582 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N63.9.583 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N63.9.584 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u}$
N63.9.585 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u}$
N63.9.586 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N63.9.587 $\mathrm{Y1}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^+$	$\surd$	0	0	$\surd$	-	-
N63.9.588 $\mathrm{Y1}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u}$
N63.9.589 $\mathrm{Y1}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y4}^+$	$\surd$	0	0	$\surd$	-	-
N63.9.590 $\mathrm{Y1}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N63.9.591 $\mathrm{Y1}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B3_u}$
N63.9.592 $\mathrm{Y1}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Y4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u}$
N63.9.593 $\mathrm{Y1}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_u}$
N63.9.594 $\mathrm{Y1}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{Y4}^+$	$\surd$	0	0	$\surd$	-	-
N63.9.595 $\mathrm{Y1}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B2_u}$
N63.9.596 $\mathrm{Y1}^+ \oplus \mathrm{Y4}^- \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_u} \oplus \mathrm{B2_u}$
N63.9.597 $\mathrm{Y1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y1}^-$	$\surd$	0	0	$\surd$	-	-
N63.9.598 $\mathrm{Y1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N63.9.599 $\mathrm{Y1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y2}^-$	$\surd$	0	0	$\surd$	-	-
N63.9.600 $\mathrm{Y1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B3_u}$
N63.9.601 $\mathrm{Y1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y3}^-$	$\surd$	0	0	$\surd$	-	-

Non-coplanar SSGs with parent space group $Cmcm$ (No. 63) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N63.9.602 $\mathrm{Y1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_u} \oplus \mathrm{B2_u}$
N63.9.603 $\mathrm{Y1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y4}^-$	$\surd$	0	0	$\surd$	-	-
N63.9.604 $\mathrm{Y1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N63.9.605 $\mathrm{Y1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u}$
N63.9.606 $\mathrm{Y1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u}$
N63.9.607 $\mathrm{Y1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N63.9.608 $\mathrm{Y1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N63.9.609 $\mathrm{Y1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u}$
N63.9.610 $\mathrm{Y1}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y2}^-$	$\surd$	0	0	$\surd$	-	-
N63.9.611 $\mathrm{Y1}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_u}$
N63.9.612 $\mathrm{Y1}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y3}^-$	$\surd$	0	0	$\surd$	-	-
N63.9.613 $\mathrm{Y1}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_u}$
N63.9.614 $\mathrm{Y1}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y4}^-$	$\surd$	0	0	$\surd$	-	-
N63.9.615 $\mathrm{Y1}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B3_u}$
N63.9.616 $\mathrm{Y1}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u}$
N63.9.617 $\mathrm{Y1}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Y4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_u}$
N63.9.618 $\mathrm{Y1}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u}$
N63.9.619 $\mathrm{Y1}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Y3}^-$	$\surd$	0	0	$\surd$	-	-
N63.9.620 $\mathrm{Y1}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Y4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N63.9.621 $\mathrm{Y1}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Y4}^-$	$\surd$	0	0	$\surd$	-	-
N63.9.622 $\mathrm{Y1}^- \oplus \mathrm{Y4}^+ \oplus \mathrm{Y4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_u} \oplus \mathrm{B2_u}$
N63.9.623 $\mathrm{Y1}^- \oplus \mathrm{Y4}^+ \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B2_u}$
N63.9.624 $\mathrm{Y1}^- \oplus \mathrm{Y4}^- \oplus \mathrm{Y4}^-$	$\surd$	0	0	$\surd$	-	-
N63.9.625 $\mathrm{Y2}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^+$	$\surd$	0	0	$\surd$	-	-
N63.9.626 $\mathrm{Y2}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u}$
N63.9.627 $\mathrm{Y2}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^+$	$\surd$	0	0	$\surd$	-	-
N63.9.628 $\mathrm{Y2}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_u} \oplus \mathrm{B2_u}$
N63.9.629 $\mathrm{Y2}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y4}^+$	$\surd$	0	0	$\surd$	-	-
N63.9.630 $\mathrm{Y2}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B3_u}$
N63.9.631 $\mathrm{Y2}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u}$
N63.9.632 $\mathrm{Y2}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B2_u}$
N63.9.633 $\mathrm{Y2}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B2_u}$
N63.9.634 $\mathrm{Y2}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u}$
N63.9.635 $\mathrm{Y2}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u}$
N63.9.636 $\mathrm{Y2}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^+$	$\surd$	0	0	$\surd$	-	-
N63.9.637 $\mathrm{Y2}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B2_u}$
N63.9.638 $\mathrm{Y2}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y4}^+$	$\surd$	0	0	$\surd$	-	-
N63.9.639 $\mathrm{Y2}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u}$
N63.9.640 $\mathrm{Y2}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_u} \oplus \mathrm{B2_u}$
N63.9.641 $\mathrm{Y2}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Y4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N63.9.642 $\mathrm{Y2}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_u}$
N63.9.643 $\mathrm{Y2}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{Y4}^+$	$\surd$	0	0	$\surd$	-	-
N63.9.644 $\mathrm{Y2}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u}$
N63.9.645 $\mathrm{Y2}^+ \oplus \mathrm{Y4}^- \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B3_u}$
N63.9.646 $\mathrm{Y2}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y2}^-$	$\surd$	0	0	$\surd$	-	-
N63.9.647 $\mathrm{Y2}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_u} \oplus \mathrm{B2_u}$

Non-coplanar SSGs with parent space group $Cmcm$ (No. 63) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N63.9.648 $\mathrm{Y2^-}\oplus\mathrm{Y2^-}\oplus\mathrm{Y3^-}$	$\surd$	0	0	$\surd$	-	-
N63.9.649 $\mathrm{Y2^-}\oplus\mathrm{Y2^-}\oplus\mathrm{Y4^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u}\oplus\mathrm{B3_u}$
N63.9.650 $\mathrm{Y2^-}\oplus\mathrm{Y2^-}\oplus\mathrm{Y4^-}$	$\surd$	0	0	$\surd$	-	-
N63.9.651 $\mathrm{Y2^-}\oplus\mathrm{Y3^+}\oplus\mathrm{Y3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_u}\oplus\mathrm{B2_u}$
N63.9.652 $\mathrm{Y2^-}\oplus\mathrm{Y3^+}\oplus\mathrm{Y3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B2_u}$
N63.9.653 $\mathrm{Y2^-}\oplus\mathrm{Y3^+}\oplus\mathrm{Y4^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u}\oplus\mathrm{B2_u}$
N63.9.654 $\mathrm{Y2^-}\oplus\mathrm{Y3^+}\oplus\mathrm{Y4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B2_u}$
N63.9.655 $\mathrm{Y2^-}\oplus\mathrm{Y3^-}\oplus\mathrm{Y3^-}$	$\surd$	0	0	$\surd$	-	-
N63.9.656 $\mathrm{Y2^-}\oplus\mathrm{Y3^-}\oplus\mathrm{Y4^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B3_u}$
N63.9.657 $\mathrm{Y2^-}\oplus\mathrm{Y3^-}\oplus\mathrm{Y4^-}$	$\surd$	0	0	$\surd$	-	-
N63.9.658 $\mathrm{Y2^-}\oplus\mathrm{Y4^+}\oplus\mathrm{Y4^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u}\oplus\mathrm{B3_u}$
N63.9.659 $\mathrm{Y2^-}\oplus\mathrm{Y4^+}\oplus\mathrm{Y4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B3_u}$
N63.9.660 $\mathrm{Y2^-}\oplus\mathrm{Y4^-}\oplus\mathrm{Y4^-}$	$\surd$	0	0	$\surd$	-	-
N63.9.661 $\mathrm{Y3^+}\oplus\mathrm{Y3^+}\oplus\mathrm{Y3^+}$	$\surd$	0	0	$\surd$	-	-
N63.9.662 $\mathrm{Y3^+}\oplus\mathrm{Y3^+}\oplus\mathrm{Y3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{A_u}$
N63.9.663 $\mathrm{Y3^+}\oplus\mathrm{Y3^+}\oplus\mathrm{Y4^+}$	$\surd$	0	0	$\surd$	-	-
N63.9.664 $\mathrm{Y3^+}\oplus\mathrm{Y3^+}\oplus\mathrm{Y4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B1_u}$
N63.9.665 $\mathrm{Y3^+}\oplus\mathrm{Y3^-}\oplus\mathrm{Y3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{A_u}$
N63.9.666 $\mathrm{Y3^+}\oplus\mathrm{Y3^-}\oplus\mathrm{Y4^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B1_u}$
N63.9.667 $\mathrm{Y3^+}\oplus\mathrm{Y3^-}\oplus\mathrm{Y4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B1_u}$
N63.9.668 $\mathrm{Y3^+}\oplus\mathrm{Y4^+}\oplus\mathrm{Y4^+}$	$\surd$	0	0	$\surd$	-	-
N63.9.669 $\mathrm{Y3^+}\oplus\mathrm{Y4^+}\oplus\mathrm{Y4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B1_u}$
N63.9.670 $\mathrm{Y3^+}\oplus\mathrm{Y4^-}\oplus\mathrm{Y4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B1_u}$
N63.9.671 $\mathrm{Y3^-}\oplus\mathrm{Y3^-}\oplus\mathrm{Y3^-}$	$\surd$	0	0	$\surd$	-	-
N63.9.672 $\mathrm{Y3^-}\oplus\mathrm{Y3^-}\oplus\mathrm{Y4^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B1_u}$
N63.9.673 $\mathrm{Y3^-}\oplus\mathrm{Y3^-}\oplus\mathrm{Y4^-}$	$\surd$	0	0	$\surd$	-	-
N63.9.674 $\mathrm{Y3^-}\oplus\mathrm{Y4^+}\oplus\mathrm{Y4^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B1_u}$
N63.9.675 $\mathrm{Y3^-}\oplus\mathrm{Y4^+}\oplus\mathrm{Y4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B1_u}$
N63.9.676 $\mathrm{Y3^-}\oplus\mathrm{Y4^-}\oplus\mathrm{Y4^-}$	$\surd$	0	0	$\surd$	-	-
N63.9.677 $\mathrm{Y4^+}\oplus\mathrm{Y4^+}\oplus\mathrm{Y4^+}$	$\surd$	0	0	$\surd$	-	-
N63.9.678 $\mathrm{Y4^+}\oplus\mathrm{Y4^+}\oplus\mathrm{Y4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{A_u}$
N63.9.679 $\mathrm{Y4^+}\oplus\mathrm{Y4^-}\oplus\mathrm{Y4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{A_u}$
N63.9.680 $\mathrm{Y4^-}\oplus\mathrm{Y4^-}\oplus\mathrm{Y4^-}$	$\surd$	0	0	$\surd$	-	-
N63.12.1 $\mathrm{GM1^-}\oplus\mathrm{T1}$	$\surd$	1	1	$\times$	-	-
N63.12.2 $\mathrm{GM1^-}\oplus\mathrm{T2}$	$\surd$	1	1	$\times$	-	-
N63.12.3 $\mathrm{GM1^-}\oplus\mathrm{Z1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N63.12.4 $\mathrm{GM1^-}\oplus\mathrm{Z2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N63.12.5 $\mathrm{GM2^+}\oplus\mathrm{T1}$	$\surd$	1	1	$\surd$	222	B1
N63.12.6 $\mathrm{GM2^+}\oplus\mathrm{T2}$	$\surd$	1	1	$\surd$	222	B1
N63.12.7 $\mathrm{GM2^+}\oplus\mathrm{Z1}$	$\surd$	1	1	$\surd$	222	B1
N63.12.8 $\mathrm{GM2^+}\oplus\mathrm{Z2}$	$\surd$	1	1	$\surd$	222	B1
N63.12.9 $\mathrm{GM2^-}\oplus\mathrm{T1}$	$\surd$	1	1	$\times$	-	-
N63.12.10 $\mathrm{GM2^-}\oplus\mathrm{T2}$	$\surd$	1	1	$\times$	-	-
N63.12.11 $\mathrm{GM2^-}\oplus\mathrm{Z1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N63.12.12 $\mathrm{GM2^-}\oplus\mathrm{Z2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N63.12.13 $\mathrm{GM3^+}\oplus\mathrm{T1}$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $Cmcm$ (No. 63) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N63.12.14 $\mathrm{GM3^+} \oplus \mathrm{T2}$	$\surd$	1	1	$\times$	-	-
N63.12.15 $\mathrm{GM3^+} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$mm2$	$\mathrm{B2}$
N63.12.16 $\mathrm{GM3^+} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	$mm2$	$\mathrm{B2}$
N63.12.17 $\mathrm{GM3^-} \oplus \mathrm{T1}$	$\surd$	1	1	$\times$	-	-
N63.12.18 $\mathrm{GM3^-} \oplus \mathrm{T2}$	$\surd$	1	1	$\times$	-	-
N63.12.19 $\mathrm{GM3^-} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N63.12.20 $\mathrm{GM3^-} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N63.12.21 $\mathrm{GM4^+} \oplus \mathrm{T1}$	$\surd$	1	1	$\times$	-	-
N63.12.22 $\mathrm{GM4^+} \oplus \mathrm{T2}$	$\surd$	1	1	$\times$	-	-
N63.12.23 $\mathrm{GM4^+} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$mm2$	$\mathrm{B1}$
N63.12.24 $\mathrm{GM4^+} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	$mm2$	$\mathrm{B1}$
N63.12.25 $\mathrm{GM4^-} \oplus \mathrm{T1}$	$\surd$	1	1	$\times$	-	-
N63.12.26 $\mathrm{GM4^-} \oplus \mathrm{T2}$	$\surd$	1	1	$\times$	-	-
N63.12.27 $\mathrm{GM4^-} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N63.12.28 $\mathrm{GM4^-} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N63.12.29 $\mathrm{Y1^+} \oplus \mathrm{T1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N63.12.30 $\mathrm{Y1^+} \oplus \mathrm{T2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N63.12.31 $\mathrm{Y1^+} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N63.12.32 $\mathrm{Y1^+} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N63.12.33 $\mathrm{Y1^-} \oplus \mathrm{T1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N63.12.34 $\mathrm{Y1^-} \oplus \mathrm{T2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N63.12.35 $\mathrm{Y1^-} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N63.12.36 $\mathrm{Y1^-} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N63.12.37 $\mathrm{Y2^+} \oplus \mathrm{T1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N63.12.38 $\mathrm{Y2^+} \oplus \mathrm{T2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N63.12.39 $\mathrm{Y2^+} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N63.12.40 $\mathrm{Y2^+} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N63.12.41 $\mathrm{Y2^-} \oplus \mathrm{T1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N63.12.42 $\mathrm{Y2^-} \oplus \mathrm{T2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N63.12.43 $\mathrm{Y2^-} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N63.12.44 $\mathrm{Y2^-} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N63.12.45 $\mathrm{Y3^+} \oplus \mathrm{T1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N63.12.46 $\mathrm{Y3^+} \oplus \mathrm{T2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N63.12.47 $\mathrm{Y3^+} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N63.12.48 $\mathrm{Y3^+} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N63.12.49 $\mathrm{Y3^-} \oplus \mathrm{T1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N63.12.50 $\mathrm{Y3^-} \oplus \mathrm{T2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N63.12.51 $\mathrm{Y3^-} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N63.12.52 $\mathrm{Y3^-} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N63.12.53 $\mathrm{Y4^+} \oplus \mathrm{T1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N63.12.54 $\mathrm{Y4^+} \oplus \mathrm{T2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N63.12.55 $\mathrm{Y4^+} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N63.12.56 $\mathrm{Y4^+} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N63.12.57 $\mathrm{Y4^-} \oplus \mathrm{T1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N63.12.58 $\mathrm{Y4^-} \oplus \mathrm{T2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N63.12.59 $\mathrm{Y4^-} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$

Non-coplanar SSGs with parent space group $Cmcm$ (No. 63) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N63.12.60 $\mathrm{Y4^-} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N63.13.1 $\mathrm{GM1^-} \oplus \mathrm{S1^+}$	$\surd$	1	0	$\times$	-	-
N63.13.2 $\mathrm{GM1^-} \oplus \mathrm{S1^-}$	$\surd$	1	0	$\times$	-	-
N63.13.3 $\mathrm{GM2^+} \oplus \mathrm{S1^+}$	$\surd$	1	1	$\times$	-	-
N63.13.4 $\mathrm{GM2^+} \oplus \mathrm{S1^-}$	$\surd$	1	1	$\times$	-	-
N63.13.5 $\mathrm{GM2^-} \oplus \mathrm{S1^+}$	$\surd$	1	0	$\times$	-	-
N63.13.6 $\mathrm{GM2^-} \oplus \mathrm{S1^-}$	$\surd$	1	0	$\times$	-	-
N63.13.7 $\mathrm{GM3^+} \oplus \mathrm{S1^+}$	$\surd$	1	1	$\times$	-	-
N63.13.8 $\mathrm{GM3^+} \oplus \mathrm{S1^-}$	$\surd$	1	1	$\times$	-	-
N63.13.9 $\mathrm{GM3^-} \oplus \mathrm{S1^+}$	$\surd$	1	0	$\times$	-	-
N63.13.10 $\mathrm{GM3^-} \oplus \mathrm{S1^-}$	$\surd$	1	0	$\times$	-	-
N63.13.11 $\mathrm{GM4^+} \oplus \mathrm{S1^+}$	$\surd$	1	1	$\times$	-	-
N63.13.12 $\mathrm{GM4^+} \oplus \mathrm{S1^-}$	$\surd$	1	1	$\times$	-	-
N63.13.13 $\mathrm{GM4^-} \oplus \mathrm{S1^+}$	$\surd$	1	0	$\times$	-	-
N63.13.14 $\mathrm{GM4^-} \oplus \mathrm{S1^-}$	$\surd$	1	0	$\times$	-	-
N63.13.15 $\mathrm{Y1^+} \oplus \mathrm{S1^+}$	$\times$	-	-	-	-	-
N63.13.16 $\mathrm{Y1^+} \oplus \mathrm{S1^-}$	$\times$	-	-	-	-	-
N63.13.17 $\mathrm{Y1^-} \oplus \mathrm{S1^+}$	$\times$	-	-	-	-	-
N63.13.18 $\mathrm{Y1^-} \oplus \mathrm{S1^-}$	$\times$	-	-	-	-	-
N63.13.19 $\mathrm{Y2^+} \oplus \mathrm{S1^+}$	$\times$	-	-	-	-	-
N63.13.20 $\mathrm{Y2^+} \oplus \mathrm{S1^-}$	$\times$	-	-	-	-	-
N63.13.21 $\mathrm{Y2^-} \oplus \mathrm{S1^+}$	$\times$	-	-	-	-	-
N63.13.22 $\mathrm{Y2^-} \oplus \mathrm{S1^-}$	$\times$	-	-	-	-	-
N63.13.23 $\mathrm{Y3^+} \oplus \mathrm{S1^+}$	$\times$	-	-	-	-	-
N63.13.24 $\mathrm{Y3^+} \oplus \mathrm{S1^-}$	$\times$	-	-	-	-	-
N63.13.25 $\mathrm{Y3^-} \oplus \mathrm{S1^+}$	$\times$	-	-	-	-	-
N63.13.26 $\mathrm{Y3^-} \oplus \mathrm{S1^-}$	$\times$	-	-	-	-	-
N63.13.27 $\mathrm{Y4^+} \oplus \mathrm{S1^+}$	$\times$	-	-	-	-	-
N63.13.28 $\mathrm{Y4^+} \oplus \mathrm{S1^-}$	$\times$	-	-	-	-	-
N63.13.29 $\mathrm{Y4^-} \oplus \mathrm{S1^+}$	$\times$	-	-	-	-	-
N63.13.30 $\mathrm{Y4^-} \oplus \mathrm{S1^-}$	$\times$	-	-	-	-	-
N63.14.1 $\mathrm{GM1^-} \oplus \mathrm{SM1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N63.14.2 $\mathrm{GM1^-} \oplus \mathrm{SM2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N63.14.3 $\mathrm{GM1^-} \oplus \mathrm{SM3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N63.14.4 $\mathrm{GM1^-} \oplus \mathrm{SM4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N63.14.5 $\mathrm{GM1^-} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N63.14.6 $\mathrm{GM1^-} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N63.14.7 $\mathrm{GM1^-} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N63.14.8 $\mathrm{GM1^-} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N63.14.9 $\mathrm{GM1^-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N63.14.10 $\mathrm{GM1^-} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N63.14.11 $\mathrm{GM1^-} \oplus \mathrm{H1}$	$\surd$	1	1	$\times$	-	-
N63.14.12 $\mathrm{GM1^-} \oplus \mathrm{H2}$	$\surd$	1	1	$\times$	-	-
N63.14.13 $\mathrm{GM2^+} \oplus \mathrm{SM1}$	$\surd$	1	1	$\surd$	$mm2$	B1
N63.14.14 $\mathrm{GM2^+} \oplus \mathrm{SM2}$	$\surd$	1	1	$\surd$	$mm2$	B1
N63.14.15 $\mathrm{GM2^+} \oplus \mathrm{SM3}$	$\surd$	1	1	$\surd$	$mm2$	B1

Non-coplanar SSGs with parent space group $Cmcm$ (No. 63) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N63.14.16 GM2$^+$ ⊕ SM4	√	1	1	√	$mm2$	B1
N63.14.17 GM2$^+$ ⊕ DT1	√	1	1	√	$mm2$	B2
N63.14.18 GM2$^+$ ⊕ DT2	√	1	1	√	$mm2$	B2
N63.14.19 GM2$^+$ ⊕ DT3	√	1	1	√	$mm2$	B2
N63.14.20 GM2$^+$ ⊕ DT4	√	1	1	√	$mm2$	B2
N63.14.21 GM2$^+$ ⊕ LD1	√	1	1	√	222	B1
N63.14.22 GM2$^+$ ⊕ LD2	√	1	1	√	222	B1
N63.14.23 GM2$^+$ ⊕ H1	√	1	1	√	222	B1
N63.14.24 GM2$^+$ ⊕ H2	√	1	1	√	222	B1
N63.14.25 GM2$^-$ ⊕ SM1	√	1	1	√	mmm	$\mathrm{B3_u}$
N63.14.26 GM2$^-$ ⊕ SM2	√	1	1	√	mmm	$\mathrm{B3_u}$
N63.14.27 GM2$^-$ ⊕ SM3	√	1	1	√	mmm	$\mathrm{B3_u}$
N63.14.28 GM2$^-$ ⊕ SM4	√	1	1	√	mmm	$\mathrm{B3_u}$
N63.14.29 GM2$^-$ ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N63.14.30 GM2$^-$ ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
N63.14.31 GM2$^-$ ⊕ DT3	√	1	1	√	mmm	$\mathrm{B2_u}$
N63.14.32 GM2$^-$ ⊕ DT4	√	1	1	√	mmm	$\mathrm{B2_u}$
N63.14.33 GM2$^-$ ⊕ LD1	√	1	1	√	mmm	$\mathrm{B1_u}$
N63.14.34 GM2$^-$ ⊕ LD2	√	1	1	√	mmm	$\mathrm{B1_u}$
N63.14.35 GM2$^-$ ⊕ H1	√	1	1	×	-	-
N63.14.36 GM2$^-$ ⊕ H2	√	1	1	×	-	-
N63.14.37 GM3$^+$ ⊕ SM1	√	1	1	√	222	B3
N63.14.38 GM3$^+$ ⊕ SM2	√	1	1	√	222	B3
N63.14.39 GM3$^+$ ⊕ SM3	√	1	1	√	222	B3
N63.14.40 GM3$^+$ ⊕ SM4	√	1	1	√	222	B3
N63.14.41 GM3$^+$ ⊕ DT1	√	1	1	√	$mm2$	B2
N63.14.42 GM3$^+$ ⊕ DT2	√	1	1	√	$mm2$	B2
N63.14.43 GM3$^+$ ⊕ DT3	√	1	1	√	$mm2$	B2
N63.14.44 GM3$^+$ ⊕ DT4	√	1	1	√	$mm2$	B2
N63.14.45 GM3$^+$ ⊕ LD1	√	1	1	√	$mm2$	B2
N63.14.46 GM3$^+$ ⊕ LD2	√	1	1	√	$mm2$	B2
N63.14.47 GM3$^+$ ⊕ H1	√	1	1	×	-	-
N63.14.48 GM3$^+$ ⊕ H2	√	1	1	×	-	-
N63.14.49 GM3$^-$ ⊕ SM1	√	1	1	√	mmm	$\mathrm{B3_u}$
N63.14.50 GM3$^-$ ⊕ SM2	√	1	1	√	mmm	$\mathrm{B3_u}$
N63.14.51 GM3$^-$ ⊕ SM3	√	1	1	√	mmm	$\mathrm{B3_u}$
N63.14.52 GM3$^-$ ⊕ SM4	√	1	1	√	mmm	$\mathrm{B3_u}$
N63.14.53 GM3$^-$ ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N63.14.54 GM3$^-$ ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
N63.14.55 GM3$^-$ ⊕ DT3	√	1	1	√	mmm	$\mathrm{B2_u}$
N63.14.56 GM3$^-$ ⊕ DT4	√	1	1	√	mmm	$\mathrm{B2_u}$
N63.14.57 GM3$^-$ ⊕ LD1	√	1	1	√	mmm	$\mathrm{B1_u}$
N63.14.58 GM3$^-$ ⊕ LD2	√	1	1	√	mmm	$\mathrm{B1_u}$
N63.14.59 GM3$^-$ ⊕ H1	√	1	1	×	-	-
N63.14.60 GM3$^-$ ⊕ H2	√	1	1	×	-	-
N63.14.61 GM4$^+$ ⊕ SM1	√	1	1	√	$mm2$	B1

Non-coplanar SSGs with parent space group $Cmcm$ (No. 63) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N63.14.62 $\mathrm{GM4}^{+}\oplus\mathrm{SM2}$	$\surd$	1	1	$\surd$	$mm2$	$\mathrm{B1}$
N63.14.63 $\mathrm{GM4}^{+}\oplus\mathrm{SM3}$	$\surd$	1	1	$\surd$	$mm2$	$\mathrm{B1}$
N63.14.64 $\mathrm{GM4}^{+}\oplus\mathrm{SM4}$	$\surd$	1	1	$\surd$	$mm2$	$\mathrm{B1}$
N63.14.65 $\mathrm{GM4}^{+}\oplus\mathrm{DT1}$	$\surd$	1	1	$\surd$	222	$\mathrm{B2}$
N63.14.66 $\mathrm{GM4}^{+}\oplus\mathrm{DT2}$	$\surd$	1	1	$\surd$	222	$\mathrm{B2}$
N63.14.67 $\mathrm{GM4}^{+}\oplus\mathrm{DT3}$	$\surd$	1	1	$\surd$	222	$\mathrm{B2}$
N63.14.68 $\mathrm{GM4}^{+}\oplus\mathrm{DT4}$	$\surd$	1	1	$\surd$	222	$\mathrm{B2}$
N63.14.69 $\mathrm{GM4}^{+}\oplus\mathrm{LD1}$	$\surd$	1	1	$\surd$	$mm2$	$\mathrm{B1}$
N63.14.70 $\mathrm{GM4}^{+}\oplus\mathrm{LD2}$	$\surd$	1	1	$\surd$	$mm2$	$\mathrm{B1}$
N63.14.71 $\mathrm{GM4}^{+}\oplus\mathrm{H1}$	$\surd$	1	1	$\times$	-	-
N63.14.72 $\mathrm{GM4}^{+}\oplus\mathrm{H2}$	$\surd$	1	1	$\times$	-	-
N63.14.73 $\mathrm{GM4}^{-}\oplus\mathrm{SM1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N63.14.74 $\mathrm{GM4}^{-}\oplus\mathrm{SM2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N63.14.75 $\mathrm{GM4}^{-}\oplus\mathrm{SM3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N63.14.76 $\mathrm{GM4}^{-}\oplus\mathrm{SM4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N63.14.77 $\mathrm{GM4}^{-}\oplus\mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N63.14.78 $\mathrm{GM4}^{-}\oplus\mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N63.14.79 $\mathrm{GM4}^{-}\oplus\mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N63.14.80 $\mathrm{GM4}^{-}\oplus\mathrm{DT4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N63.14.81 $\mathrm{GM4}^{-}\oplus\mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N63.14.82 $\mathrm{GM4}^{-}\oplus\mathrm{LD2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N63.14.83 $\mathrm{GM4}^{-}\oplus\mathrm{H1}$	$\surd$	1	1	$\times$	-	-
N63.14.84 $\mathrm{GM4}^{-}\oplus\mathrm{H2}$	$\surd$	1	1	$\times$	-	-
N63.14.85 $\mathrm{Y1}^{+}\oplus\mathrm{SM1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N63.14.86 $\mathrm{Y1}^{+}\oplus\mathrm{SM2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N63.14.87 $\mathrm{Y1}^{+}\oplus\mathrm{SM3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N63.14.88 $\mathrm{Y1}^{+}\oplus\mathrm{SM4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N63.14.89 $\mathrm{Y1}^{+}\oplus\mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N63.14.90 $\mathrm{Y1}^{+}\oplus\mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N63.14.91 $\mathrm{Y1}^{+}\oplus\mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N63.14.92 $\mathrm{Y1}^{+}\oplus\mathrm{DT4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N63.14.93 $\mathrm{Y1}^{+}\oplus\mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N63.14.94 $\mathrm{Y1}^{+}\oplus\mathrm{LD2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N63.14.95 $\mathrm{Y1}^{+}\oplus\mathrm{H1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N63.14.96 $\mathrm{Y1}^{+}\oplus\mathrm{H2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N63.14.97 $\mathrm{Y1}^{-}\oplus\mathrm{SM1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N63.14.98 $\mathrm{Y1}^{-}\oplus\mathrm{SM2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N63.14.99 $\mathrm{Y1}^{-}\oplus\mathrm{SM3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N63.14.100 $\mathrm{Y1}^{-}\oplus\mathrm{SM4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N63.14.101 $\mathrm{Y1}^{-}\oplus\mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N63.14.102 $\mathrm{Y1}^{-}\oplus\mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N63.14.103 $\mathrm{Y1}^{-}\oplus\mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N63.14.104 $\mathrm{Y1}^{-}\oplus\mathrm{DT4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N63.14.105 $\mathrm{Y1}^{-}\oplus\mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N63.14.106 $\mathrm{Y1}^{-}\oplus\mathrm{LD2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N63.14.107 $\mathrm{Y1}^{-}\oplus\mathrm{H1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$

Non-coplanar SSGs with parent space group $Cmcm$ (No. 63) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N63.14.108 $\mathrm{Y1}^{-} \oplus \mathrm{H2}$	√	1	1	√	mmm	$\mathrm{B1_u}$
N63.14.109 $\mathrm{Y2}^{+} \oplus \mathrm{SM1}$	√	1	1	√	mmm	$\mathrm{B3_u}$
N63.14.110 $\mathrm{Y2}^{+} \oplus \mathrm{SM2}$	√	1	1	√	mmm	$\mathrm{B3_u}$
N63.14.111 $\mathrm{Y2}^{+} \oplus \mathrm{SM3}$	√	1	1	√	mmm	$\mathrm{B3_u}$
N63.14.112 $\mathrm{Y2}^{+} \oplus \mathrm{SM4}$	√	1	1	√	mmm	$\mathrm{B3_u}$
N63.14.113 $\mathrm{Y2}^{+} \oplus \mathrm{DT1}$	√	1	1	√	mmm	$\mathrm{B2_u}$
N63.14.114 $\mathrm{Y2}^{+} \oplus \mathrm{DT2}$	√	1	1	√	mmm	$\mathrm{B2_u}$
N63.14.115 $\mathrm{Y2}^{+} \oplus \mathrm{DT3}$	√	1	1	√	mmm	$\mathrm{B2_u}$
N63.14.116 $\mathrm{Y2}^{+} \oplus \mathrm{DT4}$	√	1	1	√	mmm	$\mathrm{B2_u}$
N63.14.117 $\mathrm{Y2}^{+} \oplus \mathrm{LD1}$	√	1	1	√	mmm	$\mathrm{B1_u}$
N63.14.118 $\mathrm{Y2}^{+} \oplus \mathrm{LD2}$	√	1	1	√	mmm	$\mathrm{B1_u}$
N63.14.119 $\mathrm{Y2}^{+} \oplus \mathrm{H1}$	√	1	1	√	mmm	$\mathrm{B1_u}$
N63.14.120 $\mathrm{Y2}^{+} \oplus \mathrm{H2}$	√	1	1	√	mmm	$\mathrm{B1_u}$
N63.14.121 $\mathrm{Y2}^{-} \oplus \mathrm{SM1}$	√	1	1	√	mmm	$\mathrm{B3_u}$
N63.14.122 $\mathrm{Y2}^{-} \oplus \mathrm{SM2}$	√	1	1	√	mmm	$\mathrm{B3_u}$
N63.14.123 $\mathrm{Y2}^{-} \oplus \mathrm{SM3}$	√	1	1	√	mmm	$\mathrm{B3_u}$
N63.14.124 $\mathrm{Y2}^{-} \oplus \mathrm{SM4}$	√	1	1	√	mmm	$\mathrm{B3_u}$
N63.14.125 $\mathrm{Y2}^{-} \oplus \mathrm{DT1}$	√	1	1	√	mmm	$\mathrm{B2_u}$
N63.14.126 $\mathrm{Y2}^{-} \oplus \mathrm{DT2}$	√	1	1	√	mmm	$\mathrm{B2_u}$
N63.14.127 $\mathrm{Y2}^{-} \oplus \mathrm{DT3}$	√	1	1	√	mmm	$\mathrm{B2_u}$
N63.14.128 $\mathrm{Y2}^{-} \oplus \mathrm{DT4}$	√	1	1	√	mmm	$\mathrm{B2_u}$
N63.14.129 $\mathrm{Y2}^{-} \oplus \mathrm{LD1}$	√	1	1	√	mmm	$\mathrm{B1_u}$
N63.14.130 $\mathrm{Y2}^{-} \oplus \mathrm{LD2}$	√	1	1	√	mmm	$\mathrm{B1_u}$
N63.14.131 $\mathrm{Y2}^{-} \oplus \mathrm{H1}$	√	1	1	√	mmm	$\mathrm{B1_u}$
N63.14.132 $\mathrm{Y2}^{-} \oplus \mathrm{H2}$	√	1	1	√	mmm	$\mathrm{B1_u}$
N63.14.133 $\mathrm{Y3}^{+} \oplus \mathrm{SM1}$	√	1	1	√	mmm	$\mathrm{B3_u}$
N63.14.134 $\mathrm{Y3}^{+} \oplus \mathrm{SM2}$	√	1	1	√	mmm	$\mathrm{B3_u}$
N63.14.135 $\mathrm{Y3}^{+} \oplus \mathrm{SM3}$	√	1	1	√	mmm	$\mathrm{B3_u}$
N63.14.136 $\mathrm{Y3}^{+} \oplus \mathrm{SM4}$	√	1	1	√	mmm	$\mathrm{B3_u}$
N63.14.137 $\mathrm{Y3}^{+} \oplus \mathrm{DT1}$	√	1	1	√	mmm	$\mathrm{B2_u}$
N63.14.138 $\mathrm{Y3}^{+} \oplus \mathrm{DT2}$	√	1	1	√	mmm	$\mathrm{B2_u}$
N63.14.139 $\mathrm{Y3}^{+} \oplus \mathrm{DT3}$	√	1	1	√	mmm	$\mathrm{B2_u}$
N63.14.140 $\mathrm{Y3}^{+} \oplus \mathrm{DT4}$	√	1	1	√	mmm	$\mathrm{B2_u}$
N63.14.141 $\mathrm{Y3}^{+} \oplus \mathrm{LD1}$	√	1	1	√	mmm	$\mathrm{B1_u}$
N63.14.142 $\mathrm{Y3}^{+} \oplus \mathrm{LD2}$	√	1	1	√	mmm	$\mathrm{B1_u}$
N63.14.143 $\mathrm{Y3}^{+} \oplus \mathrm{H1}$	√	1	1	√	mmm	$\mathrm{B1_u}$
N63.14.144 $\mathrm{Y3}^{+} \oplus \mathrm{H2}$	√	1	1	√	mmm	$\mathrm{B1_u}$
N63.14.145 $\mathrm{Y3}^{-} \oplus \mathrm{SM1}$	√	1	1	√	mmm	$\mathrm{B3_u}$
N63.14.146 $\mathrm{Y3}^{-} \oplus \mathrm{SM2}$	√	1	1	√	mmm	$\mathrm{B3_u}$
N63.14.147 $\mathrm{Y3}^{-} \oplus \mathrm{SM3}$	√	1	1	√	mmm	$\mathrm{B3_u}$
N63.14.148 $\mathrm{Y3}^{-} \oplus \mathrm{SM4}$	√	1	1	√	mmm	$\mathrm{B3_u}$
N63.14.149 $\mathrm{Y3}^{-} \oplus \mathrm{DT1}$	√	1	1	√	mmm	$\mathrm{B2_u}$
N63.14.150 $\mathrm{Y3}^{-} \oplus \mathrm{DT2}$	√	1	1	√	mmm	$\mathrm{B2_u}$
N63.14.151 $\mathrm{Y3}^{-} \oplus \mathrm{DT3}$	√	1	1	√	mmm	$\mathrm{B2_u}$
N63.14.152 $\mathrm{Y3}^{-} \oplus \mathrm{DT4}$	√	1	1	√	mmm	$\mathrm{B2_u}$
N63.14.153 $\mathrm{Y3}^{-} \oplus \mathrm{LD1}$	√	1	1	√	mmm	$\mathrm{B1_u}$

Non-coplanar SSGs with parent space group $Cmcm$ (No. 63) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N63.14.154 $\mathrm{Y3}^{-} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N63.14.155 $\mathrm{Y3}^{-} \oplus \mathrm{H1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N63.14.156 $\mathrm{Y3}^{-} \oplus \mathrm{H2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N63.14.157 $\mathrm{Y4}^{+} \oplus \mathrm{SM1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N63.14.158 $\mathrm{Y4}^{+} \oplus \mathrm{SM2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N63.14.159 $\mathrm{Y4}^{+} \oplus \mathrm{SM3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N63.14.160 $\mathrm{Y4}^{+} \oplus \mathrm{SM4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N63.14.161 $\mathrm{Y4}^{+} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N63.14.162 $\mathrm{Y4}^{+} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N63.14.163 $\mathrm{Y4}^{+} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N63.14.164 $\mathrm{Y4}^{+} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N63.14.165 $\mathrm{Y4}^{+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N63.14.166 $\mathrm{Y4}^{+} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N63.14.167 $\mathrm{Y4}^{+} \oplus \mathrm{H1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N63.14.168 $\mathrm{Y4}^{+} \oplus \mathrm{H2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N63.14.169 $\mathrm{Y4}^{-} \oplus \mathrm{SM1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N63.14.170 $\mathrm{Y4}^{-} \oplus \mathrm{SM2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N63.14.171 $\mathrm{Y4}^{-} \oplus \mathrm{SM3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N63.14.172 $\mathrm{Y4}^{-} \oplus \mathrm{SM4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N63.14.173 $\mathrm{Y4}^{-} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N63.14.174 $\mathrm{Y4}^{-} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N63.14.175 $\mathrm{Y4}^{-} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N63.14.176 $\mathrm{Y4}^{-} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N63.14.177 $\mathrm{Y4}^{-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N63.14.178 $\mathrm{Y4}^{-} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N63.14.179 $\mathrm{Y4}^{-} \oplus \mathrm{H1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N63.14.180 $\mathrm{Y4}^{-} \oplus \mathrm{H2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$

TABLE S190: Collinear SSGs with parent space group $Cmce$ (No. 64).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L64.1.1 $\mathrm{GM1}^{+}$	1	mmm	$\mathrm{A_g}$
L64.2.1 $\mathrm{GM1}^{-}$	0	-	-
L64.2.2 $\mathrm{GM2}^{+}$	1	mmm	$\mathrm{B1_g}$
L64.2.3 $\mathrm{GM2}^{-}$	0	-	-
L64.2.4 $\mathrm{GM3}^{+}$	1	mmm	$\mathrm{B3_g}$
L64.2.5 $\mathrm{GM3}^{-}$	0	-	-
L64.2.6 $\mathrm{GM4}^{+}$	1	mmm	$\mathrm{B2_g}$
L64.2.7 $\mathrm{GM4}^{-}$	0	-	-
L64.2.8 $\mathrm{Y1}^{+}$	0	-	-
L64.2.9 $\mathrm{Y1}^{-}$	0	-	-
L64.2.10 $\mathrm{Y2}^{+}$	0	-	-
L64.2.11 $\mathrm{Y2}^{-}$	0	-	-
L64.2.12 $\mathrm{Y3}^{+}$	0	-	-
L64.2.13 $\mathrm{Y3}^{-}$	0	-	-
L64.2.14 $\mathrm{Y4}^{+}$	0	-	-

Collinear SSGs with parent space group $Cmce$ (No. 64)(continued)

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L64.2.15 $\mathrm{Y4}^{-}$	0	-	-

TABLE S191: Coplanar SSGs with parent space group $Cmce$ (No. 64).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P64.1.1 $\mathrm{GM1}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_g}$
P64.2.1 $\mathrm{GM1}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_u}$
P64.2.2 $\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B1_g}$
P64.2.3 $\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B1_u}$
P64.2.4 $\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}$
P64.2.5 $\mathrm{GM3}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}$
P64.2.6 $\mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B2_g}$
P64.2.7 $\mathrm{GM4}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B2_u}$
P64.2.8 $\mathrm{Y1}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P64.2.9 $\mathrm{Y1}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P64.2.10 $\mathrm{Y2}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P64.2.11 $\mathrm{Y2}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P64.2.12 $\mathrm{Y3}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P64.2.13 $\mathrm{Y3}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P64.2.14 $\mathrm{Y4}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P64.2.15 $\mathrm{Y4}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P64.3.1 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}$	$\surd$	0	0	$\surd$	-	-
P64.3.2 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_u}$
P64.3.3 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
P64.3.4 $\mathrm{GM1}^{-}\oplus\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_u}$
P64.3.5 $\mathrm{GM1}^{-}\oplus\mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
P64.3.6 $\mathrm{GM1}^{-}\oplus\mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_g}\oplus\mathrm{B2_u}$
P64.3.7 $\mathrm{GM1}^{-}\oplus\mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
P64.3.8 $\mathrm{GM1}^{-}\oplus\mathrm{Y1}^{+}$	$\surd$	1	1	$\times$	-	-
P64.3.9 $\mathrm{GM1}^{-}\oplus\mathrm{Y1}^{-}$	$\surd$	1	1	$\times$	-	-
P64.3.10 $\mathrm{GM1}^{-}\oplus\mathrm{Y2}^{+}$	$\surd$	1	1	$\times$	-	-
P64.3.11 $\mathrm{GM1}^{-}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\times$	-	-
P64.3.12 $\mathrm{GM1}^{-}\oplus\mathrm{Y3}^{+}$	$\surd$	1	1	$\times$	-	-
P64.3.13 $\mathrm{GM1}^{-}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\times$	-	-
P64.3.14 $\mathrm{GM1}^{-}\oplus\mathrm{Y4}^{+}$	$\surd$	1	1	$\times$	-	-
P64.3.15 $\mathrm{GM1}^{-}\oplus\mathrm{Y4}^{-}$	$\surd$	1	1	$\times$	-	-
P64.3.16 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_g}$
P64.3.17 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B1_g}$
P64.3.18 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B3_g}$
P64.3.19 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B2_u}$
P64.3.20 $\mathrm{GM2}^{+}\oplus\mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B2_g}$
P64.3.21 $\mathrm{GM2}^{+}\oplus\mathrm{GM4}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B3_u}$
P64.3.22 $\mathrm{GM2}^{+}\oplus\mathrm{Y1}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
P64.3.23 $\mathrm{GM2}^{+}\oplus\mathrm{Y1}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
P64.3.24 $\mathrm{GM2}^{+}\oplus\mathrm{Y2}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
P64.3.25 $\mathrm{GM2}^{+}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$

Coplanar SSGs with parent space group $Cmce$ (No. 64) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P64.3.26 $\mathrm{GM2}^{+}\oplus\mathrm{Y3}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
P64.3.27 $\mathrm{GM2}^{+}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
P64.3.28 $\mathrm{GM2}^{+}\oplus\mathrm{Y4}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
P64.3.29 $\mathrm{GM2}^{+}\oplus\mathrm{Y4}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
P64.3.30 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
P64.3.31 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B2_u}$
P64.3.32 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
P64.3.33 $\mathrm{GM2}^{-}\oplus\mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u}\oplus\mathrm{B2_g}$
P64.3.34 $\mathrm{GM2}^{-}\oplus\mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
P64.3.35 $\mathrm{GM2}^{-}\oplus\mathrm{Y1}^{+}$	$\surd$	1	1	$\times$	-	-
P64.3.36 $\mathrm{GM2}^{-}\oplus\mathrm{Y1}^{-}$	$\surd$	1	1	$\times$	-	-
P64.3.37 $\mathrm{GM2}^{-}\oplus\mathrm{Y2}^{+}$	$\surd$	1	1	$\times$	-	-
P64.3.38 $\mathrm{GM2}^{-}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\times$	-	-
P64.3.39 $\mathrm{GM2}^{-}\oplus\mathrm{Y3}^{+}$	$\surd$	1	1	$\times$	-	-
P64.3.40 $\mathrm{GM2}^{-}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\times$	-	-
P64.3.41 $\mathrm{GM2}^{-}\oplus\mathrm{Y4}^{+}$	$\surd$	1	1	$\times$	-	-
P64.3.42 $\mathrm{GM2}^{-}\oplus\mathrm{Y4}^{-}$	$\surd$	1	1	$\times$	-	-
P64.3.43 $\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_g}$
P64.3.44 $\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B3_g}$
P64.3.45 $\mathrm{GM3}^{+}\oplus\mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B2_g}$
P64.3.46 $\mathrm{GM3}^{+}\oplus\mathrm{GM4}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B3_g}$
P64.3.47 $\mathrm{GM3}^{+}\oplus\mathrm{Y1}^{+}$	$\surd$	1	0	$\times$	-	-
P64.3.48 $\mathrm{GM3}^{+}\oplus\mathrm{Y1}^{-}$	$\surd$	1	0	$\times$	-	-
P64.3.49 $\mathrm{GM3}^{+}\oplus\mathrm{Y2}^{+}$	$\surd$	1	0	$\times$	-	-
P64.3.50 $\mathrm{GM3}^{+}\oplus\mathrm{Y2}^{-}$	$\surd$	1	0	$\times$	-	-
P64.3.51 $\mathrm{GM3}^{+}\oplus\mathrm{Y3}^{+}$	$\surd$	1	0	$\times$	-	-
P64.3.52 $\mathrm{GM3}^{+}\oplus\mathrm{Y3}^{-}$	$\surd$	1	0	$\times$	-	-
P64.3.53 $\mathrm{GM3}^{+}\oplus\mathrm{Y4}^{+}$	$\surd$	1	0	$\times$	-	-
P64.3.54 $\mathrm{GM3}^{+}\oplus\mathrm{Y4}^{-}$	$\surd$	1	0	$\times$	-	-
P64.3.55 $\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
P64.3.56 $\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B2_g}$
P64.3.57 $\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
P64.3.58 $\mathrm{GM3}^{-}\oplus\mathrm{Y1}^{+}$	$\surd$	1	1	$\times$	-	-
P64.3.59 $\mathrm{GM3}^{-}\oplus\mathrm{Y1}^{-}$	$\surd$	1	1	$\times$	-	-
P64.3.60 $\mathrm{GM3}^{-}\oplus\mathrm{Y2}^{+}$	$\surd$	1	1	$\times$	-	-
P64.3.61 $\mathrm{GM3}^{-}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\times$	-	-
P64.3.62 $\mathrm{GM3}^{-}\oplus\mathrm{Y3}^{+}$	$\surd$	1	1	$\times$	-	-
P64.3.63 $\mathrm{GM3}^{-}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\times$	-	-
P64.3.64 $\mathrm{GM3}^{-}\oplus\mathrm{Y4}^{+}$	$\surd$	1	1	$\times$	-	-
P64.3.65 $\mathrm{GM3}^{-}\oplus\mathrm{Y4}^{-}$	$\surd$	1	1	$\times$	-	-
P64.3.66 $\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_g}\oplus\mathrm{B2_g}$
P64.3.67 $\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B2_g}$
P64.3.68 $\mathrm{GM4}^{+}\oplus\mathrm{Y1}^{+}$	$\surd$	1	0	$\times$	-	-
P64.3.69 $\mathrm{GM4}^{+}\oplus\mathrm{Y1}^{-}$	$\surd$	1	0	$\times$	-	-
P64.3.70 $\mathrm{GM4}^{+}\oplus\mathrm{Y2}^{+}$	$\surd$	1	0	$\times$	-	-
P64.3.71 $\mathrm{GM4}^{+}\oplus\mathrm{Y2}^{-}$	$\surd$	1	0	$\times$	-	-

Coplanar SSGs with parent space group $Cmce$ (No. 64) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P64.3.72 $\mathrm{GM4}^{+}\oplus\mathrm{Y3}^{+}$	$\surd$	1	0	$\times$	-	-
P64.3.73 $\mathrm{GM4}^{+}\oplus\mathrm{Y3}^{-}$	$\surd$	1	0	$\times$	-	-
P64.3.74 $\mathrm{GM4}^{+}\oplus\mathrm{Y4}^{+}$	$\surd$	1	0	$\times$	-	-
P64.3.75 $\mathrm{GM4}^{+}\oplus\mathrm{Y4}^{-}$	$\surd$	1	0	$\times$	-	-
P64.3.76 $\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
P64.3.77 $\mathrm{GM4}^{-}\oplus\mathrm{Y1}^{+}$	$\surd$	1	1	$\times$	-	-
P64.3.78 $\mathrm{GM4}^{-}\oplus\mathrm{Y1}^{-}$	$\surd$	1	1	$\times$	-	-
P64.3.79 $\mathrm{GM4}^{-}\oplus\mathrm{Y2}^{+}$	$\surd$	1	1	$\times$	-	-
P64.3.80 $\mathrm{GM4}^{-}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\times$	-	-
P64.3.81 $\mathrm{GM4}^{-}\oplus\mathrm{Y3}^{+}$	$\surd$	1	1	$\times$	-	-
P64.3.82 $\mathrm{GM4}^{-}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\times$	-	-
P64.3.83 $\mathrm{GM4}^{-}\oplus\mathrm{Y4}^{+}$	$\surd$	1	1	$\times$	-	-
P64.3.84 $\mathrm{GM4}^{-}\oplus\mathrm{Y4}^{-}$	$\surd$	1	1	$\times$	-	-
P64.3.85 $\mathrm{Y1}^{+}\oplus\mathrm{Y1}^{+}$	$\surd$	1	0	$\times$	-	-
P64.3.86 $\mathrm{Y1}^{+}\oplus\mathrm{Y1}^{-}$	$\surd$	1	1	$\times$	-	-
P64.3.87 $\mathrm{Y1}^{+}\oplus\mathrm{Y2}^{+}$	$\surd$	1	0	$\times$	-	-
P64.3.88 $\mathrm{Y1}^{+}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\times$	-	-
P64.3.89 $\mathrm{Y1}^{+}\oplus\mathrm{Y3}^{+}$	$\surd$	1	0	$\times$	-	-
P64.3.90 $\mathrm{Y1}^{+}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P64.3.91 $\mathrm{Y1}^{+}\oplus\mathrm{Y4}^{+}$	$\surd$	1	0	$\times$	-	-
P64.3.92 $\mathrm{Y1}^{+}\oplus\mathrm{Y4}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P64.3.93 $\mathrm{Y1}^{-}\oplus\mathrm{Y1}^{-}$	$\surd$	1	0	$\times$	-	-
P64.3.94 $\mathrm{Y1}^{-}\oplus\mathrm{Y2}^{+}$	$\surd$	1	1	$\times$	-	-
P64.3.95 $\mathrm{Y1}^{-}\oplus\mathrm{Y2}^{-}$	$\surd$	1	0	$\times$	-	-
P64.3.96 $\mathrm{Y1}^{-}\oplus\mathrm{Y3}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P64.3.97 $\mathrm{Y1}^{-}\oplus\mathrm{Y3}^{-}$	$\surd$	1	0	$\times$	-	-
P64.3.98 $\mathrm{Y1}^{-}\oplus\mathrm{Y4}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P64.3.99 $\mathrm{Y1}^{-}\oplus\mathrm{Y4}^{-}$	$\surd$	1	0	$\times$	-	-
P64.3.100 $\mathrm{Y2}^{+}\oplus\mathrm{Y2}^{+}$	$\surd$	1	0	$\times$	-	-
P64.3.101 $\mathrm{Y2}^{+}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\times$	-	-
P64.3.102 $\mathrm{Y2}^{+}\oplus\mathrm{Y3}^{+}$	$\surd$	1	0	$\times$	-	-
P64.3.103 $\mathrm{Y2}^{+}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P64.3.104 $\mathrm{Y2}^{+}\oplus\mathrm{Y4}^{+}$	$\surd$	1	0	$\times$	-	-
P64.3.105 $\mathrm{Y2}^{+}\oplus\mathrm{Y4}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P64.3.106 $\mathrm{Y2}^{-}\oplus\mathrm{Y2}^{-}$	$\surd$	1	0	$\times$	-	-
P64.3.107 $\mathrm{Y2}^{-}\oplus\mathrm{Y3}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P64.3.108 $\mathrm{Y2}^{-}\oplus\mathrm{Y3}^{-}$	$\surd$	1	0	$\times$	-	-
P64.3.109 $\mathrm{Y2}^{-}\oplus\mathrm{Y4}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P64.3.110 $\mathrm{Y2}^{-}\oplus\mathrm{Y4}^{-}$	$\surd$	1	0	$\times$	-	-
P64.3.111 $\mathrm{Y3}^{+}\oplus\mathrm{Y3}^{+}$	$\surd$	1	0	$\times$	-	-
P64.3.112 $\mathrm{Y3}^{+}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\times$	-	-
P64.3.113 $\mathrm{Y3}^{+}\oplus\mathrm{Y4}^{+}$	$\surd$	1	0	$\times$	-	-
P64.3.114 $\mathrm{Y3}^{+}\oplus\mathrm{Y4}^{-}$	$\surd$	1	1	$\times$	-	-
P64.3.115 $\mathrm{Y3}^{-}\oplus\mathrm{Y3}^{-}$	$\surd$	1	0	$\times$	-	-
P64.3.116 $\mathrm{Y3}^{-}\oplus\mathrm{Y4}^{+}$	$\surd$	1	1	$\times$	-	-
P64.3.117 $\mathrm{Y3}^{-}\oplus\mathrm{Y4}^{-}$	$\surd$	1	0	$\times$	-	-

Coplanar SSGs with parent space group $Cmce$ (No. 64) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P64.3.118 $\mathrm{Y4}^{+} \oplus \mathrm{Y4}^{+}$	$\surd$	1	0	$\times$	-	-
P64.3.119 $\mathrm{Y4}^{+} \oplus \mathrm{Y4}^{-}$	$\surd$	1	1	$\times$	-	-
P64.3.120 $\mathrm{Y4}^{-} \oplus \mathrm{Y4}^{-}$	$\surd$	1	0	$\times$	-	-
P64.6.1 T1	$\surd$	1	1	$\times$	-	-
P64.6.2 T2	$\surd$	1	1	$\times$	-	-
P64.6.3 Z1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P64.6.4 Z2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P64.8.1 SM1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P64.8.2 SM2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P64.8.3 SM3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P64.8.4 SM4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P64.8.5 DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P64.8.6 DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P64.8.7 DT3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P64.8.8 DT4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P64.8.9 LD1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P64.8.10 LD2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P64.8.11 H1	$\surd$	1	1	$\times$	-	-
P64.8.12 H2	$\surd$	1	1	$\times$	-	-

TABLE S192: Non-coplanar SSGs with parent space group $Cmce$ (No. 64).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N64.1.1 $\mathrm{GM1}^{+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{A_g}$
N64.2.1 $\mathrm{GM1}^{-}$	$\surd$	2	2	$\surd$	222	$\mathrm{A1} \oplus \mathrm{A1}$
N64.2.2 $\mathrm{GM2}^{+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B1_g}$
N64.2.3 $\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{A1}$
N64.2.4 $\mathrm{GM3}^{+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B3_g}$
N64.2.5 $\mathrm{GM3}^{-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{A1}$
N64.2.6 $\mathrm{GM4}^{+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B2_g}$
N64.2.7 $\mathrm{GM4}^{-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{A1}$
N64.2.8 $\mathrm{Y1}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
N64.2.9 $\mathrm{Y1}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
N64.2.10 $\mathrm{Y2}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
N64.2.11 $\mathrm{Y2}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
N64.2.12 $\mathrm{Y3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
N64.2.13 $\mathrm{Y3}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
N64.2.14 $\mathrm{Y4}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
N64.2.15 $\mathrm{Y4}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
N64.3.1 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{A_u}$
N64.3.2 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{A2}$
N64.3.3 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N64.3.4 $\mathrm{GM1}^{-} \oplus \mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{A2}$
N64.3.5 $\mathrm{GM1}^{-} \oplus \mathrm{GM3}^{-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B3_u}$
N64.3.6 $\mathrm{GM1}^{-} \oplus \mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{A2}$
N64.3.7 $\mathrm{GM1}^{-} \oplus \mathrm{GM4}^{-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B2_u}$

Non-coplanar SSGs with parent space group $Cmce$ (No. 64) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N64.3.8 $\mathrm{GM1}^- \oplus \mathrm{Y1}^+$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
N64.3.9 $\mathrm{GM1}^- \oplus \mathrm{Y1}^-$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
N64.3.10 $\mathrm{GM1}^- \oplus \mathrm{Y2}^+$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
N64.3.11 $\mathrm{GM1}^- \oplus \mathrm{Y2}^-$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
N64.3.12 $\mathrm{GM1}^- \oplus \mathrm{Y3}^+$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
N64.3.13 $\mathrm{GM1}^- \oplus \mathrm{Y3}^-$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
N64.3.14 $\mathrm{GM1}^- \oplus \mathrm{Y4}^+$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
N64.3.15 $\mathrm{GM1}^- \oplus \mathrm{Y4}^-$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
N64.3.16 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N64.3.17 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	√	2	2	√	222	$\mathrm{A1} \oplus \mathrm{B1}$
N64.3.18 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+$	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g} \oplus \mathrm{B3_g}$
N64.3.19 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^-$	√	2	2	√	$mm2$	$\mathrm{A1} \oplus \mathrm{B1}$
N64.3.20 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+$	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g} \oplus \mathrm{B2_g}$
N64.3.21 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^-$	√	2	2	√	$mm2$	$\mathrm{A1} \oplus \mathrm{B2}$
N64.3.22 $\mathrm{GM2}^+ \oplus \mathrm{Y1}^+$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
N64.3.23 $\mathrm{GM2}^+ \oplus \mathrm{Y1}^-$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
N64.3.24 $\mathrm{GM2}^+ \oplus \mathrm{Y2}^+$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
N64.3.25 $\mathrm{GM2}^+ \oplus \mathrm{Y2}^-$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
N64.3.26 $\mathrm{GM2}^+ \oplus \mathrm{Y3}^+$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
N64.3.27 $\mathrm{GM2}^+ \oplus \mathrm{Y3}^-$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
N64.3.28 $\mathrm{GM2}^+ \oplus \mathrm{Y4}^+$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
N64.3.29 $\mathrm{GM2}^+ \oplus \mathrm{Y4}^-$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
N64.3.30 $\mathrm{GM2}^- \oplus \mathrm{GM2}^-$	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N64.3.31 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+$	√	2	2	√	$mm2$	$\mathrm{A1} \oplus \mathrm{B2}$
N64.3.32 $\mathrm{GM2}^- \oplus \mathrm{GM3}^-$	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u} \oplus \mathrm{B3_u}$
N64.3.33 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+$	√	2	2	√	$mm2$	$\mathrm{A1} \oplus \mathrm{B1}$
N64.3.34 $\mathrm{GM2}^- \oplus \mathrm{GM4}^-$	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_u}$
N64.3.35 $\mathrm{GM2}^- \oplus \mathrm{Y1}^+$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
N64.3.36 $\mathrm{GM2}^- \oplus \mathrm{Y1}^-$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
N64.3.37 $\mathrm{GM2}^- \oplus \mathrm{Y2}^+$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
N64.3.38 $\mathrm{GM2}^- \oplus \mathrm{Y2}^-$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
N64.3.39 $\mathrm{GM2}^- \oplus \mathrm{Y3}^+$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
N64.3.40 $\mathrm{GM2}^- \oplus \mathrm{Y3}^-$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
N64.3.41 $\mathrm{GM2}^- \oplus \mathrm{Y4}^+$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
N64.3.42 $\mathrm{GM2}^- \oplus \mathrm{Y4}^-$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
N64.3.43 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N64.3.44 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	√	2	2	√	222	$\mathrm{A1} \oplus \mathrm{B3}$
N64.3.45 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N64.3.46 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	√	2	2	√	$mm2$	$\mathrm{A1} \oplus \mathrm{B2}$
N64.3.47 $\mathrm{GM3}^+ \oplus \mathrm{Y1}^+$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g}$
N64.3.48 $\mathrm{GM3}^+ \oplus \mathrm{Y1}^-$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g}$
N64.3.49 $\mathrm{GM3}^+ \oplus \mathrm{Y2}^+$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g}$
N64.3.50 $\mathrm{GM3}^+ \oplus \mathrm{Y2}^-$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g}$
N64.3.51 $\mathrm{GM3}^+ \oplus \mathrm{Y3}^+$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g}$
N64.3.52 $\mathrm{GM3}^+ \oplus \mathrm{Y3}^-$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g}$
N64.3.53 $\mathrm{GM3}^+ \oplus \mathrm{Y4}^+$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g}$

Non-coplanar SSGs with parent space group $Cmce$ (No. 64) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N64.3.54 $\mathrm{GM3}^{+}\oplus\mathrm{Y4}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}$
N64.3.55 $\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}\oplus\mathrm{B3_u}$
N64.3.56 $\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1}\oplus\mathrm{B1}$
N64.3.57 $\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}\oplus\mathrm{B2_u}$
N64.3.58 $\mathrm{GM3}^{-}\oplus\mathrm{Y1}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}$
N64.3.59 $\mathrm{GM3}^{-}\oplus\mathrm{Y1}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}$
N64.3.60 $\mathrm{GM3}^{-}\oplus\mathrm{Y2}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}$
N64.3.61 $\mathrm{GM3}^{-}\oplus\mathrm{Y2}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}$
N64.3.62 $\mathrm{GM3}^{-}\oplus\mathrm{Y3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}$
N64.3.63 $\mathrm{GM3}^{-}\oplus\mathrm{Y3}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}$
N64.3.64 $\mathrm{GM3}^{-}\oplus\mathrm{Y4}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}$
N64.3.65 $\mathrm{GM3}^{-}\oplus\mathrm{Y4}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}$
N64.3.66 $\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B2_g}\oplus\mathrm{B2_g}$
N64.3.67 $\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{-}$	$\surd$	2	2	$\surd$	222	$\mathrm{A1}\oplus\mathrm{B2}$
N64.3.68 $\mathrm{GM4}^{+}\oplus\mathrm{Y1}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B2_g}$
N64.3.69 $\mathrm{GM4}^{+}\oplus\mathrm{Y1}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B2_g}$
N64.3.70 $\mathrm{GM4}^{+}\oplus\mathrm{Y2}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B2_g}$
N64.3.71 $\mathrm{GM4}^{+}\oplus\mathrm{Y2}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B2_g}$
N64.3.72 $\mathrm{GM4}^{+}\oplus\mathrm{Y3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B2_g}$
N64.3.73 $\mathrm{GM4}^{+}\oplus\mathrm{Y3}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B2_g}$
N64.3.74 $\mathrm{GM4}^{+}\oplus\mathrm{Y4}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B2_g}$
N64.3.75 $\mathrm{GM4}^{+}\oplus\mathrm{Y4}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B2_g}$
N64.3.76 $\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B2_u}\oplus\mathrm{B2_u}$
N64.3.77 $\mathrm{GM4}^{-}\oplus\mathrm{Y1}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B2_u}$
N64.3.78 $\mathrm{GM4}^{-}\oplus\mathrm{Y1}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B2_u}$
N64.3.79 $\mathrm{GM4}^{-}\oplus\mathrm{Y2}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B2_u}$
N64.3.80 $\mathrm{GM4}^{-}\oplus\mathrm{Y2}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B2_u}$
N64.3.81 $\mathrm{GM4}^{-}\oplus\mathrm{Y3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B2_u}$
N64.3.82 $\mathrm{GM4}^{-}\oplus\mathrm{Y3}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B2_u}$
N64.3.83 $\mathrm{GM4}^{-}\oplus\mathrm{Y4}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B2_u}$
N64.3.84 $\mathrm{GM4}^{-}\oplus\mathrm{Y4}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B2_u}$
N64.3.85 $\mathrm{Y1}^{+}\oplus\mathrm{Y1}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N64.3.86 $\mathrm{Y1}^{+}\oplus\mathrm{Y1}^{-}$	$\surd$	1	1	$\surd$	222	A1
N64.3.87 $\mathrm{Y1}^{+}\oplus\mathrm{Y2}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N64.3.88 $\mathrm{Y1}^{+}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\surd$	$mm2$	A1
N64.3.89 $\mathrm{Y1}^{+}\oplus\mathrm{Y3}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N64.3.90 $\mathrm{Y1}^{+}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\surd$	$mm2$	A1
N64.3.91 $\mathrm{Y1}^{+}\oplus\mathrm{Y4}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N64.3.92 $\mathrm{Y1}^{+}\oplus\mathrm{Y4}^{-}$	$\surd$	1	1	$\surd$	$mm2$	A1
N64.3.93 $\mathrm{Y1}^{-}\oplus\mathrm{Y1}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N64.3.94 $\mathrm{Y1}^{-}\oplus\mathrm{Y2}^{+}$	$\surd$	1	1	$\surd$	$mm2$	A1
N64.3.95 $\mathrm{Y1}^{-}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N64.3.96 $\mathrm{Y1}^{-}\oplus\mathrm{Y3}^{+}$	$\surd$	1	1	$\surd$	$mm2$	A1
N64.3.97 $\mathrm{Y1}^{-}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N64.3.98 $\mathrm{Y1}^{-}\oplus\mathrm{Y4}^{+}$	$\surd$	1	1	$\surd$	$mm2$	A1
N64.3.99 $\mathrm{Y1}^{-}\oplus\mathrm{Y4}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$

Non-coplanar SSGs with parent space group $Cmce$ (No. 64) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N64.3.100 $\mathrm{Y2}^{+} \oplus \mathrm{Y2}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N64.3.101 $\mathrm{Y2}^{+} \oplus \mathrm{Y2}^{-}$	√	1	1	√	222	A1
N64.3.102 $\mathrm{Y2}^{+} \oplus \mathrm{Y3}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N64.3.103 $\mathrm{Y2}^{+} \oplus \mathrm{Y3}^{-}$	√	1	1	√	$mm2$	A1
N64.3.104 $\mathrm{Y2}^{+} \oplus \mathrm{Y4}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N64.3.105 $\mathrm{Y2}^{+} \oplus \mathrm{Y4}^{-}$	√	1	1	√	$mm2$	A1
N64.3.106 $\mathrm{Y2}^{-} \oplus \mathrm{Y2}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N64.3.107 $\mathrm{Y2}^{-} \oplus \mathrm{Y3}^{+}$	√	1	1	√	$mm2$	A1
N64.3.108 $\mathrm{Y2}^{-} \oplus \mathrm{Y3}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N64.3.109 $\mathrm{Y2}^{-} \oplus \mathrm{Y4}^{+}$	√	1	1	√	$mm2$	A1
N64.3.110 $\mathrm{Y2}^{-} \oplus \mathrm{Y4}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N64.3.111 $\mathrm{Y3}^{+} \oplus \mathrm{Y3}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N64.3.112 $\mathrm{Y3}^{+} \oplus \mathrm{Y3}^{-}$	√	1	1	√	222	A1
N64.3.113 $\mathrm{Y3}^{+} \oplus \mathrm{Y4}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N64.3.114 $\mathrm{Y3}^{+} \oplus \mathrm{Y4}^{-}$	√	1	1	√	$mm2$	A1
N64.3.115 $\mathrm{Y3}^{-} \oplus \mathrm{Y3}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N64.3.116 $\mathrm{Y3}^{-} \oplus \mathrm{Y4}^{+}$	√	1	1	√	$mm2$	A1
N64.3.117 $\mathrm{Y3}^{-} \oplus \mathrm{Y4}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N64.3.118 $\mathrm{Y4}^{+} \oplus \mathrm{Y4}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N64.3.119 $\mathrm{Y4}^{+} \oplus \mathrm{Y4}^{-}$	√	1	1	√	222	A1
N64.3.120 $\mathrm{Y4}^{-} \oplus \mathrm{Y4}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N64.6.1 T1	√	1	1	√	$mm2$	A1
N64.6.2 T2	√	1	1	√	$mm2$	A1
N64.6.3 Z1	√	1	1	√	$mm2$	A1
N64.6.4 Z2	√	1	1	√	$mm2$	A1
N64.8.1 SM1	√	1	1	√	$mm2$	A1
N64.8.2 SM2	√	1	1	√	$mm2$	A1
N64.8.3 SM3	√	1	1	√	$mm2$	A1
N64.8.4 SM4	√	1	1	√	$mm2$	A1
N64.8.5 DT1	√	1	1	√	$mm2$	A1
N64.8.6 DT2	√	1	1	√	$mm2$	A1
N64.8.7 DT3	√	1	1	√	$mm2$	A1
N64.8.8 DT4	√	1	1	√	$mm2$	A1
N64.8.9 LD1	√	1	1	√	$mm2$	A1
N64.8.10 LD2	√	1	1	√	$mm2$	A1
N64.8.11 H1	√	1	1	√	$mm2$	A1
N64.8.12 H2	√	1	1	√	$mm2$	A1
N64.9.1 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-}$	√	0	0	√	-	-
N64.9.2 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-} \oplus \mathrm{GM2}^{+}$	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N64.9.3 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-} \oplus \mathrm{GM2}^{-}$	√	0	0	√	-	-
N64.9.4 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-} \oplus \mathrm{GM3}^{+}$	√	3	3	√	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N64.9.5 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-} \oplus \mathrm{GM3}^{-}$	√	0	0	√	-	-
N64.9.6 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-} \oplus \mathrm{GM4}^{+}$	√	3	3	√	mmm	$\mathrm{B2_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N64.9.7 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-} \oplus \mathrm{GM4}^{-}$	√	0	0	√	-	-
N64.9.8 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-} \oplus \mathrm{Y1}^{+}$	√	0	0	√	-	-
N64.9.9 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-} \oplus \mathrm{Y1}^{-}$	√	0	0	√	-	-

Non-coplanar SSGs with parent space group $Cmce$ (No. 64) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N64.9.10 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{Y2}^+$	$\surd$	0	0	$\surd$	-	-
N64.9.11 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{Y2}^-$	$\surd$	0	0	$\surd$	-	-
N64.9.12 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{Y3}^+$	$\surd$	0	0	$\surd$	-	-
N64.9.13 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{Y3}^-$	$\surd$	0	0	$\surd$	-	-
N64.9.14 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{Y4}^+$	$\surd$	0	0	$\surd$	-	-
N64.9.15 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{Y4}^-$	$\surd$	0	0	$\surd$	-	-
N64.9.16 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	2	2	$\surd$	222	$\mathrm{B1} \oplus \mathrm{B1}$
N64.9.17 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N64.9.18 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2} \oplus \mathrm{B1}$
N64.9.19 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_u}$
N64.9.20 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2} \oplus \mathrm{B1}$
N64.9.21 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B3_u}$
N64.9.22 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N64.9.23 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N64.9.24 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N64.9.25 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N64.9.26 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N64.9.27 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N64.9.28 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{Y4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N64.9.29 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N64.9.30 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
N64.9.31 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N64.9.32 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N64.9.33 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N64.9.34 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N64.9.35 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Y1}^+$	$\surd$	0	0	$\surd$	-	-
N64.9.36 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Y1}^-$	$\surd$	0	0	$\surd$	-	-
N64.9.37 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Y2}^+$	$\surd$	0	0	$\surd$	-	-
N64.9.38 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Y2}^-$	$\surd$	0	0	$\surd$	-	-
N64.9.39 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Y3}^+$	$\surd$	0	0	$\surd$	-	-
N64.9.40 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Y3}^-$	$\surd$	0	0	$\surd$	-	-
N64.9.41 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Y4}^+$	$\surd$	0	0	$\surd$	-	-
N64.9.42 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Y4}^-$	$\surd$	0	0	$\surd$	-	-
N64.9.43 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	222	$\mathrm{B3} \oplus \mathrm{B3}$
N64.9.44 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N64.9.45 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2} \oplus \mathrm{B1}$
N64.9.46 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N64.9.47 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u}$
N64.9.48 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u}$
N64.9.49 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u}$
N64.9.50 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u}$
N64.9.51 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u}$
N64.9.52 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u}$
N64.9.53 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Y4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u}$
N64.9.54 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u}$
N64.9.55 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-

Non-coplanar SSGs with parent space group $Cmce$ (No. 64) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N64.9.56 $\mathrm{GM1^-} \oplus \mathrm{GM3^-} \oplus \mathrm{GM4^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N64.9.57 $\mathrm{GM1^-} \oplus \mathrm{GM3^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N64.9.58 $\mathrm{GM1^-} \oplus \mathrm{GM3^-} \oplus \mathrm{Y1^+}$	$\surd$	0	0	$\surd$	-	-
N64.9.59 $\mathrm{GM1^-} \oplus \mathrm{GM3^-} \oplus \mathrm{Y1^-}$	$\surd$	0	0	$\surd$	-	-
N64.9.60 $\mathrm{GM1^-} \oplus \mathrm{GM3^-} \oplus \mathrm{Y2^+}$	$\surd$	0	0	$\surd$	-	-
N64.9.61 $\mathrm{GM1^-} \oplus \mathrm{GM3^-} \oplus \mathrm{Y2^-}$	$\surd$	0	0	$\surd$	-	-
N64.9.62 $\mathrm{GM1^-} \oplus \mathrm{GM3^-} \oplus \mathrm{Y3^+}$	$\surd$	0	0	$\surd$	-	-
N64.9.63 $\mathrm{GM1^-} \oplus \mathrm{GM3^-} \oplus \mathrm{Y3^-}$	$\surd$	0	0	$\surd$	-	-
N64.9.64 $\mathrm{GM1^-} \oplus \mathrm{GM3^-} \oplus \mathrm{Y4^+}$	$\surd$	0	0	$\surd$	-	-
N64.9.65 $\mathrm{GM1^-} \oplus \mathrm{GM3^-} \oplus \mathrm{Y4^-}$	$\surd$	0	0	$\surd$	-	-
N64.9.66 $\mathrm{GM1^-} \oplus \mathrm{GM4^+} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	222	$\mathrm{B2} \oplus \mathrm{B2}$
N64.9.67 $\mathrm{GM1^-} \oplus \mathrm{GM4^+} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N64.9.68 $\mathrm{GM1^-} \oplus \mathrm{GM4^+} \oplus \mathrm{Y1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_g} \oplus \mathrm{B2_u}$
N64.9.69 $\mathrm{GM1^-} \oplus \mathrm{GM4^+} \oplus \mathrm{Y1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_g} \oplus \mathrm{B2_u}$
N64.9.70 $\mathrm{GM1^-} \oplus \mathrm{GM4^+} \oplus \mathrm{Y2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_g} \oplus \mathrm{B2_u}$
N64.9.71 $\mathrm{GM1^-} \oplus \mathrm{GM4^+} \oplus \mathrm{Y2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_g} \oplus \mathrm{B2_u}$
N64.9.72 $\mathrm{GM1^-} \oplus \mathrm{GM4^+} \oplus \mathrm{Y3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_g} \oplus \mathrm{B2_u}$
N64.9.73 $\mathrm{GM1^-} \oplus \mathrm{GM4^+} \oplus \mathrm{Y3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_g} \oplus \mathrm{B2_u}$
N64.9.74 $\mathrm{GM1^-} \oplus \mathrm{GM4^+} \oplus \mathrm{Y4^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_g} \oplus \mathrm{B2_u}$
N64.9.75 $\mathrm{GM1^-} \oplus \mathrm{GM4^+} \oplus \mathrm{Y4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_g} \oplus \mathrm{B2_u}$
N64.9.76 $\mathrm{GM1^-} \oplus \mathrm{GM4^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N64.9.77 $\mathrm{GM1^-} \oplus \mathrm{GM4^-} \oplus \mathrm{Y1^+}$	$\surd$	0	0	$\surd$	-	-
N64.9.78 $\mathrm{GM1^-} \oplus \mathrm{GM4^-} \oplus \mathrm{Y1^-}$	$\surd$	0	0	$\surd$	-	-
N64.9.79 $\mathrm{GM1^-} \oplus \mathrm{GM4^-} \oplus \mathrm{Y2^+}$	$\surd$	0	0	$\surd$	-	-
N64.9.80 $\mathrm{GM1^-} \oplus \mathrm{GM4^-} \oplus \mathrm{Y2^-}$	$\surd$	0	0	$\surd$	-	-
N64.9.81 $\mathrm{GM1^-} \oplus \mathrm{GM4^-} \oplus \mathrm{Y3^+}$	$\surd$	0	0	$\surd$	-	-
N64.9.82 $\mathrm{GM1^-} \oplus \mathrm{GM4^-} \oplus \mathrm{Y3^-}$	$\surd$	0	0	$\surd$	-	-
N64.9.83 $\mathrm{GM1^-} \oplus \mathrm{GM4^-} \oplus \mathrm{Y4^+}$	$\surd$	0	0	$\surd$	-	-
N64.9.84 $\mathrm{GM1^-} \oplus \mathrm{GM4^-} \oplus \mathrm{Y4^-}$	$\surd$	0	0	$\surd$	-	-
N64.9.85 $\mathrm{GM1^-} \oplus \mathrm{Y1^+} \oplus \mathrm{Y1^+}$	$\surd$	1	0	$\times$	-	-
N64.9.86 $\mathrm{GM1^-} \oplus \mathrm{Y1^+} \oplus \mathrm{Y1^-}$	$\surd$	1	1	$\times$	-	-
N64.9.87 $\mathrm{GM1^-} \oplus \mathrm{Y1^+} \oplus \mathrm{Y2^+}$	$\surd$	1	0	$\times$	-	-
N64.9.88 $\mathrm{GM1^-} \oplus \mathrm{Y1^+} \oplus \mathrm{Y2^-}$	$\surd$	1	1	$\times$	-	-
N64.9.89 $\mathrm{GM1^-} \oplus \mathrm{Y1^+} \oplus \mathrm{Y3^+}$	$\surd$	1	0	$\times$	-	-
N64.9.90 $\mathrm{GM1^-} \oplus \mathrm{Y1^+} \oplus \mathrm{Y3^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N64.9.91 $\mathrm{GM1^-} \oplus \mathrm{Y1^+} \oplus \mathrm{Y4^+}$	$\surd$	1	0	$\times$	-	-
N64.9.92 $\mathrm{GM1^-} \oplus \mathrm{Y1^+} \oplus \mathrm{Y4^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N64.9.93 $\mathrm{GM1^-} \oplus \mathrm{Y1^-} \oplus \mathrm{Y1^-}$	$\surd$	1	0	$\times$	-	-
N64.9.94 $\mathrm{GM1^-} \oplus \mathrm{Y1^-} \oplus \mathrm{Y2^+}$	$\surd$	1	1	$\times$	-	-
N64.9.95 $\mathrm{GM1^-} \oplus \mathrm{Y1^-} \oplus \mathrm{Y2^-}$	$\surd$	1	0	$\times$	-	-
N64.9.96 $\mathrm{GM1^-} \oplus \mathrm{Y1^-} \oplus \mathrm{Y3^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N64.9.97 $\mathrm{GM1^-} \oplus \mathrm{Y1^-} \oplus \mathrm{Y3^-}$	$\surd$	1	0	$\times$	-	-
N64.9.98 $\mathrm{GM1^-} \oplus \mathrm{Y1^-} \oplus \mathrm{Y4^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N64.9.99 $\mathrm{GM1^-} \oplus \mathrm{Y1^-} \oplus \mathrm{Y4^-}$	$\surd$	1	0	$\times$	-	-
N64.9.100 $\mathrm{GM1^-} \oplus \mathrm{Y2^+} \oplus \mathrm{Y2^+}$	$\surd$	1	0	$\times$	-	-
N64.9.101 $\mathrm{GM1^-} \oplus \mathrm{Y2^+} \oplus \mathrm{Y2^-}$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $Cmce$ (No. 64) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N64.9.102 $\mathrm{GM1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N64.9.103 $\mathrm{GM1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N64.9.104 $\mathrm{GM1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
N64.9.105 $\mathrm{GM1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N64.9.106 $\mathrm{GM1}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N64.9.107 $\mathrm{GM1}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N64.9.108 $\mathrm{GM1}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N64.9.109 $\mathrm{GM1}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N64.9.110 $\mathrm{GM1}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y4}^-$	$\surd$	1	0	$\times$	-	-
N64.9.111 $\mathrm{GM1}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N64.9.112 $\mathrm{GM1}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\times$	-	-
N64.9.113 $\mathrm{GM1}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
N64.9.114 $\mathrm{GM1}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\times$	-	-
N64.9.115 $\mathrm{GM1}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N64.9.116 $\mathrm{GM1}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\times$	-	-
N64.9.117 $\mathrm{GM1}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Y4}^-$	$\surd$	1	0	$\times$	-	-
N64.9.118 $\mathrm{GM1}^- \oplus \mathrm{Y4}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
N64.9.119 $\mathrm{GM1}^- \oplus \mathrm{Y4}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\times$	-	-
N64.9.120 $\mathrm{GM1}^- \oplus \mathrm{Y4}^- \oplus \mathrm{Y4}^-$	$\surd$	1	0	$\times$	-	-
N64.9.121 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N64.9.122 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{A2}$
N64.9.123 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B3_g}$
N64.9.124 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2} \oplus \mathrm{B2}$
N64.9.125 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B2_g}$
N64.9.126 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B1} \oplus \mathrm{B1}$
N64.9.127 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N64.9.128 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N64.9.129 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N64.9.130 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N64.9.131 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N64.9.132 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N64.9.133 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{Y4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N64.9.134 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N64.9.135 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$
N64.9.136 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{B2}$
N64.9.137 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g} \oplus \mathrm{B2_u}$
N64.9.138 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{B1}$
N64.9.139 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g} \oplus \mathrm{B3_u}$
N64.9.140 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
N64.9.141 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
N64.9.142 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
N64.9.143 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
N64.9.144 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
N64.9.145 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
N64.9.146 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{Y4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
N64.9.147 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$

Non-coplanar SSGs with parent space group $Cmce$ (No. 64) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N64.9.148 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N64.9.149 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{B2}$
N64.9.150 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N64.9.151 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	222	$\mathrm{B1} \oplus \mathrm{B3}$
N64.9.152 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N64.9.153 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N64.9.154 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N64.9.155 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N64.9.156 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N64.9.157 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N64.9.158 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Y4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N64.9.159 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N64.9.160 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N64.9.161 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	222	$\mathrm{B1} \oplus \mathrm{B2}$
N64.9.162 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N64.9.163 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N64.9.164 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N64.9.165 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N64.9.166 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N64.9.167 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N64.9.168 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N64.9.169 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Y4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N64.9.170 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N64.9.171 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N64.9.172 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{B1}$
N64.9.173 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
N64.9.174 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
N64.9.175 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
N64.9.176 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
N64.9.177 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
N64.9.178 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
N64.9.179 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{Y4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
N64.9.180 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
N64.9.181 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N64.9.182 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_u}$
N64.9.183 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_u}$
N64.9.184 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_u}$
N64.9.185 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_u}$
N64.9.186 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_u}$
N64.9.187 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_u}$
N64.9.188 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{Y4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_u}$
N64.9.189 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_u}$
N64.9.190 $\mathrm{GM2}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N64.9.191 $\mathrm{GM2}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^-$	$\surd$	1	1	$\surd$	$mm2$	$\mathrm{A2}$
N64.9.192 $\mathrm{GM2}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N64.9.193 $\mathrm{GM2}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\surd$	222	$\mathrm{B1}$

Non-coplanar SSGs with parent space group $Cmce$ (No. 64) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N64.9.194 $\mathrm{GM2}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y3}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N64.9.195 $\mathrm{GM2}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\surd$	$mm2$	B1
N64.9.196 $\mathrm{GM2}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y4}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N64.9.197 $\mathrm{GM2}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y4}^{-}$	$\surd$	1	1	$\surd$	$mm2$	B2
N64.9.198 $\mathrm{GM2}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y1}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N64.9.199 $\mathrm{GM2}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y2}^{+}$	$\surd$	1	1	$\surd$	222	B1
N64.9.200 $\mathrm{GM2}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N64.9.201 $\mathrm{GM2}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y3}^{+}$	$\surd$	1	1	$\surd$	$mm2$	B1
N64.9.202 $\mathrm{GM2}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N64.9.203 $\mathrm{GM2}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y4}^{+}$	$\surd$	1	1	$\surd$	$mm2$	B2
N64.9.204 $\mathrm{GM2}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y4}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N64.9.205 $\mathrm{GM2}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Y2}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N64.9.206 $\mathrm{GM2}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\surd$	$mm2$	A2
N64.9.207 $\mathrm{GM2}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Y3}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N64.9.208 $\mathrm{GM2}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\surd$	$mm2$	B2
N64.9.209 $\mathrm{GM2}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Y4}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N64.9.210 $\mathrm{GM2}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Y4}^{-}$	$\surd$	1	1	$\surd$	$mm2$	B1
N64.9.211 $\mathrm{GM2}^{+}\oplus\mathrm{Y2}^{-}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N64.9.212 $\mathrm{GM2}^{+}\oplus\mathrm{Y2}^{-}\oplus\mathrm{Y3}^{+}$	$\surd$	1	1	$\surd$	$mm2$	B2
N64.9.213 $\mathrm{GM2}^{+}\oplus\mathrm{Y2}^{-}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N64.9.214 $\mathrm{GM2}^{+}\oplus\mathrm{Y2}^{-}\oplus\mathrm{Y4}^{+}$	$\surd$	1	1	$\surd$	$mm2$	B1
N64.9.215 $\mathrm{GM2}^{+}\oplus\mathrm{Y2}^{-}\oplus\mathrm{Y4}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N64.9.216 $\mathrm{GM2}^{+}\oplus\mathrm{Y3}^{+}\oplus\mathrm{Y3}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N64.9.217 $\mathrm{GM2}^{+}\oplus\mathrm{Y3}^{+}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\surd$	$mm2$	A2
N64.9.218 $\mathrm{GM2}^{+}\oplus\mathrm{Y3}^{+}\oplus\mathrm{Y4}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N64.9.219 $\mathrm{GM2}^{+}\oplus\mathrm{Y3}^{+}\oplus\mathrm{Y4}^{-}$	$\surd$	1	1	$\surd$	222	B1
N64.9.220 $\mathrm{GM2}^{+}\oplus\mathrm{Y3}^{-}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N64.9.221 $\mathrm{GM2}^{+}\oplus\mathrm{Y3}^{-}\oplus\mathrm{Y4}^{+}$	$\surd$	1	1	$\surd$	222	B1
N64.9.222 $\mathrm{GM2}^{+}\oplus\mathrm{Y3}^{-}\oplus\mathrm{Y4}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N64.9.223 $\mathrm{GM2}^{+}\oplus\mathrm{Y4}^{+}\oplus\mathrm{Y4}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N64.9.224 $\mathrm{GM2}^{+}\oplus\mathrm{Y4}^{+}\oplus\mathrm{Y4}^{-}$	$\surd$	1	1	$\surd$	$mm2$	A2
N64.9.225 $\mathrm{GM2}^{+}\oplus\mathrm{Y4}^{-}\oplus\mathrm{Y4}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N64.9.226 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
N64.9.227 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B2_u}\oplus\mathrm{B2_u}$
N64.9.228 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
N64.9.229 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{GM4}^{+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_u}\oplus\mathrm{B3_u}\oplus\mathrm{B2_g}$
N64.9.230 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
N64.9.231 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{Y1}^{+}$	$\surd$	0	0	$\surd$	-	-
N64.9.232 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{Y1}^{-}$	$\surd$	0	0	$\surd$	-	-
N64.9.233 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{Y2}^{+}$	$\surd$	0	0	$\surd$	-	-
N64.9.234 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{Y2}^{-}$	$\surd$	0	0	$\surd$	-	-
N64.9.235 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{Y3}^{+}$	$\surd$	0	0	$\surd$	-	-
N64.9.236 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{Y3}^{-}$	$\surd$	0	0	$\surd$	-	-
N64.9.237 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{Y4}^{+}$	$\surd$	0	0	$\surd$	-	-
N64.9.238 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{Y4}^{-}$	$\surd$	0	0	$\surd$	-	-
N64.9.239 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2}\oplus\mathrm{B2}$

Non-coplanar SSGs with parent space group $Cmce$ (No. 64) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N64.9.240 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N64.9.241 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	222	$\mathrm{B3} \oplus \mathrm{B2}$
N64.9.242 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N64.9.243 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N64.9.244 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N64.9.245 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N64.9.246 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N64.9.247 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N64.9.248 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N64.9.249 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Y4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N64.9.250 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N64.9.251 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N64.9.252 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_g}$
N64.9.253 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N64.9.254 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y1}^+$	$\surd$	0	0	$\surd$	-	-
N64.9.255 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y1}^-$	$\surd$	0	0	$\surd$	-	-
N64.9.256 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y2}^+$	$\surd$	0	0	$\surd$	-	-
N64.9.257 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y2}^-$	$\surd$	0	0	$\surd$	-	-
N64.9.258 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y3}^+$	$\surd$	0	0	$\surd$	-	-
N64.9.259 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y3}^-$	$\surd$	0	0	$\surd$	-	-
N64.9.260 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y4}^+$	$\surd$	0	0	$\surd$	-	-
N64.9.261 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y4}^-$	$\surd$	0	0	$\surd$	-	-
N64.9.262 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B1} \oplus \mathrm{B1}$
N64.9.263 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u} \oplus \mathrm{B2_g}$
N64.9.264 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_g}$
N64.9.265 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_g}$
N64.9.266 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_g}$
N64.9.267 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_g}$
N64.9.268 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_g}$
N64.9.269 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_g}$
N64.9.270 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{Y4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_g}$
N64.9.271 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_g}$
N64.9.272 $\mathrm{GM2}^- \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N64.9.273 $\mathrm{GM2}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Y1}^+$	$\surd$	0	0	$\surd$	-	-
N64.9.274 $\mathrm{GM2}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Y1}^-$	$\surd$	0	0	$\surd$	-	-
N64.9.275 $\mathrm{GM2}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Y2}^+$	$\surd$	0	0	$\surd$	-	-
N64.9.276 $\mathrm{GM2}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Y2}^-$	$\surd$	0	0	$\surd$	-	-
N64.9.277 $\mathrm{GM2}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Y3}^+$	$\surd$	0	0	$\surd$	-	-
N64.9.278 $\mathrm{GM2}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Y3}^-$	$\surd$	0	0	$\surd$	-	-
N64.9.279 $\mathrm{GM2}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Y4}^+$	$\surd$	0	0	$\surd$	-	-
N64.9.280 $\mathrm{GM2}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Y4}^-$	$\surd$	0	0	$\surd$	-	-
N64.9.281 $\mathrm{GM2}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	0	$\times$	-	-
N64.9.282 $\mathrm{GM2}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^-$	$\surd$	1	1	$\times$	-	-
N64.9.283 $\mathrm{GM2}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N64.9.284 $\mathrm{GM2}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\times$	-	-
N64.9.285 $\mathrm{GM2}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $Cmce$ (No. 64) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N64.9.286 $\mathrm{GM2}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N64.9.287 $\mathrm{GM2}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
N64.9.288 $\mathrm{GM2}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N64.9.289 $\mathrm{GM2}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y1}^-$	$\surd$	1	0	$\times$	-	-
N64.9.290 $\mathrm{GM2}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\times$	-	-
N64.9.291 $\mathrm{GM2}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N64.9.292 $\mathrm{GM2}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N64.9.293 $\mathrm{GM2}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N64.9.294 $\mathrm{GM2}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N64.9.295 $\mathrm{GM2}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y4}^-$	$\surd$	1	0	$\times$	-	-
N64.9.296 $\mathrm{GM2}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N64.9.297 $\mathrm{GM2}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\times$	-	-
N64.9.298 $\mathrm{GM2}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N64.9.299 $\mathrm{GM2}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N64.9.300 $\mathrm{GM2}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
N64.9.301 $\mathrm{GM2}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N64.9.302 $\mathrm{GM2}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N64.9.303 $\mathrm{GM2}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N64.9.304 $\mathrm{GM2}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N64.9.305 $\mathrm{GM2}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N64.9.306 $\mathrm{GM2}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y4}^-$	$\surd$	1	0	$\times$	-	-
N64.9.307 $\mathrm{GM2}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N64.9.308 $\mathrm{GM2}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\times$	-	-
N64.9.309 $\mathrm{GM2}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
N64.9.310 $\mathrm{GM2}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\times$	-	-
N64.9.311 $\mathrm{GM2}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N64.9.312 $\mathrm{GM2}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\times$	-	-
N64.9.313 $\mathrm{GM2}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Y4}^-$	$\surd$	1	0	$\times$	-	-
N64.9.314 $\mathrm{GM2}^- \oplus \mathrm{Y4}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
N64.9.315 $\mathrm{GM2}^- \oplus \mathrm{Y4}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\times$	-	-
N64.9.316 $\mathrm{GM2}^- \oplus \mathrm{Y4}^- \oplus \mathrm{Y4}^-$	$\surd$	1	0	$\times$	-	-
N64.9.317 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N64.9.318 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{A2}$
N64.9.319 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N64.9.320 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2} \oplus \mathrm{B2}$
N64.9.321 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
N64.9.322 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
N64.9.323 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
N64.9.324 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
N64.9.325 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
N64.9.326 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
N64.9.327 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Y4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
N64.9.328 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
N64.9.329 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B3_g}$
N64.9.330 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{B2}$
N64.9.331 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u} \oplus \mathrm{B3_g}$

Non-coplanar SSGs with parent space group $Cmce$ (No. 64) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N64.9.332 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{Y1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N64.9.333 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{Y1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N64.9.334 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{Y2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N64.9.335 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{Y2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N64.9.336 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{Y3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N64.9.337 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{Y3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N64.9.338 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{Y4^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N64.9.339 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{Y4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N64.9.340 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{GM4^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N64.9.341 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{B1}$
N64.9.342 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{Y1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g}$
N64.9.343 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{Y1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g}$
N64.9.344 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{Y2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g}$
N64.9.345 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{Y2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g}$
N64.9.346 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{Y3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g}$
N64.9.347 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{Y3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g}$
N64.9.348 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{Y4^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g}$
N64.9.349 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{Y4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g}$
N64.9.350 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B3_g}$
N64.9.351 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Y1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N64.9.352 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Y1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N64.9.353 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Y2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N64.9.354 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Y2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N64.9.355 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Y3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N64.9.356 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Y3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N64.9.357 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Y4^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N64.9.358 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Y4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N64.9.359 $\mathrm{GM3^+} \oplus \mathrm{Y1^+} \oplus \mathrm{Y1^+}$	$\surd$	1	1	$\times$	-	-
N64.9.360 $\mathrm{GM3^+} \oplus \mathrm{Y1^+} \oplus \mathrm{Y1^-}$	$\surd$	1	1	$\times$	-	-
N64.9.361 $\mathrm{GM3^+} \oplus \mathrm{Y1^+} \oplus \mathrm{Y2^+}$	$\surd$	1	1	$\times$	-	-
N64.9.362 $\mathrm{GM3^+} \oplus \mathrm{Y1^+} \oplus \mathrm{Y2^-}$	$\surd$	1	1	$\times$	-	-
N64.9.363 $\mathrm{GM3^+} \oplus \mathrm{Y1^+} \oplus \mathrm{Y3^+}$	$\surd$	1	1	$\times$	-	-
N64.9.364 $\mathrm{GM3^+} \oplus \mathrm{Y1^+} \oplus \mathrm{Y3^-}$	$\surd$	1	1	$\surd$	222	B3
N64.9.365 $\mathrm{GM3^+} \oplus \mathrm{Y1^+} \oplus \mathrm{Y4^+}$	$\surd$	1	1	$\times$	-	-
N64.9.366 $\mathrm{GM3^+} \oplus \mathrm{Y1^+} \oplus \mathrm{Y4^-}$	$\surd$	1	1	$\surd$	$mm2$	B2
N64.9.367 $\mathrm{GM3^+} \oplus \mathrm{Y1^-} \oplus \mathrm{Y1^-}$	$\surd$	1	1	$\times$	-	-
N64.9.368 $\mathrm{GM3^+} \oplus \mathrm{Y1^-} \oplus \mathrm{Y2^+}$	$\surd$	1	1	$\times$	-	-
N64.9.369 $\mathrm{GM3^+} \oplus \mathrm{Y1^-} \oplus \mathrm{Y2^-}$	$\surd$	1	1	$\times$	-	-
N64.9.370 $\mathrm{GM3^+} \oplus \mathrm{Y1^-} \oplus \mathrm{Y3^+}$	$\surd$	1	1	$\surd$	222	B3
N64.9.371 $\mathrm{GM3^+} \oplus \mathrm{Y1^-} \oplus \mathrm{Y3^-}$	$\surd$	1	1	$\times$	-	-
N64.9.372 $\mathrm{GM3^+} \oplus \mathrm{Y1^-} \oplus \mathrm{Y4^+}$	$\surd$	1	1	$\surd$	$mm2$	B2
N64.9.373 $\mathrm{GM3^+} \oplus \mathrm{Y1^-} \oplus \mathrm{Y4^-}$	$\surd$	1	1	$\times$	-	-
N64.9.374 $\mathrm{GM3^+} \oplus \mathrm{Y2^+} \oplus \mathrm{Y2^+}$	$\surd$	1	1	$\times$	-	-
N64.9.375 $\mathrm{GM3^+} \oplus \mathrm{Y2^+} \oplus \mathrm{Y2^-}$	$\surd$	1	1	$\times$	-	-
N64.9.376 $\mathrm{GM3^+} \oplus \mathrm{Y2^+} \oplus \mathrm{Y3^+}$	$\surd$	1	1	$\times$	-	-
N64.9.377 $\mathrm{GM3^+} \oplus \mathrm{Y2^+} \oplus \mathrm{Y3^-}$	$\surd$	1	1	$\surd$	$mm2$	B2

Non-coplanar SSGs with parent space group $Cmce$ (No. 64) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N64.9.378 $\mathrm{GM3}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\times$	-	-
N64.9.379 $\mathrm{GM3}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\surd$	222	B3
N64.9.380 $\mathrm{GM3}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\times$	-	-
N64.9.381 $\mathrm{GM3}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\surd$	$mm2$	B2
N64.9.382 $\mathrm{GM3}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\times$	-	-
N64.9.383 $\mathrm{GM3}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\surd$	222	B3
N64.9.384 $\mathrm{GM3}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\times$	-	-
N64.9.385 $\mathrm{GM3}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\times$	-	-
N64.9.386 $\mathrm{GM3}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\times$	-	-
N64.9.387 $\mathrm{GM3}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\times$	-	-
N64.9.388 $\mathrm{GM3}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\times$	-	-
N64.9.389 $\mathrm{GM3}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\times$	-	-
N64.9.390 $\mathrm{GM3}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\times$	-	-
N64.9.391 $\mathrm{GM3}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\times$	-	-
N64.9.392 $\mathrm{GM3}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\times$	-	-
N64.9.393 $\mathrm{GM3}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\times$	-	-
N64.9.394 $\mathrm{GM3}^+ \oplus \mathrm{Y4}^- \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\times$	-	-
N64.9.395 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N64.9.396 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B2_g}$
N64.9.397 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N64.9.398 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y1}^+$	$\surd$	0	0	$\surd$	-	-
N64.9.399 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y1}^-$	$\surd$	0	0	$\surd$	-	-
N64.9.400 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y2}^+$	$\surd$	0	0	$\surd$	-	-
N64.9.401 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y2}^-$	$\surd$	0	0	$\surd$	-	-
N64.9.402 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y3}^+$	$\surd$	0	0	$\surd$	-	-
N64.9.403 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y3}^-$	$\surd$	0	0	$\surd$	-	-
N64.9.404 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y4}^+$	$\surd$	0	0	$\surd$	-	-
N64.9.405 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y4}^-$	$\surd$	0	0	$\surd$	-	-
N64.9.406 $\mathrm{GM3}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B1} \oplus \mathrm{B1}$
N64.9.407 $\mathrm{GM3}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u} \oplus \mathrm{B2_g}$
N64.9.408 $\mathrm{GM3}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g}$
N64.9.409 $\mathrm{GM3}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g}$
N64.9.410 $\mathrm{GM3}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g}$
N64.9.411 $\mathrm{GM3}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g}$
N64.9.412 $\mathrm{GM3}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g}$
N64.9.413 $\mathrm{GM3}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g}$
N64.9.414 $\mathrm{GM3}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{Y4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g}$
N64.9.415 $\mathrm{GM3}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_g}$
N64.9.416 $\mathrm{GM3}^- \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N64.9.417 $\mathrm{GM3}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Y1}^+$	$\surd$	0	0	$\surd$	-	-
N64.9.418 $\mathrm{GM3}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Y1}^-$	$\surd$	0	0	$\surd$	-	-
N64.9.419 $\mathrm{GM3}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Y2}^+$	$\surd$	0	0	$\surd$	-	-
N64.9.420 $\mathrm{GM3}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Y2}^-$	$\surd$	0	0	$\surd$	-	-
N64.9.421 $\mathrm{GM3}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Y3}^+$	$\surd$	0	0	$\surd$	-	-
N64.9.422 $\mathrm{GM3}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Y3}^-$	$\surd$	0	0	$\surd$	-	-
N64.9.423 $\mathrm{GM3}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Y4}^+$	$\surd$	0	0	$\surd$	-	-

Non-coplanar SSGs with parent space group $Cmce$ (No. 64) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N64.9.424 $\mathrm{GM3^-}\oplus\mathrm{GM4^-}\oplus\mathrm{Y4^-}$	$\surd$	0	0	$\surd$	-	-
N64.9.425 $\mathrm{GM3^-}\oplus\mathrm{Y1^+}\oplus\mathrm{Y1^+}$	$\surd$	1	0	$\times$	-	-
N64.9.426 $\mathrm{GM3^-}\oplus\mathrm{Y1^+}\oplus\mathrm{Y1^-}$	$\surd$	1	1	$\times$	-	-
N64.9.427 $\mathrm{GM3^-}\oplus\mathrm{Y1^+}\oplus\mathrm{Y2^+}$	$\surd$	1	0	$\times$	-	-
N64.9.428 $\mathrm{GM3^-}\oplus\mathrm{Y1^+}\oplus\mathrm{Y2^-}$	$\surd$	1	1	$\times$	-	-
N64.9.429 $\mathrm{GM3^-}\oplus\mathrm{Y1^+}\oplus\mathrm{Y3^+}$	$\surd$	1	0	$\times$	-	-
N64.9.430 $\mathrm{GM3^-}\oplus\mathrm{Y1^+}\oplus\mathrm{Y3^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N64.9.431 $\mathrm{GM3^-}\oplus\mathrm{Y1^+}\oplus\mathrm{Y4^+}$	$\surd$	1	0	$\times$	-	-
N64.9.432 $\mathrm{GM3^-}\oplus\mathrm{Y1^+}\oplus\mathrm{Y4^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N64.9.433 $\mathrm{GM3^-}\oplus\mathrm{Y1^-}\oplus\mathrm{Y1^-}$	$\surd$	1	0	$\times$	-	-
N64.9.434 $\mathrm{GM3^-}\oplus\mathrm{Y1^-}\oplus\mathrm{Y2^+}$	$\surd$	1	1	$\times$	-	-
N64.9.435 $\mathrm{GM3^-}\oplus\mathrm{Y1^-}\oplus\mathrm{Y2^-}$	$\surd$	1	0	$\times$	-	-
N64.9.436 $\mathrm{GM3^-}\oplus\mathrm{Y1^-}\oplus\mathrm{Y3^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N64.9.437 $\mathrm{GM3^-}\oplus\mathrm{Y1^-}\oplus\mathrm{Y3^-}$	$\surd$	1	0	$\times$	-	-
N64.9.438 $\mathrm{GM3^-}\oplus\mathrm{Y1^-}\oplus\mathrm{Y4^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N64.9.439 $\mathrm{GM3^-}\oplus\mathrm{Y1^-}\oplus\mathrm{Y4^-}$	$\surd$	1	0	$\times$	-	-
N64.9.440 $\mathrm{GM3^-}\oplus\mathrm{Y2^+}\oplus\mathrm{Y2^+}$	$\surd$	1	0	$\times$	-	-
N64.9.441 $\mathrm{GM3^-}\oplus\mathrm{Y2^+}\oplus\mathrm{Y2^-}$	$\surd$	1	1	$\times$	-	-
N64.9.442 $\mathrm{GM3^-}\oplus\mathrm{Y2^+}\oplus\mathrm{Y3^+}$	$\surd$	1	0	$\times$	-	-
N64.9.443 $\mathrm{GM3^-}\oplus\mathrm{Y2^+}\oplus\mathrm{Y3^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N64.9.444 $\mathrm{GM3^-}\oplus\mathrm{Y2^+}\oplus\mathrm{Y4^+}$	$\surd$	1	0	$\times$	-	-
N64.9.445 $\mathrm{GM3^-}\oplus\mathrm{Y2^+}\oplus\mathrm{Y4^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N64.9.446 $\mathrm{GM3^-}\oplus\mathrm{Y2^-}\oplus\mathrm{Y2^-}$	$\surd$	1	0	$\times$	-	-
N64.9.447 $\mathrm{GM3^-}\oplus\mathrm{Y2^-}\oplus\mathrm{Y3^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N64.9.448 $\mathrm{GM3^-}\oplus\mathrm{Y2^-}\oplus\mathrm{Y3^-}$	$\surd$	1	0	$\times$	-	-
N64.9.449 $\mathrm{GM3^-}\oplus\mathrm{Y2^-}\oplus\mathrm{Y4^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N64.9.450 $\mathrm{GM3^-}\oplus\mathrm{Y2^-}\oplus\mathrm{Y4^-}$	$\surd$	1	0	$\times$	-	-
N64.9.451 $\mathrm{GM3^-}\oplus\mathrm{Y3^+}\oplus\mathrm{Y3^+}$	$\surd$	1	0	$\times$	-	-
N64.9.452 $\mathrm{GM3^-}\oplus\mathrm{Y3^+}\oplus\mathrm{Y3^-}$	$\surd$	1	1	$\times$	-	-
N64.9.453 $\mathrm{GM3^-}\oplus\mathrm{Y3^+}\oplus\mathrm{Y4^+}$	$\surd$	1	0	$\times$	-	-
N64.9.454 $\mathrm{GM3^-}\oplus\mathrm{Y3^+}\oplus\mathrm{Y4^-}$	$\surd$	1	1	$\times$	-	-
N64.9.455 $\mathrm{GM3^-}\oplus\mathrm{Y3^-}\oplus\mathrm{Y3^-}$	$\surd$	1	0	$\times$	-	-
N64.9.456 $\mathrm{GM3^-}\oplus\mathrm{Y3^-}\oplus\mathrm{Y4^+}$	$\surd$	1	1	$\times$	-	-
N64.9.457 $\mathrm{GM3^-}\oplus\mathrm{Y3^-}\oplus\mathrm{Y4^-}$	$\surd$	1	0	$\times$	-	-
N64.9.458 $\mathrm{GM3^-}\oplus\mathrm{Y4^+}\oplus\mathrm{Y4^+}$	$\surd$	1	0	$\times$	-	-
N64.9.459 $\mathrm{GM3^-}\oplus\mathrm{Y4^+}\oplus\mathrm{Y4^-}$	$\surd$	1	1	$\times$	-	-
N64.9.460 $\mathrm{GM3^-}\oplus\mathrm{Y4^-}\oplus\mathrm{Y4^-}$	$\surd$	1	0	$\times$	-	-
N64.9.461 $\mathrm{GM4^+}\oplus\mathrm{GM4^+}\oplus\mathrm{GM4^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B2_g}\oplus\mathrm{B2_g}\oplus\mathrm{B2_g}$
N64.9.462 $\mathrm{GM4^+}\oplus\mathrm{GM4^+}\oplus\mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2}\oplus\mathrm{A2}$
N64.9.463 $\mathrm{GM4^+}\oplus\mathrm{GM4^+}\oplus\mathrm{Y1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_g}\oplus\mathrm{B2_g}$
N64.9.464 $\mathrm{GM4^+}\oplus\mathrm{GM4^+}\oplus\mathrm{Y1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_g}\oplus\mathrm{B2_g}$
N64.9.465 $\mathrm{GM4^+}\oplus\mathrm{GM4^+}\oplus\mathrm{Y2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_g}\oplus\mathrm{B2_g}$
N64.9.466 $\mathrm{GM4^+}\oplus\mathrm{GM4^+}\oplus\mathrm{Y2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_g}\oplus\mathrm{B2_g}$
N64.9.467 $\mathrm{GM4^+}\oplus\mathrm{GM4^+}\oplus\mathrm{Y3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_g}\oplus\mathrm{B2_g}$
N64.9.468 $\mathrm{GM4^+}\oplus\mathrm{GM4^+}\oplus\mathrm{Y3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_g}\oplus\mathrm{B2_g}$
N64.9.469 $\mathrm{GM4^+}\oplus\mathrm{GM4^+}\oplus\mathrm{Y4^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_g}\oplus\mathrm{B2_g}$

Non-coplanar SSGs with parent space group $Cmce$ (No. 64) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N64.9.470 $\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{+}\oplus\mathrm{Y4}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_g}\oplus\mathrm{B2_g}$
N64.9.471 $\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{A_u}\oplus\mathrm{B2_g}$
N64.9.472 $\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{-}\oplus\mathrm{Y1}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B2_g}$
N64.9.473 $\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{-}\oplus\mathrm{Y1}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B2_g}$
N64.9.474 $\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{-}\oplus\mathrm{Y2}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B2_g}$
N64.9.475 $\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{-}\oplus\mathrm{Y2}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B2_g}$
N64.9.476 $\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{-}\oplus\mathrm{Y3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B2_g}$
N64.9.477 $\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{-}\oplus\mathrm{Y3}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B2_g}$
N64.9.478 $\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{-}\oplus\mathrm{Y4}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B2_g}$
N64.9.479 $\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{-}\oplus\mathrm{Y4}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B2_g}$
N64.9.480 $\mathrm{GM4}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y1}^{+}$	$\surd$	1	1	$\times$	-	-
N64.9.481 $\mathrm{GM4}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y1}^{-}$	$\surd$	1	1	$\times$	-	-
N64.9.482 $\mathrm{GM4}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y2}^{+}$	$\surd$	1	1	$\times$	-	-
N64.9.483 $\mathrm{GM4}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\times$	-	-
N64.9.484 $\mathrm{GM4}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y3}^{+}$	$\surd$	1	1	$\times$	-	-
N64.9.485 $\mathrm{GM4}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\surd$	$mm2$	B1
N64.9.486 $\mathrm{GM4}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y4}^{+}$	$\surd$	1	1	$\times$	-	-
N64.9.487 $\mathrm{GM4}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y4}^{-}$	$\surd$	1	1	$\surd$	222	B2
N64.9.488 $\mathrm{GM4}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y1}^{-}$	$\surd$	1	1	$\times$	-	-
N64.9.489 $\mathrm{GM4}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y2}^{+}$	$\surd$	1	1	$\times$	-	-
N64.9.490 $\mathrm{GM4}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\times$	-	-
N64.9.491 $\mathrm{GM4}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y3}^{+}$	$\surd$	1	1	$\surd$	$mm2$	B1
N64.9.492 $\mathrm{GM4}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\times$	-	-
N64.9.493 $\mathrm{GM4}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y4}^{+}$	$\surd$	1	1	$\surd$	222	B2
N64.9.494 $\mathrm{GM4}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y4}^{-}$	$\surd$	1	1	$\times$	-	-
N64.9.495 $\mathrm{GM4}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Y2}^{+}$	$\surd$	1	1	$\times$	-	-
N64.9.496 $\mathrm{GM4}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\times$	-	-
N64.9.497 $\mathrm{GM4}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Y3}^{+}$	$\surd$	1	1	$\times$	-	-
N64.9.498 $\mathrm{GM4}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\surd$	222	B2
N64.9.499 $\mathrm{GM4}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Y4}^{+}$	$\surd$	1	1	$\times$	-	-
N64.9.500 $\mathrm{GM4}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Y4}^{-}$	$\surd$	1	1	$\surd$	$mm2$	B1
N64.9.501 $\mathrm{GM4}^{+}\oplus\mathrm{Y2}^{-}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\times$	-	-
N64.9.502 $\mathrm{GM4}^{+}\oplus\mathrm{Y2}^{-}\oplus\mathrm{Y3}^{+}$	$\surd$	1	1	$\surd$	222	B2
N64.9.503 $\mathrm{GM4}^{+}\oplus\mathrm{Y2}^{-}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\times$	-	-
N64.9.504 $\mathrm{GM4}^{+}\oplus\mathrm{Y2}^{-}\oplus\mathrm{Y4}^{+}$	$\surd$	1	1	$\surd$	$mm2$	B1
N64.9.505 $\mathrm{GM4}^{+}\oplus\mathrm{Y2}^{-}\oplus\mathrm{Y4}^{-}$	$\surd$	1	1	$\times$	-	-
N64.9.506 $\mathrm{GM4}^{+}\oplus\mathrm{Y3}^{+}\oplus\mathrm{Y3}^{+}$	$\surd$	1	1	$\times$	-	-
N64.9.507 $\mathrm{GM4}^{+}\oplus\mathrm{Y3}^{+}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\times$	-	-
N64.9.508 $\mathrm{GM4}^{+}\oplus\mathrm{Y3}^{+}\oplus\mathrm{Y4}^{+}$	$\surd$	1	1	$\times$	-	-
N64.9.509 $\mathrm{GM4}^{+}\oplus\mathrm{Y3}^{+}\oplus\mathrm{Y4}^{-}$	$\surd$	1	1	$\times$	-	-
N64.9.510 $\mathrm{GM4}^{+}\oplus\mathrm{Y3}^{-}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\times$	-	-
N64.9.511 $\mathrm{GM4}^{+}\oplus\mathrm{Y3}^{-}\oplus\mathrm{Y4}^{+}$	$\surd$	1	1	$\times$	-	-
N64.9.512 $\mathrm{GM4}^{+}\oplus\mathrm{Y3}^{-}\oplus\mathrm{Y4}^{-}$	$\surd$	1	1	$\times$	-	-
N64.9.513 $\mathrm{GM4}^{+}\oplus\mathrm{Y4}^{+}\oplus\mathrm{Y4}^{+}$	$\surd$	1	1	$\times$	-	-
N64.9.514 $\mathrm{GM4}^{+}\oplus\mathrm{Y4}^{+}\oplus\mathrm{Y4}^{-}$	$\surd$	1	1	$\times$	-	-
N64.9.515 $\mathrm{GM4}^{+}\oplus\mathrm{Y4}^{-}\oplus\mathrm{Y4}^{-}$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $Cmce$ (No. 64) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N64.9.516 $\mathrm{GM4}^- \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N64.9.517 $\mathrm{GM4}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Y1}^+$	$\surd$	0	0	$\surd$	-	-
N64.9.518 $\mathrm{GM4}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Y1}^-$	$\surd$	0	0	$\surd$	-	-
N64.9.519 $\mathrm{GM4}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Y2}^+$	$\surd$	0	0	$\surd$	-	-
N64.9.520 $\mathrm{GM4}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Y2}^-$	$\surd$	0	0	$\surd$	-	-
N64.9.521 $\mathrm{GM4}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Y3}^+$	$\surd$	0	0	$\surd$	-	-
N64.9.522 $\mathrm{GM4}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Y3}^-$	$\surd$	0	0	$\surd$	-	-
N64.9.523 $\mathrm{GM4}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Y4}^+$	$\surd$	0	0	$\surd$	-	-
N64.9.524 $\mathrm{GM4}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Y4}^-$	$\surd$	0	0	$\surd$	-	-
N64.9.525 $\mathrm{GM4}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	0	$\times$	-	-
N64.9.526 $\mathrm{GM4}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^-$	$\surd$	1	1	$\times$	-	-
N64.9.527 $\mathrm{GM4}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N64.9.528 $\mathrm{GM4}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\times$	-	-
N64.9.529 $\mathrm{GM4}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N64.9.530 $\mathrm{GM4}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N64.9.531 $\mathrm{GM4}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
N64.9.532 $\mathrm{GM4}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N64.9.533 $\mathrm{GM4}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y1}^-$	$\surd$	1	0	$\times$	-	-
N64.9.534 $\mathrm{GM4}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\times$	-	-
N64.9.535 $\mathrm{GM4}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N64.9.536 $\mathrm{GM4}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N64.9.537 $\mathrm{GM4}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N64.9.538 $\mathrm{GM4}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N64.9.539 $\mathrm{GM4}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y4}^-$	$\surd$	1	0	$\times$	-	-
N64.9.540 $\mathrm{GM4}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N64.9.541 $\mathrm{GM4}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\times$	-	-
N64.9.542 $\mathrm{GM4}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N64.9.543 $\mathrm{GM4}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N64.9.544 $\mathrm{GM4}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
N64.9.545 $\mathrm{GM4}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N64.9.546 $\mathrm{GM4}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N64.9.547 $\mathrm{GM4}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N64.9.548 $\mathrm{GM4}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N64.9.549 $\mathrm{GM4}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N64.9.550 $\mathrm{GM4}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y4}^-$	$\surd$	1	0	$\times$	-	-
N64.9.551 $\mathrm{GM4}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N64.9.552 $\mathrm{GM4}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\times$	-	-
N64.9.553 $\mathrm{GM4}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
N64.9.554 $\mathrm{GM4}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\times$	-	-
N64.9.555 $\mathrm{GM4}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N64.9.556 $\mathrm{GM4}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\times$	-	-
N64.9.557 $\mathrm{GM4}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Y4}^-$	$\surd$	1	0	$\times$	-	-
N64.9.558 $\mathrm{GM4}^- \oplus \mathrm{Y4}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
N64.9.559 $\mathrm{GM4}^- \oplus \mathrm{Y4}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\times$	-	-
N64.9.560 $\mathrm{GM4}^- \oplus \mathrm{Y4}^- \oplus \mathrm{Y4}^-$	$\surd$	1	0	$\times$	-	-
N64.9.561 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^+$	$\surd$	0	0	$\surd$	-	-

Non-coplanar SSGs with parent space group $Cmce$ (No. 64) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N64.9.562 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u}$
N64.9.563 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^+$	$\surd$	0	0	$\surd$	-	-
N64.9.564 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N64.9.565 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y3}^+$	$\surd$	0	0	$\surd$	-	-
N64.9.566 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B3_u}$
N64.9.567 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y4}^+$	$\surd$	0	0	$\surd$	-	-
N64.9.568 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_u} \oplus \mathrm{B2_u}$
N64.9.569 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u}$
N64.9.570 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u}$
N64.9.571 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u}$
N64.9.572 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u}$
N64.9.573 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u}$
N64.9.574 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B2_u}$
N64.9.575 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B2_u}$
N64.9.576 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^+$	$\surd$	0	0	$\surd$	-	-
N64.9.577 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u}$
N64.9.578 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^+$	$\surd$	0	0	$\surd$	-	-
N64.9.579 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_u}$
N64.9.580 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y4}^+$	$\surd$	0	0	$\surd$	-	-
N64.9.581 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_u}$
N64.9.582 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N64.9.583 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N64.9.584 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u}$
N64.9.585 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u}$
N64.9.586 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N64.9.587 $\mathrm{Y1}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^+$	$\surd$	0	0	$\surd$	-	-
N64.9.588 $\mathrm{Y1}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u}$
N64.9.589 $\mathrm{Y1}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y4}^+$	$\surd$	0	0	$\surd$	-	-
N64.9.590 $\mathrm{Y1}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N64.9.591 $\mathrm{Y1}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B3_u}$
N64.9.592 $\mathrm{Y1}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Y4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u}$
N64.9.593 $\mathrm{Y1}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_u}$
N64.9.594 $\mathrm{Y1}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{Y4}^+$	$\surd$	0	0	$\surd$	-	-
N64.9.595 $\mathrm{Y1}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B2_u}$
N64.9.596 $\mathrm{Y1}^+ \oplus \mathrm{Y4}^- \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_u} \oplus \mathrm{B2_u}$
N64.9.597 $\mathrm{Y1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y1}^-$	$\surd$	0	0	$\surd$	-	-
N64.9.598 $\mathrm{Y1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N64.9.599 $\mathrm{Y1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y2}^-$	$\surd$	0	0	$\surd$	-	-
N64.9.600 $\mathrm{Y1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B3_u}$
N64.9.601 $\mathrm{Y1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y3}^-$	$\surd$	0	0	$\surd$	-	-
N64.9.602 $\mathrm{Y1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_u} \oplus \mathrm{B2_u}$
N64.9.603 $\mathrm{Y1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y4}^-$	$\surd$	0	0	$\surd$	-	-
N64.9.604 $\mathrm{Y1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N64.9.605 $\mathrm{Y1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u}$
N64.9.606 $\mathrm{Y1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u}$
N64.9.607 $\mathrm{Y1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u}$

Non-coplanar SSGs with parent space group $Cmce$ (No. 64) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N64.9.608 $\mathrm{Y1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N64.9.609 $\mathrm{Y1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u}$
N64.9.610 $\mathrm{Y1}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y2}^-$	$\surd$	0	0	$\surd$	-	-
N64.9.611 $\mathrm{Y1}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_u}$
N64.9.612 $\mathrm{Y1}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y3}^-$	$\surd$	0	0	$\surd$	-	-
N64.9.613 $\mathrm{Y1}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_u}$
N64.9.614 $\mathrm{Y1}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y4}^-$	$\surd$	0	0	$\surd$	-	-
N64.9.615 $\mathrm{Y1}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B3_u}$
N64.9.616 $\mathrm{Y1}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u}$
N64.9.617 $\mathrm{Y1}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Y4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_u}$
N64.9.618 $\mathrm{Y1}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u}$
N64.9.619 $\mathrm{Y1}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Y3}^-$	$\surd$	0	0	$\surd$	-	-
N64.9.620 $\mathrm{Y1}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Y4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N64.9.621 $\mathrm{Y1}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Y4}^-$	$\surd$	0	0	$\surd$	-	-
N64.9.622 $\mathrm{Y1}^- \oplus \mathrm{Y4}^+ \oplus \mathrm{Y4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_u} \oplus \mathrm{B2_u}$
N64.9.623 $\mathrm{Y1}^- \oplus \mathrm{Y4}^+ \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B2_u}$
N64.9.624 $\mathrm{Y1}^- \oplus \mathrm{Y4}^- \oplus \mathrm{Y4}^-$	$\surd$	0	0	$\surd$	-	-
N64.9.625 $\mathrm{Y2}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^+$	$\surd$	0	0	$\surd$	-	-
N64.9.626 $\mathrm{Y2}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u}$
N64.9.627 $\mathrm{Y2}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^+$	$\surd$	0	0	$\surd$	-	-
N64.9.628 $\mathrm{Y2}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_u} \oplus \mathrm{B2_u}$
N64.9.629 $\mathrm{Y2}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y4}^+$	$\surd$	0	0	$\surd$	-	-
N64.9.630 $\mathrm{Y2}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B3_u}$
N64.9.631 $\mathrm{Y2}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u}$
N64.9.632 $\mathrm{Y2}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B2_u}$
N64.9.633 $\mathrm{Y2}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B2_u}$
N64.9.634 $\mathrm{Y2}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u}$
N64.9.635 $\mathrm{Y2}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u}$
N64.9.636 $\mathrm{Y2}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^+$	$\surd$	0	0	$\surd$	-	-
N64.9.637 $\mathrm{Y2}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B2_u}$
N64.9.638 $\mathrm{Y2}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y4}^+$	$\surd$	0	0	$\surd$	-	-
N64.9.639 $\mathrm{Y2}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u}$
N64.9.640 $\mathrm{Y2}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_u} \oplus \mathrm{B2_u}$
N64.9.641 $\mathrm{Y2}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Y4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N64.9.642 $\mathrm{Y2}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_u}$
N64.9.643 $\mathrm{Y2}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{Y4}^+$	$\surd$	0	0	$\surd$	-	-
N64.9.644 $\mathrm{Y2}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u}$
N64.9.645 $\mathrm{Y2}^+ \oplus \mathrm{Y4}^- \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B3_u}$
N64.9.646 $\mathrm{Y2}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y2}^-$	$\surd$	0	0	$\surd$	-	-
N64.9.647 $\mathrm{Y2}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_u} \oplus \mathrm{B2_u}$
N64.9.648 $\mathrm{Y2}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y3}^-$	$\surd$	0	0	$\surd$	-	-
N64.9.649 $\mathrm{Y2}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B3_u}$
N64.9.650 $\mathrm{Y2}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y4}^-$	$\surd$	0	0	$\surd$	-	-
N64.9.651 $\mathrm{Y2}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_u} \oplus \mathrm{B2_u}$
N64.9.652 $\mathrm{Y2}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B2_u}$
N64.9.653 $\mathrm{Y2}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Y4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_u}$

Non-coplanar SSGs with parent space group $Cmce$ (No. 64) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N64.9.654 $\mathrm{Y2}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N64.9.655 $\mathrm{Y2}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Y3}^-$	$\surd$	0	0	$\surd$	-	-
N64.9.656 $\mathrm{Y2}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Y4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u}$
N64.9.657 $\mathrm{Y2}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Y4}^-$	$\surd$	0	0	$\surd$	-	-
N64.9.658 $\mathrm{Y2}^- \oplus \mathrm{Y4}^+ \oplus \mathrm{Y4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B3_u}$
N64.9.659 $\mathrm{Y2}^- \oplus \mathrm{Y4}^+ \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u}$
N64.9.660 $\mathrm{Y2}^- \oplus \mathrm{Y4}^- \oplus \mathrm{Y4}^-$	$\surd$	0	0	$\surd$	-	-
N64.9.661 $\mathrm{Y3}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^+$	$\surd$	0	0	$\surd$	-	-
N64.9.662 $\mathrm{Y3}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u}$
N64.9.663 $\mathrm{Y3}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y4}^+$	$\surd$	0	0	$\surd$	-	-
N64.9.664 $\mathrm{Y3}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N64.9.665 $\mathrm{Y3}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u}$
N64.9.666 $\mathrm{Y3}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Y4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u}$
N64.9.667 $\mathrm{Y3}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u}$
N64.9.668 $\mathrm{Y3}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{Y4}^+$	$\surd$	0	0	$\surd$	-	-
N64.9.669 $\mathrm{Y3}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u}$
N64.9.670 $\mathrm{Y3}^+ \oplus \mathrm{Y4}^- \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N64.9.671 $\mathrm{Y3}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Y3}^-$	$\surd$	0	0	$\surd$	-	-
N64.9.672 $\mathrm{Y3}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Y4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N64.9.673 $\mathrm{Y3}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Y4}^-$	$\surd$	0	0	$\surd$	-	-
N64.9.674 $\mathrm{Y3}^- \oplus \mathrm{Y4}^+ \oplus \mathrm{Y4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N64.9.675 $\mathrm{Y3}^- \oplus \mathrm{Y4}^+ \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u}$
N64.9.676 $\mathrm{Y3}^- \oplus \mathrm{Y4}^- \oplus \mathrm{Y4}^-$	$\surd$	0	0	$\surd$	-	-
N64.9.677 $\mathrm{Y4}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{Y4}^+$	$\surd$	0	0	$\surd$	-	-
N64.9.678 $\mathrm{Y4}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u}$
N64.9.679 $\mathrm{Y4}^+ \oplus \mathrm{Y4}^- \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u}$
N64.9.680 $\mathrm{Y4}^- \oplus \mathrm{Y4}^- \oplus \mathrm{Y4}^-$	$\surd$	0	0	$\surd$	-	-
N64.12.1 $\mathrm{GM1}^- \oplus \mathrm{T1}$	$\surd$	1	1	$\times$	-	-
N64.12.2 $\mathrm{GM1}^- \oplus \mathrm{T2}$	$\surd$	1	1	$\times$	-	-
N64.12.3 $\mathrm{GM1}^- \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N64.12.4 $\mathrm{GM1}^- \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N64.12.5 $\mathrm{GM2}^+ \oplus \mathrm{T1}$	$\surd$	1	1	$\surd$	222	B1
N64.12.6 $\mathrm{GM2}^+ \oplus \mathrm{T2}$	$\surd$	1	1	$\surd$	222	B1
N64.12.7 $\mathrm{GM2}^+ \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	222	B1
N64.12.8 $\mathrm{GM2}^+ \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	222	B1
N64.12.9 $\mathrm{GM2}^- \oplus \mathrm{T1}$	$\surd$	1	1	$\times$	-	-
N64.12.10 $\mathrm{GM2}^- \oplus \mathrm{T2}$	$\surd$	1	1	$\times$	-	-
N64.12.11 $\mathrm{GM2}^- \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N64.12.12 $\mathrm{GM2}^- \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N64.12.13 $\mathrm{GM3}^+ \oplus \mathrm{T1}$	$\surd$	1	1	$\times$	-	-
N64.12.14 $\mathrm{GM3}^+ \oplus \mathrm{T2}$	$\surd$	1	1	$\times$	-	-
N64.12.15 $\mathrm{GM3}^+ \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$mm2$	B2
N64.12.16 $\mathrm{GM3}^+ \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	$mm2$	B2
N64.12.17 $\mathrm{GM3}^- \oplus \mathrm{T1}$	$\surd$	1	1	$\times$	-	-
N64.12.18 $\mathrm{GM3}^- \oplus \mathrm{T2}$	$\surd$	1	1	$\times$	-	-
N64.12.19 $\mathrm{GM3}^- \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$

Non-coplanar SSGs with parent space group $Cmce$ (No. 64) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N64.12.20 GM3$^-$ ⊕ Z2	√	1	1	√	mmm	$\mathrm{B1_u}$
N64.12.21 GM4$^+$ ⊕ T1	√	1	1	×	-	-
N64.12.22 GM4$^+$ ⊕ T2	√	1	1	×	-	-
N64.12.23 GM4$^+$ ⊕ Z1	√	1	1	√	$mm2$	B1
N64.12.24 GM4$^+$ ⊕ Z2	√	1	1	√	$mm2$	B1
N64.12.25 GM4$^-$ ⊕ T1	√	1	1	×	-	-
N64.12.26 GM4$^-$ ⊕ T2	√	1	1	×	-	-
N64.12.27 GM4$^-$ ⊕ Z1	√	1	1	√	mmm	$\mathrm{B1_u}$
N64.12.28 GM4$^-$ ⊕ Z2	√	1	1	√	mmm	$\mathrm{B1_u}$
N64.12.29 Y1$^+$ ⊕ T1	√	1	1	√	mmm	$\mathrm{B1_u}$
N64.12.30 Y1$^+$ ⊕ T2	√	1	1	√	mmm	$\mathrm{B1_u}$
N64.12.31 Y1$^+$ ⊕ Z1	√	1	1	√	mmm	$\mathrm{B1_u}$
N64.12.32 Y1$^+$ ⊕ Z2	√	1	1	√	mmm	$\mathrm{B1_u}$
N64.12.33 Y1$^-$ ⊕ T1	√	1	1	√	mmm	$\mathrm{B1_u}$
N64.12.34 Y1$^-$ ⊕ T2	√	1	1	√	mmm	$\mathrm{B1_u}$
N64.12.35 Y1$^-$ ⊕ Z1	√	1	1	√	mmm	$\mathrm{B1_u}$
N64.12.36 Y1$^-$ ⊕ Z2	√	1	1	√	mmm	$\mathrm{B1_u}$
N64.12.37 Y2$^+$ ⊕ T1	√	1	1	√	mmm	$\mathrm{B1_u}$
N64.12.38 Y2$^+$ ⊕ T2	√	1	1	√	mmm	$\mathrm{B1_u}$
N64.12.39 Y2$^+$ ⊕ Z1	√	1	1	√	mmm	$\mathrm{B1_u}$
N64.12.40 Y2$^+$ ⊕ Z2	√	1	1	√	mmm	$\mathrm{B1_u}$
N64.12.41 Y2$^-$ ⊕ T1	√	1	1	√	mmm	$\mathrm{B1_u}$
N64.12.42 Y2$^-$ ⊕ T2	√	1	1	√	mmm	$\mathrm{B1_u}$
N64.12.43 Y2$^-$ ⊕ Z1	√	1	1	√	mmm	$\mathrm{B1_u}$
N64.12.44 Y2$^-$ ⊕ Z2	√	1	1	√	mmm	$\mathrm{B1_u}$
N64.12.45 Y3$^+$ ⊕ T1	√	1	1	√	mmm	$\mathrm{B1_u}$
N64.12.46 Y3$^+$ ⊕ T2	√	1	1	√	mmm	$\mathrm{B1_u}$
N64.12.47 Y3$^+$ ⊕ Z1	√	1	1	√	mmm	$\mathrm{B1_u}$
N64.12.48 Y3$^+$ ⊕ Z2	√	1	1	√	mmm	$\mathrm{B1_u}$
N64.12.49 Y3$^-$ ⊕ T1	√	1	1	√	mmm	$\mathrm{B1_u}$
N64.12.50 Y3$^-$ ⊕ T2	√	1	1	√	mmm	$\mathrm{B1_u}$
N64.12.51 Y3$^-$ ⊕ Z1	√	1	1	√	mmm	$\mathrm{B1_u}$
N64.12.52 Y3$^-$ ⊕ Z2	√	1	1	√	mmm	$\mathrm{B1_u}$
N64.12.53 Y4$^+$ ⊕ T1	√	1	1	√	mmm	$\mathrm{B1_u}$
N64.12.54 Y4$^+$ ⊕ T2	√	1	1	√	mmm	$\mathrm{B1_u}$
N64.12.55 Y4$^+$ ⊕ Z1	√	1	1	√	mmm	$\mathrm{B1_u}$
N64.12.56 Y4$^+$ ⊕ Z2	√	1	1	√	mmm	$\mathrm{B1_u}$
N64.12.57 Y4$^-$ ⊕ T1	√	1	1	√	mmm	$\mathrm{B1_u}$
N64.12.58 Y4$^-$ ⊕ T2	√	1	1	√	mmm	$\mathrm{B1_u}$
N64.12.59 Y4$^-$ ⊕ Z1	√	1	1	√	mmm	$\mathrm{B1_u}$
N64.12.60 Y4$^-$ ⊕ Z2	√	1	1	√	mmm	$\mathrm{B1_u}$
N64.14.1 GM1$^-$ ⊕ SM1	√	1	1	√	mmm	$\mathrm{B3_u}$
N64.14.2 GM1$^-$ ⊕ SM2	√	1	1	√	mmm	$\mathrm{B3_u}$
N64.14.3 GM1$^-$ ⊕ SM3	√	1	1	√	mmm	$\mathrm{B3_u}$
N64.14.4 GM1$^-$ ⊕ SM4	√	1	1	√	mmm	$\mathrm{B3_u}$
N64.14.5 GM1$^-$ ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$

Non-coplanar SSGs with parent space group $Cmce$ (No. 64) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N64.14.6 GM1$^-$ ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
N64.14.7 GM1$^-$ ⊕ DT3	√	1	1	√	mmm	$\mathrm{B2_u}$
N64.14.8 GM1$^-$ ⊕ DT4	√	1	1	√	mmm	$\mathrm{B2_u}$
N64.14.9 GM1$^-$ ⊕ LD1	√	1	1	√	mmm	$\mathrm{B1_u}$
N64.14.10 GM1$^-$ ⊕ LD2	√	1	1	√	mmm	$\mathrm{B1_u}$
N64.14.11 GM1$^-$ ⊕ H1	√	1	1	×	-	-
N64.14.12 GM1$^-$ ⊕ H2	√	1	1	×	-	-
N64.14.13 GM2$^+$ ⊕ SM1	√	1	1	√	$mm2$	B1
N64.14.14 GM2$^+$ ⊕ SM2	√	1	1	√	$mm2$	B1
N64.14.15 GM2$^+$ ⊕ SM3	√	1	1	√	$mm2$	B1
N64.14.16 GM2$^+$ ⊕ SM4	√	1	1	√	$mm2$	B1
N64.14.17 GM2$^+$ ⊕ DT1	√	1	1	√	$mm2$	B2
N64.14.18 GM2$^+$ ⊕ DT2	√	1	1	√	$mm2$	B2
N64.14.19 GM2$^+$ ⊕ DT3	√	1	1	√	$mm2$	B2
N64.14.20 GM2$^+$ ⊕ DT4	√	1	1	√	$mm2$	B2
N64.14.21 GM2$^+$ ⊕ LD1	√	1	1	√	222	B1
N64.14.22 GM2$^+$ ⊕ LD2	√	1	1	√	222	B1
N64.14.23 GM2$^+$ ⊕ H1	√	1	1	√	222	B1
N64.14.24 GM2$^+$ ⊕ H2	√	1	1	√	222	B1
N64.14.25 GM2$^-$ ⊕ SM1	√	1	1	√	mmm	$\mathrm{B3_u}$
N64.14.26 GM2$^-$ ⊕ SM2	√	1	1	√	mmm	$\mathrm{B3_u}$
N64.14.27 GM2$^-$ ⊕ SM3	√	1	1	√	mmm	$\mathrm{B3_u}$
N64.14.28 GM2$^-$ ⊕ SM4	√	1	1	√	mmm	$\mathrm{B3_u}$
N64.14.29 GM2$^-$ ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N64.14.30 GM2$^-$ ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
N64.14.31 GM2$^-$ ⊕ DT3	√	1	1	√	mmm	$\mathrm{B2_u}$
N64.14.32 GM2$^-$ ⊕ DT4	√	1	1	√	mmm	$\mathrm{B2_u}$
N64.14.33 GM2$^-$ ⊕ LD1	√	1	1	√	mmm	$\mathrm{B1_u}$
N64.14.34 GM2$^-$ ⊕ LD2	√	1	1	√	mmm	$\mathrm{B1_u}$
N64.14.35 GM2$^-$ ⊕ H1	√	1	1	×	-	-
N64.14.36 GM2$^-$ ⊕ H2	√	1	1	×	-	-
N64.14.37 GM3$^+$ ⊕ SM1	√	1	1	√	222	B3
N64.14.38 GM3$^+$ ⊕ SM2	√	1	1	√	222	B3
N64.14.39 GM3$^+$ ⊕ SM3	√	1	1	√	222	B3
N64.14.40 GM3$^+$ ⊕ SM4	√	1	1	√	222	B3
N64.14.41 GM3$^+$ ⊕ DT1	√	1	1	√	$mm2$	B2
N64.14.42 GM3$^+$ ⊕ DT2	√	1	1	√	$mm2$	B2
N64.14.43 GM3$^+$ ⊕ DT3	√	1	1	√	$mm2$	B2
N64.14.44 GM3$^+$ ⊕ DT4	√	1	1	√	$mm2$	B2
N64.14.45 GM3$^+$ ⊕ LD1	√	1	1	√	$mm2$	B2
N64.14.46 GM3$^+$ ⊕ LD2	√	1	1	√	$mm2$	B2
N64.14.47 GM3$^+$ ⊕ H1	√	1	1	×	-	-
N64.14.48 GM3$^+$ ⊕ H2	√	1	1	×	-	-
N64.14.49 GM3$^-$ ⊕ SM1	√	1	1	√	mmm	$\mathrm{B3_u}$
N64.14.50 GM3$^-$ ⊕ SM2	√	1	1	√	mmm	$\mathrm{B3_u}$
N64.14.51 GM3$^-$ ⊕ SM3	√	1	1	√	mmm	$\mathrm{B3_u}$

Non-coplanar SSGs with parent space group $Cmce$ (No. 64) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N64.14.52 GM3$^-$ ⊕ SM4	√	1	1	√	mmm	$\mathrm{B3_u}$
N64.14.53 GM3$^-$ ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N64.14.54 GM3$^-$ ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
N64.14.55 GM3$^-$ ⊕ DT3	√	1	1	√	mmm	$\mathrm{B2_u}$
N64.14.56 GM3$^-$ ⊕ DT4	√	1	1	√	mmm	$\mathrm{B2_u}$
N64.14.57 GM3$^-$ ⊕ LD1	√	1	1	√	mmm	$\mathrm{B1_u}$
N64.14.58 GM3$^-$ ⊕ LD2	√	1	1	√	mmm	$\mathrm{B1_u}$
N64.14.59 GM3$^-$ ⊕ H1	√	1	1	×	-	-
N64.14.60 GM3$^-$ ⊕ H2	√	1	1	×	-	-
N64.14.61 GM4$^+$ ⊕ SM1	√	1	1	√	$mm2$	B1
N64.14.62 GM4$^+$ ⊕ SM2	√	1	1	√	$mm2$	B1
N64.14.63 GM4$^+$ ⊕ SM3	√	1	1	√	$mm2$	B1
N64.14.64 GM4$^+$ ⊕ SM4	√	1	1	√	$mm2$	B1
N64.14.65 GM4$^+$ ⊕ DT1	√	1	1	√	222	B2
N64.14.66 GM4$^+$ ⊕ DT2	√	1	1	√	222	B2
N64.14.67 GM4$^+$ ⊕ DT3	√	1	1	√	222	B2
N64.14.68 GM4$^+$ ⊕ DT4	√	1	1	√	222	B2
N64.14.69 GM4$^+$ ⊕ LD1	√	1	1	√	$mm2$	B1
N64.14.70 GM4$^+$ ⊕ LD2	√	1	1	√	$mm2$	B1
N64.14.71 GM4$^+$ ⊕ H1	√	1	1	×	-	-
N64.14.72 GM4$^+$ ⊕ H2	√	1	1	×	-	-
N64.14.73 GM4$^-$ ⊕ SM1	√	1	1	√	mmm	$\mathrm{B3_u}$
N64.14.74 GM4$^-$ ⊕ SM2	√	1	1	√	mmm	$\mathrm{B3_u}$
N64.14.75 GM4$^-$ ⊕ SM3	√	1	1	√	mmm	$\mathrm{B3_u}$
N64.14.76 GM4$^-$ ⊕ SM4	√	1	1	√	mmm	$\mathrm{B3_u}$
N64.14.77 GM4$^-$ ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N64.14.78 GM4$^-$ ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
N64.14.79 GM4$^-$ ⊕ DT3	√	1	1	√	mmm	$\mathrm{B2_u}$
N64.14.80 GM4$^-$ ⊕ DT4	√	1	1	√	mmm	$\mathrm{B2_u}$
N64.14.81 GM4$^-$ ⊕ LD1	√	1	1	√	mmm	$\mathrm{B1_u}$
N64.14.82 GM4$^-$ ⊕ LD2	√	1	1	√	mmm	$\mathrm{B1_u}$
N64.14.83 GM4$^-$ ⊕ H1	√	1	1	×	-	-
N64.14.84 GM4$^-$ ⊕ H2	√	1	1	×	-	-
N64.14.85 Y1$^+$ ⊕ SM1	√	1	1	√	mmm	$\mathrm{B3_u}$
N64.14.86 Y1$^+$ ⊕ SM2	√	1	1	√	mmm	$\mathrm{B3_u}$
N64.14.87 Y1$^+$ ⊕ SM3	√	1	1	√	mmm	$\mathrm{B3_u}$
N64.14.88 Y1$^+$ ⊕ SM4	√	1	1	√	mmm	$\mathrm{B3_u}$
N64.14.89 Y1$^+$ ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N64.14.90 Y1$^+$ ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
N64.14.91 Y1$^+$ ⊕ DT3	√	1	1	√	mmm	$\mathrm{B2_u}$
N64.14.92 Y1$^+$ ⊕ DT4	√	1	1	√	mmm	$\mathrm{B2_u}$
N64.14.93 Y1$^+$ ⊕ LD1	√	1	1	√	mmm	$\mathrm{B1_u}$
N64.14.94 Y1$^+$ ⊕ LD2	√	1	1	√	mmm	$\mathrm{B1_u}$
N64.14.95 Y1$^+$ ⊕ H1	√	1	1	√	mmm	$\mathrm{B1_u}$
N64.14.96 Y1$^+$ ⊕ H2	√	1	1	√	mmm	$\mathrm{B1_u}$
N64.14.97 Y1$^-$ ⊕ SM1	√	1	1	√	mmm	$\mathrm{B3_u}$

Non-coplanar SSGs with parent space group $Cmce$ (No. 64) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N64.14.98 $\mathrm{Y1}^{-} \oplus \mathrm{SM2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N64.14.99 $\mathrm{Y1}^{-} \oplus \mathrm{SM3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N64.14.100 $\mathrm{Y1}^{-} \oplus \mathrm{SM4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N64.14.101 $\mathrm{Y1}^{-} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N64.14.102 $\mathrm{Y1}^{-} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N64.14.103 $\mathrm{Y1}^{-} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N64.14.104 $\mathrm{Y1}^{-} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N64.14.105 $\mathrm{Y1}^{-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N64.14.106 $\mathrm{Y1}^{-} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N64.14.107 $\mathrm{Y1}^{-} \oplus \mathrm{H1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N64.14.108 $\mathrm{Y1}^{-} \oplus \mathrm{H2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N64.14.109 $\mathrm{Y2}^{+} \oplus \mathrm{SM1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N64.14.110 $\mathrm{Y2}^{+} \oplus \mathrm{SM2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N64.14.111 $\mathrm{Y2}^{+} \oplus \mathrm{SM3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N64.14.112 $\mathrm{Y2}^{+} \oplus \mathrm{SM4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N64.14.113 $\mathrm{Y2}^{+} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N64.14.114 $\mathrm{Y2}^{+} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N64.14.115 $\mathrm{Y2}^{+} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N64.14.116 $\mathrm{Y2}^{+} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N64.14.117 $\mathrm{Y2}^{+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N64.14.118 $\mathrm{Y2}^{+} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N64.14.119 $\mathrm{Y2}^{+} \oplus \mathrm{H1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N64.14.120 $\mathrm{Y2}^{+} \oplus \mathrm{H2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N64.14.121 $\mathrm{Y2}^{-} \oplus \mathrm{SM1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N64.14.122 $\mathrm{Y2}^{-} \oplus \mathrm{SM2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N64.14.123 $\mathrm{Y2}^{-} \oplus \mathrm{SM3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N64.14.124 $\mathrm{Y2}^{-} \oplus \mathrm{SM4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N64.14.125 $\mathrm{Y2}^{-} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N64.14.126 $\mathrm{Y2}^{-} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N64.14.127 $\mathrm{Y2}^{-} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N64.14.128 $\mathrm{Y2}^{-} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N64.14.129 $\mathrm{Y2}^{-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N64.14.130 $\mathrm{Y2}^{-} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N64.14.131 $\mathrm{Y2}^{-} \oplus \mathrm{H1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N64.14.132 $\mathrm{Y2}^{-} \oplus \mathrm{H2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N64.14.133 $\mathrm{Y3}^{+} \oplus \mathrm{SM1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N64.14.134 $\mathrm{Y3}^{+} \oplus \mathrm{SM2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N64.14.135 $\mathrm{Y3}^{+} \oplus \mathrm{SM3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N64.14.136 $\mathrm{Y3}^{+} \oplus \mathrm{SM4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N64.14.137 $\mathrm{Y3}^{+} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N64.14.138 $\mathrm{Y3}^{+} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N64.14.139 $\mathrm{Y3}^{+} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N64.14.140 $\mathrm{Y3}^{+} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N64.14.141 $\mathrm{Y3}^{+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N64.14.142 $\mathrm{Y3}^{+} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N64.14.143 $\mathrm{Y3}^{+} \oplus \mathrm{H1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$

Non-coplanar SSGs with parent space group $Cmce$ (No. 64) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N64.14.144 $\mathrm{Y3}^{+} \oplus \mathrm{H2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N64.14.145 $\mathrm{Y3}^{-} \oplus \mathrm{SM1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N64.14.146 $\mathrm{Y3}^{-} \oplus \mathrm{SM2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N64.14.147 $\mathrm{Y3}^{-} \oplus \mathrm{SM3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N64.14.148 $\mathrm{Y3}^{-} \oplus \mathrm{SM4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N64.14.149 $\mathrm{Y3}^{-} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N64.14.150 $\mathrm{Y3}^{-} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N64.14.151 $\mathrm{Y3}^{-} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N64.14.152 $\mathrm{Y3}^{-} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N64.14.153 $\mathrm{Y3}^{-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N64.14.154 $\mathrm{Y3}^{-} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N64.14.155 $\mathrm{Y3}^{-} \oplus \mathrm{H1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N64.14.156 $\mathrm{Y3}^{-} \oplus \mathrm{H2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N64.14.157 $\mathrm{Y4}^{+} \oplus \mathrm{SM1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N64.14.158 $\mathrm{Y4}^{+} \oplus \mathrm{SM2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N64.14.159 $\mathrm{Y4}^{+} \oplus \mathrm{SM3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N64.14.160 $\mathrm{Y4}^{+} \oplus \mathrm{SM4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N64.14.161 $\mathrm{Y4}^{+} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N64.14.162 $\mathrm{Y4}^{+} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N64.14.163 $\mathrm{Y4}^{+} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N64.14.164 $\mathrm{Y4}^{+} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N64.14.165 $\mathrm{Y4}^{+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N64.14.166 $\mathrm{Y4}^{+} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N64.14.167 $\mathrm{Y4}^{+} \oplus \mathrm{H1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N64.14.168 $\mathrm{Y4}^{+} \oplus \mathrm{H2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N64.14.169 $\mathrm{Y4}^{-} \oplus \mathrm{SM1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N64.14.170 $\mathrm{Y4}^{-} \oplus \mathrm{SM2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N64.14.171 $\mathrm{Y4}^{-} \oplus \mathrm{SM3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N64.14.172 $\mathrm{Y4}^{-} \oplus \mathrm{SM4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N64.14.173 $\mathrm{Y4}^{-} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N64.14.174 $\mathrm{Y4}^{-} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N64.14.175 $\mathrm{Y4}^{-} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N64.14.176 $\mathrm{Y4}^{-} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N64.14.177 $\mathrm{Y4}^{-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N64.14.178 $\mathrm{Y4}^{-} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N64.14.179 $\mathrm{Y4}^{-} \oplus \mathrm{H1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N64.14.180 $\mathrm{Y4}^{-} \oplus \mathrm{H2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$

TABLE S193: Collinear SSGs with parent space group $Cmmm$ (No. 65).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L65.1.1 $\mathrm{GM1}^{+}$	1	mmm	$\mathrm{A_g}$
L65.2.1 $\mathrm{GM1}^{-}$	0	-	-
L65.2.2 $\mathrm{GM2}^{+}$	1	mmm	$\mathrm{B1_g}$
L65.2.3 $\mathrm{GM2}^{-}$	0	-	-
L65.2.4 $\mathrm{GM3}^{+}$	1	mmm	$\mathrm{B3_g}$

Collinear SSGs with parent space group $Cmmm$ (No. 65)(continued)

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L65.2.5 $\mathrm{GM3}^-$	0	-	-
L65.2.6 $\mathrm{T1}^+$	0	-	-
L65.2.7 $\mathrm{T1}^-$	0	-	-
L65.2.8 $\mathrm{T3}^+$	0	-	-
L65.2.9 $\mathrm{Y1}^+$	0	-	-
L65.2.10 $\mathrm{Y1}^-$	0	-	-
L65.2.11 $\mathrm{Y2}^+$	0	-	-
L65.2.12 $\mathrm{Y2}^-$	0	-	-
L65.2.13 $\mathrm{Y3}^+$	0	-	-
L65.2.14 $\mathrm{Y3}^-$	0	-	-
L65.2.15 $\mathrm{Z1}^+$	0	-	-
L65.2.16 $\mathrm{Z1}^-$	0	-	-
L65.2.17 $\mathrm{Z3}^+$	0	-	-

TABLE S194: Coplanar SSGs with parent space group $Cmmm$ (No. 65).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P65.1.1 $\mathrm{GM1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_g}$
P65.2.1 $\mathrm{GM1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_u}$
P65.2.2 $\mathrm{GM2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B1_g}$
P65.2.3 $\mathrm{GM2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B1_u}$
P65.2.4 $\mathrm{GM3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}$
P65.2.5 $\mathrm{GM3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}$
P65.2.6 $\mathrm{T1}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P65.2.7 $\mathrm{T1}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P65.2.8 $\mathrm{T3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P65.2.9 $\mathrm{Y1}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P65.2.10 $\mathrm{Y1}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P65.2.11 $\mathrm{Y2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P65.2.12 $\mathrm{Y2}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P65.2.13 $\mathrm{Y3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P65.2.14 $\mathrm{Y3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P65.2.15 $\mathrm{Z1}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P65.2.16 $\mathrm{Z1}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P65.2.17 $\mathrm{Z3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P65.3.1 $\mathrm{GM1}^-\oplus\mathrm{GM1}^-$	$\surd$	0	0	$\surd$	-	-
P65.3.2 $\mathrm{GM1}^-\oplus\mathrm{GM2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_u}$
P65.3.3 $\mathrm{GM1}^-\oplus\mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
P65.3.4 $\mathrm{GM1}^-\oplus\mathrm{GM3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_u}$
P65.3.5 $\mathrm{GM1}^-\oplus\mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
P65.3.6 $\mathrm{GM1}^-\oplus\mathrm{T1}^+$	$\surd$	1	1	$\times$	-	-
P65.3.7 $\mathrm{GM1}^-\oplus\mathrm{T1}^-$	$\surd$	1	1	$\times$	-	-
P65.3.8 $\mathrm{GM1}^-\oplus\mathrm{T3}^+$	$\surd$	1	1	$\times$	-	-
P65.3.9 $\mathrm{GM1}^-\oplus\mathrm{Y1}^+$	$\surd$	1	1	$\times$	-	-
P65.3.10 $\mathrm{GM1}^-\oplus\mathrm{Y1}^-$	$\surd$	1	1	$\times$	-	-
P65.3.11 $\mathrm{GM1}^-\oplus\mathrm{Y2}^+$	$\surd$	1	1	$\times$	-	-

Coplanar SSGs with parent space group $Cmmm$ (No. 65) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P65.3.12 $\mathrm{GM1^-} \oplus \mathrm{Y2^-}$	$\surd$	1	1	$\times$	-	-
P65.3.13 $\mathrm{GM1^-} \oplus \mathrm{Y3^+}$	$\surd$	1	1	$\times$	-	-
P65.3.14 $\mathrm{GM1^-} \oplus \mathrm{Y3^-}$	$\surd$	1	1	$\times$	-	-
P65.3.15 $\mathrm{GM1^-} \oplus \mathrm{Z1^+}$	$\surd$	1	1	$\times$	-	-
P65.3.16 $\mathrm{GM1^-} \oplus \mathrm{Z1^-}$	$\surd$	1	1	$\times$	-	-
P65.3.17 $\mathrm{GM1^-} \oplus \mathrm{Z3^+}$	$\surd$	1	1	$\times$	-	-
P65.3.18 $\mathrm{GM2^+} \oplus \mathrm{GM2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
P65.3.19 $\mathrm{GM2^+} \oplus \mathrm{GM2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
P65.3.20 $\mathrm{GM2^+} \oplus \mathrm{GM3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
P65.3.21 $\mathrm{GM2^+} \oplus \mathrm{GM3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
P65.3.22 $\mathrm{GM2^+} \oplus \mathrm{T1^+}$	$\surd$	1	0	$\times$	-	-
P65.3.23 $\mathrm{GM2^+} \oplus \mathrm{T1^-}$	$\surd$	1	0	$\times$	-	-
P65.3.24 $\mathrm{GM2^+} \oplus \mathrm{T3^+}$	$\surd$	1	0	$\times$	-	-
P65.3.25 $\mathrm{GM2^+} \oplus \mathrm{Y1^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
P65.3.26 $\mathrm{GM2^+} \oplus \mathrm{Y1^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
P65.3.27 $\mathrm{GM2^+} \oplus \mathrm{Y2^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
P65.3.28 $\mathrm{GM2^+} \oplus \mathrm{Y2^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
P65.3.29 $\mathrm{GM2^+} \oplus \mathrm{Y3^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
P65.3.30 $\mathrm{GM2^+} \oplus \mathrm{Y3^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
P65.3.31 $\mathrm{GM2^+} \oplus \mathrm{Z1^+}$	$\surd$	1	0	$\times$	-	-
P65.3.32 $\mathrm{GM2^+} \oplus \mathrm{Z1^-}$	$\surd$	1	0	$\times$	-	-
P65.3.33 $\mathrm{GM2^+} \oplus \mathrm{Z3^+}$	$\surd$	1	0	$\times$	-	-
P65.3.34 $\mathrm{GM2^-} \oplus \mathrm{GM2^-}$	$\surd$	0	0	$\surd$	-	-
P65.3.35 $\mathrm{GM2^-} \oplus \mathrm{GM3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
P65.3.36 $\mathrm{GM2^-} \oplus \mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
P65.3.37 $\mathrm{GM2^-} \oplus \mathrm{T1^+}$	$\surd$	1	1	$\times$	-	-
P65.3.38 $\mathrm{GM2^-} \oplus \mathrm{T1^-}$	$\surd$	1	1	$\times$	-	-
P65.3.39 $\mathrm{GM2^-} \oplus \mathrm{T3^+}$	$\surd$	1	1	$\times$	-	-
P65.3.40 $\mathrm{GM2^-} \oplus \mathrm{Y1^+}$	$\surd$	1	1	$\times$	-	-
P65.3.41 $\mathrm{GM2^-} \oplus \mathrm{Y1^-}$	$\surd$	1	1	$\times$	-	-
P65.3.42 $\mathrm{GM2^-} \oplus \mathrm{Y2^+}$	$\surd$	1	1	$\times$	-	-
P65.3.43 $\mathrm{GM2^-} \oplus \mathrm{Y2^-}$	$\surd$	1	1	$\times$	-	-
P65.3.44 $\mathrm{GM2^-} \oplus \mathrm{Y3^+}$	$\surd$	1	1	$\times$	-	-
P65.3.45 $\mathrm{GM2^-} \oplus \mathrm{Y3^-}$	$\surd$	1	1	$\times$	-	-
P65.3.46 $\mathrm{GM2^-} \oplus \mathrm{Z1^+}$	$\surd$	1	1	$\times$	-	-
P65.3.47 $\mathrm{GM2^-} \oplus \mathrm{Z1^-}$	$\surd$	1	1	$\times$	-	-
P65.3.48 $\mathrm{GM2^-} \oplus \mathrm{Z3^+}$	$\surd$	1	1	$\times$	-	-
P65.3.49 $\mathrm{GM3^+} \oplus \mathrm{GM3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
P65.3.50 $\mathrm{GM3^+} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g}$
P65.3.51 $\mathrm{GM3^+} \oplus \mathrm{GM3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
P65.3.52 $\mathrm{GM3^+} \oplus \mathrm{GM4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
P65.3.53 $\mathrm{GM3^+} \oplus \mathrm{T1^+}$	$\surd$	1	0	$\times$	-	-
P65.3.54 $\mathrm{GM3^+} \oplus \mathrm{T1^-}$	$\surd$	1	0	$\times$	-	-
P65.3.55 $\mathrm{GM3^+} \oplus \mathrm{T3^+}$	$\surd$	1	0	$\times$	-	-
P65.3.56 $\mathrm{GM3^+} \oplus \mathrm{T3^-}$	$\surd$	1	0	$\times$	-	-
P65.3.57 $\mathrm{GM3^+} \oplus \mathrm{Y1^+}$	$\surd$	1	0	$\times$	-	-

Coplanar SSGs with parent space group $Cmmm$ (No. 65) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P65.3.58 $\mathrm{GM3}^+ \oplus \mathrm{Y1}^-$	$\surd$	1	0	$\times$	-	-
P65.3.59 $\mathrm{GM3}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
P65.3.60 $\mathrm{GM3}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
P65.3.61 $\mathrm{GM3}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
P65.3.62 $\mathrm{GM3}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
P65.3.63 $\mathrm{GM3}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
P65.3.64 $\mathrm{GM3}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	0	$\times$	-	-
P65.3.65 $\mathrm{GM3}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
P65.3.66 $\mathrm{GM3}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
P65.3.67 $\mathrm{GM3}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
P65.3.68 $\mathrm{GM3}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
P65.3.69 $\mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
P65.3.70 $\mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
P65.3.71 $\mathrm{GM3}^- \oplus \mathrm{T1}^+$	$\surd$	1	1	$\times$	-	-
P65.3.72 $\mathrm{GM3}^- \oplus \mathrm{T1}^-$	$\surd$	1	1	$\times$	-	-
P65.3.73 $\mathrm{GM3}^- \oplus \mathrm{T3}^+$	$\surd$	1	1	$\times$	-	-
P65.3.74 $\mathrm{GM3}^- \oplus \mathrm{T3}^-$	$\surd$	1	1	$\times$	-	-
P65.3.75 $\mathrm{GM3}^- \oplus \mathrm{Y1}^+$	$\surd$	1	1	$\times$	-	-
P65.3.76 $\mathrm{GM3}^- \oplus \mathrm{Y1}^-$	$\surd$	1	1	$\times$	-	-
P65.3.77 $\mathrm{GM3}^- \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\times$	-	-
P65.3.78 $\mathrm{GM3}^- \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\times$	-	-
P65.3.79 $\mathrm{GM3}^- \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\times$	-	-
P65.3.80 $\mathrm{GM3}^- \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\times$	-	-
P65.3.81 $\mathrm{GM3}^- \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\times$	-	-
P65.3.82 $\mathrm{GM3}^- \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\times$	-	-
P65.3.83 $\mathrm{GM3}^- \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\times$	-	-
P65.3.84 $\mathrm{GM3}^- \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
P65.3.85 $\mathrm{GM3}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
P65.3.86 $\mathrm{GM3}^- \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
P65.3.87 $\mathrm{T1}^+ \oplus \mathrm{T1}^+$	$\surd$	1	0	$\times$	-	-
P65.3.88 $\mathrm{T1}^+ \oplus \mathrm{T2}^-$	$\surd$	1	1	$\times$	-	-
P65.3.89 $\mathrm{T1}^+ \oplus \mathrm{T1}^-$	$\surd$	1	1	$\times$	-	-
P65.3.90 $\mathrm{T1}^+ \oplus \mathrm{T2}^+$	$\surd$	1	0	$\times$	-	-
P65.3.91 $\mathrm{T1}^+ \oplus \mathrm{T3}^+$	$\surd$	1	0	$\times$	-	-
P65.3.92 $\mathrm{T1}^+ \oplus \mathrm{T3}^-$	$\surd$	1	1	$\times$	-	-
P65.3.93 $\mathrm{T1}^+ \oplus \mathrm{Y1}^+$	$\times$	-	-	-	-	-
P65.3.94 $\mathrm{T1}^+ \oplus \mathrm{Y1}^-$	$\times$	-	-	-	-	-
P65.3.95 $\mathrm{T1}^+ \oplus \mathrm{Y2}^+$	$\times$	-	-	-	-	-
P65.3.96 $\mathrm{T1}^+ \oplus \mathrm{Y2}^-$	$\times$	-	-	-	-	-
P65.3.97 $\mathrm{T1}^+ \oplus \mathrm{Y3}^+$	$\times$	-	-	-	-	-
P65.3.98 $\mathrm{T1}^+ \oplus \mathrm{Y3}^-$	$\times$	-	-	-	-	-
P65.3.99 $\mathrm{T1}^+ \oplus \mathrm{Z1}^+$	$\times$	-	-	-	-	-
P65.3.100 $\mathrm{T1}^+ \oplus \mathrm{Z2}^-$	$\times$	-	-	-	-	-
P65.3.101 $\mathrm{T1}^+ \oplus \mathrm{Z1}^-$	$\times$	-	-	-	-	-
P65.3.102 $\mathrm{T1}^+ \oplus \mathrm{Z2}^+$	$\times$	-	-	-	-	-
P65.3.103 $\mathrm{T1}^+ \oplus \mathrm{Z3}^+$	$\times$	-	-	-	-	-

Coplanar SSGs with parent space group $Cmmm$ (No. 65) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P65.3.104 $\mathrm{T1}^+ \oplus \mathrm{Z3}^-$	$\times$	-	-	-	-	-
P65.3.105 $\mathrm{T1}^- \oplus \mathrm{T1}^-$	$\surd$	1	0	$\times$	-	-
P65.3.106 $\mathrm{T1}^- \oplus \mathrm{T2}^+$	$\surd$	1	1	$\times$	-	-
P65.3.107 $\mathrm{T1}^- \oplus \mathrm{T3}^+$	$\surd$	1	1	$\times$	-	-
P65.3.108 $\mathrm{T1}^- \oplus \mathrm{T3}^-$	$\surd$	1	0	$\times$	-	-
P65.3.109 $\mathrm{T1}^- \oplus \mathrm{Y1}^+$	$\times$	-	-	-	-	-
P65.3.110 $\mathrm{T1}^- \oplus \mathrm{Y1}^-$	$\times$	-	-	-	-	-
P65.3.111 $\mathrm{T1}^- \oplus \mathrm{Y2}^+$	$\times$	-	-	-	-	-
P65.3.112 $\mathrm{T1}^- \oplus \mathrm{Y2}^-$	$\times$	-	-	-	-	-
P65.3.113 $\mathrm{T1}^- \oplus \mathrm{Y3}^+$	$\times$	-	-	-	-	-
P65.3.114 $\mathrm{T1}^- \oplus \mathrm{Y3}^-$	$\times$	-	-	-	-	-
P65.3.115 $\mathrm{T1}^- \oplus \mathrm{Z1}^+$	$\times$	-	-	-	-	-
P65.3.116 $\mathrm{T1}^- \oplus \mathrm{Z2}^-$	$\times$	-	-	-	-	-
P65.3.117 $\mathrm{T1}^- \oplus \mathrm{Z1}^-$	$\times$	-	-	-	-	-
P65.3.118 $\mathrm{T1}^- \oplus \mathrm{Z2}^+$	$\times$	-	-	-	-	-
P65.3.119 $\mathrm{T1}^- \oplus \mathrm{Z3}^+$	$\times$	-	-	-	-	-
P65.3.120 $\mathrm{T1}^- \oplus \mathrm{Z3}^-$	$\times$	-	-	-	-	-
P65.3.121 $\mathrm{T3}^+ \oplus \mathrm{T3}^+$	$\surd$	1	0	$\times$	-	-
P65.3.122 $\mathrm{T3}^+ \oplus \mathrm{T3}^-$	$\surd$	1	1	$\times$	-	-
P65.3.123 $\mathrm{T3}^+ \oplus \mathrm{T4}^+$	$\surd$	1	0	$\times$	-	-
P65.3.124 $\mathrm{T3}^+ \oplus \mathrm{T4}^-$	$\surd$	1	1	$\times$	-	-
P65.3.125 $\mathrm{T3}^+ \oplus \mathrm{Y1}^+$	$\times$	-	-	-	-	-
P65.3.126 $\mathrm{T3}^+ \oplus \mathrm{Y1}^-$	$\times$	-	-	-	-	-
P65.3.127 $\mathrm{T3}^+ \oplus \mathrm{Y2}^+$	$\times$	-	-	-	-	-
P65.3.128 $\mathrm{T3}^+ \oplus \mathrm{Y2}^-$	$\times$	-	-	-	-	-
P65.3.129 $\mathrm{T3}^+ \oplus \mathrm{Y3}^+$	$\times$	-	-	-	-	-
P65.3.130 $\mathrm{T3}^+ \oplus \mathrm{Y4}^+$	$\times$	-	-	-	-	-
P65.3.131 $\mathrm{T3}^+ \oplus \mathrm{Y3}^-$	$\times$	-	-	-	-	-
P65.3.132 $\mathrm{T3}^+ \oplus \mathrm{Y4}^-$	$\times$	-	-	-	-	-
P65.3.133 $\mathrm{T3}^+ \oplus \mathrm{Z1}^+$	$\times$	-	-	-	-	-
P65.3.134 $\mathrm{T3}^+ \oplus \mathrm{Z2}^-$	$\times$	-	-	-	-	-
P65.3.135 $\mathrm{T3}^+ \oplus \mathrm{Z1}^-$	$\times$	-	-	-	-	-
P65.3.136 $\mathrm{T3}^+ \oplus \mathrm{Z2}^+$	$\times$	-	-	-	-	-
P65.3.137 $\mathrm{T3}^+ \oplus \mathrm{Z3}^+$	$\times$	-	-	-	-	-
P65.3.138 $\mathrm{T3}^+ \oplus \mathrm{Z3}^-$	$\times$	-	-	-	-	-
P65.3.139 $\mathrm{T3}^+ \oplus \mathrm{Z4}^+$	$\times$	-	-	-	-	-
P65.3.140 $\mathrm{T3}^+ \oplus \mathrm{Z4}^-$	$\times$	-	-	-	-	-
P65.3.141 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	0	$\times$	-	-
P65.3.142 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^-$	$\surd$	1	1	$\times$	-	-
P65.3.143 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
P65.3.144 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\times$	-	-
P65.3.145 $\mathrm{Y1}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
P65.3.146 $\mathrm{Y1}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P65.3.147 $\mathrm{Y1}^+ \oplus \mathrm{Z1}^+$	$\times$	-	-	-	-	-
P65.3.148 $\mathrm{Y1}^+ \oplus \mathrm{Z1}^-$	$\times$	-	-	-	-	-
P65.3.149 $\mathrm{Y1}^+ \oplus \mathrm{Z3}^+$	$\times$	-	-	-	-	-

Coplanar SSGs with parent space group $Cmmm$ (No. 65) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P65.3.150 $\mathrm{Y1}^- \oplus \mathrm{Y1}^-$	$\surd$	1	0	$\times$	-	-
P65.3.151 $\mathrm{Y1}^- \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\times$	-	-
P65.3.152 $\mathrm{Y1}^- \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
P65.3.153 $\mathrm{Y1}^- \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P65.3.154 $\mathrm{Y1}^- \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
P65.3.155 $\mathrm{Y1}^- \oplus \mathrm{Z1}^+$	$\times$	-	-	-	-	-
P65.3.156 $\mathrm{Y1}^- \oplus \mathrm{Z1}^-$	$\times$	-	-	-	-	-
P65.3.157 $\mathrm{Y1}^- \oplus \mathrm{Z3}^+$	$\times$	-	-	-	-	-
P65.3.158 $\mathrm{Y2}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
P65.3.159 $\mathrm{Y2}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\times$	-	-
P65.3.160 $\mathrm{Y2}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
P65.3.161 $\mathrm{Y2}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P65.3.162 $\mathrm{Y2}^+ \oplus \mathrm{Z1}^+$	$\times$	-	-	-	-	-
P65.3.163 $\mathrm{Y2}^+ \oplus \mathrm{Z1}^-$	$\times$	-	-	-	-	-
P65.3.164 $\mathrm{Y2}^+ \oplus \mathrm{Z3}^+$	$\times$	-	-	-	-	-
P65.3.165 $\mathrm{Y2}^- \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
P65.3.166 $\mathrm{Y2}^- \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P65.3.167 $\mathrm{Y2}^- \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
P65.3.168 $\mathrm{Y2}^- \oplus \mathrm{Z1}^+$	$\times$	-	-	-	-	-
P65.3.169 $\mathrm{Y2}^- \oplus \mathrm{Z1}^-$	$\times$	-	-	-	-	-
P65.3.170 $\mathrm{Y2}^- \oplus \mathrm{Z3}^+$	$\times$	-	-	-	-	-
P65.3.171 $\mathrm{Y3}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
P65.3.172 $\mathrm{Y3}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
P65.3.173 $\mathrm{Y3}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\times$	-	-
P65.3.174 $\mathrm{Y3}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\times$	-	-
P65.3.175 $\mathrm{Y3}^+ \oplus \mathrm{Z1}^+$	$\times$	-	-	-	-	-
P65.3.176 $\mathrm{Y3}^+ \oplus \mathrm{Z1}^-$	$\times$	-	-	-	-	-
P65.3.177 $\mathrm{Y3}^+ \oplus \mathrm{Z3}^+$	$\times$	-	-	-	-	-
P65.3.178 $\mathrm{Y3}^+ \oplus \mathrm{Z3}^-$	$\times$	-	-	-	-	-
P65.3.179 $\mathrm{Y3}^- \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
P65.3.180 $\mathrm{Y3}^- \oplus \mathrm{Y4}^-$	$\surd$	1	0	$\times$	-	-
P65.3.181 $\mathrm{Y3}^- \oplus \mathrm{Z1}^+$	$\times$	-	-	-	-	-
P65.3.182 $\mathrm{Y3}^- \oplus \mathrm{Z1}^-$	$\times$	-	-	-	-	-
P65.3.183 $\mathrm{Y3}^- \oplus \mathrm{Z3}^+$	$\times$	-	-	-	-	-
P65.3.184 $\mathrm{Y3}^- \oplus \mathrm{Z3}^-$	$\times$	-	-	-	-	-
P65.3.185 $\mathrm{Z1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
P65.3.186 $\mathrm{Z1}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P65.3.187 $\mathrm{Z1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
P65.3.188 $\mathrm{Z1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
P65.3.189 $\mathrm{Z1}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
P65.3.190 $\mathrm{Z1}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
P65.3.191 $\mathrm{Z1}^- \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
P65.3.192 $\mathrm{Z1}^- \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P65.3.193 $\mathrm{Z1}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
P65.3.194 $\mathrm{Z1}^- \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
P65.3.195 $\mathrm{Z3}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-

Coplanar SSGs with parent space group $Cmmm$ (No. 65) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P65.3.196 $\mathrm{Z3}^{+} \oplus \mathrm{Z3}^{-}$	$\surd$	1	1	$\times$	-	-
P65.3.197 $\mathrm{Z3}^{+} \oplus \mathrm{Z4}^{+}$	$\surd$	1	0	$\times$	-	-
P65.3.198 $\mathrm{Z3}^{+} \oplus \mathrm{Z4}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P65.7.1 $\mathrm{S1}^{+}$	$\times$	-	-	-	-	-
P65.7.2 $\mathrm{S1}^{-}$	$\times$	-	-	-	-	-
P65.7.3 $\mathrm{R1}^{+}$	$\times$	-	-	-	-	-
P65.8.1 DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P65.8.2 DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P65.8.3 DT3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P65.8.4 DT4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P65.8.5 A1	$\surd$	1	1	$\times$	-	-
P65.8.6 A2	$\surd$	1	1	$\times$	-	-
P65.8.7 LD1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P65.8.8 LD2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P65.8.9 LD3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P65.8.10 H1	$\surd$	1	1	$\times$	-	-
P65.8.11 H2	$\surd$	1	1	$\times$	-	-
P65.8.12 H3	$\surd$	1	1	$\times$	-	-

TABLE S195: Non-coplanar SSGs with parent space group $Cmmm$ (No. 65).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N65.1.1 $\mathrm{GM1}^{+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{A_g}$
N65.2.1 $\mathrm{GM1}^{-}$	$\surd$	2	2	$\surd$	222	$\mathrm{A1} \oplus \mathrm{A1}$
N65.2.2 $\mathrm{GM2}^{+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B1_g}$
N65.2.3 $\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{A1}$
N65.2.4 $\mathrm{GM3}^{+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B3_g}$
N65.2.5 $\mathrm{GM3}^{-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{A1}$
N65.2.6 $\mathrm{T1}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
N65.2.7 $\mathrm{T1}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
N65.2.8 $\mathrm{T3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
N65.2.9 $\mathrm{Y1}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
N65.2.10 $\mathrm{Y1}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
N65.2.11 $\mathrm{Y2}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
N65.2.12 $\mathrm{Y2}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
N65.2.13 $\mathrm{Y3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
N65.2.14 $\mathrm{Y3}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
N65.2.15 $\mathrm{Z1}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
N65.2.16 $\mathrm{Z1}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
N65.2.17 $\mathrm{Z3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
N65.3.1 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{A_u}$
N65.3.2 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{A2}$
N65.3.3 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N65.3.4 $\mathrm{GM1}^{-} \oplus \mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{A2}$
N65.3.5 $\mathrm{GM1}^{-} \oplus \mathrm{GM3}^{-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B3_u}$
N65.3.6 $\mathrm{GM1}^{-} \oplus \mathrm{T1}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$

Non-coplanar SSGs with parent space group $Cmmm$ (No. 65) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N65.3.7 $\mathrm{GM1}^- \oplus \mathrm{T1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
N65.3.8 $\mathrm{GM1}^- \oplus \mathrm{T3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
N65.3.9 $\mathrm{GM1}^- \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
N65.3.10 $\mathrm{GM1}^- \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
N65.3.11 $\mathrm{GM1}^- \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
N65.3.12 $\mathrm{GM1}^- \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
N65.3.13 $\mathrm{GM1}^- \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
N65.3.14 $\mathrm{GM1}^- \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
N65.3.15 $\mathrm{GM1}^- \oplus \mathrm{Z1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
N65.3.16 $\mathrm{GM1}^- \oplus \mathrm{Z1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
N65.3.17 $\mathrm{GM1}^- \oplus \mathrm{Z3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
N65.3.18 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N65.3.19 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	2	2	$\surd$	222	$\mathrm{A1} \oplus \mathrm{B1}$
N65.3.20 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g} \oplus \mathrm{B3_g}$
N65.3.21 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{B1}$
N65.3.22 $\mathrm{GM2}^+ \oplus \mathrm{T1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
N65.3.23 $\mathrm{GM2}^+ \oplus \mathrm{T1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
N65.3.24 $\mathrm{GM2}^+ \oplus \mathrm{T3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
N65.3.25 $\mathrm{GM2}^+ \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
N65.3.26 $\mathrm{GM2}^+ \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
N65.3.27 $\mathrm{GM2}^+ \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
N65.3.28 $\mathrm{GM2}^+ \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
N65.3.29 $\mathrm{GM2}^+ \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
N65.3.30 $\mathrm{GM2}^+ \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
N65.3.31 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
N65.3.32 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
N65.3.33 $\mathrm{GM2}^+ \oplus \mathrm{Z3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
N65.3.34 $\mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N65.3.35 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{B2}$
N65.3.36 $\mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u} \oplus \mathrm{B3_u}$
N65.3.37 $\mathrm{GM2}^- \oplus \mathrm{T1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
N65.3.38 $\mathrm{GM2}^- \oplus \mathrm{T1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
N65.3.39 $\mathrm{GM2}^- \oplus \mathrm{T3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
N65.3.40 $\mathrm{GM2}^- \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
N65.3.41 $\mathrm{GM2}^- \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
N65.3.42 $\mathrm{GM2}^- \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
N65.3.43 $\mathrm{GM2}^- \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
N65.3.44 $\mathrm{GM2}^- \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
N65.3.45 $\mathrm{GM2}^- \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
N65.3.46 $\mathrm{GM2}^- \oplus \mathrm{Z1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
N65.3.47 $\mathrm{GM2}^- \oplus \mathrm{Z1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
N65.3.48 $\mathrm{GM2}^- \oplus \mathrm{Z3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
N65.3.49 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N65.3.50 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N65.3.51 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	222	$\mathrm{A1} \oplus \mathrm{B3}$
N65.3.52 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{B2}$

Non-coplanar SSGs with parent space group $Cmmm$ (No. 65) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N65.3.53 $\mathrm{GM3}^{+}\oplus\mathrm{T1}^{+}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}$
N65.3.54 $\mathrm{GM3}^{+}\oplus\mathrm{T1}^{-}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}$
N65.3.55 $\mathrm{GM3}^{+}\oplus\mathrm{T3}^{+}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}$
N65.3.56 $\mathrm{GM3}^{+}\oplus\mathrm{T3}^{-}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}$
N65.3.57 $\mathrm{GM3}^{+}\oplus\mathrm{Y1}^{+}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}$
N65.3.58 $\mathrm{GM3}^{+}\oplus\mathrm{Y1}^{-}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}$
N65.3.59 $\mathrm{GM3}^{+}\oplus\mathrm{Y2}^{+}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}$
N65.3.60 $\mathrm{GM3}^{+}\oplus\mathrm{Y2}^{-}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}$
N65.3.61 $\mathrm{GM3}^{+}\oplus\mathrm{Y3}^{+}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}$
N65.3.62 $\mathrm{GM3}^{+}\oplus\mathrm{Y4}^{+}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}$
N65.3.63 $\mathrm{GM3}^{+}\oplus\mathrm{Y3}^{-}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}$
N65.3.64 $\mathrm{GM3}^{+}\oplus\mathrm{Y4}^{-}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}$
N65.3.65 $\mathrm{GM3}^{+}\oplus\mathrm{Z1}^{+}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}$
N65.3.66 $\mathrm{GM3}^{+}\oplus\mathrm{Z1}^{-}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}$
N65.3.67 $\mathrm{GM3}^{+}\oplus\mathrm{Z3}^{+}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}$
N65.3.68 $\mathrm{GM3}^{+}\oplus\mathrm{Z3}^{-}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}$
N65.3.69 $\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}$	√	3	3	√	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}\oplus\mathrm{B3_u}$
N65.3.70 $\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{-}$	√	3	3	√	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}\oplus\mathrm{B2_u}$
N65.3.71 $\mathrm{GM3}^{-}\oplus\mathrm{T1}^{+}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}$
N65.3.72 $\mathrm{GM3}^{-}\oplus\mathrm{T1}^{-}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}$
N65.3.73 $\mathrm{GM3}^{-}\oplus\mathrm{T3}^{+}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}$
N65.3.74 $\mathrm{GM3}^{-}\oplus\mathrm{T3}^{-}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}$
N65.3.75 $\mathrm{GM3}^{-}\oplus\mathrm{Y1}^{+}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}$
N65.3.76 $\mathrm{GM3}^{-}\oplus\mathrm{Y1}^{-}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}$
N65.3.77 $\mathrm{GM3}^{-}\oplus\mathrm{Y2}^{+}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}$
N65.3.78 $\mathrm{GM3}^{-}\oplus\mathrm{Y2}^{-}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}$
N65.3.79 $\mathrm{GM3}^{-}\oplus\mathrm{Y3}^{+}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}$
N65.3.80 $\mathrm{GM3}^{-}\oplus\mathrm{Y4}^{+}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}$
N65.3.81 $\mathrm{GM3}^{-}\oplus\mathrm{Y3}^{-}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}$
N65.3.82 $\mathrm{GM3}^{-}\oplus\mathrm{Y4}^{-}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}$
N65.3.83 $\mathrm{GM3}^{-}\oplus\mathrm{Z1}^{+}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}$
N65.3.84 $\mathrm{GM3}^{-}\oplus\mathrm{Z1}^{-}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}$
N65.3.85 $\mathrm{GM3}^{-}\oplus\mathrm{Z3}^{+}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}$
N65.3.86 $\mathrm{GM3}^{-}\oplus\mathrm{Z3}^{-}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}$
N65.3.87 $\mathrm{T1}^{+}\oplus\mathrm{T1}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N65.3.88 $\mathrm{T1}^{+}\oplus\mathrm{T2}^{-}$	√	1	1	√	$mm2$	A1
N65.3.89 $\mathrm{T1}^{+}\oplus\mathrm{T1}^{-}$	√	1	1	√	222	A1
N65.3.90 $\mathrm{T1}^{+}\oplus\mathrm{T2}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N65.3.91 $\mathrm{T1}^{+}\oplus\mathrm{T3}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N65.3.92 $\mathrm{T1}^{+}\oplus\mathrm{T3}^{-}$	√	1	1	√	$mm2$	A1
N65.3.93 $\mathrm{T1}^{+}\oplus\mathrm{Y1}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N65.3.94 $\mathrm{T1}^{+}\oplus\mathrm{Y1}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N65.3.95 $\mathrm{T1}^{+}\oplus\mathrm{Y2}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N65.3.96 $\mathrm{T1}^{+}\oplus\mathrm{Y2}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N65.3.97 $\mathrm{T1}^{+}\oplus\mathrm{Y3}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N65.3.98 $\mathrm{T1}^{+}\oplus\mathrm{Y3}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$

Non-coplanar SSGs with parent space group $Cmmm$ (No. 65) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N65.3.99 $\mathrm{T1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N65.3.100 $\mathrm{T1}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N65.3.101 $\mathrm{T1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N65.3.102 $\mathrm{T1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N65.3.103 $\mathrm{T1}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N65.3.104 $\mathrm{T1}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N65.3.105 $\mathrm{T1}^- \oplus \mathrm{T1}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N65.3.106 $\mathrm{T1}^- \oplus \mathrm{T2}^+$	$\surd$	1	1	$\surd$	$mm2$	A1
N65.3.107 $\mathrm{T1}^- \oplus \mathrm{T3}^+$	$\surd$	1	1	$\surd$	$mm2$	A1
N65.3.108 $\mathrm{T1}^- \oplus \mathrm{T3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N65.3.109 $\mathrm{T1}^- \oplus \mathrm{Y1}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N65.3.110 $\mathrm{T1}^- \oplus \mathrm{Y1}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N65.3.111 $\mathrm{T1}^- \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N65.3.112 $\mathrm{T1}^- \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N65.3.113 $\mathrm{T1}^- \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N65.3.114 $\mathrm{T1}^- \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N65.3.115 $\mathrm{T1}^- \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N65.3.116 $\mathrm{T1}^- \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N65.3.117 $\mathrm{T1}^- \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N65.3.118 $\mathrm{T1}^- \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N65.3.119 $\mathrm{T1}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N65.3.120 $\mathrm{T1}^- \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N65.3.121 $\mathrm{T3}^+ \oplus \mathrm{T3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N65.3.122 $\mathrm{T3}^+ \oplus \mathrm{T3}^-$	$\surd$	1	1	$\surd$	222	A1
N65.3.123 $\mathrm{T3}^+ \oplus \mathrm{T4}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N65.3.124 $\mathrm{T3}^+ \oplus \mathrm{T4}^-$	$\surd$	1	1	$\surd$	$mm2$	A1
N65.3.125 $\mathrm{T3}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N65.3.126 $\mathrm{T3}^+ \oplus \mathrm{Y1}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N65.3.127 $\mathrm{T3}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N65.3.128 $\mathrm{T3}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N65.3.129 $\mathrm{T3}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N65.3.130 $\mathrm{T3}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N65.3.131 $\mathrm{T3}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N65.3.132 $\mathrm{T3}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N65.3.133 $\mathrm{T3}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N65.3.134 $\mathrm{T3}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N65.3.135 $\mathrm{T3}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N65.3.136 $\mathrm{T3}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N65.3.137 $\mathrm{T3}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N65.3.138 $\mathrm{T3}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N65.3.139 $\mathrm{T3}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N65.3.140 $\mathrm{T3}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N65.3.141 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N65.3.142 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^-$	$\surd$	1	1	$\surd$	222	A1
N65.3.143 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N65.3.144 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\surd$	$mm2$	A1

Non-coplanar SSGs with parent space group $Cmmm$ (No. 65) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N65.3.145 $\mathrm{Y1}^{+}\oplus\mathrm{Y3}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N65.3.146 $\mathrm{Y1}^{+}\oplus\mathrm{Y3}^{-}$	√	1	1	√	$mm2$	A1
N65.3.147 $\mathrm{Y1}^{+}\oplus\mathrm{Z1}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N65.3.148 $\mathrm{Y1}^{+}\oplus\mathrm{Z1}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N65.3.149 $\mathrm{Y1}^{+}\oplus\mathrm{Z3}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N65.3.150 $\mathrm{Y1}^{-}\oplus\mathrm{Y1}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N65.3.151 $\mathrm{Y1}^{-}\oplus\mathrm{Y2}^{+}$	√	1	1	√	$mm2$	A1
N65.3.152 $\mathrm{Y1}^{-}\oplus\mathrm{Y2}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N65.3.153 $\mathrm{Y1}^{-}\oplus\mathrm{Y3}^{+}$	√	1	1	√	$mm2$	A1
N65.3.154 $\mathrm{Y1}^{-}\oplus\mathrm{Y3}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N65.3.155 $\mathrm{Y1}^{-}\oplus\mathrm{Z1}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N65.3.156 $\mathrm{Y1}^{-}\oplus\mathrm{Z1}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N65.3.157 $\mathrm{Y1}^{-}\oplus\mathrm{Z3}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N65.3.158 $\mathrm{Y2}^{+}\oplus\mathrm{Y2}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N65.3.159 $\mathrm{Y2}^{+}\oplus\mathrm{Y2}^{-}$	√	1	1	√	222	A1
N65.3.160 $\mathrm{Y2}^{+}\oplus\mathrm{Y3}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N65.3.161 $\mathrm{Y2}^{+}\oplus\mathrm{Y3}^{-}$	√	1	1	√	$mm2$	A1
N65.3.162 $\mathrm{Y2}^{+}\oplus\mathrm{Z1}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N65.3.163 $\mathrm{Y2}^{+}\oplus\mathrm{Z1}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N65.3.164 $\mathrm{Y2}^{+}\oplus\mathrm{Z3}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N65.3.165 $\mathrm{Y2}^{-}\oplus\mathrm{Y2}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N65.3.166 $\mathrm{Y2}^{-}\oplus\mathrm{Y3}^{+}$	√	1	1	√	$mm2$	A1
N65.3.167 $\mathrm{Y2}^{-}\oplus\mathrm{Y3}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N65.3.168 $\mathrm{Y2}^{-}\oplus\mathrm{Z1}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N65.3.169 $\mathrm{Y2}^{-}\oplus\mathrm{Z1}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N65.3.170 $\mathrm{Y2}^{-}\oplus\mathrm{Z3}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N65.3.171 $\mathrm{Y3}^{+}\oplus\mathrm{Y3}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N65.3.172 $\mathrm{Y3}^{+}\oplus\mathrm{Y4}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N65.3.173 $\mathrm{Y3}^{+}\oplus\mathrm{Y3}^{-}$	√	1	1	√	222	A1
N65.3.174 $\mathrm{Y3}^{+}\oplus\mathrm{Y4}^{-}$	√	1	1	√	$mm2$	A1
N65.3.175 $\mathrm{Y3}^{+}\oplus\mathrm{Z1}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N65.3.176 $\mathrm{Y3}^{+}\oplus\mathrm{Z1}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N65.3.177 $\mathrm{Y3}^{+}\oplus\mathrm{Z3}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N65.3.178 $\mathrm{Y3}^{+}\oplus\mathrm{Z3}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N65.3.179 $\mathrm{Y3}^{-}\oplus\mathrm{Y3}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N65.3.180 $\mathrm{Y3}^{-}\oplus\mathrm{Y4}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N65.3.181 $\mathrm{Y3}^{-}\oplus\mathrm{Z1}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N65.3.182 $\mathrm{Y3}^{-}\oplus\mathrm{Z1}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N65.3.183 $\mathrm{Y3}^{-}\oplus\mathrm{Z3}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N65.3.184 $\mathrm{Y3}^{-}\oplus\mathrm{Z3}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N65.3.185 $\mathrm{Z1}^{+}\oplus\mathrm{Z1}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N65.3.186 $\mathrm{Z1}^{+}\oplus\mathrm{Z2}^{-}$	√	1	1	√	$mm2$	A1
N65.3.187 $\mathrm{Z1}^{+}\oplus\mathrm{Z1}^{-}$	√	1	1	√	222	A1
N65.3.188 $\mathrm{Z1}^{+}\oplus\mathrm{Z2}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N65.3.189 $\mathrm{Z1}^{+}\oplus\mathrm{Z3}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N65.3.190 $\mathrm{Z1}^{+}\oplus\mathrm{Z3}^{-}$	√	1	1	√	$mm2$	A1

Non-coplanar SSGs with parent space group $Cmmm$ (No. 65) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N65.3.191 $\mathrm{Z1}^- \oplus \mathrm{Z1}^-$	√	1	1	√	mmm	$\mathrm{A_g}$
N65.3.192 $\mathrm{Z1}^- \oplus \mathrm{Z2}^+$	√	1	1	√	$mm2$	A1
N65.3.193 $\mathrm{Z1}^- \oplus \mathrm{Z3}^+$	√	1	1	√	$mm2$	A1
N65.3.194 $\mathrm{Z1}^- \oplus \mathrm{Z3}^-$	√	1	1	√	mmm	$\mathrm{A_g}$
N65.3.195 $\mathrm{Z3}^+ \oplus \mathrm{Z3}^+$	√	1	1	√	mmm	$\mathrm{A_g}$
N65.3.196 $\mathrm{Z3}^+ \oplus \mathrm{Z3}^-$	√	1	1	√	222	A1
N65.3.197 $\mathrm{Z3}^+ \oplus \mathrm{Z4}^+$	√	1	1	√	mmm	$\mathrm{A_g}$
N65.3.198 $\mathrm{Z3}^+ \oplus \mathrm{Z4}^-$	√	1	1	√	$mm2$	A1
N65.7.1 $\mathrm{S1}^+$	√	1	1	√	mmm	$\mathrm{A_g}$
N65.7.2 $\mathrm{S1}^-$	√	1	1	√	mmm	$\mathrm{A_g}$
N65.7.3 $\mathrm{R1}^+$	√	1	1	√	mmm	$\mathrm{A_g}$
N65.8.1 DT1	√	1	1	√	$mm2$	A1
N65.8.2 DT2	√	1	1	√	$mm2$	A1
N65.8.3 DT3	√	1	1	√	$mm2$	A1
N65.8.4 DT4	√	1	1	√	$mm2$	A1
N65.8.5 A1	√	1	1	√	$mm2$	A1
N65.8.6 A2	√	1	1	√	$mm2$	A1
N65.8.7 LD1	√	1	1	√	$mm2$	A1
N65.8.8 LD2	√	1	1	√	$mm2$	A1
N65.8.9 LD3	√	1	1	√	$mm2$	A1
N65.8.10 H1	√	1	1	√	$mm2$	A1
N65.8.11 H2	√	1	1	√	$mm2$	A1
N65.8.12 H3	√	1	1	√	$mm2$	A1
N65.9.1 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{GM1}^-$	√	0	0	√	-	-
N65.9.2 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{GM2}^+$	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N65.9.3 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{GM2}^-$	√	0	0	√	-	-
N65.9.4 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{GM3}^+$	√	3	3	√	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N65.9.5 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{GM3}^-$	√	0	0	√	-	-
N65.9.6 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{T1}^+$	√	0	0	√	-	-
N65.9.7 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{T1}^-$	√	0	0	√	-	-
N65.9.8 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{T3}^+$	√	0	0	√	-	-
N65.9.9 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{Y1}^+$	√	0	0	√	-	-
N65.9.10 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{Y1}^-$	√	0	0	√	-	-
N65.9.11 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{Y2}^+$	√	0	0	√	-	-
N65.9.12 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{Y2}^-$	√	0	0	√	-	-
N65.9.13 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{Y3}^+$	√	0	0	√	-	-
N65.9.14 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{Y3}^-$	√	0	0	√	-	-
N65.9.15 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{Z1}^+$	√	0	0	√	-	-
N65.9.16 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{Z1}^-$	√	0	0	√	-	-
N65.9.17 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{Z3}^+$	√	0	0	√	-	-
N65.9.18 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	√	2	2	√	222	$\mathrm{B1} \oplus \mathrm{B1}$
N65.9.19 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N65.9.20 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM3}^+$	√	2	2	√	$mm2$	$\mathrm{B2} \oplus \mathrm{B1}$
N65.9.21 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM3}^-$	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_u}$
N65.9.22 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{T1}^+$	√	2	2	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N65.9.23 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{T1}^-$	√	2	2	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$

Non-coplanar SSGs with parent space group $Cmmm$ (No. 65) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N65.9.24 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{T3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N65.9.25 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{Y1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N65.9.26 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{Y1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N65.9.27 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{Y2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N65.9.28 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{Y2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N65.9.29 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{Y3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N65.9.30 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{Y3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N65.9.31 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{Z1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N65.9.32 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{Z1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N65.9.33 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{Z3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N65.9.34 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{GM2^-}$	$\surd$	0	0	$\surd$	-	-
N65.9.35 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{GM3^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N65.9.36 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
N65.9.37 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{T1^+}$	$\surd$	0	0	$\surd$	-	-
N65.9.38 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{T1^-}$	$\surd$	0	0	$\surd$	-	-
N65.9.39 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{T3^+}$	$\surd$	0	0	$\surd$	-	-
N65.9.40 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{Y1^+}$	$\surd$	0	0	$\surd$	-	-
N65.9.41 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{Y1^-}$	$\surd$	0	0	$\surd$	-	-
N65.9.42 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{Y2^+}$	$\surd$	0	0	$\surd$	-	-
N65.9.43 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{Y2^-}$	$\surd$	0	0	$\surd$	-	-
N65.9.44 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{Y3^+}$	$\surd$	0	0	$\surd$	-	-
N65.9.45 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{Y3^-}$	$\surd$	0	0	$\surd$	-	-
N65.9.46 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{Z1^+}$	$\surd$	0	0	$\surd$	-	-
N65.9.47 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{Z1^-}$	$\surd$	0	0	$\surd$	-	-
N65.9.48 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{Z3^+}$	$\surd$	0	0	$\surd$	-	-
N65.9.49 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{GM3^+}$	$\surd$	2	2	$\surd$	222	$\mathrm{B3} \oplus \mathrm{B3}$
N65.9.50 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2} \oplus \mathrm{B1}$
N65.9.51 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{GM3^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N65.9.52 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N65.9.53 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{T1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u}$
N65.9.54 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{T1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u}$
N65.9.55 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{T3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u}$
N65.9.56 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{T3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u}$
N65.9.57 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{Y1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u}$
N65.9.58 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{Y1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u}$
N65.9.59 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{Y2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u}$
N65.9.60 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{Y2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u}$
N65.9.61 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{Y3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u}$
N65.9.62 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{Y4^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u}$
N65.9.63 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{Y3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u}$
N65.9.64 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{Y4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u}$
N65.9.65 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{Z1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u}$
N65.9.66 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{Z1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u}$
N65.9.67 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{Z3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u}$
N65.9.68 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{Z3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u}$
N65.9.69 $\mathrm{GM1^-} \oplus \mathrm{GM3^-} \oplus \mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-

Non-coplanar SSGs with parent space group $Cmmm$ (No. 65) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N65.9.70 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N65.9.71 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{T1}^+$	$\surd$	0	0	$\surd$	-	-
N65.9.72 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{T1}^-$	$\surd$	0	0	$\surd$	-	-
N65.9.73 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{T3}^+$	$\surd$	0	0	$\surd$	-	-
N65.9.74 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{T3}^-$	$\surd$	0	0	$\surd$	-	-
N65.9.75 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y1}^+$	$\surd$	0	0	$\surd$	-	-
N65.9.76 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y1}^-$	$\surd$	0	0	$\surd$	-	-
N65.9.77 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y2}^+$	$\surd$	0	0	$\surd$	-	-
N65.9.78 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y2}^-$	$\surd$	0	0	$\surd$	-	-
N65.9.79 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y3}^+$	$\surd$	0	0	$\surd$	-	-
N65.9.80 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y4}^+$	$\surd$	0	0	$\surd$	-	-
N65.9.81 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y3}^-$	$\surd$	0	0	$\surd$	-	-
N65.9.82 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y4}^-$	$\surd$	0	0	$\surd$	-	-
N65.9.83 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Z1}^+$	$\surd$	0	0	$\surd$	-	-
N65.9.84 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Z1}^-$	$\surd$	0	0	$\surd$	-	-
N65.9.85 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Z3}^+$	$\surd$	0	0	$\surd$	-	-
N65.9.86 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Z3}^-$	$\surd$	0	0	$\surd$	-	-
N65.9.87 $\mathrm{GM1}^- \oplus \mathrm{T1}^+ \oplus \mathrm{T1}^+$	$\surd$	1	0	$\times$	-	-
N65.9.88 $\mathrm{GM1}^- \oplus \mathrm{T1}^+ \oplus \mathrm{T2}^-$	$\surd$	1	1	$\times$	-	-
N65.9.89 $\mathrm{GM1}^- \oplus \mathrm{T1}^+ \oplus \mathrm{T1}^-$	$\surd$	1	1	$\times$	-	-
N65.9.90 $\mathrm{GM1}^- \oplus \mathrm{T1}^+ \oplus \mathrm{T2}^+$	$\surd$	1	0	$\times$	-	-
N65.9.91 $\mathrm{GM1}^- \oplus \mathrm{T1}^+ \oplus \mathrm{T3}^+$	$\surd$	1	0	$\times$	-	-
N65.9.92 $\mathrm{GM1}^- \oplus \mathrm{T1}^+ \oplus \mathrm{T3}^-$	$\surd$	1	1	$\times$	-	-
N65.9.93 $\mathrm{GM1}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	0	$\times$	-	-
N65.9.94 $\mathrm{GM1}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Y1}^-$	$\surd$	1	0	$\times$	-	-
N65.9.95 $\mathrm{GM1}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N65.9.96 $\mathrm{GM1}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N65.9.97 $\mathrm{GM1}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N65.9.98 $\mathrm{GM1}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N65.9.99 $\mathrm{GM1}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N65.9.100 $\mathrm{GM1}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-
N65.9.101 $\mathrm{GM1}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N65.9.102 $\mathrm{GM1}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N65.9.103 $\mathrm{GM1}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N65.9.104 $\mathrm{GM1}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N65.9.105 $\mathrm{GM1}^- \oplus \mathrm{T1}^- \oplus \mathrm{T1}^-$	$\surd$	1	0	$\times$	-	-
N65.9.106 $\mathrm{GM1}^- \oplus \mathrm{T1}^- \oplus \mathrm{T2}^+$	$\surd$	1	1	$\times$	-	-
N65.9.107 $\mathrm{GM1}^- \oplus \mathrm{T1}^- \oplus \mathrm{T3}^+$	$\surd$	1	1	$\times$	-	-
N65.9.108 $\mathrm{GM1}^- \oplus \mathrm{T1}^- \oplus \mathrm{T3}^-$	$\surd$	1	0	$\times$	-	-
N65.9.109 $\mathrm{GM1}^- \oplus \mathrm{T1}^- \oplus \mathrm{Y1}^+$	$\surd$	1	0	$\times$	-	-
N65.9.110 $\mathrm{GM1}^- \oplus \mathrm{T1}^- \oplus \mathrm{Y1}^-$	$\surd$	1	0	$\times$	-	-
N65.9.111 $\mathrm{GM1}^- \oplus \mathrm{T1}^- \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N65.9.112 $\mathrm{GM1}^- \oplus \mathrm{T1}^- \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N65.9.113 $\mathrm{GM1}^- \oplus \mathrm{T1}^- \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N65.9.114 $\mathrm{GM1}^- \oplus \mathrm{T1}^- \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N65.9.115 $\mathrm{GM1}^- \oplus \mathrm{T1}^- \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $Cmmm$ (No. 65) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N65.9.116 $\mathrm{GM1}^- \oplus \mathrm{T1}^- \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-
N65.9.117 $\mathrm{GM1}^- \oplus \mathrm{T1}^- \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N65.9.118 $\mathrm{GM1}^- \oplus \mathrm{T1}^- \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N65.9.119 $\mathrm{GM1}^- \oplus \mathrm{T1}^- \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N65.9.120 $\mathrm{GM1}^- \oplus \mathrm{T1}^- \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N65.9.121 $\mathrm{GM1}^- \oplus \mathrm{T3}^+ \oplus \mathrm{T3}^+$	$\surd$	1	0	$\times$	-	-
N65.9.122 $\mathrm{GM1}^- \oplus \mathrm{T3}^+ \oplus \mathrm{T3}^-$	$\surd$	1	1	$\times$	-	-
N65.9.123 $\mathrm{GM1}^- \oplus \mathrm{T3}^+ \oplus \mathrm{T4}^+$	$\surd$	1	0	$\times$	-	-
N65.9.124 $\mathrm{GM1}^- \oplus \mathrm{T3}^+ \oplus \mathrm{T4}^-$	$\surd$	1	1	$\times$	-	-
N65.9.125 $\mathrm{GM1}^- \oplus \mathrm{T3}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	0	$\times$	-	-
N65.9.126 $\mathrm{GM1}^- \oplus \mathrm{T3}^+ \oplus \mathrm{Y1}^-$	$\surd$	1	0	$\times$	-	-
N65.9.127 $\mathrm{GM1}^- \oplus \mathrm{T3}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N65.9.128 $\mathrm{GM1}^- \oplus \mathrm{T3}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N65.9.129 $\mathrm{GM1}^- \oplus \mathrm{T3}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N65.9.130 $\mathrm{GM1}^- \oplus \mathrm{T3}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
N65.9.131 $\mathrm{GM1}^- \oplus \mathrm{T3}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N65.9.132 $\mathrm{GM1}^- \oplus \mathrm{T3}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	0	$\times$	-	-
N65.9.133 $\mathrm{GM1}^- \oplus \mathrm{T3}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N65.9.134 $\mathrm{GM1}^- \oplus \mathrm{T3}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-
N65.9.135 $\mathrm{GM1}^- \oplus \mathrm{T3}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N65.9.136 $\mathrm{GM1}^- \oplus \mathrm{T3}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N65.9.137 $\mathrm{GM1}^- \oplus \mathrm{T3}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N65.9.138 $\mathrm{GM1}^- \oplus \mathrm{T3}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N65.9.139 $\mathrm{GM1}^- \oplus \mathrm{T3}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N65.9.140 $\mathrm{GM1}^- \oplus \mathrm{T3}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	0	$\times$	-	-
N65.9.141 $\mathrm{GM1}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	0	$\times$	-	-
N65.9.142 $\mathrm{GM1}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^-$	$\surd$	1	1	$\times$	-	-
N65.9.143 $\mathrm{GM1}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N65.9.144 $\mathrm{GM1}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\times$	-	-
N65.9.145 $\mathrm{GM1}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N65.9.146 $\mathrm{GM1}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N65.9.147 $\mathrm{GM1}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N65.9.148 $\mathrm{GM1}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N65.9.149 $\mathrm{GM1}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N65.9.150 $\mathrm{GM1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y1}^-$	$\surd$	1	0	$\times$	-	-
N65.9.151 $\mathrm{GM1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\times$	-	-
N65.9.152 $\mathrm{GM1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N65.9.153 $\mathrm{GM1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N65.9.154 $\mathrm{GM1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N65.9.155 $\mathrm{GM1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N65.9.156 $\mathrm{GM1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N65.9.157 $\mathrm{GM1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N65.9.158 $\mathrm{GM1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N65.9.159 $\mathrm{GM1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\times$	-	-
N65.9.160 $\mathrm{GM1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N65.9.161 $\mathrm{GM1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$

Non-coplanar SSGs with parent space group $Cmmm$ (No. 65) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N65.9.162 $\mathrm{GM1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N65.9.163 $\mathrm{GM1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N65.9.164 $\mathrm{GM1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N65.9.165 $\mathrm{GM1}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N65.9.166 $\mathrm{GM1}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N65.9.167 $\mathrm{GM1}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N65.9.168 $\mathrm{GM1}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N65.9.169 $\mathrm{GM1}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N65.9.170 $\mathrm{GM1}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N65.9.171 $\mathrm{GM1}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N65.9.172 $\mathrm{GM1}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
N65.9.173 $\mathrm{GM1}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\times$	-	-
N65.9.174 $\mathrm{GM1}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\times$	-	-
N65.9.175 $\mathrm{GM1}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N65.9.176 $\mathrm{GM1}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N65.9.177 $\mathrm{GM1}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N65.9.178 $\mathrm{GM1}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N65.9.179 $\mathrm{GM1}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N65.9.180 $\mathrm{GM1}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Y4}^-$	$\surd$	1	0	$\times$	-	-
N65.9.181 $\mathrm{GM1}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N65.9.182 $\mathrm{GM1}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N65.9.183 $\mathrm{GM1}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N65.9.184 $\mathrm{GM1}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N65.9.185 $\mathrm{GM1}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N65.9.186 $\mathrm{GM1}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.9.187 $\mathrm{GM1}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
N65.9.188 $\mathrm{GM1}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N65.9.189 $\mathrm{GM1}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N65.9.190 $\mathrm{GM1}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N65.9.191 $\mathrm{GM1}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N65.9.192 $\mathrm{GM1}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.9.193 $\mathrm{GM1}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
N65.9.194 $\mathrm{GM1}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N65.9.195 $\mathrm{GM1}^- \oplus \mathrm{Z3}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N65.9.196 $\mathrm{GM1}^- \oplus \mathrm{Z3}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N65.9.197 $\mathrm{GM1}^- \oplus \mathrm{Z3}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N65.9.198 $\mathrm{GM1}^- \oplus \mathrm{Z3}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.9.199 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N65.9.200 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{A2}$
N65.9.201 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B3_g}$
N65.9.202 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2} \oplus \mathrm{B2}$
N65.9.203 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{T1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N65.9.204 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{T1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N65.9.205 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{T3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N65.9.206 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N65.9.207 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$

Non-coplanar SSGs with parent space group $Cmmm$ (No. 65) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N65.9.208 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}\oplus\mathrm{Y2}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_g}$
N65.9.209 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}\oplus\mathrm{Y2}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_g}$
N65.9.210 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}\oplus\mathrm{Y3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_g}$
N65.9.211 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}\oplus\mathrm{Y3}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_g}$
N65.9.212 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}\oplus\mathrm{Z1}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_g}$
N65.9.213 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}\oplus\mathrm{Z1}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_g}$
N65.9.214 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}\oplus\mathrm{Z3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_g}$
N65.9.215 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{A_u}\oplus\mathrm{B1_g}$
N65.9.216 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2}\oplus\mathrm{B2}$
N65.9.217 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B1_g}\oplus\mathrm{B2_u}$
N65.9.218 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}\oplus\mathrm{T1}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B1_g}$
N65.9.219 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}\oplus\mathrm{T1}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B1_g}$
N65.9.220 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}\oplus\mathrm{T3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B1_g}$
N65.9.221 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}\oplus\mathrm{Y1}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B1_g}$
N65.9.222 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}\oplus\mathrm{Y1}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B1_g}$
N65.9.223 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}\oplus\mathrm{Y2}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B1_g}$
N65.9.224 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}\oplus\mathrm{Y2}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B1_g}$
N65.9.225 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}\oplus\mathrm{Y3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B1_g}$
N65.9.226 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}\oplus\mathrm{Y3}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B1_g}$
N65.9.227 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}\oplus\mathrm{Z1}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B1_g}$
N65.9.228 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}\oplus\mathrm{Z1}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B1_g}$
N65.9.229 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}\oplus\mathrm{Z3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B1_g}$
N65.9.230 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B3_g}\oplus\mathrm{B3_g}$
N65.9.231 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{+}\oplus\mathrm{GM4}^{+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B3_g}\oplus\mathrm{B2_g}$
N65.9.232 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2}\oplus\mathrm{B2}$
N65.9.233 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{+}\oplus\mathrm{GM4}^{-}$	$\surd$	2	2	$\surd$	222	$\mathrm{B1}\oplus\mathrm{B3}$
N65.9.234 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{+}\oplus\mathrm{T1}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B3_g}$
N65.9.235 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{+}\oplus\mathrm{T1}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B3_g}$
N65.9.236 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{+}\oplus\mathrm{T3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B3_g}$
N65.9.237 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{+}\oplus\mathrm{T3}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B3_g}$
N65.9.238 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{+}\oplus\mathrm{Y1}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B3_g}$
N65.9.239 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{+}\oplus\mathrm{Y1}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B3_g}$
N65.9.240 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{+}\oplus\mathrm{Y2}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B3_g}$
N65.9.241 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{+}\oplus\mathrm{Y2}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B3_g}$
N65.9.242 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{+}\oplus\mathrm{Y3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B3_g}$
N65.9.243 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{+}\oplus\mathrm{Y4}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B3_g}$
N65.9.244 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{+}\oplus\mathrm{Y3}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B3_g}$
N65.9.245 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{+}\oplus\mathrm{Y4}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B3_g}$
N65.9.246 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{+}\oplus\mathrm{Z1}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B3_g}$
N65.9.247 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{+}\oplus\mathrm{Z1}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B3_g}$
N65.9.248 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{+}\oplus\mathrm{Z3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B3_g}$
N65.9.249 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{+}\oplus\mathrm{Z3}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B3_g}$
N65.9.250 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B2_u}\oplus\mathrm{B2_u}$
N65.9.251 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B3_u}\oplus\mathrm{B2_u}$
N65.9.252 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{-}\oplus\mathrm{T1}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B2_u}$
N65.9.253 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{-}\oplus\mathrm{T1}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B2_u}$

Non-coplanar SSGs with parent space group $Cmmm$ (No. 65) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N65.9.254 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{-}\oplus\mathrm{T3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B2_u}$
N65.9.255 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{-}\oplus\mathrm{T3}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B2_u}$
N65.9.256 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{-}\oplus\mathrm{Y1}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B2_u}$
N65.9.257 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{-}\oplus\mathrm{Y1}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B2_u}$
N65.9.258 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{-}\oplus\mathrm{Y2}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B2_u}$
N65.9.259 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{-}\oplus\mathrm{Y2}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B2_u}$
N65.9.260 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{-}\oplus\mathrm{Y3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B2_u}$
N65.9.261 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{-}\oplus\mathrm{Y4}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B2_u}$
N65.9.262 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{-}\oplus\mathrm{Y3}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B2_u}$
N65.9.263 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{-}\oplus\mathrm{Y4}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B2_u}$
N65.9.264 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{-}\oplus\mathrm{Z1}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B2_u}$
N65.9.265 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{-}\oplus\mathrm{Z1}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B2_u}$
N65.9.266 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{-}\oplus\mathrm{Z3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B2_u}$
N65.9.267 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{-}\oplus\mathrm{Z3}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B2_u}$
N65.9.268 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{+}\oplus\mathrm{T1}^{+}$	$\surd$	1	1	$\times$	-	-
N65.9.269 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{+}\oplus\mathrm{T2}^{-}$	$\surd$	1	1	$\surd$	222	B1
N65.9.270 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{+}\oplus\mathrm{T1}^{-}$	$\surd$	1	1	$\times$	-	-
N65.9.271 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{+}\oplus\mathrm{T2}^{+}$	$\surd$	1	1	$\times$	-	-
N65.9.272 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{+}\oplus\mathrm{T3}^{+}$	$\surd$	1	1	$\times$	-	-
N65.9.273 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{+}\oplus\mathrm{T3}^{-}$	$\surd$	1	1	$\times$	-	-
N65.9.274 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{+}\oplus\mathrm{Y1}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N65.9.275 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{+}\oplus\mathrm{Y1}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N65.9.276 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{+}\oplus\mathrm{Y2}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N65.9.277 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{+}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N65.9.278 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{+}\oplus\mathrm{Y3}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N65.9.279 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{+}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N65.9.280 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{+}\oplus\mathrm{Z1}^{+}$	$\surd$	1	1	$\times$	-	-
N65.9.281 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{+}\oplus\mathrm{Z2}^{-}$	$\surd$	1	1	$\times$	-	-
N65.9.282 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{+}\oplus\mathrm{Z1}^{-}$	$\surd$	1	1	$\times$	-	-
N65.9.283 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{+}\oplus\mathrm{Z2}^{+}$	$\surd$	1	1	$\times$	-	-
N65.9.284 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{+}\oplus\mathrm{Z3}^{+}$	$\surd$	1	1	$\times$	-	-
N65.9.285 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{+}\oplus\mathrm{Z3}^{-}$	$\surd$	1	1	$\times$	-	-
N65.9.286 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{-}\oplus\mathrm{T1}^{-}$	$\surd$	1	1	$\times$	-	-
N65.9.287 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{-}\oplus\mathrm{T2}^{+}$	$\surd$	1	1	$\surd$	222	B1
N65.9.288 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{-}\oplus\mathrm{T3}^{+}$	$\surd$	1	1	$\times$	-	-
N65.9.289 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{-}\oplus\mathrm{T3}^{-}$	$\surd$	1	1	$\times$	-	-
N65.9.290 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{-}\oplus\mathrm{Y1}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N65.9.291 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{-}\oplus\mathrm{Y1}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N65.9.292 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{-}\oplus\mathrm{Y2}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N65.9.293 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{-}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N65.9.294 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{-}\oplus\mathrm{Y3}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N65.9.295 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{-}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N65.9.296 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{-}\oplus\mathrm{Z1}^{+}$	$\surd$	1	1	$\times$	-	-
N65.9.297 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{-}\oplus\mathrm{Z2}^{-}$	$\surd$	1	1	$\times$	-	-
N65.9.298 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{-}\oplus\mathrm{Z1}^{-}$	$\surd$	1	1	$\times$	-	-
N65.9.299 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{-}\oplus\mathrm{Z2}^{+}$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $Cmmm$ (No. 65) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N65.9.300 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{-}\oplus\mathrm{Z3}^{+}$	$\surd$	1	1	$\times$	-	-
N65.9.301 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{-}\oplus\mathrm{Z3}^{-}$	$\surd$	1	1	$\times$	-	-
N65.9.302 $\mathrm{GM2}^{+}\oplus\mathrm{T3}^{+}\oplus\mathrm{T3}^{+}$	$\surd$	1	1	$\times$	-	-
N65.9.303 $\mathrm{GM2}^{+}\oplus\mathrm{T3}^{+}\oplus\mathrm{T3}^{-}$	$\surd$	1	1	$\times$	-	-
N65.9.304 $\mathrm{GM2}^{+}\oplus\mathrm{T3}^{+}\oplus\mathrm{T4}^{+}$	$\surd$	1	1	$\times$	-	-
N65.9.305 $\mathrm{GM2}^{+}\oplus\mathrm{T3}^{+}\oplus\mathrm{T4}^{-}$	$\surd$	1	1	$\surd$	222	B1
N65.9.306 $\mathrm{GM2}^{+}\oplus\mathrm{T3}^{+}\oplus\mathrm{Y1}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N65.9.307 $\mathrm{GM2}^{+}\oplus\mathrm{T3}^{+}\oplus\mathrm{Y1}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N65.9.308 $\mathrm{GM2}^{+}\oplus\mathrm{T3}^{+}\oplus\mathrm{Y2}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N65.9.309 $\mathrm{GM2}^{+}\oplus\mathrm{T3}^{+}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N65.9.310 $\mathrm{GM2}^{+}\oplus\mathrm{T3}^{+}\oplus\mathrm{Y3}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N65.9.311 $\mathrm{GM2}^{+}\oplus\mathrm{T3}^{+}\oplus\mathrm{Y4}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N65.9.312 $\mathrm{GM2}^{+}\oplus\mathrm{T3}^{+}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N65.9.313 $\mathrm{GM2}^{+}\oplus\mathrm{T3}^{+}\oplus\mathrm{Y4}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N65.9.314 $\mathrm{GM2}^{+}\oplus\mathrm{T3}^{+}\oplus\mathrm{Z1}^{+}$	$\surd$	1	1	$\times$	-	-
N65.9.315 $\mathrm{GM2}^{+}\oplus\mathrm{T3}^{+}\oplus\mathrm{Z2}^{-}$	$\surd$	1	1	$\times$	-	-
N65.9.316 $\mathrm{GM2}^{+}\oplus\mathrm{T3}^{+}\oplus\mathrm{Z1}^{-}$	$\surd$	1	1	$\times$	-	-
N65.9.317 $\mathrm{GM2}^{+}\oplus\mathrm{T3}^{+}\oplus\mathrm{Z2}^{+}$	$\surd$	1	1	$\times$	-	-
N65.9.318 $\mathrm{GM2}^{+}\oplus\mathrm{T3}^{+}\oplus\mathrm{Z3}^{+}$	$\surd$	1	1	$\times$	-	-
N65.9.319 $\mathrm{GM2}^{+}\oplus\mathrm{T3}^{+}\oplus\mathrm{Z3}^{-}$	$\surd$	1	1	$\times$	-	-
N65.9.320 $\mathrm{GM2}^{+}\oplus\mathrm{T3}^{+}\oplus\mathrm{Z4}^{+}$	$\surd$	1	1	$\times$	-	-
N65.9.321 $\mathrm{GM2}^{+}\oplus\mathrm{T3}^{+}\oplus\mathrm{Z4}^{-}$	$\surd$	1	1	$\times$	-	-
N65.9.322 $\mathrm{GM2}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y1}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N65.9.323 $\mathrm{GM2}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y1}^{-}$	$\surd$	1	1	$\surd$	$mm2$	A2
N65.9.324 $\mathrm{GM2}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y2}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N65.9.325 $\mathrm{GM2}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\surd$	222	B1
N65.9.326 $\mathrm{GM2}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y3}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N65.9.327 $\mathrm{GM2}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\surd$	$mm2$	B1
N65.9.328 $\mathrm{GM2}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Z1}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N65.9.329 $\mathrm{GM2}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Z1}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N65.9.330 $\mathrm{GM2}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Z3}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N65.9.331 $\mathrm{GM2}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y1}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N65.9.332 $\mathrm{GM2}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y2}^{+}$	$\surd$	1	1	$\surd$	222	B1
N65.9.333 $\mathrm{GM2}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N65.9.334 $\mathrm{GM2}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y3}^{+}$	$\surd$	1	1	$\surd$	$mm2$	B1
N65.9.335 $\mathrm{GM2}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N65.9.336 $\mathrm{GM2}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Z1}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N65.9.337 $\mathrm{GM2}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Z1}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N65.9.338 $\mathrm{GM2}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Z3}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N65.9.339 $\mathrm{GM2}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Y2}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N65.9.340 $\mathrm{GM2}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\surd$	$mm2$	A2
N65.9.341 $\mathrm{GM2}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Y3}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N65.9.342 $\mathrm{GM2}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\surd$	$mm2$	B2
N65.9.343 $\mathrm{GM2}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Z1}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N65.9.344 $\mathrm{GM2}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Z1}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N65.9.345 $\mathrm{GM2}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Z3}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$

Non-coplanar SSGs with parent space group $Cmmm$ (No. 65) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N65.9.346 $\mathrm{GM2}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N65.9.347 $\mathrm{GM2}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\surd$	$mm2$	B2
N65.9.348 $\mathrm{GM2}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N65.9.349 $\mathrm{GM2}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N65.9.350 $\mathrm{GM2}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N65.9.351 $\mathrm{GM2}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N65.9.352 $\mathrm{GM2}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N65.9.353 $\mathrm{GM2}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N65.9.354 $\mathrm{GM2}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\surd$	$mm2$	A2
N65.9.355 $\mathrm{GM2}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\surd$	222	B1
N65.9.356 $\mathrm{GM2}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N65.9.357 $\mathrm{GM2}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N65.9.358 $\mathrm{GM2}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N65.9.359 $\mathrm{GM2}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N65.9.360 $\mathrm{GM2}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N65.9.361 $\mathrm{GM2}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N65.9.362 $\mathrm{GM2}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N65.9.363 $\mathrm{GM2}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N65.9.364 $\mathrm{GM2}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N65.9.365 $\mathrm{GM2}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N65.9.366 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\times$	-	-
N65.9.367 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\surd$	222	B1
N65.9.368 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
N65.9.369 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\times$	-	-
N65.9.370 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
N65.9.371 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N65.9.372 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
N65.9.373 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\surd$	222	B1
N65.9.374 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
N65.9.375 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N65.9.376 $\mathrm{GM2}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
N65.9.377 $\mathrm{GM2}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N65.9.378 $\mathrm{GM2}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\times$	-	-
N65.9.379 $\mathrm{GM2}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\surd$	222	B1
N65.9.380 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
N65.9.381 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N65.9.382 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N65.9.383 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{T1}^+$	$\surd$	0	0	$\surd$	-	-
N65.9.384 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{T1}^-$	$\surd$	0	0	$\surd$	-	-
N65.9.385 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{T3}^+$	$\surd$	0	0	$\surd$	-	-
N65.9.386 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Y1}^+$	$\surd$	0	0	$\surd$	-	-
N65.9.387 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Y1}^-$	$\surd$	0	0	$\surd$	-	-
N65.9.388 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Y2}^+$	$\surd$	0	0	$\surd$	-	-
N65.9.389 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Y2}^-$	$\surd$	0	0	$\surd$	-	-
N65.9.390 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Y3}^+$	$\surd$	0	0	$\surd$	-	-
N65.9.391 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Y3}^-$	$\surd$	0	0	$\surd$	-	-

Non-coplanar SSGs with parent space group $Cmmm$ (No. 65) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N65.9.392 $\mathrm{GM2^-} \oplus \mathrm{GM2^-} \oplus \mathrm{Z1^+}$	$\surd$	0	0	$\surd$	-	-
N65.9.393 $\mathrm{GM2^-} \oplus \mathrm{GM2^-} \oplus \mathrm{Z1^-}$	$\surd$	0	0	$\surd$	-	-
N65.9.394 $\mathrm{GM2^-} \oplus \mathrm{GM2^-} \oplus \mathrm{Z3^+}$	$\surd$	0	0	$\surd$	-	-
N65.9.395 $\mathrm{GM2^-} \oplus \mathrm{GM3^+} \oplus \mathrm{GM3^+}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2} \oplus \mathrm{B2}$
N65.9.396 $\mathrm{GM2^-} \oplus \mathrm{GM3^+} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	222	$\mathrm{B3} \oplus \mathrm{B2}$
N65.9.397 $\mathrm{GM2^-} \oplus \mathrm{GM3^+} \oplus \mathrm{GM3^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N65.9.398 $\mathrm{GM2^-} \oplus \mathrm{GM3^+} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N65.9.399 $\mathrm{GM2^-} \oplus \mathrm{GM3^+} \oplus \mathrm{T1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N65.9.400 $\mathrm{GM2^-} \oplus \mathrm{GM3^+} \oplus \mathrm{T1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N65.9.401 $\mathrm{GM2^-} \oplus \mathrm{GM3^+} \oplus \mathrm{T3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N65.9.402 $\mathrm{GM2^-} \oplus \mathrm{GM3^+} \oplus \mathrm{T3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N65.9.403 $\mathrm{GM2^-} \oplus \mathrm{GM3^+} \oplus \mathrm{Y1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N65.9.404 $\mathrm{GM2^-} \oplus \mathrm{GM3^+} \oplus \mathrm{Y1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N65.9.405 $\mathrm{GM2^-} \oplus \mathrm{GM3^+} \oplus \mathrm{Y2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N65.9.406 $\mathrm{GM2^-} \oplus \mathrm{GM3^+} \oplus \mathrm{Y2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N65.9.407 $\mathrm{GM2^-} \oplus \mathrm{GM3^+} \oplus \mathrm{Y3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N65.9.408 $\mathrm{GM2^-} \oplus \mathrm{GM3^+} \oplus \mathrm{Y4^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N65.9.409 $\mathrm{GM2^-} \oplus \mathrm{GM3^+} \oplus \mathrm{Y3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N65.9.410 $\mathrm{GM2^-} \oplus \mathrm{GM3^+} \oplus \mathrm{Y4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N65.9.411 $\mathrm{GM2^-} \oplus \mathrm{GM3^+} \oplus \mathrm{Z1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N65.9.412 $\mathrm{GM2^-} \oplus \mathrm{GM3^+} \oplus \mathrm{Z1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N65.9.413 $\mathrm{GM2^-} \oplus \mathrm{GM3^+} \oplus \mathrm{Z3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N65.9.414 $\mathrm{GM2^-} \oplus \mathrm{GM3^+} \oplus \mathrm{Z3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N65.9.415 $\mathrm{GM2^-} \oplus \mathrm{GM3^-} \oplus \mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
N65.9.416 $\mathrm{GM2^-} \oplus \mathrm{GM3^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N65.9.417 $\mathrm{GM2^-} \oplus \mathrm{GM3^-} \oplus \mathrm{T1^+}$	$\surd$	0	0	$\surd$	-	-
N65.9.418 $\mathrm{GM2^-} \oplus \mathrm{GM3^-} \oplus \mathrm{T1^-}$	$\surd$	0	0	$\surd$	-	-
N65.9.419 $\mathrm{GM2^-} \oplus \mathrm{GM3^-} \oplus \mathrm{T3^+}$	$\surd$	0	0	$\surd$	-	-
N65.9.420 $\mathrm{GM2^-} \oplus \mathrm{GM3^-} \oplus \mathrm{T3^-}$	$\surd$	0	0	$\surd$	-	-
N65.9.421 $\mathrm{GM2^-} \oplus \mathrm{GM3^-} \oplus \mathrm{Y1^+}$	$\surd$	0	0	$\surd$	-	-
N65.9.422 $\mathrm{GM2^-} \oplus \mathrm{GM3^-} \oplus \mathrm{Y1^-}$	$\surd$	0	0	$\surd$	-	-
N65.9.423 $\mathrm{GM2^-} \oplus \mathrm{GM3^-} \oplus \mathrm{Y2^+}$	$\surd$	0	0	$\surd$	-	-
N65.9.424 $\mathrm{GM2^-} \oplus \mathrm{GM3^-} \oplus \mathrm{Y2^-}$	$\surd$	0	0	$\surd$	-	-
N65.9.425 $\mathrm{GM2^-} \oplus \mathrm{GM3^-} \oplus \mathrm{Y3^+}$	$\surd$	0	0	$\surd$	-	-
N65.9.426 $\mathrm{GM2^-} \oplus \mathrm{GM3^-} \oplus \mathrm{Y4^+}$	$\surd$	0	0	$\surd$	-	-
N65.9.427 $\mathrm{GM2^-} \oplus \mathrm{GM3^-} \oplus \mathrm{Y3^-}$	$\surd$	0	0	$\surd$	-	-
N65.9.428 $\mathrm{GM2^-} \oplus \mathrm{GM3^-} \oplus \mathrm{Y4^-}$	$\surd$	0	0	$\surd$	-	-
N65.9.429 $\mathrm{GM2^-} \oplus \mathrm{GM3^-} \oplus \mathrm{Z1^+}$	$\surd$	0	0	$\surd$	-	-
N65.9.430 $\mathrm{GM2^-} \oplus \mathrm{GM3^-} \oplus \mathrm{Z1^-}$	$\surd$	0	0	$\surd$	-	-
N65.9.431 $\mathrm{GM2^-} \oplus \mathrm{GM3^-} \oplus \mathrm{Z3^+}$	$\surd$	0	0	$\surd$	-	-
N65.9.432 $\mathrm{GM2^-} \oplus \mathrm{GM3^-} \oplus \mathrm{Z3^-}$	$\surd$	0	0	$\surd$	-	-
N65.9.433 $\mathrm{GM2^-} \oplus \mathrm{T1^+} \oplus \mathrm{T1^+}$	$\surd$	1	0	$\times$	-	-
N65.9.434 $\mathrm{GM2^-} \oplus \mathrm{T1^+} \oplus \mathrm{T2^-}$	$\surd$	1	1	$\times$	-	-
N65.9.435 $\mathrm{GM2^-} \oplus \mathrm{T1^+} \oplus \mathrm{T1^-}$	$\surd$	1	1	$\times$	-	-
N65.9.436 $\mathrm{GM2^-} \oplus \mathrm{T1^+} \oplus \mathrm{T2^+}$	$\surd$	1	0	$\times$	-	-
N65.9.437 $\mathrm{GM2^-} \oplus \mathrm{T1^+} \oplus \mathrm{T3^+}$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $Cmmm$ (No. 65) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N65.9.438 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{T3}^-$	$\surd$	1	1	$\times$	-	-
N65.9.439 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	0	$\times$	-	-
N65.9.440 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Y1}^-$	$\surd$	1	0	$\times$	-	-
N65.9.441 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N65.9.442 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N65.9.443 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N65.9.444 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N65.9.445 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N65.9.446 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-
N65.9.447 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N65.9.448 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N65.9.449 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N65.9.450 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N65.9.451 $\mathrm{GM2}^- \oplus \mathrm{T1}^- \oplus \mathrm{T1}^-$	$\surd$	1	0	$\times$	-	-
N65.9.452 $\mathrm{GM2}^- \oplus \mathrm{T1}^- \oplus \mathrm{T2}^+$	$\surd$	1	1	$\times$	-	-
N65.9.453 $\mathrm{GM2}^- \oplus \mathrm{T1}^- \oplus \mathrm{T3}^+$	$\surd$	1	1	$\times$	-	-
N65.9.454 $\mathrm{GM2}^- \oplus \mathrm{T1}^- \oplus \mathrm{T3}^-$	$\surd$	1	0	$\times$	-	-
N65.9.455 $\mathrm{GM2}^- \oplus \mathrm{T1}^- \oplus \mathrm{Y1}^+$	$\surd$	1	0	$\times$	-	-
N65.9.456 $\mathrm{GM2}^- \oplus \mathrm{T1}^- \oplus \mathrm{Y1}^-$	$\surd$	1	0	$\times$	-	-
N65.9.457 $\mathrm{GM2}^- \oplus \mathrm{T1}^- \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N65.9.458 $\mathrm{GM2}^- \oplus \mathrm{T1}^- \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N65.9.459 $\mathrm{GM2}^- \oplus \mathrm{T1}^- \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N65.9.460 $\mathrm{GM2}^- \oplus \mathrm{T1}^- \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N65.9.461 $\mathrm{GM2}^- \oplus \mathrm{T1}^- \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N65.9.462 $\mathrm{GM2}^- \oplus \mathrm{T1}^- \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-
N65.9.463 $\mathrm{GM2}^- \oplus \mathrm{T1}^- \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N65.9.464 $\mathrm{GM2}^- \oplus \mathrm{T1}^- \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N65.9.465 $\mathrm{GM2}^- \oplus \mathrm{T1}^- \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N65.9.466 $\mathrm{GM2}^- \oplus \mathrm{T1}^- \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N65.9.467 $\mathrm{GM2}^- \oplus \mathrm{T3}^+ \oplus \mathrm{T3}^+$	$\surd$	1	0	$\times$	-	-
N65.9.468 $\mathrm{GM2}^- \oplus \mathrm{T3}^+ \oplus \mathrm{T3}^-$	$\surd$	1	1	$\times$	-	-
N65.9.469 $\mathrm{GM2}^- \oplus \mathrm{T3}^+ \oplus \mathrm{T4}^+$	$\surd$	1	0	$\times$	-	-
N65.9.470 $\mathrm{GM2}^- \oplus \mathrm{T3}^+ \oplus \mathrm{T4}^-$	$\surd$	1	1	$\times$	-	-
N65.9.471 $\mathrm{GM2}^- \oplus \mathrm{T3}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	0	$\times$	-	-
N65.9.472 $\mathrm{GM2}^- \oplus \mathrm{T3}^+ \oplus \mathrm{Y1}^-$	$\surd$	1	0	$\times$	-	-
N65.9.473 $\mathrm{GM2}^- \oplus \mathrm{T3}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N65.9.474 $\mathrm{GM2}^- \oplus \mathrm{T3}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N65.9.475 $\mathrm{GM2}^- \oplus \mathrm{T3}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N65.9.476 $\mathrm{GM2}^- \oplus \mathrm{T3}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
N65.9.477 $\mathrm{GM2}^- \oplus \mathrm{T3}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N65.9.478 $\mathrm{GM2}^- \oplus \mathrm{T3}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	0	$\times$	-	-
N65.9.479 $\mathrm{GM2}^- \oplus \mathrm{T3}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N65.9.480 $\mathrm{GM2}^- \oplus \mathrm{T3}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-
N65.9.481 $\mathrm{GM2}^- \oplus \mathrm{T3}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N65.9.482 $\mathrm{GM2}^- \oplus \mathrm{T3}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N65.9.483 $\mathrm{GM2}^- \oplus \mathrm{T3}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $Cmmm$ (No. 65) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N65.9.484 GM2$^-$ ⊕ T3$^+$ ⊕ Z3$^-$	√	1	0	×	-	-
N65.9.485 GM2$^-$ ⊕ T3$^+$ ⊕ Z4$^+$	√	1	0	×	-	-
N65.9.486 GM2$^-$ ⊕ T3$^+$ ⊕ Z4$^-$	√	1	0	×	-	-
N65.9.487 GM2$^-$ ⊕ Y1$^+$ ⊕ Y1$^+$	√	1	0	×	-	-
N65.9.488 GM2$^-$ ⊕ Y1$^+$ ⊕ Y1$^-$	√	1	1	×	-	-
N65.9.489 GM2$^-$ ⊕ Y1$^+$ ⊕ Y2$^+$	√	1	0	×	-	-
N65.9.490 GM2$^-$ ⊕ Y1$^+$ ⊕ Y2$^-$	√	1	1	×	-	-
N65.9.491 GM2$^-$ ⊕ Y1$^+$ ⊕ Y3$^+$	√	1	0	×	-	-
N65.9.492 GM2$^-$ ⊕ Y1$^+$ ⊕ Y3$^-$	√	1	1	√	mmm	B3$_{\mathrm{u}}$
N65.9.493 GM2$^-$ ⊕ Y1$^+$ ⊕ Z1$^+$	√	1	0	×	-	-
N65.9.494 GM2$^-$ ⊕ Y1$^+$ ⊕ Z1$^-$	√	1	0	×	-	-
N65.9.495 GM2$^-$ ⊕ Y1$^+$ ⊕ Z3$^+$	√	1	0	×	-	-
N65.9.496 GM2$^-$ ⊕ Y1$^-$ ⊕ Y1$^-$	√	1	0	×	-	-
N65.9.497 GM2$^-$ ⊕ Y1$^-$ ⊕ Y2$^+$	√	1	1	×	-	-
N65.9.498 GM2$^-$ ⊕ Y1$^-$ ⊕ Y2$^-$	√	1	0	×	-	-
N65.9.499 GM2$^-$ ⊕ Y1$^-$ ⊕ Y3$^+$	√	1	1	√	mmm	B3$_{\mathrm{u}}$
N65.9.500 GM2$^-$ ⊕ Y1$^-$ ⊕ Y3$^-$	√	1	0	×	-	-
N65.9.501 GM2$^-$ ⊕ Y1$^-$ ⊕ Z1$^+$	√	1	0	×	-	-
N65.9.502 GM2$^-$ ⊕ Y1$^-$ ⊕ Z1$^-$	√	1	0	×	-	-
N65.9.503 GM2$^-$ ⊕ Y1$^-$ ⊕ Z3$^+$	√	1	0	×	-	-
N65.9.504 GM2$^-$ ⊕ Y2$^+$ ⊕ Y2$^+$	√	1	0	×	-	-
N65.9.505 GM2$^-$ ⊕ Y2$^+$ ⊕ Y2$^-$	√	1	1	×	-	-
N65.9.506 GM2$^-$ ⊕ Y2$^+$ ⊕ Y3$^+$	√	1	0	×	-	-
N65.9.507 GM2$^-$ ⊕ Y2$^+$ ⊕ Y3$^-$	√	1	1	√	mmm	B2$_{\mathrm{u}}$
N65.9.508 GM2$^-$ ⊕ Y2$^+$ ⊕ Z1$^+$	√	1	0	×	-	-
N65.9.509 GM2$^-$ ⊕ Y2$^+$ ⊕ Z1$^-$	√	1	0	×	-	-
N65.9.510 GM2$^-$ ⊕ Y2$^+$ ⊕ Z3$^+$	√	1	0	×	-	-
N65.9.511 GM2$^-$ ⊕ Y2$^-$ ⊕ Y2$^-$	√	1	0	×	-	-
N65.9.512 GM2$^-$ ⊕ Y2$^-$ ⊕ Y3$^+$	√	1	1	√	mmm	B2$_{\mathrm{u}}$
N65.9.513 GM2$^-$ ⊕ Y2$^-$ ⊕ Y3$^-$	√	1	0	×	-	-
N65.9.514 GM2$^-$ ⊕ Y2$^-$ ⊕ Z1$^+$	√	1	0	×	-	-
N65.9.515 GM2$^-$ ⊕ Y2$^-$ ⊕ Z1$^-$	√	1	0	×	-	-
N65.9.516 GM2$^-$ ⊕ Y2$^-$ ⊕ Z3$^+$	√	1	0	×	-	-
N65.9.517 GM2$^-$ ⊕ Y3$^+$ ⊕ Y3$^+$	√	1	0	×	-	-
N65.9.518 GM2$^-$ ⊕ Y3$^+$ ⊕ Y4$^+$	√	1	0	×	-	-
N65.9.519 GM2$^-$ ⊕ Y3$^+$ ⊕ Y3$^-$	√	1	1	×	-	-
N65.9.520 GM2$^-$ ⊕ Y3$^+$ ⊕ Y4$^-$	√	1	1	×	-	-
N65.9.521 GM2$^-$ ⊕ Y3$^+$ ⊕ Z1$^+$	√	1	0	×	-	-
N65.9.522 GM2$^-$ ⊕ Y3$^+$ ⊕ Z1$^-$	√	1	0	×	-	-
N65.9.523 GM2$^-$ ⊕ Y3$^+$ ⊕ Z3$^+$	√	1	0	×	-	-
N65.9.524 GM2$^-$ ⊕ Y3$^+$ ⊕ Z3$^-$	√	1	0	×	-	-
N65.9.525 GM2$^-$ ⊕ Y3$^-$ ⊕ Y3$^-$	√	1	0	×	-	-
N65.9.526 GM2$^-$ ⊕ Y3$^-$ ⊕ Y4$^-$	√	1	0	×	-	-
N65.9.527 GM2$^-$ ⊕ Y3$^-$ ⊕ Z1$^+$	√	1	0	×	-	-
N65.9.528 GM2$^-$ ⊕ Y3$^-$ ⊕ Z1$^-$	√	1	0	×	-	-
N65.9.529 GM2$^-$ ⊕ Y3$^-$ ⊕ Z3$^+$	√	1	0	×	-	-

Non-coplanar SSGs with parent space group $Cmmm$ (No. 65) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N65.9.530 $\mathrm{GM2}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N65.9.531 $\mathrm{GM2}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N65.9.532 $\mathrm{GM2}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.9.533 $\mathrm{GM2}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
N65.9.534 $\mathrm{GM2}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N65.9.535 $\mathrm{GM2}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N65.9.536 $\mathrm{GM2}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N65.9.537 $\mathrm{GM2}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N65.9.538 $\mathrm{GM2}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.9.539 $\mathrm{GM2}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
N65.9.540 $\mathrm{GM2}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N65.9.541 $\mathrm{GM2}^- \oplus \mathrm{Z3}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N65.9.542 $\mathrm{GM2}^- \oplus \mathrm{Z3}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N65.9.543 $\mathrm{GM2}^- \oplus \mathrm{Z3}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N65.9.544 $\mathrm{GM2}^- \oplus \mathrm{Z3}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.9.545 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N65.9.546 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N65.9.547 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{A2}$
N65.9.548 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2} \oplus \mathrm{B2}$
N65.9.549 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{B2}$
N65.9.550 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{T1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
N65.9.551 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{T1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g}$
N65.9.552 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{T1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
N65.9.553 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{T1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g}$
N65.9.554 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{T3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
N65.9.555 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{T3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
N65.9.556 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{T3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g}$
N65.9.557 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
N65.9.558 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g}$
N65.9.559 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
N65.9.560 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g}$
N65.9.561 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
N65.9.562 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g}$
N65.9.563 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
N65.9.564 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g}$
N65.9.565 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
N65.9.566 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Y4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
N65.9.567 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g}$
N65.9.568 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
N65.9.569 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
N65.9.570 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g}$
N65.9.571 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Z1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
N65.9.572 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{Z1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g}$
N65.9.573 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Z1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
N65.9.574 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{Z1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g}$
N65.9.575 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Z3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$

Non-coplanar SSGs with parent space group $Cmmm$ (No. 65) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N65.9.576 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{Z3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
N65.9.577 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{Z3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g}$
N65.9.578 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{GM3^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B3_g}$
N65.9.579 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u} \oplus \mathrm{B3_g}$
N65.9.580 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B3_g}$
N65.9.581 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{T1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N65.9.582 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{T1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N65.9.583 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{T1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N65.9.584 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{T1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N65.9.585 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{T3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N65.9.586 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{T3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N65.9.587 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{T3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N65.9.588 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{T3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N65.9.589 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{Y1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N65.9.590 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Y1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N65.9.591 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{Y1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N65.9.592 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Y1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N65.9.593 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{Y2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N65.9.594 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Y2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N65.9.595 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{Y2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N65.9.596 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Y2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N65.9.597 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{Y3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N65.9.598 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{Y4^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N65.9.599 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Y3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N65.9.600 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Y4^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N65.9.601 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{Y3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N65.9.602 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{Y4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N65.9.603 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Y3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N65.9.604 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Y4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N65.9.605 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{Z1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N65.9.606 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Z1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N65.9.607 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{Z1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N65.9.608 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Z1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N65.9.609 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{Z3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N65.9.610 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{Z3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N65.9.611 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Z3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N65.9.612 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Z3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N65.9.613 $\mathrm{GM3^+} \oplus \mathrm{T1^+} \oplus \mathrm{T1^+}$	$\surd$	1	1	$\times$	-	-
N65.9.614 $\mathrm{GM3^+} \oplus \mathrm{T1^+} \oplus \mathrm{T2^-}$	$\surd$	1	1	$\times$	-	-
N65.9.615 $\mathrm{GM3^+} \oplus \mathrm{T1^+} \oplus \mathrm{T1^-}$	$\surd$	1	1	$\times$	-	-
N65.9.616 $\mathrm{GM3^+} \oplus \mathrm{T1^+} \oplus \mathrm{T2^+}$	$\surd$	1	1	$\times$	-	-
N65.9.617 $\mathrm{GM3^+} \oplus \mathrm{T1^+} \oplus \mathrm{T3^+}$	$\surd$	1	1	$\times$	-	-
N65.9.618 $\mathrm{GM3^+} \oplus \mathrm{T1^+} \oplus \mathrm{T3^-}$	$\surd$	1	1	$\times$	-	-
N65.9.619 $\mathrm{GM3^+} \oplus \mathrm{T1^+} \oplus \mathrm{T4^+}$	$\surd$	1	1	$\times$	-	-
N65.9.620 $\mathrm{GM3^+} \oplus \mathrm{T1^+} \oplus \mathrm{T4^-}$	$\surd$	1	1	$\times$	-	-
N65.9.621 $\mathrm{GM3^+} \oplus \mathrm{T1^+} \oplus \mathrm{Y1^+}$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $Cmmm$ (No. 65) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N65.9.622 $\mathrm{GM3}^{+} \oplus \mathrm{T1}^{+} \oplus \mathrm{Y1}^{-}$	$\surd$	1	1	$\times$	-	-
N65.9.623 $\mathrm{GM3}^{+} \oplus \mathrm{T1}^{+} \oplus \mathrm{Y2}^{+}$	$\surd$	1	1	$\times$	-	-
N65.9.624 $\mathrm{GM3}^{+} \oplus \mathrm{T1}^{+} \oplus \mathrm{Y2}^{-}$	$\surd$	1	1	$\times$	-	-
N65.9.625 $\mathrm{GM3}^{+} \oplus \mathrm{T1}^{+} \oplus \mathrm{Y3}^{+}$	$\surd$	1	1	$\times$	-	-
N65.9.626 $\mathrm{GM3}^{+} \oplus \mathrm{T1}^{+} \oplus \mathrm{Y4}^{+}$	$\surd$	1	1	$\times$	-	-
N65.9.627 $\mathrm{GM3}^{+} \oplus \mathrm{T1}^{+} \oplus \mathrm{Y3}^{-}$	$\surd$	1	1	$\times$	-	-
N65.9.628 $\mathrm{GM3}^{+} \oplus \mathrm{T1}^{+} \oplus \mathrm{Y4}^{-}$	$\surd$	1	1	$\times$	-	-
N65.9.629 $\mathrm{GM3}^{+} \oplus \mathrm{T1}^{+} \oplus \mathrm{Z1}^{+}$	$\surd$	1	1	$\times$	-	-
N65.9.630 $\mathrm{GM3}^{+} \oplus \mathrm{T1}^{+} \oplus \mathrm{Z2}^{-}$	$\surd$	1	1	$\times$	-	-
N65.9.631 $\mathrm{GM3}^{+} \oplus \mathrm{T1}^{+} \oplus \mathrm{Z1}^{-}$	$\surd$	1	1	$\times$	-	-
N65.9.632 $\mathrm{GM3}^{+} \oplus \mathrm{T1}^{+} \oplus \mathrm{Z2}^{+}$	$\surd$	1	1	$\times$	-	-
N65.9.633 $\mathrm{GM3}^{+} \oplus \mathrm{T1}^{+} \oplus \mathrm{Z3}^{+}$	$\surd$	1	1	$\times$	-	-
N65.9.634 $\mathrm{GM3}^{+} \oplus \mathrm{T1}^{+} \oplus \mathrm{Z3}^{-}$	$\surd$	1	1	$\times$	-	-
N65.9.635 $\mathrm{GM3}^{+} \oplus \mathrm{T1}^{+} \oplus \mathrm{Z4}^{+}$	$\surd$	1	1	$\times$	-	-
N65.9.636 $\mathrm{GM3}^{+} \oplus \mathrm{T1}^{+} \oplus \mathrm{Z4}^{-}$	$\surd$	1	1	$\times$	-	-
N65.9.637 $\mathrm{GM3}^{+} \oplus \mathrm{T1}^{-} \oplus \mathrm{T1}^{-}$	$\surd$	1	1	$\times$	-	-
N65.9.638 $\mathrm{GM3}^{+} \oplus \mathrm{T1}^{-} \oplus \mathrm{T2}^{+}$	$\surd$	1	1	$\times$	-	-
N65.9.639 $\mathrm{GM3}^{+} \oplus \mathrm{T1}^{-} \oplus \mathrm{T3}^{+}$	$\surd$	1	1	$\times$	-	-
N65.9.640 $\mathrm{GM3}^{+} \oplus \mathrm{T1}^{-} \oplus \mathrm{T3}^{-}$	$\surd$	1	1	$\times$	-	-
N65.9.641 $\mathrm{GM3}^{+} \oplus \mathrm{T1}^{-} \oplus \mathrm{T4}^{+}$	$\surd$	1	1	$\times$	-	-
N65.9.642 $\mathrm{GM3}^{+} \oplus \mathrm{T1}^{-} \oplus \mathrm{T4}^{-}$	$\surd$	1	1	$\times$	-	-
N65.9.643 $\mathrm{GM3}^{+} \oplus \mathrm{T1}^{-} \oplus \mathrm{Y1}^{+}$	$\surd$	1	1	$\times$	-	-
N65.9.644 $\mathrm{GM3}^{+} \oplus \mathrm{T1}^{-} \oplus \mathrm{Y1}^{-}$	$\surd$	1	1	$\times$	-	-
N65.9.645 $\mathrm{GM3}^{+} \oplus \mathrm{T1}^{-} \oplus \mathrm{Y2}^{+}$	$\surd$	1	1	$\times$	-	-
N65.9.646 $\mathrm{GM3}^{+} \oplus \mathrm{T1}^{-} \oplus \mathrm{Y2}^{-}$	$\surd$	1	1	$\times$	-	-
N65.9.647 $\mathrm{GM3}^{+} \oplus \mathrm{T1}^{-} \oplus \mathrm{Y3}^{+}$	$\surd$	1	1	$\times$	-	-
N65.9.648 $\mathrm{GM3}^{+} \oplus \mathrm{T1}^{-} \oplus \mathrm{Y4}^{+}$	$\surd$	1	1	$\times$	-	-
N65.9.649 $\mathrm{GM3}^{+} \oplus \mathrm{T1}^{-} \oplus \mathrm{Y3}^{-}$	$\surd$	1	1	$\times$	-	-
N65.9.650 $\mathrm{GM3}^{+} \oplus \mathrm{T1}^{-} \oplus \mathrm{Y4}^{-}$	$\surd$	1	1	$\times$	-	-
N65.9.651 $\mathrm{GM3}^{+} \oplus \mathrm{T1}^{-} \oplus \mathrm{Z1}^{+}$	$\surd$	1	1	$\times$	-	-
N65.9.652 $\mathrm{GM3}^{+} \oplus \mathrm{T1}^{-} \oplus \mathrm{Z2}^{-}$	$\surd$	1	1	$\times$	-	-
N65.9.653 $\mathrm{GM3}^{+} \oplus \mathrm{T1}^{-} \oplus \mathrm{Z1}^{-}$	$\surd$	1	1	$\times$	-	-
N65.9.654 $\mathrm{GM3}^{+} \oplus \mathrm{T1}^{-} \oplus \mathrm{Z2}^{+}$	$\surd$	1	1	$\times$	-	-
N65.9.655 $\mathrm{GM3}^{+} \oplus \mathrm{T1}^{-} \oplus \mathrm{Z3}^{+}$	$\surd$	1	1	$\times$	-	-
N65.9.656 $\mathrm{GM3}^{+} \oplus \mathrm{T1}^{-} \oplus \mathrm{Z3}^{-}$	$\surd$	1	1	$\times$	-	-
N65.9.657 $\mathrm{GM3}^{+} \oplus \mathrm{T1}^{-} \oplus \mathrm{Z4}^{+}$	$\surd$	1	1	$\times$	-	-
N65.9.658 $\mathrm{GM3}^{+} \oplus \mathrm{T1}^{-} \oplus \mathrm{Z4}^{-}$	$\surd$	1	1	$\times$	-	-
N65.9.659 $\mathrm{GM3}^{+} \oplus \mathrm{T3}^{+} \oplus \mathrm{T3}^{+}$	$\surd$	1	1	$\times$	-	-
N65.9.660 $\mathrm{GM3}^{+} \oplus \mathrm{T3}^{+} \oplus \mathrm{T3}^{-}$	$\surd$	1	1	$\times$	-	-
N65.9.661 $\mathrm{GM3}^{+} \oplus \mathrm{T3}^{+} \oplus \mathrm{T4}^{+}$	$\surd$	1	1	$\times$	-	-
N65.9.662 $\mathrm{GM3}^{+} \oplus \mathrm{T3}^{+} \oplus \mathrm{T4}^{-}$	$\surd$	1	1	$\times$	-	-
N65.9.663 $\mathrm{GM3}^{+} \oplus \mathrm{T3}^{-} \oplus \mathrm{T3}^{-}$	$\surd$	1	1	$\times$	-	-
N65.9.664 $\mathrm{GM3}^{+} \oplus \mathrm{T3}^{-} \oplus \mathrm{T4}^{+}$	$\surd$	1	1	$\times$	-	-
N65.9.665 $\mathrm{GM3}^{+} \oplus \mathrm{T3}^{+} \oplus \mathrm{Y1}^{+}$	$\surd$	1	1	$\times$	-	-
N65.9.666 $\mathrm{GM3}^{+} \oplus \mathrm{T3}^{-} \oplus \mathrm{Y1}^{+}$	$\surd$	1	1	$\times$	-	-
N65.9.667 $\mathrm{GM3}^{+} \oplus \mathrm{T3}^{+} \oplus \mathrm{Y1}^{-}$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $Cmmm$ (No. 65) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N65.9.668 $\mathrm{GM3}^{+}\oplus\mathrm{T3}^{-}\oplus\mathrm{Y1}^{-}$	$\surd$	1	1	$\times$	-	-
N65.9.669 $\mathrm{GM3}^{+}\oplus\mathrm{T3}^{+}\oplus\mathrm{Y2}^{+}$	$\surd$	1	1	$\times$	-	-
N65.9.670 $\mathrm{GM3}^{+}\oplus\mathrm{T3}^{-}\oplus\mathrm{Y2}^{+}$	$\surd$	1	1	$\times$	-	-
N65.9.671 $\mathrm{GM3}^{+}\oplus\mathrm{T3}^{+}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\times$	-	-
N65.9.672 $\mathrm{GM3}^{+}\oplus\mathrm{T3}^{-}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\times$	-	-
N65.9.673 $\mathrm{GM3}^{+}\oplus\mathrm{T3}^{+}\oplus\mathrm{Y3}^{+}$	$\surd$	1	1	$\times$	-	-
N65.9.674 $\mathrm{GM3}^{+}\oplus\mathrm{T3}^{+}\oplus\mathrm{Y4}^{+}$	$\surd$	1	1	$\times$	-	-
N65.9.675 $\mathrm{GM3}^{+}\oplus\mathrm{T3}^{-}\oplus\mathrm{Y3}^{+}$	$\surd$	1	1	$\times$	-	-
N65.9.676 $\mathrm{GM3}^{+}\oplus\mathrm{T3}^{-}\oplus\mathrm{Y4}^{+}$	$\surd$	1	1	$\times$	-	-
N65.9.677 $\mathrm{GM3}^{+}\oplus\mathrm{T3}^{+}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\times$	-	-
N65.9.678 $\mathrm{GM3}^{+}\oplus\mathrm{T3}^{+}\oplus\mathrm{Y4}^{-}$	$\surd$	1	1	$\times$	-	-
N65.9.679 $\mathrm{GM3}^{+}\oplus\mathrm{T3}^{-}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\times$	-	-
N65.9.680 $\mathrm{GM3}^{+}\oplus\mathrm{T3}^{-}\oplus\mathrm{Y4}^{-}$	$\surd$	1	1	$\times$	-	-
N65.9.681 $\mathrm{GM3}^{+}\oplus\mathrm{T3}^{+}\oplus\mathrm{Z1}^{+}$	$\surd$	1	1	$\times$	-	-
N65.9.682 $\mathrm{GM3}^{+}\oplus\mathrm{T3}^{+}\oplus\mathrm{Z2}^{-}$	$\surd$	1	1	$\times$	-	-
N65.9.683 $\mathrm{GM3}^{+}\oplus\mathrm{T3}^{-}\oplus\mathrm{Z1}^{+}$	$\surd$	1	1	$\times$	-	-
N65.9.684 $\mathrm{GM3}^{+}\oplus\mathrm{T3}^{-}\oplus\mathrm{Z2}^{-}$	$\surd$	1	1	$\times$	-	-
N65.9.685 $\mathrm{GM3}^{+}\oplus\mathrm{T3}^{+}\oplus\mathrm{Z1}^{-}$	$\surd$	1	1	$\times$	-	-
N65.9.686 $\mathrm{GM3}^{+}\oplus\mathrm{T3}^{+}\oplus\mathrm{Z2}^{+}$	$\surd$	1	1	$\times$	-	-
N65.9.687 $\mathrm{GM3}^{+}\oplus\mathrm{T3}^{-}\oplus\mathrm{Z1}^{-}$	$\surd$	1	1	$\times$	-	-
N65.9.688 $\mathrm{GM3}^{+}\oplus\mathrm{T3}^{-}\oplus\mathrm{Z2}^{+}$	$\surd$	1	1	$\times$	-	-
N65.9.689 $\mathrm{GM3}^{+}\oplus\mathrm{T3}^{+}\oplus\mathrm{Z3}^{+}$	$\surd$	1	1	$\times$	-	-
N65.9.690 $\mathrm{GM3}^{+}\oplus\mathrm{T3}^{+}\oplus\mathrm{Z3}^{-}$	$\surd$	1	1	$\times$	-	-
N65.9.691 $\mathrm{GM3}^{+}\oplus\mathrm{T3}^{+}\oplus\mathrm{Z4}^{+}$	$\surd$	1	1	$\times$	-	-
N65.9.692 $\mathrm{GM3}^{+}\oplus\mathrm{T3}^{+}\oplus\mathrm{Z4}^{-}$	$\surd$	1	1	$\times$	-	-
N65.9.693 $\mathrm{GM3}^{+}\oplus\mathrm{T3}^{-}\oplus\mathrm{Z3}^{+}$	$\surd$	1	1	$\times$	-	-
N65.9.694 $\mathrm{GM3}^{+}\oplus\mathrm{T3}^{-}\oplus\mathrm{Z3}^{-}$	$\surd$	1	1	$\times$	-	-
N65.9.695 $\mathrm{GM3}^{+}\oplus\mathrm{T3}^{-}\oplus\mathrm{Z4}^{+}$	$\surd$	1	1	$\times$	-	-
N65.9.696 $\mathrm{GM3}^{+}\oplus\mathrm{T3}^{-}\oplus\mathrm{Z4}^{-}$	$\surd$	1	1	$\times$	-	-
N65.9.697 $\mathrm{GM3}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y1}^{+}$	$\surd$	1	1	$\times$	-	-
N65.9.698 $\mathrm{GM3}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y1}^{-}$	$\surd$	1	1	$\times$	-	-
N65.9.699 $\mathrm{GM3}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y2}^{+}$	$\surd$	1	1	$\times$	-	-
N65.9.700 $\mathrm{GM3}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\times$	-	-
N65.9.701 $\mathrm{GM3}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y3}^{+}$	$\surd$	1	1	$\times$	-	-
N65.9.702 $\mathrm{GM3}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y4}^{+}$	$\surd$	1	1	$\times$	-	-
N65.9.703 $\mathrm{GM3}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\surd$	222	B3
N65.9.704 $\mathrm{GM3}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y4}^{-}$	$\surd$	1	1	$\surd$	$mm2$	B2
N65.9.705 $\mathrm{GM3}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Z1}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N65.9.706 $\mathrm{GM3}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Z1}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N65.9.707 $\mathrm{GM3}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Z3}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N65.9.708 $\mathrm{GM3}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Z3}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N65.9.709 $\mathrm{GM3}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y1}^{-}$	$\surd$	1	1	$\times$	-	-
N65.9.710 $\mathrm{GM3}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y2}^{+}$	$\surd$	1	1	$\times$	-	-
N65.9.711 $\mathrm{GM3}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\times$	-	-
N65.9.712 $\mathrm{GM3}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y3}^{+}$	$\surd$	1	1	$\surd$	222	B3
N65.9.713 $\mathrm{GM3}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y4}^{+}$	$\surd$	1	1	$\surd$	$mm2$	B2

Non-coplanar SSGs with parent space group $Cmmm$ (No. 65) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N65.9.714 $\mathrm{GM3}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\times$	-	-
N65.9.715 $\mathrm{GM3}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y4}^{-}$	$\surd$	1	1	$\times$	-	-
N65.9.716 $\mathrm{GM3}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Z1}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N65.9.717 $\mathrm{GM3}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Z1}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N65.9.718 $\mathrm{GM3}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Z3}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N65.9.719 $\mathrm{GM3}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Z3}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N65.9.720 $\mathrm{GM3}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Y2}^{+}$	$\surd$	1	1	$\times$	-	-
N65.9.721 $\mathrm{GM3}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\times$	-	-
N65.9.722 $\mathrm{GM3}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Y3}^{+}$	$\surd$	1	1	$\times$	-	-
N65.9.723 $\mathrm{GM3}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Y4}^{+}$	$\surd$	1	1	$\times$	-	-
N65.9.724 $\mathrm{GM3}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\surd$	$mm2$	B2
N65.9.725 $\mathrm{GM3}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Y4}^{-}$	$\surd$	1	1	$\surd$	222	B3
N65.9.726 $\mathrm{GM3}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Z1}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N65.9.727 $\mathrm{GM3}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Z1}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N65.9.728 $\mathrm{GM3}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Z3}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N65.9.729 $\mathrm{GM3}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Z3}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N65.9.730 $\mathrm{GM3}^{+}\oplus\mathrm{Y2}^{-}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\times$	-	-
N65.9.731 $\mathrm{GM3}^{+}\oplus\mathrm{Y2}^{-}\oplus\mathrm{Y3}^{+}$	$\surd$	1	1	$\surd$	$mm2$	B2
N65.9.732 $\mathrm{GM3}^{+}\oplus\mathrm{Y2}^{-}\oplus\mathrm{Y4}^{+}$	$\surd$	1	1	$\surd$	222	B3
N65.9.733 $\mathrm{GM3}^{+}\oplus\mathrm{Y2}^{-}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\times$	-	-
N65.9.734 $\mathrm{GM3}^{+}\oplus\mathrm{Y2}^{-}\oplus\mathrm{Y4}^{-}$	$\surd$	1	1	$\times$	-	-
N65.9.735 $\mathrm{GM3}^{+}\oplus\mathrm{Y2}^{-}\oplus\mathrm{Z1}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N65.9.736 $\mathrm{GM3}^{+}\oplus\mathrm{Y2}^{-}\oplus\mathrm{Z1}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N65.9.737 $\mathrm{GM3}^{+}\oplus\mathrm{Y2}^{-}\oplus\mathrm{Z3}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N65.9.738 $\mathrm{GM3}^{+}\oplus\mathrm{Y2}^{-}\oplus\mathrm{Z3}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N65.9.739 $\mathrm{GM3}^{+}\oplus\mathrm{Y3}^{+}\oplus\mathrm{Y3}^{+}$	$\surd$	1	1	$\times$	-	-
N65.9.740 $\mathrm{GM3}^{+}\oplus\mathrm{Y3}^{+}\oplus\mathrm{Y4}^{+}$	$\surd$	1	1	$\times$	-	-
N65.9.741 $\mathrm{GM3}^{+}\oplus\mathrm{Y4}^{+}\oplus\mathrm{Y4}^{+}$	$\surd$	1	1	$\times$	-	-
N65.9.742 $\mathrm{GM3}^{+}\oplus\mathrm{Y3}^{+}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\times$	-	-
N65.9.743 $\mathrm{GM3}^{+}\oplus\mathrm{Y3}^{+}\oplus\mathrm{Y4}^{-}$	$\surd$	1	1	$\times$	-	-
N65.9.744 $\mathrm{GM3}^{+}\oplus\mathrm{Y4}^{+}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\times$	-	-
N65.9.745 $\mathrm{GM3}^{+}\oplus\mathrm{Y4}^{+}\oplus\mathrm{Y4}^{-}$	$\surd$	1	1	$\times$	-	-
N65.9.746 $\mathrm{GM3}^{+}\oplus\mathrm{Y3}^{+}\oplus\mathrm{Z1}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N65.9.747 $\mathrm{GM3}^{+}\oplus\mathrm{Y4}^{+}\oplus\mathrm{Z1}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N65.9.748 $\mathrm{GM3}^{+}\oplus\mathrm{Y3}^{+}\oplus\mathrm{Z1}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N65.9.749 $\mathrm{GM3}^{+}\oplus\mathrm{Y4}^{+}\oplus\mathrm{Z1}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N65.9.750 $\mathrm{GM3}^{+}\oplus\mathrm{Y3}^{+}\oplus\mathrm{Z3}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N65.9.751 $\mathrm{GM3}^{+}\oplus\mathrm{Y3}^{+}\oplus\mathrm{Z3}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N65.9.752 $\mathrm{GM3}^{+}\oplus\mathrm{Y4}^{+}\oplus\mathrm{Z3}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N65.9.753 $\mathrm{GM3}^{+}\oplus\mathrm{Y4}^{+}\oplus\mathrm{Z3}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N65.9.754 $\mathrm{GM3}^{+}\oplus\mathrm{Y3}^{-}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\times$	-	-
N65.9.755 $\mathrm{GM3}^{+}\oplus\mathrm{Y3}^{-}\oplus\mathrm{Y4}^{-}$	$\surd$	1	1	$\times$	-	-
N65.9.756 $\mathrm{GM3}^{+}\oplus\mathrm{Y4}^{-}\oplus\mathrm{Y4}^{-}$	$\surd$	1	1	$\times$	-	-
N65.9.757 $\mathrm{GM3}^{+}\oplus\mathrm{Y3}^{-}\oplus\mathrm{Z1}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N65.9.758 $\mathrm{GM3}^{+}\oplus\mathrm{Y4}^{-}\oplus\mathrm{Z1}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N65.9.759 $\mathrm{GM3}^{+}\oplus\mathrm{Y3}^{-}\oplus\mathrm{Z1}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$

Non-coplanar SSGs with parent space group $Cmmm$ (No. 65) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N65.9.760 $\mathrm{GM3}^{+}\oplus\mathrm{Y4}^{-}\oplus\mathrm{Z1}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N65.9.761 $\mathrm{GM3}^{+}\oplus\mathrm{Y3}^{-}\oplus\mathrm{Z3}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N65.9.762 $\mathrm{GM3}^{+}\oplus\mathrm{Y3}^{-}\oplus\mathrm{Z3}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N65.9.763 $\mathrm{GM3}^{+}\oplus\mathrm{Y4}^{-}\oplus\mathrm{Z3}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N65.9.764 $\mathrm{GM3}^{+}\oplus\mathrm{Y4}^{-}\oplus\mathrm{Z3}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N65.9.765 $\mathrm{GM3}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z1}^{+}$	$\surd$	1	1	$\times$	-	-
N65.9.766 $\mathrm{GM3}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z2}^{-}$	$\surd$	1	1	$\surd$	$mm2$	B2
N65.9.767 $\mathrm{GM3}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z1}^{-}$	$\surd$	1	1	$\times$	-	-
N65.9.768 $\mathrm{GM3}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z2}^{+}$	$\surd$	1	1	$\times$	-	-
N65.9.769 $\mathrm{GM3}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z3}^{+}$	$\surd$	1	1	$\times$	-	-
N65.9.770 $\mathrm{GM3}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z3}^{-}$	$\surd$	1	1	$\times$	-	-
N65.9.771 $\mathrm{GM3}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z4}^{+}$	$\surd$	1	1	$\times$	-	-
N65.9.772 $\mathrm{GM3}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z4}^{-}$	$\surd$	1	1	$\times$	-	-
N65.9.773 $\mathrm{GM3}^{+}\oplus\mathrm{Z1}^{-}\oplus\mathrm{Z1}^{-}$	$\surd$	1	1	$\times$	-	-
N65.9.774 $\mathrm{GM3}^{+}\oplus\mathrm{Z1}^{-}\oplus\mathrm{Z2}^{+}$	$\surd$	1	1	$\surd$	$mm2$	B2
N65.9.775 $\mathrm{GM3}^{+}\oplus\mathrm{Z1}^{-}\oplus\mathrm{Z3}^{+}$	$\surd$	1	1	$\times$	-	-
N65.9.776 $\mathrm{GM3}^{+}\oplus\mathrm{Z1}^{-}\oplus\mathrm{Z3}^{-}$	$\surd$	1	1	$\times$	-	-
N65.9.777 $\mathrm{GM3}^{+}\oplus\mathrm{Z1}^{-}\oplus\mathrm{Z4}^{+}$	$\surd$	1	1	$\times$	-	-
N65.9.778 $\mathrm{GM3}^{+}\oplus\mathrm{Z1}^{-}\oplus\mathrm{Z4}^{-}$	$\surd$	1	1	$\times$	-	-
N65.9.779 $\mathrm{GM3}^{+}\oplus\mathrm{Z3}^{+}\oplus\mathrm{Z3}^{+}$	$\surd$	1	1	$\times$	-	-
N65.9.780 $\mathrm{GM3}^{+}\oplus\mathrm{Z3}^{+}\oplus\mathrm{Z3}^{-}$	$\surd$	1	1	$\times$	-	-
N65.9.781 $\mathrm{GM3}^{+}\oplus\mathrm{Z3}^{+}\oplus\mathrm{Z4}^{+}$	$\surd$	1	1	$\times$	-	-
N65.9.782 $\mathrm{GM3}^{+}\oplus\mathrm{Z3}^{+}\oplus\mathrm{Z4}^{-}$	$\surd$	1	1	$\surd$	$mm2$	B2
N65.9.783 $\mathrm{GM3}^{+}\oplus\mathrm{Z3}^{-}\oplus\mathrm{Z3}^{-}$	$\surd$	1	1	$\times$	-	-
N65.9.784 $\mathrm{GM3}^{+}\oplus\mathrm{Z3}^{-}\oplus\mathrm{Z4}^{+}$	$\surd$	1	1	$\surd$	$mm2$	B2
N65.9.785 $\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
N65.9.786 $\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
N65.9.787 $\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{T1}^{+}$	$\surd$	0	0	$\surd$	-	-
N65.9.788 $\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{-}\oplus\mathrm{T1}^{+}$	$\surd$	0	0	$\surd$	-	-
N65.9.789 $\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{T1}^{-}$	$\surd$	0	0	$\surd$	-	-
N65.9.790 $\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{-}\oplus\mathrm{T1}^{-}$	$\surd$	0	0	$\surd$	-	-
N65.9.791 $\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{T3}^{+}$	$\surd$	0	0	$\surd$	-	-
N65.9.792 $\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{T3}^{-}$	$\surd$	0	0	$\surd$	-	-
N65.9.793 $\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{-}\oplus\mathrm{T3}^{+}$	$\surd$	0	0	$\surd$	-	-
N65.9.794 $\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{Y1}^{+}$	$\surd$	0	0	$\surd$	-	-
N65.9.795 $\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{-}\oplus\mathrm{Y1}^{+}$	$\surd$	0	0	$\surd$	-	-
N65.9.796 $\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{Y1}^{-}$	$\surd$	0	0	$\surd$	-	-
N65.9.797 $\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{-}\oplus\mathrm{Y1}^{-}$	$\surd$	0	0	$\surd$	-	-
N65.9.798 $\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{Y2}^{+}$	$\surd$	0	0	$\surd$	-	-
N65.9.799 $\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{-}\oplus\mathrm{Y2}^{+}$	$\surd$	0	0	$\surd$	-	-
N65.9.800 $\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{Y2}^{-}$	$\surd$	0	0	$\surd$	-	-
N65.9.801 $\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{-}\oplus\mathrm{Y2}^{-}$	$\surd$	0	0	$\surd$	-	-
N65.9.802 $\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{Y3}^{+}$	$\surd$	0	0	$\surd$	-	-
N65.9.803 $\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{Y4}^{+}$	$\surd$	0	0	$\surd$	-	-
N65.9.804 $\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{-}\oplus\mathrm{Y3}^{+}$	$\surd$	0	0	$\surd$	-	-
N65.9.805 $\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{Y3}^{-}$	$\surd$	0	0	$\surd$	-	-

Non-coplanar SSGs with parent space group $Cmmm$ (No. 65) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N65.9.806 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y4}^-$	$\surd$	0	0	$\surd$	-	-
N65.9.807 $\mathrm{GM3}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Y3}^-$	$\surd$	0	0	$\surd$	-	-
N65.9.808 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Z1}^+$	$\surd$	0	0	$\surd$	-	-
N65.9.809 $\mathrm{GM3}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Z1}^+$	$\surd$	0	0	$\surd$	-	-
N65.9.810 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Z1}^-$	$\surd$	0	0	$\surd$	-	-
N65.9.811 $\mathrm{GM3}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Z1}^-$	$\surd$	0	0	$\surd$	-	-
N65.9.812 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Z3}^+$	$\surd$	0	0	$\surd$	-	-
N65.9.813 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Z3}^-$	$\surd$	0	0	$\surd$	-	-
N65.9.814 $\mathrm{GM3}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Z3}^+$	$\surd$	0	0	$\surd$	-	-
N65.9.815 $\mathrm{GM3}^- \oplus \mathrm{T1}^+ \oplus \mathrm{T1}^+$	$\surd$	1	0	$\times$	-	-
N65.9.816 $\mathrm{GM3}^- \oplus \mathrm{T1}^+ \oplus \mathrm{T2}^-$	$\surd$	1	1	$\times$	-	-
N65.9.817 $\mathrm{GM3}^- \oplus \mathrm{T1}^+ \oplus \mathrm{T1}^-$	$\surd$	1	1	$\times$	-	-
N65.9.818 $\mathrm{GM3}^- \oplus \mathrm{T1}^+ \oplus \mathrm{T2}^+$	$\surd$	1	0	$\times$	-	-
N65.9.819 $\mathrm{GM3}^- \oplus \mathrm{T1}^+ \oplus \mathrm{T3}^+$	$\surd$	1	0	$\times$	-	-
N65.9.820 $\mathrm{GM3}^- \oplus \mathrm{T1}^+ \oplus \mathrm{T3}^-$	$\surd$	1	1	$\times$	-	-
N65.9.821 $\mathrm{GM3}^- \oplus \mathrm{T1}^+ \oplus \mathrm{T4}^+$	$\surd$	1	0	$\times$	-	-
N65.9.822 $\mathrm{GM3}^- \oplus \mathrm{T1}^+ \oplus \mathrm{T4}^-$	$\surd$	1	1	$\times$	-	-
N65.9.823 $\mathrm{GM3}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	0	$\times$	-	-
N65.9.824 $\mathrm{GM3}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Y1}^-$	$\surd$	1	0	$\times$	-	-
N65.9.825 $\mathrm{GM3}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N65.9.826 $\mathrm{GM3}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N65.9.827 $\mathrm{GM3}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N65.9.828 $\mathrm{GM3}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
N65.9.829 $\mathrm{GM3}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N65.9.830 $\mathrm{GM3}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	0	$\times$	-	-
N65.9.831 $\mathrm{GM3}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N65.9.832 $\mathrm{GM3}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-
N65.9.833 $\mathrm{GM3}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N65.9.834 $\mathrm{GM3}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N65.9.835 $\mathrm{GM3}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N65.9.836 $\mathrm{GM3}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N65.9.837 $\mathrm{GM3}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N65.9.838 $\mathrm{GM3}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	0	$\times$	-	-
N65.9.839 $\mathrm{GM3}^- \oplus \mathrm{T1}^- \oplus \mathrm{T1}^-$	$\surd$	1	0	$\times$	-	-
N65.9.840 $\mathrm{GM3}^- \oplus \mathrm{T1}^- \oplus \mathrm{T2}^+$	$\surd$	1	1	$\times$	-	-
N65.9.841 $\mathrm{GM3}^- \oplus \mathrm{T1}^- \oplus \mathrm{T3}^+$	$\surd$	1	1	$\times$	-	-
N65.9.842 $\mathrm{GM3}^- \oplus \mathrm{T1}^- \oplus \mathrm{T3}^-$	$\surd$	1	0	$\times$	-	-
N65.9.843 $\mathrm{GM3}^- \oplus \mathrm{T1}^- \oplus \mathrm{T4}^+$	$\surd$	1	1	$\times$	-	-
N65.9.844 $\mathrm{GM3}^- \oplus \mathrm{T1}^- \oplus \mathrm{T4}^-$	$\surd$	1	0	$\times$	-	-
N65.9.845 $\mathrm{GM3}^- \oplus \mathrm{T1}^- \oplus \mathrm{Y1}^+$	$\surd$	1	0	$\times$	-	-
N65.9.846 $\mathrm{GM3}^- \oplus \mathrm{T1}^- \oplus \mathrm{Y1}^-$	$\surd$	1	0	$\times$	-	-
N65.9.847 $\mathrm{GM3}^- \oplus \mathrm{T1}^- \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N65.9.848 $\mathrm{GM3}^- \oplus \mathrm{T1}^- \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N65.9.849 $\mathrm{GM3}^- \oplus \mathrm{T1}^- \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N65.9.850 $\mathrm{GM3}^- \oplus \mathrm{T1}^- \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
N65.9.851 $\mathrm{GM3}^- \oplus \mathrm{T1}^- \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $Cmmm$ (No. 65) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N65.9.852 $\mathrm{GM3}^{-} \oplus \mathrm{T1}^{-} \oplus \mathrm{Y4}^{-}$	$\surd$	1	0	$\times$	-	-
N65.9.853 $\mathrm{GM3}^{-} \oplus \mathrm{T1}^{-} \oplus \mathrm{Z1}^{+}$	$\surd$	1	0	$\times$	-	-
N65.9.854 $\mathrm{GM3}^{-} \oplus \mathrm{T1}^{-} \oplus \mathrm{Z2}^{-}$	$\surd$	1	0	$\times$	-	-
N65.9.855 $\mathrm{GM3}^{-} \oplus \mathrm{T1}^{-} \oplus \mathrm{Z1}^{-}$	$\surd$	1	0	$\times$	-	-
N65.9.856 $\mathrm{GM3}^{-} \oplus \mathrm{T1}^{-} \oplus \mathrm{Z2}^{+}$	$\surd$	1	0	$\times$	-	-
N65.9.857 $\mathrm{GM3}^{-} \oplus \mathrm{T1}^{-} \oplus \mathrm{Z3}^{+}$	$\surd$	1	0	$\times$	-	-
N65.9.858 $\mathrm{GM3}^{-} \oplus \mathrm{T1}^{-} \oplus \mathrm{Z3}^{-}$	$\surd$	1	0	$\times$	-	-
N65.9.859 $\mathrm{GM3}^{-} \oplus \mathrm{T1}^{-} \oplus \mathrm{Z4}^{+}$	$\surd$	1	0	$\times$	-	-
N65.9.860 $\mathrm{GM3}^{-} \oplus \mathrm{T1}^{-} \oplus \mathrm{Z4}^{-}$	$\surd$	1	0	$\times$	-	-
N65.9.861 $\mathrm{GM3}^{-} \oplus \mathrm{T3}^{+} \oplus \mathrm{T3}^{+}$	$\surd$	1	0	$\times$	-	-
N65.9.862 $\mathrm{GM3}^{-} \oplus \mathrm{T3}^{+} \oplus \mathrm{T3}^{-}$	$\surd$	1	1	$\times$	-	-
N65.9.863 $\mathrm{GM3}^{-} \oplus \mathrm{T3}^{+} \oplus \mathrm{T4}^{+}$	$\surd$	1	0	$\times$	-	-
N65.9.864 $\mathrm{GM3}^{-} \oplus \mathrm{T3}^{+} \oplus \mathrm{T4}^{-}$	$\surd$	1	1	$\times$	-	-
N65.9.865 $\mathrm{GM3}^{-} \oplus \mathrm{T3}^{-} \oplus \mathrm{T3}^{-}$	$\surd$	1	0	$\times$	-	-
N65.9.866 $\mathrm{GM3}^{-} \oplus \mathrm{T3}^{-} \oplus \mathrm{T4}^{+}$	$\surd$	1	1	$\times$	-	-
N65.9.867 $\mathrm{GM3}^{-} \oplus \mathrm{T3}^{+} \oplus \mathrm{Y1}^{+}$	$\surd$	1	0	$\times$	-	-
N65.9.868 $\mathrm{GM3}^{-} \oplus \mathrm{T3}^{-} \oplus \mathrm{Y1}^{+}$	$\surd$	1	0	$\times$	-	-
N65.9.869 $\mathrm{GM3}^{-} \oplus \mathrm{T3}^{+} \oplus \mathrm{Y1}^{-}$	$\surd$	1	0	$\times$	-	-
N65.9.870 $\mathrm{GM3}^{-} \oplus \mathrm{T3}^{-} \oplus \mathrm{Y1}^{-}$	$\surd$	1	0	$\times$	-	-
N65.9.871 $\mathrm{GM3}^{-} \oplus \mathrm{T3}^{+} \oplus \mathrm{Y2}^{+}$	$\surd$	1	0	$\times$	-	-
N65.9.872 $\mathrm{GM3}^{-} \oplus \mathrm{T3}^{-} \oplus \mathrm{Y2}^{+}$	$\surd$	1	0	$\times$	-	-
N65.9.873 $\mathrm{GM3}^{-} \oplus \mathrm{T3}^{+} \oplus \mathrm{Y2}^{-}$	$\surd$	1	0	$\times$	-	-
N65.9.874 $\mathrm{GM3}^{-} \oplus \mathrm{T3}^{-} \oplus \mathrm{Y2}^{-}$	$\surd$	1	0	$\times$	-	-
N65.9.875 $\mathrm{GM3}^{-} \oplus \mathrm{T3}^{+} \oplus \mathrm{Y3}^{+}$	$\surd$	1	0	$\times$	-	-
N65.9.876 $\mathrm{GM3}^{-} \oplus \mathrm{T3}^{+} \oplus \mathrm{Y4}^{+}$	$\surd$	1	0	$\times$	-	-
N65.9.877 $\mathrm{GM3}^{-} \oplus \mathrm{T3}^{-} \oplus \mathrm{Y3}^{+}$	$\surd$	1	0	$\times$	-	-
N65.9.878 $\mathrm{GM3}^{-} \oplus \mathrm{T3}^{-} \oplus \mathrm{Y4}^{+}$	$\surd$	1	0	$\times$	-	-
N65.9.879 $\mathrm{GM3}^{-} \oplus \mathrm{T3}^{+} \oplus \mathrm{Y3}^{-}$	$\surd$	1	0	$\times$	-	-
N65.9.880 $\mathrm{GM3}^{-} \oplus \mathrm{T3}^{+} \oplus \mathrm{Y4}^{-}$	$\surd$	1	0	$\times$	-	-
N65.9.881 $\mathrm{GM3}^{-} \oplus \mathrm{T3}^{-} \oplus \mathrm{Y3}^{-}$	$\surd$	1	0	$\times$	-	-
N65.9.882 $\mathrm{GM3}^{-} \oplus \mathrm{T3}^{-} \oplus \mathrm{Y4}^{-}$	$\surd$	1	0	$\times$	-	-
N65.9.883 $\mathrm{GM3}^{-} \oplus \mathrm{T3}^{+} \oplus \mathrm{Z1}^{+}$	$\surd$	1	0	$\times$	-	-
N65.9.884 $\mathrm{GM3}^{-} \oplus \mathrm{T3}^{+} \oplus \mathrm{Z2}^{-}$	$\surd$	1	0	$\times$	-	-
N65.9.885 $\mathrm{GM3}^{-} \oplus \mathrm{T3}^{-} \oplus \mathrm{Z1}^{+}$	$\surd$	1	0	$\times$	-	-
N65.9.886 $\mathrm{GM3}^{-} \oplus \mathrm{T3}^{-} \oplus \mathrm{Z2}^{-}$	$\surd$	1	0	$\times$	-	-
N65.9.887 $\mathrm{GM3}^{-} \oplus \mathrm{T3}^{+} \oplus \mathrm{Z1}^{-}$	$\surd$	1	0	$\times$	-	-
N65.9.888 $\mathrm{GM3}^{-} \oplus \mathrm{T3}^{+} \oplus \mathrm{Z2}^{+}$	$\surd$	1	0	$\times$	-	-
N65.9.889 $\mathrm{GM3}^{-} \oplus \mathrm{T3}^{-} \oplus \mathrm{Z1}^{-}$	$\surd$	1	0	$\times$	-	-
N65.9.890 $\mathrm{GM3}^{-} \oplus \mathrm{T3}^{-} \oplus \mathrm{Z2}^{+}$	$\surd$	1	0	$\times$	-	-
N65.9.891 $\mathrm{GM3}^{-} \oplus \mathrm{T3}^{+} \oplus \mathrm{Z3}^{+}$	$\surd$	1	0	$\times$	-	-
N65.9.892 $\mathrm{GM3}^{-} \oplus \mathrm{T3}^{+} \oplus \mathrm{Z3}^{-}$	$\surd$	1	0	$\times$	-	-
N65.9.893 $\mathrm{GM3}^{-} \oplus \mathrm{T3}^{+} \oplus \mathrm{Z4}^{+}$	$\surd$	1	0	$\times$	-	-
N65.9.894 $\mathrm{GM3}^{-} \oplus \mathrm{T3}^{+} \oplus \mathrm{Z4}^{-}$	$\surd$	1	0	$\times$	-	-
N65.9.895 $\mathrm{GM3}^{-} \oplus \mathrm{T3}^{-} \oplus \mathrm{Z3}^{+}$	$\surd$	1	0	$\times$	-	-
N65.9.896 $\mathrm{GM3}^{-} \oplus \mathrm{T3}^{-} \oplus \mathrm{Z3}^{-}$	$\surd$	1	0	$\times$	-	-
N65.9.897 $\mathrm{GM3}^{-} \oplus \mathrm{T3}^{-} \oplus \mathrm{Z4}^{+}$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $Cmmm$ (No. 65) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N65.9.898 GM3$^-$ ⊕ T3$^-$ ⊕ Z4$^-$	√	1	0	×	-	-
N65.9.899 GM3$^-$ ⊕ Y1$^+$ ⊕ Y1$^+$	√	1	0	×	-	-
N65.9.900 GM3$^-$ ⊕ Y1$^+$ ⊕ Y1$^-$	√	1	1	×	-	-
N65.9.901 GM3$^-$ ⊕ Y1$^+$ ⊕ Y2$^+$	√	1	0	×	-	-
N65.9.902 GM3$^-$ ⊕ Y1$^+$ ⊕ Y2$^-$	√	1	1	×	-	-
N65.9.903 GM3$^-$ ⊕ Y1$^+$ ⊕ Y3$^+$	√	1	0	×	-	-
N65.9.904 GM3$^-$ ⊕ Y1$^+$ ⊕ Y4$^+$	√	1	0	×	-	-
N65.9.905 GM3$^-$ ⊕ Y1$^+$ ⊕ Y3$^-$	√	1	1	√	mmm	$\mathrm{B3_u}$
N65.9.906 GM3$^-$ ⊕ Y1$^+$ ⊕ Y4$^-$	√	1	1	√	mmm	$\mathrm{B2_u}$
N65.9.907 GM3$^-$ ⊕ Y1$^+$ ⊕ Z1$^+$	√	1	0	×	-	-
N65.9.908 GM3$^-$ ⊕ Y1$^+$ ⊕ Z1$^-$	√	1	0	×	-	-
N65.9.909 GM3$^-$ ⊕ Y1$^+$ ⊕ Z3$^+$	√	1	0	×	-	-
N65.9.910 GM3$^-$ ⊕ Y1$^+$ ⊕ Z3$^-$	√	1	0	×	-	-
N65.9.911 GM3$^-$ ⊕ Y1$^-$ ⊕ Y1$^-$	√	1	0	×	-	-
N65.9.912 GM3$^-$ ⊕ Y1$^-$ ⊕ Y2$^+$	√	1	1	×	-	-
N65.9.913 GM3$^-$ ⊕ Y1$^-$ ⊕ Y2$^-$	√	1	0	×	-	-
N65.9.914 GM3$^-$ ⊕ Y1$^-$ ⊕ Y3$^+$	√	1	1	√	mmm	$\mathrm{B3_u}$
N65.9.915 GM3$^-$ ⊕ Y1$^-$ ⊕ Y4$^+$	√	1	1	√	mmm	$\mathrm{B2_u}$
N65.9.916 GM3$^-$ ⊕ Y1$^-$ ⊕ Y3$^-$	√	1	0	×	-	-
N65.9.917 GM3$^-$ ⊕ Y1$^-$ ⊕ Y4$^-$	√	1	0	×	-	-
N65.9.918 GM3$^-$ ⊕ Y1$^-$ ⊕ Z1$^+$	√	1	0	×	-	-
N65.9.919 GM3$^-$ ⊕ Y1$^-$ ⊕ Z1$^-$	√	1	0	×	-	-
N65.9.920 GM3$^-$ ⊕ Y1$^-$ ⊕ Z3$^+$	√	1	0	×	-	-
N65.9.921 GM3$^-$ ⊕ Y1$^-$ ⊕ Z3$^-$	√	1	0	×	-	-
N65.9.922 GM3$^-$ ⊕ Y2$^+$ ⊕ Y2$^+$	√	1	0	×	-	-
N65.9.923 GM3$^-$ ⊕ Y2$^+$ ⊕ Y2$^-$	√	1	1	×	-	-
N65.9.924 GM3$^-$ ⊕ Y2$^+$ ⊕ Y3$^+$	√	1	0	×	-	-
N65.9.925 GM3$^-$ ⊕ Y2$^+$ ⊕ Y4$^+$	√	1	0	×	-	-
N65.9.926 GM3$^-$ ⊕ Y2$^+$ ⊕ Y3$^-$	√	1	1	√	mmm	$\mathrm{B2_u}$
N65.9.927 GM3$^-$ ⊕ Y2$^+$ ⊕ Y4$^-$	√	1	1	√	mmm	$\mathrm{B3_u}$
N65.9.928 GM3$^-$ ⊕ Y2$^+$ ⊕ Z1$^+$	√	1	0	×	-	-
N65.9.929 GM3$^-$ ⊕ Y2$^+$ ⊕ Z1$^-$	√	1	0	×	-	-
N65.9.930 GM3$^-$ ⊕ Y2$^+$ ⊕ Z3$^+$	√	1	0	×	-	-
N65.9.931 GM3$^-$ ⊕ Y2$^+$ ⊕ Z3$^-$	√	1	0	×	-	-
N65.9.932 GM3$^-$ ⊕ Y2$^-$ ⊕ Y2$^-$	√	1	0	×	-	-
N65.9.933 GM3$^-$ ⊕ Y2$^-$ ⊕ Y3$^+$	√	1	1	√	mmm	$\mathrm{B2_u}$
N65.9.934 GM3$^-$ ⊕ Y2$^-$ ⊕ Y4$^+$	√	1	1	√	mmm	$\mathrm{B3_u}$
N65.9.935 GM3$^-$ ⊕ Y2$^-$ ⊕ Y3$^-$	√	1	0	×	-	-
N65.9.936 GM3$^-$ ⊕ Y2$^-$ ⊕ Y4$^-$	√	1	0	×	-	-
N65.9.937 GM3$^-$ ⊕ Y2$^-$ ⊕ Z1$^+$	√	1	0	×	-	-
N65.9.938 GM3$^-$ ⊕ Y2$^-$ ⊕ Z1$^-$	√	1	0	×	-	-
N65.9.939 GM3$^-$ ⊕ Y2$^-$ ⊕ Z3$^+$	√	1	0	×	-	-
N65.9.940 GM3$^-$ ⊕ Y2$^-$ ⊕ Z3$^-$	√	1	0	×	-	-
N65.9.941 GM3$^-$ ⊕ Y3$^+$ ⊕ Y3$^+$	√	1	0	×	-	-
N65.9.942 GM3$^-$ ⊕ Y3$^+$ ⊕ Y4$^+$	√	1	0	×	-	-
N65.9.943 GM3$^-$ ⊕ Y4$^+$ ⊕ Y4$^+$	√	1	0	×	-	-

Non-coplanar SSGs with parent space group $Cmmm$ (No. 65) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N65.9.944 $\mathrm{GM3^-} \oplus \mathrm{Y3^+} \oplus \mathrm{Y3^-}$	$\surd$	1	1	$\times$	-	-
N65.9.945 $\mathrm{GM3^-} \oplus \mathrm{Y3^+} \oplus \mathrm{Y4^-}$	$\surd$	1	1	$\times$	-	-
N65.9.946 $\mathrm{GM3^-} \oplus \mathrm{Y4^+} \oplus \mathrm{Y3^-}$	$\surd$	1	1	$\times$	-	-
N65.9.947 $\mathrm{GM3^-} \oplus \mathrm{Y4^+} \oplus \mathrm{Y4^-}$	$\surd$	1	1	$\times$	-	-
N65.9.948 $\mathrm{GM3^-} \oplus \mathrm{Y3^+} \oplus \mathrm{Z1^+}$	$\surd$	1	0	$\times$	-	-
N65.9.949 $\mathrm{GM3^-} \oplus \mathrm{Y4^+} \oplus \mathrm{Z1^+}$	$\surd$	1	0	$\times$	-	-
N65.9.950 $\mathrm{GM3^-} \oplus \mathrm{Y3^+} \oplus \mathrm{Z1^-}$	$\surd$	1	0	$\times$	-	-
N65.9.951 $\mathrm{GM3^-} \oplus \mathrm{Y4^+} \oplus \mathrm{Z1^-}$	$\surd$	1	0	$\times$	-	-
N65.9.952 $\mathrm{GM3^-} \oplus \mathrm{Y3^+} \oplus \mathrm{Z3^+}$	$\surd$	1	0	$\times$	-	-
N65.9.953 $\mathrm{GM3^-} \oplus \mathrm{Y3^+} \oplus \mathrm{Z3^-}$	$\surd$	1	0	$\times$	-	-
N65.9.954 $\mathrm{GM3^-} \oplus \mathrm{Y4^+} \oplus \mathrm{Z3^+}$	$\surd$	1	0	$\times$	-	-
N65.9.955 $\mathrm{GM3^-} \oplus \mathrm{Y4^+} \oplus \mathrm{Z3^-}$	$\surd$	1	0	$\times$	-	-
N65.9.956 $\mathrm{GM3^-} \oplus \mathrm{Y3^-} \oplus \mathrm{Y3^-}$	$\surd$	1	0	$\times$	-	-
N65.9.957 $\mathrm{GM3^-} \oplus \mathrm{Y3^-} \oplus \mathrm{Y4^-}$	$\surd$	1	0	$\times$	-	-
N65.9.958 $\mathrm{GM3^-} \oplus \mathrm{Y4^-} \oplus \mathrm{Y4^-}$	$\surd$	1	0	$\times$	-	-
N65.9.959 $\mathrm{GM3^-} \oplus \mathrm{Y3^-} \oplus \mathrm{Z1^+}$	$\surd$	1	0	$\times$	-	-
N65.9.960 $\mathrm{GM3^-} \oplus \mathrm{Y4^-} \oplus \mathrm{Z1^+}$	$\surd$	1	0	$\times$	-	-
N65.9.961 $\mathrm{GM3^-} \oplus \mathrm{Y3^-} \oplus \mathrm{Z1^-}$	$\surd$	1	0	$\times$	-	-
N65.9.962 $\mathrm{GM3^-} \oplus \mathrm{Y4^-} \oplus \mathrm{Z1^-}$	$\surd$	1	0	$\times$	-	-
N65.9.963 $\mathrm{GM3^-} \oplus \mathrm{Y3^-} \oplus \mathrm{Z3^+}$	$\surd$	1	0	$\times$	-	-
N65.9.964 $\mathrm{GM3^-} \oplus \mathrm{Y3^-} \oplus \mathrm{Z3^-}$	$\surd$	1	0	$\times$	-	-
N65.9.965 $\mathrm{GM3^-} \oplus \mathrm{Y4^-} \oplus \mathrm{Z3^+}$	$\surd$	1	0	$\times$	-	-
N65.9.966 $\mathrm{GM3^-} \oplus \mathrm{Y4^-} \oplus \mathrm{Z3^-}$	$\surd$	1	0	$\times$	-	-
N65.9.967 $\mathrm{GM3^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z1^+}$	$\surd$	1	0	$\times$	-	-
N65.9.968 $\mathrm{GM3^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.9.969 $\mathrm{GM3^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z1^-}$	$\surd$	1	1	$\times$	-	-
N65.9.970 $\mathrm{GM3^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z2^+}$	$\surd$	1	0	$\times$	-	-
N65.9.971 $\mathrm{GM3^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z3^+}$	$\surd$	1	0	$\times$	-	-
N65.9.972 $\mathrm{GM3^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z3^-}$	$\surd$	1	1	$\times$	-	-
N65.9.973 $\mathrm{GM3^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z4^+}$	$\surd$	1	0	$\times$	-	-
N65.9.974 $\mathrm{GM3^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z4^-}$	$\surd$	1	1	$\times$	-	-
N65.9.975 $\mathrm{GM3^-} \oplus \mathrm{Z1^-} \oplus \mathrm{Z1^-}$	$\surd$	1	0	$\times$	-	-
N65.9.976 $\mathrm{GM3^-} \oplus \mathrm{Z1^-} \oplus \mathrm{Z2^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.9.977 $\mathrm{GM3^-} \oplus \mathrm{Z1^-} \oplus \mathrm{Z3^+}$	$\surd$	1	1	$\times$	-	-
N65.9.978 $\mathrm{GM3^-} \oplus \mathrm{Z1^-} \oplus \mathrm{Z3^-}$	$\surd$	1	0	$\times$	-	-
N65.9.979 $\mathrm{GM3^-} \oplus \mathrm{Z1^-} \oplus \mathrm{Z4^+}$	$\surd$	1	1	$\times$	-	-
N65.9.980 $\mathrm{GM3^-} \oplus \mathrm{Z1^-} \oplus \mathrm{Z4^-}$	$\surd$	1	0	$\times$	-	-
N65.9.981 $\mathrm{GM3^-} \oplus \mathrm{Z3^+} \oplus \mathrm{Z3^+}$	$\surd$	1	0	$\times$	-	-
N65.9.982 $\mathrm{GM3^-} \oplus \mathrm{Z3^+} \oplus \mathrm{Z3^-}$	$\surd$	1	1	$\times$	-	-
N65.9.983 $\mathrm{GM3^-} \oplus \mathrm{Z3^+} \oplus \mathrm{Z4^+}$	$\surd$	1	0	$\times$	-	-
N65.9.984 $\mathrm{GM3^-} \oplus \mathrm{Z3^+} \oplus \mathrm{Z4^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.9.985 $\mathrm{GM3^-} \oplus \mathrm{Z3^-} \oplus \mathrm{Z3^-}$	$\surd$	1	0	$\times$	-	-
N65.9.986 $\mathrm{GM3^-} \oplus \mathrm{Z3^-} \oplus \mathrm{Z4^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.9.987 $\mathrm{T1^+} \oplus \mathrm{T1^+} \oplus \mathrm{T1^+}$	$\surd$	0	0	$\surd$	-	-
N65.9.988 $\mathrm{T1^+} \oplus \mathrm{T1^+} \oplus \mathrm{T2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N65.9.989 $\mathrm{T1^+} \oplus \mathrm{T1^+} \oplus \mathrm{T1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u}$

Non-coplanar SSGs with parent space group $Cmmm$ (No. 65) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N65.9.990 $\mathrm{T1}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{T2}^+$	$\surd$	0	0	$\surd$	-	-
N65.9.991 $\mathrm{T1}^+ \oplus \mathrm{T2}^- \oplus \mathrm{T1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u}$
N65.9.992 $\mathrm{T1}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{T3}^+$	$\surd$	0	0	$\surd$	-	-
N65.9.993 $\mathrm{T1}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{T3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B3_u}$
N65.9.994 $\mathrm{T1}^+ \oplus \mathrm{T2}^- \oplus \mathrm{T3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N65.9.995 $\mathrm{T1}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	0	$\times$	-	-
N65.9.996 $\mathrm{T1}^+ \oplus \mathrm{T2}^- \oplus \mathrm{Y1}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.9.997 $\mathrm{T1}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Y1}^-$	$\surd$	1	0	$\times$	-	-
N65.9.998 $\mathrm{T1}^+ \oplus \mathrm{T2}^- \oplus \mathrm{Y1}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.9.999 $\mathrm{T1}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1000 $\mathrm{T1}^+ \oplus \mathrm{T2}^- \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.9.1001 $\mathrm{T1}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1002 $\mathrm{T1}^+ \oplus \mathrm{T2}^- \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.9.1003 $\mathrm{T1}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1004 $\mathrm{T1}^+ \oplus \mathrm{T2}^- \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.9.1005 $\mathrm{T1}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1006 $\mathrm{T1}^+ \oplus \mathrm{T2}^- \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.9.1007 $\mathrm{T1}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1008 $\mathrm{T1}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1009 $\mathrm{T1}^+ \oplus \mathrm{T2}^- \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\times$	-	-
N65.9.1010 $\mathrm{T1}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1011 $\mathrm{T1}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1012 $\mathrm{T1}^+ \oplus \mathrm{T2}^- \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
N65.9.1013 $\mathrm{T1}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1014 $\mathrm{T1}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1015 $\mathrm{T1}^+ \oplus \mathrm{T2}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
N65.9.1016 $\mathrm{T1}^+ \oplus \mathrm{T1}^- \oplus \mathrm{T1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u}$
N65.9.1017 $\mathrm{T1}^+ \oplus \mathrm{T1}^- \oplus \mathrm{T2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u}$
N65.9.1018 $\mathrm{T1}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{T2}^+$	$\surd$	0	0	$\surd$	-	-
N65.9.1019 $\mathrm{T1}^+ \oplus \mathrm{T1}^- \oplus \mathrm{T3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u}$
N65.9.1020 $\mathrm{T1}^+ \oplus \mathrm{T1}^- \oplus \mathrm{T3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u}$
N65.9.1021 $\mathrm{T1}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{T3}^+$	$\surd$	0	0	$\surd$	-	-
N65.9.1022 $\mathrm{T1}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{T3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_u}$
N65.9.1023 $\mathrm{T1}^+ \oplus \mathrm{T1}^- \oplus \mathrm{Y1}^+$	$\surd$	1	1	$\times$	-	-
N65.9.1024 $\mathrm{T1}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1025 $\mathrm{T1}^+ \oplus \mathrm{T1}^- \oplus \mathrm{Y1}^-$	$\surd$	1	1	$\times$	-	-
N65.9.1026 $\mathrm{T1}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{Y1}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1027 $\mathrm{T1}^+ \oplus \mathrm{T1}^- \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\times$	-	-
N65.9.1028 $\mathrm{T1}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1029 $\mathrm{T1}^+ \oplus \mathrm{T1}^- \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\times$	-	-
N65.9.1030 $\mathrm{T1}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1031 $\mathrm{T1}^+ \oplus \mathrm{T1}^- \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\times$	-	-
N65.9.1032 $\mathrm{T1}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1033 $\mathrm{T1}^+ \oplus \mathrm{T1}^- \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\times$	-	-
N65.9.1034 $\mathrm{T1}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1035 $\mathrm{T1}^+ \oplus \mathrm{T1}^- \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $Cmmm$ (No. 65) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N65.9.1036 $\mathrm{T1}^+ \oplus \mathrm{T1}^- \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\times$	-	-
N65.9.1037 $\mathrm{T1}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1038 $\mathrm{T1}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1039 $\mathrm{T1}^+ \oplus \mathrm{T1}^- \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
N65.9.1040 $\mathrm{T1}^+ \oplus \mathrm{T1}^- \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\times$	-	-
N65.9.1041 $\mathrm{T1}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1042 $\mathrm{T1}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1043 $\mathrm{T1}^+ \oplus \mathrm{T1}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
N65.9.1044 $\mathrm{T1}^+ \oplus \mathrm{T1}^- \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N65.9.1045 $\mathrm{T1}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1046 $\mathrm{T1}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1047 $\mathrm{T1}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{T3}^+$	$\surd$	0	0	$\surd$	-	-
N65.9.1048 $\mathrm{T1}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{T3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u}$
N65.9.1049 $\mathrm{T1}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{T4}^+$	$\surd$	0	0	$\surd$	-	-
N65.9.1050 $\mathrm{T1}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{T4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N65.9.1051 $\mathrm{T1}^+ \oplus \mathrm{T3}^- \oplus \mathrm{T3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B3_u}$
N65.9.1052 $\mathrm{T1}^+ \oplus \mathrm{T3}^- \oplus \mathrm{T4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_u}$
N65.9.1053 $\mathrm{T1}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1054 $\mathrm{T1}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Y1}^+$	$\surd$	1	1	$\times$	-	-
N65.9.1055 $\mathrm{T1}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{Y1}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1056 $\mathrm{T1}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Y1}^-$	$\surd$	1	1	$\times$	-	-
N65.9.1057 $\mathrm{T1}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1058 $\mathrm{T1}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\times$	-	-
N65.9.1059 $\mathrm{T1}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1060 $\mathrm{T1}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\times$	-	-
N65.9.1061 $\mathrm{T1}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1062 $\mathrm{T1}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1063 $\mathrm{T1}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\times$	-	-
N65.9.1064 $\mathrm{T1}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\times$	-	-
N65.9.1065 $\mathrm{T1}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1066 $\mathrm{T1}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1067 $\mathrm{T1}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\times$	-	-
N65.9.1068 $\mathrm{T1}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\times$	-	-
N65.9.1069 $\mathrm{T1}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1070 $\mathrm{T1}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1071 $\mathrm{T1}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N65.9.1072 $\mathrm{T1}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N65.9.1073 $\mathrm{T1}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1074 $\mathrm{T1}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1075 $\mathrm{T1}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N65.9.1076 $\mathrm{T1}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N65.9.1077 $\mathrm{T1}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1078 $\mathrm{T1}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1079 $\mathrm{T1}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1080 $\mathrm{T1}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1081 $\mathrm{T1}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$

Non-coplanar SSGs with parent space group $Cmmm$ (No. 65) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N65.9.1082 $\mathrm{T1}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N65.9.1083 $\mathrm{T1}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N65.9.1084 $\mathrm{T1}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N65.9.1085 $\mathrm{T1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1086 $\mathrm{T1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_u}$
N65.9.1087 $\mathrm{T1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1088 $\mathrm{T1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.9.1089 $\mathrm{T1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1090 $\mathrm{T1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N65.9.1091 $\mathrm{T1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Z1}^+$	$\times$	-	-	-	-	-
N65.9.1092 $\mathrm{T1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Z2}^-$	$\times$	-	-	-	-	-
N65.9.1093 $\mathrm{T1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Z1}^-$	$\times$	-	-	-	-	-
N65.9.1094 $\mathrm{T1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Z2}^+$	$\times$	-	-	-	-	-
N65.9.1095 $\mathrm{T1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Z3}^+$	$\times$	-	-	-	-	-
N65.9.1096 $\mathrm{T1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Z3}^-$	$\times$	-	-	-	-	-
N65.9.1097 $\mathrm{T1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y1}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1098 $\mathrm{T1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.9.1099 $\mathrm{T1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1100 $\mathrm{T1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N65.9.1101 $\mathrm{T1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1102 $\mathrm{T1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Z1}^+$	$\times$	-	-	-	-	-
N65.9.1103 $\mathrm{T1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Z2}^-$	$\times$	-	-	-	-	-
N65.9.1104 $\mathrm{T1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Z1}^-$	$\times$	-	-	-	-	-
N65.9.1105 $\mathrm{T1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Z2}^+$	$\times$	-	-	-	-	-
N65.9.1106 $\mathrm{T1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Z3}^+$	$\times$	-	-	-	-	-
N65.9.1107 $\mathrm{T1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Z3}^-$	$\times$	-	-	-	-	-
N65.9.1108 $\mathrm{T1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1109 $\mathrm{T1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_u}$
N65.9.1110 $\mathrm{T1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1111 $\mathrm{T1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N65.9.1112 $\mathrm{T1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Z1}^+$	$\times$	-	-	-	-	-
N65.9.1113 $\mathrm{T1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Z2}^-$	$\times$	-	-	-	-	-
N65.9.1114 $\mathrm{T1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Z1}^-$	$\times$	-	-	-	-	-
N65.9.1115 $\mathrm{T1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Z2}^+$	$\times$	-	-	-	-	-
N65.9.1116 $\mathrm{T1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Z3}^+$	$\times$	-	-	-	-	-
N65.9.1117 $\mathrm{T1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Z3}^-$	$\times$	-	-	-	-	-
N65.9.1118 $\mathrm{T1}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1119 $\mathrm{T1}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N65.9.1120 $\mathrm{T1}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1121 $\mathrm{T1}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Z1}^+$	$\times$	-	-	-	-	-
N65.9.1122 $\mathrm{T1}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Z2}^-$	$\times$	-	-	-	-	-
N65.9.1123 $\mathrm{T1}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Z1}^-$	$\times$	-	-	-	-	-
N65.9.1124 $\mathrm{T1}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Z2}^+$	$\times$	-	-	-	-	-
N65.9.1125 $\mathrm{T1}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Z3}^+$	$\times$	-	-	-	-	-
N65.9.1126 $\mathrm{T1}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Z3}^-$	$\times$	-	-	-	-	-
N65.9.1127 $\mathrm{T1}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $Cmmm$ (No. 65) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N65.9.1128 $\mathrm{T1}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1129 $\mathrm{T1}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_u}$
N65.9.1130 $\mathrm{T1}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.9.1131 $\mathrm{T1}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Z1}^+$	$\times$	-	-	-	-	-
N65.9.1132 $\mathrm{T1}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Z2}^-$	$\times$	-	-	-	-	-
N65.9.1133 $\mathrm{T1}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Z1}^-$	$\times$	-	-	-	-	-
N65.9.1134 $\mathrm{T1}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Z2}^+$	$\times$	-	-	-	-	-
N65.9.1135 $\mathrm{T1}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Z3}^+$	$\times$	-	-	-	-	-
N65.9.1136 $\mathrm{T1}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Z3}^-$	$\times$	-	-	-	-	-
N65.9.1137 $\mathrm{T1}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Z4}^+$	$\times$	-	-	-	-	-
N65.9.1138 $\mathrm{T1}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Z4}^-$	$\times$	-	-	-	-	-
N65.9.1139 $\mathrm{T1}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1140 $\mathrm{T1}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Y4}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1141 $\mathrm{T1}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Z1}^+$	$\times$	-	-	-	-	-
N65.9.1142 $\mathrm{T1}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Z2}^-$	$\times$	-	-	-	-	-
N65.9.1143 $\mathrm{T1}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Z1}^-$	$\times$	-	-	-	-	-
N65.9.1144 $\mathrm{T1}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Z2}^+$	$\times$	-	-	-	-	-
N65.9.1145 $\mathrm{T1}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Z3}^+$	$\times$	-	-	-	-	-
N65.9.1146 $\mathrm{T1}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Z3}^-$	$\times$	-	-	-	-	-
N65.9.1147 $\mathrm{T1}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Z4}^+$	$\times$	-	-	-	-	-
N65.9.1148 $\mathrm{T1}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Z4}^-$	$\times$	-	-	-	-	-
N65.9.1149 $\mathrm{T1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1150 $\mathrm{T1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.9.1151 $\mathrm{T1}^+ \oplus \mathrm{Z2}^- \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1152 $\mathrm{T1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_u}$
N65.9.1153 $\mathrm{T1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1154 $\mathrm{T1}^+ \oplus \mathrm{Z2}^- \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1155 $\mathrm{T1}^+ \oplus \mathrm{Z2}^- \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_u}$
N65.9.1156 $\mathrm{T1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1157 $\mathrm{T1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N65.9.1158 $\mathrm{T1}^+ \oplus \mathrm{Z2}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N65.9.1159 $\mathrm{T1}^+ \oplus \mathrm{Z2}^- \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1160 $\mathrm{T1}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1161 $\mathrm{T1}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.9.1162 $\mathrm{T1}^+ \oplus \mathrm{Z2}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1163 $\mathrm{T1}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N65.9.1164 $\mathrm{T1}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1165 $\mathrm{T1}^+ \oplus \mathrm{Z2}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1166 $\mathrm{T1}^+ \oplus \mathrm{Z2}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N65.9.1167 $\mathrm{T1}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1168 $\mathrm{T1}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_u}$
N65.9.1169 $\mathrm{T1}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1170 $\mathrm{T1}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.9.1171 $\mathrm{T1}^+ \oplus \mathrm{Z3}^- \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1172 $\mathrm{T1}^+ \oplus \mathrm{Z3}^- \oplus \mathrm{Z4}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1173 $\mathrm{T1}^- \oplus \mathrm{T1}^- \oplus \mathrm{T1}^-$	$\surd$	0	0	$\surd$	-	-

Non-coplanar SSGs with parent space group $Cmmm$ (No. 65) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N65.9.1174 $\mathrm{T1}^- \oplus \mathrm{T1}^- \oplus \mathrm{T2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N65.9.1175 $\mathrm{T1}^- \oplus \mathrm{T1}^- \oplus \mathrm{T3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B3_u}$
N65.9.1176 $\mathrm{T1}^- \oplus \mathrm{T1}^- \oplus \mathrm{T3}^-$	$\surd$	0	0	$\surd$	-	-
N65.9.1177 $\mathrm{T1}^- \oplus \mathrm{T2}^+ \oplus \mathrm{T3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u}$
N65.9.1178 $\mathrm{T1}^- \oplus \mathrm{T1}^- \oplus \mathrm{Y1}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1179 $\mathrm{T1}^- \oplus \mathrm{T2}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.9.1180 $\mathrm{T1}^- \oplus \mathrm{T1}^- \oplus \mathrm{Y1}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1181 $\mathrm{T1}^- \oplus \mathrm{T2}^+ \oplus \mathrm{Y1}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.9.1182 $\mathrm{T1}^- \oplus \mathrm{T1}^- \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1183 $\mathrm{T1}^- \oplus \mathrm{T2}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.9.1184 $\mathrm{T1}^- \oplus \mathrm{T1}^- \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1185 $\mathrm{T1}^- \oplus \mathrm{T2}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.9.1186 $\mathrm{T1}^- \oplus \mathrm{T1}^- \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1187 $\mathrm{T1}^- \oplus \mathrm{T2}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.9.1188 $\mathrm{T1}^- \oplus \mathrm{T1}^- \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1189 $\mathrm{T1}^- \oplus \mathrm{T2}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.9.1190 $\mathrm{T1}^- \oplus \mathrm{T1}^- \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1191 $\mathrm{T1}^- \oplus \mathrm{T1}^- \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1192 $\mathrm{T1}^- \oplus \mathrm{T2}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\times$	-	-
N65.9.1193 $\mathrm{T1}^- \oplus \mathrm{T1}^- \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1194 $\mathrm{T1}^- \oplus \mathrm{T1}^- \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1195 $\mathrm{T1}^- \oplus \mathrm{T2}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
N65.9.1196 $\mathrm{T1}^- \oplus \mathrm{T1}^- \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1197 $\mathrm{T1}^- \oplus \mathrm{T1}^- \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1198 $\mathrm{T1}^- \oplus \mathrm{T2}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
N65.9.1199 $\mathrm{T1}^- \oplus \mathrm{T3}^+ \oplus \mathrm{T3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B3_u}$
N65.9.1200 $\mathrm{T1}^- \oplus \mathrm{T3}^+ \oplus \mathrm{T3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u}$
N65.9.1201 $\mathrm{T1}^- \oplus \mathrm{T3}^+ \oplus \mathrm{T4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_u}$
N65.9.1202 $\mathrm{T1}^- \oplus \mathrm{T3}^+ \oplus \mathrm{T4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u}$
N65.9.1203 $\mathrm{T1}^- \oplus \mathrm{T3}^- \oplus \mathrm{T3}^-$	$\surd$	0	0	$\surd$	-	-
N65.9.1204 $\mathrm{T1}^- \oplus \mathrm{T3}^- \oplus \mathrm{T4}^-$	$\surd$	0	0	$\surd$	-	-
N65.9.1205 $\mathrm{T1}^- \oplus \mathrm{T3}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	1	$\times$	-	-
N65.9.1206 $\mathrm{T1}^- \oplus \mathrm{T3}^- \oplus \mathrm{Y1}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1207 $\mathrm{T1}^- \oplus \mathrm{T3}^+ \oplus \mathrm{Y1}^-$	$\surd$	1	1	$\times$	-	-
N65.9.1208 $\mathrm{T1}^- \oplus \mathrm{T3}^- \oplus \mathrm{Y1}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1209 $\mathrm{T1}^- \oplus \mathrm{T3}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\times$	-	-
N65.9.1210 $\mathrm{T1}^- \oplus \mathrm{T3}^- \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1211 $\mathrm{T1}^- \oplus \mathrm{T3}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\times$	-	-
N65.9.1212 $\mathrm{T1}^- \oplus \mathrm{T3}^- \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1213 $\mathrm{T1}^- \oplus \mathrm{T3}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\times$	-	-
N65.9.1214 $\mathrm{T1}^- \oplus \mathrm{T3}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\times$	-	-
N65.9.1215 $\mathrm{T1}^- \oplus \mathrm{T3}^- \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1216 $\mathrm{T1}^- \oplus \mathrm{T3}^- \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1217 $\mathrm{T1}^- \oplus \mathrm{T3}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\times$	-	-
N65.9.1218 $\mathrm{T1}^- \oplus \mathrm{T3}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\times$	-	-
N65.9.1219 $\mathrm{T1}^- \oplus \mathrm{T3}^- \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $Cmmm$ (No. 65) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N65.9.1220 $\mathrm{T1}^- \oplus \mathrm{T3}^- \oplus \mathrm{Y4}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1221 $\mathrm{T1}^- \oplus \mathrm{T3}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N65.9.1222 $\mathrm{T1}^- \oplus \mathrm{T3}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N65.9.1223 $\mathrm{T1}^- \oplus \mathrm{T3}^- \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1224 $\mathrm{T1}^- \oplus \mathrm{T3}^- \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1225 $\mathrm{T1}^- \oplus \mathrm{T3}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N65.9.1226 $\mathrm{T1}^- \oplus \mathrm{T3}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N65.9.1227 $\mathrm{T1}^- \oplus \mathrm{T3}^- \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1228 $\mathrm{T1}^- \oplus \mathrm{T3}^- \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1229 $\mathrm{T1}^- \oplus \mathrm{T3}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N65.9.1230 $\mathrm{T1}^- \oplus \mathrm{T3}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N65.9.1231 $\mathrm{T1}^- \oplus \mathrm{T3}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N65.9.1232 $\mathrm{T1}^- \oplus \mathrm{T3}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N65.9.1233 $\mathrm{T1}^- \oplus \mathrm{T3}^- \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1234 $\mathrm{T1}^- \oplus \mathrm{T3}^- \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1235 $\mathrm{T1}^- \oplus \mathrm{T3}^- \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1236 $\mathrm{T1}^- \oplus \mathrm{T3}^- \oplus \mathrm{Z4}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1237 $\mathrm{T1}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1238 $\mathrm{T1}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_u}$
N65.9.1239 $\mathrm{T1}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1240 $\mathrm{T1}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.9.1241 $\mathrm{T1}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1242 $\mathrm{T1}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N65.9.1243 $\mathrm{T1}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Z1}^+$	$\times$	-	-	-	-	-
N65.9.1244 $\mathrm{T1}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Z2}^-$	$\times$	-	-	-	-	-
N65.9.1245 $\mathrm{T1}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Z1}^-$	$\times$	-	-	-	-	-
N65.9.1246 $\mathrm{T1}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Z2}^+$	$\times$	-	-	-	-	-
N65.9.1247 $\mathrm{T1}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Z3}^+$	$\times$	-	-	-	-	-
N65.9.1248 $\mathrm{T1}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Z3}^-$	$\times$	-	-	-	-	-
N65.9.1249 $\mathrm{T1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y1}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1250 $\mathrm{T1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.9.1251 $\mathrm{T1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1252 $\mathrm{T1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N65.9.1253 $\mathrm{T1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1254 $\mathrm{T1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Z1}^+$	$\times$	-	-	-	-	-
N65.9.1255 $\mathrm{T1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Z2}^-$	$\times$	-	-	-	-	-
N65.9.1256 $\mathrm{T1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Z1}^-$	$\times$	-	-	-	-	-
N65.9.1257 $\mathrm{T1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Z2}^+$	$\times$	-	-	-	-	-
N65.9.1258 $\mathrm{T1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Z3}^+$	$\times$	-	-	-	-	-
N65.9.1259 $\mathrm{T1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Z3}^-$	$\times$	-	-	-	-	-
N65.9.1260 $\mathrm{T1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1261 $\mathrm{T1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_u}$
N65.9.1262 $\mathrm{T1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1263 $\mathrm{T1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N65.9.1264 $\mathrm{T1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Z1}^+$	$\times$	-	-	-	-	-
N65.9.1265 $\mathrm{T1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Z2}^-$	$\times$	-	-	-	-	-

Non-coplanar SSGs with parent space group $Cmmm$ (No. 65) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N65.9.1266 $\mathrm{T1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Z1}^-$	$\times$	-	-	-	-	-
N65.9.1267 $\mathrm{T1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Z2}^+$	$\times$	-	-	-	-	-
N65.9.1268 $\mathrm{T1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Z3}^+$	$\times$	-	-	-	-	-
N65.9.1269 $\mathrm{T1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Z3}^-$	$\times$	-	-	-	-	-
N65.9.1270 $\mathrm{T1}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1271 $\mathrm{T1}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N65.9.1272 $\mathrm{T1}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1273 $\mathrm{T1}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Z1}^+$	$\times$	-	-	-	-	-
N65.9.1274 $\mathrm{T1}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Z2}^-$	$\times$	-	-	-	-	-
N65.9.1275 $\mathrm{T1}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Z1}^-$	$\times$	-	-	-	-	-
N65.9.1276 $\mathrm{T1}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Z2}^+$	$\times$	-	-	-	-	-
N65.9.1277 $\mathrm{T1}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Z3}^+$	$\times$	-	-	-	-	-
N65.9.1278 $\mathrm{T1}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Z3}^-$	$\times$	-	-	-	-	-
N65.9.1279 $\mathrm{T1}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1280 $\mathrm{T1}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1281 $\mathrm{T1}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_u}$
N65.9.1282 $\mathrm{T1}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.9.1283 $\mathrm{T1}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Z1}^+$	$\times$	-	-	-	-	-
N65.9.1284 $\mathrm{T1}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Z2}^-$	$\times$	-	-	-	-	-
N65.9.1285 $\mathrm{T1}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Z1}^-$	$\times$	-	-	-	-	-
N65.9.1286 $\mathrm{T1}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Z2}^+$	$\times$	-	-	-	-	-
N65.9.1287 $\mathrm{T1}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Z3}^+$	$\times$	-	-	-	-	-
N65.9.1288 $\mathrm{T1}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Z3}^-$	$\times$	-	-	-	-	-
N65.9.1289 $\mathrm{T1}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Z4}^+$	$\times$	-	-	-	-	-
N65.9.1290 $\mathrm{T1}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Z4}^-$	$\times$	-	-	-	-	-
N65.9.1291 $\mathrm{T1}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1292 $\mathrm{T1}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Y4}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1293 $\mathrm{T1}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Z1}^+$	$\times$	-	-	-	-	-
N65.9.1294 $\mathrm{T1}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Z2}^-$	$\times$	-	-	-	-	-
N65.9.1295 $\mathrm{T1}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Z1}^-$	$\times$	-	-	-	-	-
N65.9.1296 $\mathrm{T1}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Z2}^+$	$\times$	-	-	-	-	-
N65.9.1297 $\mathrm{T1}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Z3}^+$	$\times$	-	-	-	-	-
N65.9.1298 $\mathrm{T1}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Z3}^-$	$\times$	-	-	-	-	-
N65.9.1299 $\mathrm{T1}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Z4}^+$	$\times$	-	-	-	-	-
N65.9.1300 $\mathrm{T1}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Z4}^-$	$\times$	-	-	-	-	-
N65.9.1301 $\mathrm{T1}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1302 $\mathrm{T1}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.9.1303 $\mathrm{T1}^- \oplus \mathrm{Z2}^- \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1304 $\mathrm{T1}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_u}$
N65.9.1305 $\mathrm{T1}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1306 $\mathrm{T1}^- \oplus \mathrm{Z2}^- \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1307 $\mathrm{T1}^- \oplus \mathrm{Z2}^- \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_u}$
N65.9.1308 $\mathrm{T1}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1309 $\mathrm{T1}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N65.9.1310 $\mathrm{T1}^- \oplus \mathrm{Z2}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N65.9.1311 $\mathrm{T1}^- \oplus \mathrm{Z2}^- \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $Cmmm$ (No. 65) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N65.9.1312 $\mathrm{T1}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1313 $\mathrm{T1}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.9.1314 $\mathrm{T1}^- \oplus \mathrm{Z2}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1315 $\mathrm{T1}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N65.9.1316 $\mathrm{T1}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1317 $\mathrm{T1}^- \oplus \mathrm{Z2}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1318 $\mathrm{T1}^- \oplus \mathrm{Z2}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N65.9.1319 $\mathrm{T1}^- \oplus \mathrm{Z3}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1320 $\mathrm{T1}^- \oplus \mathrm{Z3}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_u}$
N65.9.1321 $\mathrm{T1}^- \oplus \mathrm{Z3}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1322 $\mathrm{T1}^- \oplus \mathrm{Z3}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.9.1323 $\mathrm{T1}^- \oplus \mathrm{Z3}^- \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1324 $\mathrm{T1}^- \oplus \mathrm{Z3}^- \oplus \mathrm{Z4}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1325 $\mathrm{T3}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{T3}^+$	$\surd$	0	0	$\surd$	-	-
N65.9.1326 $\mathrm{T3}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{T3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u}$
N65.9.1327 $\mathrm{T3}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{T4}^+$	$\surd$	0	0	$\surd$	-	-
N65.9.1328 $\mathrm{T3}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{T4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N65.9.1329 $\mathrm{T3}^+ \oplus \mathrm{T3}^- \oplus \mathrm{T4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u}$
N65.9.1330 $\mathrm{T3}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1331 $\mathrm{T3}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Y1}^+$	$\surd$	1	1	$\times$	-	-
N65.9.1332 $\mathrm{T3}^+ \oplus \mathrm{T4}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1333 $\mathrm{T3}^+ \oplus \mathrm{T4}^- \oplus \mathrm{Y1}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.9.1334 $\mathrm{T3}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{Y1}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1335 $\mathrm{T3}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Y1}^-$	$\surd$	1	1	$\times$	-	-
N65.9.1336 $\mathrm{T3}^+ \oplus \mathrm{T4}^+ \oplus \mathrm{Y1}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1337 $\mathrm{T3}^+ \oplus \mathrm{T4}^- \oplus \mathrm{Y1}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.9.1338 $\mathrm{T3}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1339 $\mathrm{T3}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\times$	-	-
N65.9.1340 $\mathrm{T3}^+ \oplus \mathrm{T4}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1341 $\mathrm{T3}^+ \oplus \mathrm{T4}^- \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.9.1342 $\mathrm{T3}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1343 $\mathrm{T3}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\times$	-	-
N65.9.1344 $\mathrm{T3}^+ \oplus \mathrm{T4}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1345 $\mathrm{T3}^+ \oplus \mathrm{T4}^- \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.9.1346 $\mathrm{T3}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1347 $\mathrm{T3}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1348 $\mathrm{T3}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\times$	-	-
N65.9.1349 $\mathrm{T3}^+ \oplus \mathrm{T4}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1350 $\mathrm{T3}^+ \oplus \mathrm{T4}^- \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.9.1351 $\mathrm{T3}^+ \oplus \mathrm{T4}^- \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.9.1352 $\mathrm{T3}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1353 $\mathrm{T3}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1354 $\mathrm{T3}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\times$	-	-
N65.9.1355 $\mathrm{T3}^+ \oplus \mathrm{T4}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1356 $\mathrm{T3}^+ \oplus \mathrm{T4}^- \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.9.1357 $\mathrm{T3}^+ \oplus \mathrm{T4}^- \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$

Non-coplanar SSGs with parent space group $Cmmm$ (No. 65) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N65.9.1358 $\mathrm{T3}^{+}\oplus\mathrm{T3}^{+}\oplus\mathrm{Z1}^{+}$	$\surd$	1	0	$\times$	-	-
N65.9.1359 $\mathrm{T3}^{+}\oplus\mathrm{T3}^{+}\oplus\mathrm{Z2}^{-}$	$\surd$	1	0	$\times$	-	-
N65.9.1360 $\mathrm{T3}^{+}\oplus\mathrm{T3}^{-}\oplus\mathrm{Z1}^{+}$	$\surd$	1	1	$\times$	-	-
N65.9.1361 $\mathrm{T3}^{+}\oplus\mathrm{T4}^{+}\oplus\mathrm{Z1}^{+}$	$\surd$	1	0	$\times$	-	-
N65.9.1362 $\mathrm{T3}^{+}\oplus\mathrm{T4}^{+}\oplus\mathrm{Z2}^{-}$	$\surd$	1	0	$\times$	-	-
N65.9.1363 $\mathrm{T3}^{+}\oplus\mathrm{T4}^{-}\oplus\mathrm{Z1}^{+}$	$\surd$	1	1	$\times$	-	-
N65.9.1364 $\mathrm{T3}^{+}\oplus\mathrm{T3}^{+}\oplus\mathrm{Z1}^{-}$	$\surd$	1	0	$\times$	-	-
N65.9.1365 $\mathrm{T3}^{+}\oplus\mathrm{T3}^{+}\oplus\mathrm{Z2}^{+}$	$\surd$	1	0	$\times$	-	-
N65.9.1366 $\mathrm{T3}^{+}\oplus\mathrm{T3}^{-}\oplus\mathrm{Z1}^{-}$	$\surd$	1	1	$\times$	-	-
N65.9.1367 $\mathrm{T3}^{+}\oplus\mathrm{T4}^{+}\oplus\mathrm{Z1}^{-}$	$\surd$	1	0	$\times$	-	-
N65.9.1368 $\mathrm{T3}^{+}\oplus\mathrm{T4}^{+}\oplus\mathrm{Z2}^{+}$	$\surd$	1	0	$\times$	-	-
N65.9.1369 $\mathrm{T3}^{+}\oplus\mathrm{T4}^{-}\oplus\mathrm{Z1}^{-}$	$\surd$	1	1	$\times$	-	-
N65.9.1370 $\mathrm{T3}^{+}\oplus\mathrm{T3}^{+}\oplus\mathrm{Z3}^{+}$	$\surd$	1	0	$\times$	-	-
N65.9.1371 $\mathrm{T3}^{+}\oplus\mathrm{T3}^{+}\oplus\mathrm{Z3}^{-}$	$\surd$	1	0	$\times$	-	-
N65.9.1372 $\mathrm{T3}^{+}\oplus\mathrm{T3}^{+}\oplus\mathrm{Z4}^{+}$	$\surd$	1	0	$\times$	-	-
N65.9.1373 $\mathrm{T3}^{+}\oplus\mathrm{T3}^{+}\oplus\mathrm{Z4}^{-}$	$\surd$	1	0	$\times$	-	-
N65.9.1374 $\mathrm{T3}^{+}\oplus\mathrm{T3}^{-}\oplus\mathrm{Z3}^{+}$	$\surd$	1	1	$\times$	-	-
N65.9.1375 $\mathrm{T3}^{+}\oplus\mathrm{T3}^{-}\oplus\mathrm{Z4}^{+}$	$\surd$	1	1	$\times$	-	-
N65.9.1376 $\mathrm{T3}^{+}\oplus\mathrm{T4}^{+}\oplus\mathrm{Z3}^{+}$	$\surd$	1	0	$\times$	-	-
N65.9.1377 $\mathrm{T3}^{+}\oplus\mathrm{T4}^{+}\oplus\mathrm{Z3}^{-}$	$\surd$	1	0	$\times$	-	-
N65.9.1378 $\mathrm{T3}^{+}\oplus\mathrm{T4}^{-}\oplus\mathrm{Z3}^{+}$	$\surd$	1	1	$\times$	-	-
N65.9.1379 $\mathrm{T3}^{+}\oplus\mathrm{T4}^{-}\oplus\mathrm{Z3}^{-}$	$\surd$	1	1	$\times$	-	-
N65.9.1380 $\mathrm{T3}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y1}^{+}$	$\surd$	1	0	$\times$	-	-
N65.9.1381 $\mathrm{T3}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y1}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_u}$
N65.9.1382 $\mathrm{T3}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y2}^{+}$	$\surd$	1	0	$\times$	-	-
N65.9.1383 $\mathrm{T3}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.9.1384 $\mathrm{T3}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y3}^{+}$	$\surd$	1	0	$\times$	-	-
N65.9.1385 $\mathrm{T3}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y4}^{+}$	$\surd$	1	0	$\times$	-	-
N65.9.1386 $\mathrm{T3}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N65.9.1387 $\mathrm{T3}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y4}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N65.9.1388 $\mathrm{T3}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Z1}^{+}$	$\times$	-	-	-	-	-
N65.9.1389 $\mathrm{T3}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Z2}^{-}$	$\times$	-	-	-	-	-
N65.9.1390 $\mathrm{T3}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Z1}^{-}$	$\times$	-	-	-	-	-
N65.9.1391 $\mathrm{T3}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Z2}^{+}$	$\times$	-	-	-	-	-
N65.9.1392 $\mathrm{T3}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Z3}^{+}$	$\times$	-	-	-	-	-
N65.9.1393 $\mathrm{T3}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Z3}^{-}$	$\times$	-	-	-	-	-
N65.9.1394 $\mathrm{T3}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Z4}^{+}$	$\times$	-	-	-	-	-
N65.9.1395 $\mathrm{T3}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Z4}^{-}$	$\times$	-	-	-	-	-
N65.9.1396 $\mathrm{T3}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y1}^{-}$	$\surd$	1	0	$\times$	-	-
N65.9.1397 $\mathrm{T3}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y2}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.9.1398 $\mathrm{T3}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y2}^{-}$	$\surd$	1	0	$\times$	-	-
N65.9.1399 $\mathrm{T3}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y3}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N65.9.1400 $\mathrm{T3}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y4}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N65.9.1401 $\mathrm{T3}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y3}^{-}$	$\surd$	1	0	$\times$	-	-
N65.9.1402 $\mathrm{T3}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Y4}^{-}$	$\surd$	1	0	$\times$	-	-
N65.9.1403 $\mathrm{T3}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Z1}^{+}$	$\times$	-	-	-	-	-

Non-coplanar SSGs with parent space group $Cmmm$ (No. 65) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N65.9.1404 $\mathrm{T3}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Z2}^{-}$	$\times$	-	-	-	-	-
N65.9.1405 $\mathrm{T3}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Z1}^{-}$	$\times$	-	-	-	-	-
N65.9.1406 $\mathrm{T3}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Z2}^{+}$	$\times$	-	-	-	-	-
N65.9.1407 $\mathrm{T3}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Z3}^{+}$	$\times$	-	-	-	-	-
N65.9.1408 $\mathrm{T3}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Z3}^{-}$	$\times$	-	-	-	-	-
N65.9.1409 $\mathrm{T3}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Z4}^{+}$	$\times$	-	-	-	-	-
N65.9.1410 $\mathrm{T3}^{+}\oplus\mathrm{Y1}^{-}\oplus\mathrm{Z4}^{-}$	$\times$	-	-	-	-	-
N65.9.1411 $\mathrm{T3}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Y2}^{+}$	$\surd$	1	0	$\times$	-	-
N65.9.1412 $\mathrm{T3}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_u}$
N65.9.1413 $\mathrm{T3}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Y3}^{+}$	$\surd$	1	0	$\times$	-	-
N65.9.1414 $\mathrm{T3}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Y4}^{+}$	$\surd$	1	0	$\times$	-	-
N65.9.1415 $\mathrm{T3}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N65.9.1416 $\mathrm{T3}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Y4}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N65.9.1417 $\mathrm{T3}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Z1}^{+}$	$\times$	-	-	-	-	-
N65.9.1418 $\mathrm{T3}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Z2}^{-}$	$\times$	-	-	-	-	-
N65.9.1419 $\mathrm{T3}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Z1}^{-}$	$\times$	-	-	-	-	-
N65.9.1420 $\mathrm{T3}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Z2}^{+}$	$\times$	-	-	-	-	-
N65.9.1421 $\mathrm{T3}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Z3}^{+}$	$\times$	-	-	-	-	-
N65.9.1422 $\mathrm{T3}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Z3}^{-}$	$\times$	-	-	-	-	-
N65.9.1423 $\mathrm{T3}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Z4}^{+}$	$\times$	-	-	-	-	-
N65.9.1424 $\mathrm{T3}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Z4}^{-}$	$\times$	-	-	-	-	-
N65.9.1425 $\mathrm{T3}^{+}\oplus\mathrm{Y2}^{-}\oplus\mathrm{Y2}^{-}$	$\surd$	1	0	$\times$	-	-
N65.9.1426 $\mathrm{T3}^{+}\oplus\mathrm{Y2}^{-}\oplus\mathrm{Y3}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N65.9.1427 $\mathrm{T3}^{+}\oplus\mathrm{Y2}^{-}\oplus\mathrm{Y4}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N65.9.1428 $\mathrm{T3}^{+}\oplus\mathrm{Y2}^{-}\oplus\mathrm{Y3}^{-}$	$\surd$	1	0	$\times$	-	-
N65.9.1429 $\mathrm{T3}^{+}\oplus\mathrm{Y2}^{-}\oplus\mathrm{Y4}^{-}$	$\surd$	1	0	$\times$	-	-
N65.9.1430 $\mathrm{T3}^{+}\oplus\mathrm{Y2}^{-}\oplus\mathrm{Z1}^{+}$	$\times$	-	-	-	-	-
N65.9.1431 $\mathrm{T3}^{+}\oplus\mathrm{Y2}^{-}\oplus\mathrm{Z2}^{-}$	$\times$	-	-	-	-	-
N65.9.1432 $\mathrm{T3}^{+}\oplus\mathrm{Y2}^{-}\oplus\mathrm{Z1}^{-}$	$\times$	-	-	-	-	-
N65.9.1433 $\mathrm{T3}^{+}\oplus\mathrm{Y2}^{-}\oplus\mathrm{Z2}^{+}$	$\times$	-	-	-	-	-
N65.9.1434 $\mathrm{T3}^{+}\oplus\mathrm{Y2}^{-}\oplus\mathrm{Z3}^{+}$	$\times$	-	-	-	-	-
N65.9.1435 $\mathrm{T3}^{+}\oplus\mathrm{Y2}^{-}\oplus\mathrm{Z3}^{-}$	$\times$	-	-	-	-	-
N65.9.1436 $\mathrm{T3}^{+}\oplus\mathrm{Y2}^{-}\oplus\mathrm{Z4}^{+}$	$\times$	-	-	-	-	-
N65.9.1437 $\mathrm{T3}^{+}\oplus\mathrm{Y2}^{-}\oplus\mathrm{Z4}^{-}$	$\times$	-	-	-	-	-
N65.9.1438 $\mathrm{T3}^{+}\oplus\mathrm{Y3}^{+}\oplus\mathrm{Y3}^{+}$	$\surd$	1	0	$\times$	-	-
N65.9.1439 $\mathrm{T3}^{+}\oplus\mathrm{Y3}^{+}\oplus\mathrm{Y4}^{+}$	$\surd$	1	0	$\times$	-	-
N65.9.1440 $\mathrm{T3}^{+}\oplus\mathrm{Y4}^{+}\oplus\mathrm{Y4}^{+}$	$\surd$	1	0	$\times$	-	-
N65.9.1441 $\mathrm{T3}^{+}\oplus\mathrm{Y3}^{+}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_u}$
N65.9.1442 $\mathrm{T3}^{+}\oplus\mathrm{Y3}^{+}\oplus\mathrm{Y4}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.9.1443 $\mathrm{T3}^{+}\oplus\mathrm{Y4}^{+}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.9.1444 $\mathrm{T3}^{+}\oplus\mathrm{Y4}^{+}\oplus\mathrm{Y4}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_u}$
N65.9.1445 $\mathrm{T3}^{+}\oplus\mathrm{Y3}^{+}\oplus\mathrm{Z1}^{+}$	$\times$	-	-	-	-	-
N65.9.1446 $\mathrm{T3}^{+}\oplus\mathrm{Y3}^{+}\oplus\mathrm{Z2}^{-}$	$\times$	-	-	-	-	-
N65.9.1447 $\mathrm{T3}^{+}\oplus\mathrm{Y4}^{+}\oplus\mathrm{Z1}^{+}$	$\times$	-	-	-	-	-
N65.9.1448 $\mathrm{T3}^{+}\oplus\mathrm{Y4}^{+}\oplus\mathrm{Z2}^{-}$	$\times$	-	-	-	-	-
N65.9.1449 $\mathrm{T3}^{+}\oplus\mathrm{Y3}^{+}\oplus\mathrm{Z1}^{-}$	$\times$	-	-	-	-	-

Non-coplanar SSGs with parent space group $Cmmm$ (No. 65) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N65.9.1450 $\mathrm{T3}^{+}\oplus\mathrm{Y3}^{+}\oplus\mathrm{Z2}^{+}$	$\times$	-	-	-	-	-
N65.9.1451 $\mathrm{T3}^{+}\oplus\mathrm{Y4}^{+}\oplus\mathrm{Z1}^{-}$	$\times$	-	-	-	-	-
N65.9.1452 $\mathrm{T3}^{+}\oplus\mathrm{Y4}^{+}\oplus\mathrm{Z2}^{+}$	$\times$	-	-	-	-	-
N65.9.1453 $\mathrm{T3}^{+}\oplus\mathrm{Y3}^{+}\oplus\mathrm{Z3}^{+}$	$\times$	-	-	-	-	-
N65.9.1454 $\mathrm{T3}^{+}\oplus\mathrm{Y3}^{+}\oplus\mathrm{Z3}^{-}$	$\times$	-	-	-	-	-
N65.9.1455 $\mathrm{T3}^{+}\oplus\mathrm{Y3}^{+}\oplus\mathrm{Z4}^{+}$	$\times$	-	-	-	-	-
N65.9.1456 $\mathrm{T3}^{+}\oplus\mathrm{Y3}^{+}\oplus\mathrm{Z4}^{-}$	$\times$	-	-	-	-	-
N65.9.1457 $\mathrm{T3}^{+}\oplus\mathrm{Y4}^{+}\oplus\mathrm{Z3}^{+}$	$\times$	-	-	-	-	-
N65.9.1458 $\mathrm{T3}^{+}\oplus\mathrm{Y4}^{+}\oplus\mathrm{Z3}^{-}$	$\times$	-	-	-	-	-
N65.9.1459 $\mathrm{T3}^{+}\oplus\mathrm{Y4}^{+}\oplus\mathrm{Z4}^{+}$	$\times$	-	-	-	-	-
N65.9.1460 $\mathrm{T3}^{+}\oplus\mathrm{Y4}^{+}\oplus\mathrm{Z4}^{-}$	$\times$	-	-	-	-	-
N65.9.1461 $\mathrm{T3}^{+}\oplus\mathrm{Y3}^{-}\oplus\mathrm{Y3}^{-}$	$\surd$	1	0	$\times$	-	-
N65.9.1462 $\mathrm{T3}^{+}\oplus\mathrm{Y3}^{-}\oplus\mathrm{Y4}^{-}$	$\surd$	1	0	$\times$	-	-
N65.9.1463 $\mathrm{T3}^{+}\oplus\mathrm{Y4}^{-}\oplus\mathrm{Y4}^{-}$	$\surd$	1	0	$\times$	-	-
N65.9.1464 $\mathrm{T3}^{+}\oplus\mathrm{Y3}^{-}\oplus\mathrm{Z1}^{+}$	$\times$	-	-	-	-	-
N65.9.1465 $\mathrm{T3}^{+}\oplus\mathrm{Y3}^{-}\oplus\mathrm{Z2}^{-}$	$\times$	-	-	-	-	-
N65.9.1466 $\mathrm{T3}^{+}\oplus\mathrm{Y4}^{-}\oplus\mathrm{Z1}^{+}$	$\times$	-	-	-	-	-
N65.9.1467 $\mathrm{T3}^{+}\oplus\mathrm{Y4}^{-}\oplus\mathrm{Z2}^{-}$	$\times$	-	-	-	-	-
N65.9.1468 $\mathrm{T3}^{+}\oplus\mathrm{Y3}^{-}\oplus\mathrm{Z1}^{-}$	$\times$	-	-	-	-	-
N65.9.1469 $\mathrm{T3}^{+}\oplus\mathrm{Y3}^{-}\oplus\mathrm{Z2}^{+}$	$\times$	-	-	-	-	-
N65.9.1470 $\mathrm{T3}^{+}\oplus\mathrm{Y4}^{-}\oplus\mathrm{Z1}^{-}$	$\times$	-	-	-	-	-
N65.9.1471 $\mathrm{T3}^{+}\oplus\mathrm{Y4}^{-}\oplus\mathrm{Z2}^{+}$	$\times$	-	-	-	-	-
N65.9.1472 $\mathrm{T3}^{+}\oplus\mathrm{Y3}^{-}\oplus\mathrm{Z3}^{+}$	$\times$	-	-	-	-	-
N65.9.1473 $\mathrm{T3}^{+}\oplus\mathrm{Y3}^{-}\oplus\mathrm{Z3}^{-}$	$\times$	-	-	-	-	-
N65.9.1474 $\mathrm{T3}^{+}\oplus\mathrm{Y3}^{-}\oplus\mathrm{Z4}^{+}$	$\times$	-	-	-	-	-
N65.9.1475 $\mathrm{T3}^{+}\oplus\mathrm{Y3}^{-}\oplus\mathrm{Z4}^{-}$	$\times$	-	-	-	-	-
N65.9.1476 $\mathrm{T3}^{+}\oplus\mathrm{Y4}^{-}\oplus\mathrm{Z3}^{+}$	$\times$	-	-	-	-	-
N65.9.1477 $\mathrm{T3}^{+}\oplus\mathrm{Y4}^{-}\oplus\mathrm{Z3}^{-}$	$\times$	-	-	-	-	-
N65.9.1478 $\mathrm{T3}^{+}\oplus\mathrm{Y4}^{-}\oplus\mathrm{Z4}^{+}$	$\times$	-	-	-	-	-
N65.9.1479 $\mathrm{T3}^{+}\oplus\mathrm{Y4}^{-}\oplus\mathrm{Z4}^{-}$	$\times$	-	-	-	-	-
N65.9.1480 $\mathrm{T3}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z1}^{+}$	$\surd$	1	0	$\times$	-	-
N65.9.1481 $\mathrm{T3}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z2}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.9.1482 $\mathrm{T3}^{+}\oplus\mathrm{Z2}^{-}\oplus\mathrm{Z2}^{-}$	$\surd$	1	0	$\times$	-	-
N65.9.1483 $\mathrm{T3}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z1}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_u}$
N65.9.1484 $\mathrm{T3}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z2}^{+}$	$\surd$	1	0	$\times$	-	-
N65.9.1485 $\mathrm{T3}^{+}\oplus\mathrm{Z2}^{-}\oplus\mathrm{Z1}^{-}$	$\surd$	1	0	$\times$	-	-
N65.9.1486 $\mathrm{T3}^{+}\oplus\mathrm{Z2}^{-}\oplus\mathrm{Z2}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_u}$
N65.9.1487 $\mathrm{T3}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z3}^{+}$	$\surd$	1	0	$\times$	-	-
N65.9.1488 $\mathrm{T3}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z3}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N65.9.1489 $\mathrm{T3}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z4}^{+}$	$\surd$	1	0	$\times$	-	-
N65.9.1490 $\mathrm{T3}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z4}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N65.9.1491 $\mathrm{T3}^{+}\oplus\mathrm{Z2}^{-}\oplus\mathrm{Z3}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N65.9.1492 $\mathrm{T3}^{+}\oplus\mathrm{Z2}^{-}\oplus\mathrm{Z3}^{-}$	$\surd$	1	0	$\times$	-	-
N65.9.1493 $\mathrm{T3}^{+}\oplus\mathrm{Z2}^{-}\oplus\mathrm{Z4}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N65.9.1494 $\mathrm{T3}^{+}\oplus\mathrm{Z2}^{-}\oplus\mathrm{Z4}^{-}$	$\surd$	1	0	$\times$	-	-
N65.9.1495 $\mathrm{T3}^{+}\oplus\mathrm{Z1}^{-}\oplus\mathrm{Z1}^{-}$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $Cmmm$ (No. 65) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N65.9.1496 $\mathrm{T3}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.9.1497 $\mathrm{T3}^+ \oplus \mathrm{Z2}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1498 $\mathrm{T3}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N65.9.1499 $\mathrm{T3}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1500 $\mathrm{T3}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N65.9.1501 $\mathrm{T3}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z4}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1502 $\mathrm{T3}^+ \oplus \mathrm{Z2}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1503 $\mathrm{T3}^+ \oplus \mathrm{Z2}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N65.9.1504 $\mathrm{T3}^+ \oplus \mathrm{Z2}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1505 $\mathrm{T3}^+ \oplus \mathrm{Z2}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N65.9.1506 $\mathrm{T3}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1507 $\mathrm{T3}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_u}$
N65.9.1508 $\mathrm{T3}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1509 $\mathrm{T3}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.9.1510 $\mathrm{T3}^+ \oplus \mathrm{Z3}^- \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1511 $\mathrm{T3}^+ \oplus \mathrm{Z3}^- \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.9.1512 $\mathrm{T3}^+ \oplus \mathrm{Z3}^- \oplus \mathrm{Z4}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1513 $\mathrm{T3}^+ \oplus \mathrm{Z4}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1514 $\mathrm{T3}^+ \oplus \mathrm{Z4}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_u}$
N65.9.1515 $\mathrm{T3}^+ \oplus \mathrm{Z4}^- \oplus \mathrm{Z4}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1516 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^+$	$\surd$	0	0	$\surd$	-	-
N65.9.1517 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u}$
N65.9.1518 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^+$	$\surd$	0	0	$\surd$	-	-
N65.9.1519 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N65.9.1520 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y3}^+$	$\surd$	0	0	$\surd$	-	-
N65.9.1521 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B3_u}$
N65.9.1522 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1523 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1524 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1525 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u}$
N65.9.1526 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u}$
N65.9.1527 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u}$
N65.9.1528 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u}$
N65.9.1529 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u}$
N65.9.1530 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\times$	-	-
N65.9.1531 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
N65.9.1532 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
N65.9.1533 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^+$	$\surd$	0	0	$\surd$	-	-
N65.9.1534 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u}$
N65.9.1535 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^+$	$\surd$	0	0	$\surd$	-	-
N65.9.1536 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_u}$
N65.9.1537 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1538 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1539 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1540 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N65.9.1541 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u}$

Non-coplanar SSGs with parent space group $Cmmm$ (No. 65) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N65.9.1542 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u}$
N65.9.1543 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\times$	-	-
N65.9.1544 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
N65.9.1545 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
N65.9.1546 $\mathrm{Y1}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^+$	$\surd$	0	0	$\surd$	-	-
N65.9.1547 $\mathrm{Y1}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y4}^+$	$\surd$	0	0	$\surd$	-	-
N65.9.1548 $\mathrm{Y1}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u}$
N65.9.1549 $\mathrm{Y1}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N65.9.1550 $\mathrm{Y1}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1551 $\mathrm{Y1}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1552 $\mathrm{Y1}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1553 $\mathrm{Y1}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1554 $\mathrm{Y1}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B3_u}$
N65.9.1555 $\mathrm{Y1}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_u}$
N65.9.1556 $\mathrm{Y1}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N65.9.1557 $\mathrm{Y1}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N65.9.1558 $\mathrm{Y1}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N65.9.1559 $\mathrm{Y1}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N65.9.1560 $\mathrm{Y1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1561 $\mathrm{Y1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.9.1562 $\mathrm{Y1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
N65.9.1563 $\mathrm{Y1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1564 $\mathrm{Y1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1565 $\mathrm{Y1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N65.9.1566 $\mathrm{Y1}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1567 $\mathrm{Y1}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.9.1568 $\mathrm{Y1}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
N65.9.1569 $\mathrm{Y1}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1570 $\mathrm{Y1}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1571 $\mathrm{Y1}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N65.9.1572 $\mathrm{Y1}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1573 $\mathrm{Y1}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.9.1574 $\mathrm{Y1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y1}^-$	$\surd$	0	0	$\surd$	-	-
N65.9.1575 $\mathrm{Y1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N65.9.1576 $\mathrm{Y1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y2}^-$	$\surd$	0	0	$\surd$	-	-
N65.9.1577 $\mathrm{Y1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B3_u}$
N65.9.1578 $\mathrm{Y1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y3}^-$	$\surd$	0	0	$\surd$	-	-
N65.9.1579 $\mathrm{Y1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1580 $\mathrm{Y1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1581 $\mathrm{Y1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1582 $\mathrm{Y1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N65.9.1583 $\mathrm{Y1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u}$
N65.9.1584 $\mathrm{Y1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u}$
N65.9.1585 $\mathrm{Y1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N65.9.1586 $\mathrm{Y1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\times$	-	-
N65.9.1587 $\mathrm{Y1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $Cmmm$ (No. 65) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N65.9.1588 $\mathrm{Y1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
N65.9.1589 $\mathrm{Y1}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y2}^-$	$\surd$	0	0	$\surd$	-	-
N65.9.1590 $\mathrm{Y1}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_u}$
N65.9.1591 $\mathrm{Y1}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y3}^-$	$\surd$	0	0	$\surd$	-	-
N65.9.1592 $\mathrm{Y1}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1593 $\mathrm{Y1}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1594 $\mathrm{Y1}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1595 $\mathrm{Y1}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B3_u}$
N65.9.1596 $\mathrm{Y1}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Y4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_u}$
N65.9.1597 $\mathrm{Y1}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u}$
N65.9.1598 $\mathrm{Y1}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u}$
N65.9.1599 $\mathrm{Y1}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N65.9.1600 $\mathrm{Y1}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N65.9.1601 $\mathrm{Y1}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N65.9.1602 $\mathrm{Y1}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N65.9.1603 $\mathrm{Y1}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Y3}^-$	$\surd$	0	0	$\surd$	-	-
N65.9.1604 $\mathrm{Y1}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Y4}^-$	$\surd$	0	0	$\surd$	-	-
N65.9.1605 $\mathrm{Y1}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1606 $\mathrm{Y1}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1607 $\mathrm{Y1}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1608 $\mathrm{Y1}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1609 $\mathrm{Y1}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1610 $\mathrm{Y1}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.9.1611 $\mathrm{Y1}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
N65.9.1612 $\mathrm{Y1}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1613 $\mathrm{Y1}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1614 $\mathrm{Y1}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N65.9.1615 $\mathrm{Y1}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1616 $\mathrm{Y1}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.9.1617 $\mathrm{Y1}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
N65.9.1618 $\mathrm{Y1}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1619 $\mathrm{Y1}^- \oplus \mathrm{Z3}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1620 $\mathrm{Y1}^- \oplus \mathrm{Z3}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N65.9.1621 $\mathrm{Y1}^- \oplus \mathrm{Z3}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1622 $\mathrm{Y1}^- \oplus \mathrm{Z3}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.9.1623 $\mathrm{Y2}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^+$	$\surd$	0	0	$\surd$	-	-
N65.9.1624 $\mathrm{Y2}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u}$
N65.9.1625 $\mathrm{Y2}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^+$	$\surd$	0	0	$\surd$	-	-
N65.9.1626 $\mathrm{Y2}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_u} \oplus \mathrm{B2_u}$
N65.9.1627 $\mathrm{Y2}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1628 $\mathrm{Y2}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1629 $\mathrm{Y2}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1630 $\mathrm{Y2}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u}$
N65.9.1631 $\mathrm{Y2}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B2_u}$
N65.9.1632 $\mathrm{Y2}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B2_u}$
N65.9.1633 $\mathrm{Y2}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $Cmmm$ (No. 65) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N65.9.1634 $\mathrm{Y2}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
N65.9.1635 $\mathrm{Y2}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
N65.9.1636 $\mathrm{Y2}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^+$	$\surd$	0	0	$\surd$	-	-
N65.9.1637 $\mathrm{Y2}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y4}^+$	$\surd$	0	0	$\surd$	-	-
N65.9.1638 $\mathrm{Y2}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B2_u}$
N65.9.1639 $\mathrm{Y2}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u}$
N65.9.1640 $\mathrm{Y2}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1641 $\mathrm{Y2}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1642 $\mathrm{Y2}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1643 $\mathrm{Y2}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1644 $\mathrm{Y2}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_u} \oplus \mathrm{B2_u}$
N65.9.1645 $\mathrm{Y2}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_u}$
N65.9.1646 $\mathrm{Y2}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N65.9.1647 $\mathrm{Y2}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N65.9.1648 $\mathrm{Y2}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N65.9.1649 $\mathrm{Y2}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N65.9.1650 $\mathrm{Y2}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1651 $\mathrm{Y2}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.9.1652 $\mathrm{Y2}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
N65.9.1653 $\mathrm{Y2}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1654 $\mathrm{Y2}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1655 $\mathrm{Y2}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N65.9.1656 $\mathrm{Y2}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1657 $\mathrm{Y2}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.9.1658 $\mathrm{Y2}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
N65.9.1659 $\mathrm{Y2}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1660 $\mathrm{Y2}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1661 $\mathrm{Y2}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N65.9.1662 $\mathrm{Y2}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1663 $\mathrm{Y2}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.9.1664 $\mathrm{Y2}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y2}^-$	$\surd$	0	0	$\surd$	-	-
N65.9.1665 $\mathrm{Y2}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_u} \oplus \mathrm{B2_u}$
N65.9.1666 $\mathrm{Y2}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y3}^-$	$\surd$	0	0	$\surd$	-	-
N65.9.1667 $\mathrm{Y2}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1668 $\mathrm{Y2}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1669 $\mathrm{Y2}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1670 $\mathrm{Y2}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_u} \oplus \mathrm{B2_u}$
N65.9.1671 $\mathrm{Y2}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Y4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_u}$
N65.9.1672 $\mathrm{Y2}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B2_u}$
N65.9.1673 $\mathrm{Y2}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N65.9.1674 $\mathrm{Y2}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N65.9.1675 $\mathrm{Y2}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N65.9.1676 $\mathrm{Y2}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N65.9.1677 $\mathrm{Y2}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N65.9.1678 $\mathrm{Y2}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Y3}^-$	$\surd$	0	0	$\surd$	-	-
N65.9.1679 $\mathrm{Y2}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Y4}^-$	$\surd$	0	0	$\surd$	-	-

Non-coplanar SSGs with parent space group $Cmmm$ (No. 65) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N65.9.1680 $\mathrm{Y2}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1681 $\mathrm{Y2}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1682 $\mathrm{Y2}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1683 $\mathrm{Y2}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1684 $\mathrm{Y2}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1685 $\mathrm{Y2}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.9.1686 $\mathrm{Y2}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
N65.9.1687 $\mathrm{Y2}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1688 $\mathrm{Y2}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1689 $\mathrm{Y2}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N65.9.1690 $\mathrm{Y2}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1691 $\mathrm{Y2}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.9.1692 $\mathrm{Y2}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
N65.9.1693 $\mathrm{Y2}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1694 $\mathrm{Y2}^- \oplus \mathrm{Z3}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1695 $\mathrm{Y2}^- \oplus \mathrm{Z3}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N65.9.1696 $\mathrm{Y2}^- \oplus \mathrm{Z3}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1697 $\mathrm{Y2}^- \oplus \mathrm{Z3}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.9.1698 $\mathrm{Y3}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^+$	$\surd$	0	0	$\surd$	-	-
N65.9.1699 $\mathrm{Y3}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y4}^+$	$\surd$	0	0	$\surd$	-	-
N65.9.1700 $\mathrm{Y3}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u}$
N65.9.1701 $\mathrm{Y3}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N65.9.1702 $\mathrm{Y3}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u}$
N65.9.1703 $\mathrm{Y3}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1704 $\mathrm{Y3}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1705 $\mathrm{Y3}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1706 $\mathrm{Y3}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1707 $\mathrm{Y3}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1708 $\mathrm{Y3}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1709 $\mathrm{Y3}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1710 $\mathrm{Y3}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u}$
N65.9.1711 $\mathrm{Y3}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u}$
N65.9.1712 $\mathrm{Y3}^+ \oplus \mathrm{Y4}^- \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N65.9.1713 $\mathrm{Y3}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\times$	-	-
N65.9.1714 $\mathrm{Y3}^+ \oplus \mathrm{Y4}^- \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\times$	-	-
N65.9.1715 $\mathrm{Y3}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
N65.9.1716 $\mathrm{Y3}^+ \oplus \mathrm{Y4}^- \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
N65.9.1717 $\mathrm{Y3}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
N65.9.1718 $\mathrm{Y3}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N65.9.1719 $\mathrm{Y3}^+ \oplus \mathrm{Y4}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
N65.9.1720 $\mathrm{Y3}^+ \oplus \mathrm{Y4}^- \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N65.9.1721 $\mathrm{Y3}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1722 $\mathrm{Y3}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.9.1723 $\mathrm{Y3}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
N65.9.1724 $\mathrm{Y3}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1725 $\mathrm{Y3}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $Cmmm$ (No. 65) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N65.9.1726 $\mathrm{Y3}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N65.9.1727 $\mathrm{Y3}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1728 $\mathrm{Y3}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\times$	-	-
N65.9.1729 $\mathrm{Y3}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1730 $\mathrm{Y3}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.9.1731 $\mathrm{Y3}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
N65.9.1732 $\mathrm{Y3}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1733 $\mathrm{Y3}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\times$	-	-
N65.9.1734 $\mathrm{Y3}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z4}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1735 $\mathrm{Y3}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1736 $\mathrm{Y3}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N65.9.1737 $\mathrm{Y3}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1738 $\mathrm{Y3}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.9.1739 $\mathrm{Y3}^+ \oplus \mathrm{Z3}^- \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1740 $\mathrm{Y3}^+ \oplus \mathrm{Z3}^- \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.9.1741 $\mathrm{Y3}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Y3}^-$	$\surd$	0	0	$\surd$	-	-
N65.9.1742 $\mathrm{Y3}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Y4}^-$	$\surd$	0	0	$\surd$	-	-
N65.9.1743 $\mathrm{Y3}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1744 $\mathrm{Y3}^- \oplus \mathrm{Y4}^- \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1745 $\mathrm{Y3}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1746 $\mathrm{Y3}^- \oplus \mathrm{Y4}^- \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1747 $\mathrm{Y3}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1748 $\mathrm{Y3}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1749 $\mathrm{Y3}^- \oplus \mathrm{Y4}^- \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1750 $\mathrm{Y3}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1751 $\mathrm{Y3}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.9.1752 $\mathrm{Y3}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
N65.9.1753 $\mathrm{Y3}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1754 $\mathrm{Y3}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1755 $\mathrm{Y3}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N65.9.1756 $\mathrm{Y3}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1757 $\mathrm{Y3}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\times$	-	-
N65.9.1758 $\mathrm{Y3}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1759 $\mathrm{Y3}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.9.1760 $\mathrm{Y3}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
N65.9.1761 $\mathrm{Y3}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1762 $\mathrm{Y3}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\times$	-	-
N65.9.1763 $\mathrm{Y3}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z4}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1764 $\mathrm{Y3}^- \oplus \mathrm{Z3}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1765 $\mathrm{Y3}^- \oplus \mathrm{Z3}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N65.9.1766 $\mathrm{Y3}^- \oplus \mathrm{Z3}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N65.9.1767 $\mathrm{Y3}^- \oplus \mathrm{Z3}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.9.1768 $\mathrm{Y3}^- \oplus \mathrm{Z3}^- \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N65.9.1769 $\mathrm{Y3}^- \oplus \mathrm{Z3}^- \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.9.1770 $\mathrm{Z1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^+$	$\surd$	0	0	$\surd$	-	-
N65.9.1771 $\mathrm{Z1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u}$

Non-coplanar SSGs with parent space group $Cmmm$ (No. 65) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N65.9.1772 $\mathrm{Z1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u}$
N65.9.1773 $\mathrm{Z1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^+$	$\surd$	0	0	$\surd$	-	-
N65.9.1774 $\mathrm{Z1}^+ \oplus \mathrm{Z2}^- \oplus \mathrm{Z1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u}$
N65.9.1775 $\mathrm{Z1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^+$	$\surd$	0	0	$\surd$	-	-
N65.9.1776 $\mathrm{Z1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B3_u}$
N65.9.1777 $\mathrm{Z1}^+ \oplus \mathrm{Z2}^- \oplus \mathrm{Z3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N65.9.1778 $\mathrm{Z1}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u}$
N65.9.1779 $\mathrm{Z1}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u}$
N65.9.1780 $\mathrm{Z1}^+ \oplus \mathrm{Z2}^+ \oplus \mathrm{Z2}^+$	$\surd$	0	0	$\surd$	-	-
N65.9.1781 $\mathrm{Z1}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u}$
N65.9.1782 $\mathrm{Z1}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u}$
N65.9.1783 $\mathrm{Z1}^+ \oplus \mathrm{Z2}^+ \oplus \mathrm{Z3}^+$	$\surd$	0	0	$\surd$	-	-
N65.9.1784 $\mathrm{Z1}^+ \oplus \mathrm{Z2}^+ \oplus \mathrm{Z3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_u}$
N65.9.1785 $\mathrm{Z1}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z3}^+$	$\surd$	0	0	$\surd$	-	-
N65.9.1786 $\mathrm{Z1}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u}$
N65.9.1787 $\mathrm{Z1}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z4}^+$	$\surd$	0	0	$\surd$	-	-
N65.9.1788 $\mathrm{Z1}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N65.9.1789 $\mathrm{Z1}^+ \oplus \mathrm{Z3}^- \oplus \mathrm{Z3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B3_u}$
N65.9.1790 $\mathrm{Z1}^+ \oplus \mathrm{Z3}^- \oplus \mathrm{Z4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_u}$
N65.9.1791 $\mathrm{Z1}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z1}^-$	$\surd$	0	0	$\surd$	-	-
N65.9.1792 $\mathrm{Z1}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N65.9.1793 $\mathrm{Z1}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B3_u}$
N65.9.1794 $\mathrm{Z1}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z3}^-$	$\surd$	0	0	$\surd$	-	-
N65.9.1795 $\mathrm{Z1}^- \oplus \mathrm{Z2}^+ \oplus \mathrm{Z3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u}$
N65.9.1796 $\mathrm{Z1}^- \oplus \mathrm{Z3}^+ \oplus \mathrm{Z3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B3_u}$
N65.9.1797 $\mathrm{Z1}^- \oplus \mathrm{Z3}^+ \oplus \mathrm{Z3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u}$
N65.9.1798 $\mathrm{Z1}^- \oplus \mathrm{Z3}^+ \oplus \mathrm{Z4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_u}$
N65.9.1799 $\mathrm{Z1}^- \oplus \mathrm{Z3}^+ \oplus \mathrm{Z4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u}$
N65.9.1800 $\mathrm{Z1}^- \oplus \mathrm{Z3}^- \oplus \mathrm{Z3}^-$	$\surd$	0	0	$\surd$	-	-
N65.9.1801 $\mathrm{Z1}^- \oplus \mathrm{Z3}^- \oplus \mathrm{Z4}^-$	$\surd$	0	0	$\surd$	-	-
N65.9.1802 $\mathrm{Z3}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z3}^+$	$\surd$	0	0	$\surd$	-	-
N65.9.1803 $\mathrm{Z3}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u}$
N65.9.1804 $\mathrm{Z3}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z4}^+$	$\surd$	0	0	$\surd$	-	-
N65.9.1805 $\mathrm{Z3}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N65.9.1806 $\mathrm{Z3}^+ \oplus \mathrm{Z3}^- \oplus \mathrm{Z4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u}$
N65.13.1 $\mathrm{GM1}^- \oplus \mathrm{S1}^+$	$\surd$	1	0	$\times$	-	-
N65.13.2 $\mathrm{GM1}^- \oplus \mathrm{S1}^-$	$\surd$	1	0	$\times$	-	-
N65.13.3 $\mathrm{GM1}^- \oplus \mathrm{R1}^+$	$\surd$	1	0	$\times$	-	-
N65.13.4 $\mathrm{GM2}^+ \oplus \mathrm{S1}^+$	$\surd$	1	1	$\times$	-	-
N65.13.5 $\mathrm{GM2}^+ \oplus \mathrm{S1}^-$	$\surd$	1	1	$\times$	-	-
N65.13.6 $\mathrm{GM2}^+ \oplus \mathrm{R1}^+$	$\surd$	1	1	$\times$	-	-
N65.13.7 $\mathrm{GM2}^- \oplus \mathrm{S1}^+$	$\surd$	1	0	$\times$	-	-
N65.13.8 $\mathrm{GM2}^- \oplus \mathrm{S1}^-$	$\surd$	1	0	$\times$	-	-
N65.13.9 $\mathrm{GM2}^- \oplus \mathrm{R1}^+$	$\surd$	1	0	$\times$	-	-
N65.13.10 $\mathrm{GM3}^+ \oplus \mathrm{S1}^+$	$\surd$	1	1	$\times$	-	-
N65.13.11 $\mathrm{GM3}^+ \oplus \mathrm{S1}^-$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $Cmmm$ (No. 65) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N65.13.12 $\mathrm{GM3}^+ \oplus \mathrm{R1}^+$	$\surd$	1	1	$\times$	-	-
N65.13.13 $\mathrm{GM3}^- \oplus \mathrm{S1}^+$	$\surd$	1	0	$\times$	-	-
N65.13.14 $\mathrm{GM3}^- \oplus \mathrm{S1}^-$	$\surd$	1	0	$\times$	-	-
N65.13.15 $\mathrm{GM3}^- \oplus \mathrm{R1}^+$	$\surd$	1	0	$\times$	-	-
N65.13.16 $\mathrm{T1}^+ \oplus \mathrm{S1}^+$	$\times$	-	-	-	-	-
N65.13.17 $\mathrm{T1}^+ \oplus \mathrm{S1}^-$	$\times$	-	-	-	-	-
N65.13.18 $\mathrm{T1}^+ \oplus \mathrm{R1}^+$	$\times$	-	-	-	-	-
N65.13.19 $\mathrm{T1}^+ \oplus \mathrm{R1}^-$	$\times$	-	-	-	-	-
N65.13.20 $\mathrm{T1}^- \oplus \mathrm{S1}^+$	$\times$	-	-	-	-	-
N65.13.21 $\mathrm{T1}^- \oplus \mathrm{S1}^-$	$\times$	-	-	-	-	-
N65.13.22 $\mathrm{T1}^- \oplus \mathrm{R1}^+$	$\times$	-	-	-	-	-
N65.13.23 $\mathrm{T1}^- \oplus \mathrm{R1}^-$	$\times$	-	-	-	-	-
N65.13.24 $\mathrm{T3}^+ \oplus \mathrm{S1}^+$	$\times$	-	-	-	-	-
N65.13.25 $\mathrm{T3}^+ \oplus \mathrm{S1}^-$	$\times$	-	-	-	-	-
N65.13.26 $\mathrm{T3}^+ \oplus \mathrm{R1}^+$	$\times$	-	-	-	-	-
N65.13.27 $\mathrm{T3}^+ \oplus \mathrm{R1}^-$	$\times$	-	-	-	-	-
N65.13.28 $\mathrm{Y1}^+ \oplus \mathrm{S1}^+$	$\times$	-	-	-	-	-
N65.13.29 $\mathrm{Y1}^+ \oplus \mathrm{S1}^-$	$\times$	-	-	-	-	-
N65.13.30 $\mathrm{Y1}^+ \oplus \mathrm{R1}^+$	$\times$	-	-	-	-	-
N65.13.31 $\mathrm{Y1}^- \oplus \mathrm{S1}^+$	$\times$	-	-	-	-	-
N65.13.32 $\mathrm{Y1}^- \oplus \mathrm{S1}^-$	$\times$	-	-	-	-	-
N65.13.33 $\mathrm{Y1}^- \oplus \mathrm{R1}^+$	$\times$	-	-	-	-	-
N65.13.34 $\mathrm{Y2}^+ \oplus \mathrm{S1}^+$	$\times$	-	-	-	-	-
N65.13.35 $\mathrm{Y2}^+ \oplus \mathrm{S1}^-$	$\times$	-	-	-	-	-
N65.13.36 $\mathrm{Y2}^+ \oplus \mathrm{R1}^+$	$\times$	-	-	-	-	-
N65.13.37 $\mathrm{Y2}^- \oplus \mathrm{S1}^+$	$\times$	-	-	-	-	-
N65.13.38 $\mathrm{Y2}^- \oplus \mathrm{S1}^-$	$\times$	-	-	-	-	-
N65.13.39 $\mathrm{Y2}^- \oplus \mathrm{R1}^+$	$\times$	-	-	-	-	-
N65.13.40 $\mathrm{Y3}^+ \oplus \mathrm{S1}^+$	$\times$	-	-	-	-	-
N65.13.41 $\mathrm{Y3}^+ \oplus \mathrm{S1}^-$	$\times$	-	-	-	-	-
N65.13.42 $\mathrm{Y3}^+ \oplus \mathrm{R1}^+$	$\times$	-	-	-	-	-
N65.13.43 $\mathrm{Y3}^- \oplus \mathrm{S1}^+$	$\times$	-	-	-	-	-
N65.13.44 $\mathrm{Y3}^- \oplus \mathrm{S1}^-$	$\times$	-	-	-	-	-
N65.13.45 $\mathrm{Y3}^- \oplus \mathrm{R1}^+$	$\times$	-	-	-	-	-
N65.13.46 $\mathrm{Z1}^+ \oplus \mathrm{S1}^+$	$\times$	-	-	-	-	-
N65.13.47 $\mathrm{Z1}^+ \oplus \mathrm{S1}^-$	$\times$	-	-	-	-	-
N65.13.48 $\mathrm{Z1}^+ \oplus \mathrm{R1}^+$	$\times$	-	-	-	-	-
N65.13.49 $\mathrm{Z1}^+ \oplus \mathrm{R1}^-$	$\times$	-	-	-	-	-
N65.13.50 $\mathrm{Z1}^- \oplus \mathrm{S1}^+$	$\times$	-	-	-	-	-
N65.13.51 $\mathrm{Z1}^- \oplus \mathrm{S1}^-$	$\times$	-	-	-	-	-
N65.13.52 $\mathrm{Z1}^- \oplus \mathrm{R1}^+$	$\times$	-	-	-	-	-
N65.13.53 $\mathrm{Z1}^- \oplus \mathrm{R1}^-$	$\times$	-	-	-	-	-
N65.13.54 $\mathrm{Z3}^+ \oplus \mathrm{S1}^+$	$\times$	-	-	-	-	-
N65.13.55 $\mathrm{Z3}^+ \oplus \mathrm{S1}^-$	$\times$	-	-	-	-	-
N65.13.56 $\mathrm{Z3}^+ \oplus \mathrm{R1}^+$	$\times$	-	-	-	-	-
N65.13.57 $\mathrm{Z3}^+ \oplus \mathrm{R1}^-$	$\times$	-	-	-	-	-

Non-coplanar SSGs with parent space group $Cmmm$ (No. 65) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N65.14.1 GM1$^-$ ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N65.14.2 GM1$^-$ ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
N65.14.3 GM1$^-$ ⊕ DT3	√	1	1	√	mmm	$\mathrm{B2_u}$
N65.14.4 GM1$^-$ ⊕ DT4	√	1	1	√	mmm	$\mathrm{B2_u}$
N65.14.5 GM1$^-$ ⊕ A1	√	1	1	×	-	-
N65.14.6 GM1$^-$ ⊕ A2	√	1	1	×	-	-
N65.14.7 GM1$^-$ ⊕ LD1	√	1	1	√	mmm	$\mathrm{B1_u}$
N65.14.8 GM1$^-$ ⊕ LD2	√	1	1	√	mmm	$\mathrm{B1_u}$
N65.14.9 GM1$^-$ ⊕ LD3	√	1	1	√	mmm	$\mathrm{B1_u}$
N65.14.10 GM1$^-$ ⊕ H1	√	1	1	×	-	-
N65.14.11 GM1$^-$ ⊕ H2	√	1	1	×	-	-
N65.14.12 GM1$^-$ ⊕ H3	√	1	1	×	-	-
N65.14.13 GM2$^+$ ⊕ DT1	√	1	1	√	$mm2$	B2
N65.14.14 GM2$^+$ ⊕ DT2	√	1	1	√	$mm2$	B2
N65.14.15 GM2$^+$ ⊕ DT3	√	1	1	√	$mm2$	B2
N65.14.16 GM2$^+$ ⊕ DT4	√	1	1	√	$mm2$	B2
N65.14.17 GM2$^+$ ⊕ A1	√	1	1	×	-	-
N65.14.18 GM2$^+$ ⊕ A2	√	1	1	×	-	-
N65.14.19 GM2$^+$ ⊕ LD1	√	1	1	√	222	B1
N65.14.20 GM2$^+$ ⊕ LD2	√	1	1	√	222	B1
N65.14.21 GM2$^+$ ⊕ LD3	√	1	1	√	222	B1
N65.14.22 GM2$^+$ ⊕ H1	√	1	1	√	222	B1
N65.14.23 GM2$^+$ ⊕ H2	√	1	1	√	222	B1
N65.14.24 GM2$^+$ ⊕ H3	√	1	1	√	222	B1
N65.14.25 GM2$^-$ ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N65.14.26 GM2$^-$ ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
N65.14.27 GM2$^-$ ⊕ DT3	√	1	1	√	mmm	$\mathrm{B2_u}$
N65.14.28 GM2$^-$ ⊕ DT4	√	1	1	√	mmm	$\mathrm{B2_u}$
N65.14.29 GM2$^-$ ⊕ A1	√	1	1	×	-	-
N65.14.30 GM2$^-$ ⊕ A2	√	1	1	×	-	-
N65.14.31 GM2$^-$ ⊕ LD1	√	1	1	√	mmm	$\mathrm{B1_u}$
N65.14.32 GM2$^-$ ⊕ LD2	√	1	1	√	mmm	$\mathrm{B1_u}$
N65.14.33 GM2$^-$ ⊕ LD3	√	1	1	√	mmm	$\mathrm{B1_u}$
N65.14.34 GM2$^-$ ⊕ H1	√	1	1	×	-	-
N65.14.35 GM2$^-$ ⊕ H2	√	1	1	×	-	-
N65.14.36 GM2$^-$ ⊕ H3	√	1	1	×	-	-
N65.14.37 GM3$^+$ ⊕ SM1	√	1	1	√	222	B3
N65.14.38 GM3$^+$ ⊕ DT1	√	1	1	√	$mm2$	B2
N65.14.39 GM3$^+$ ⊕ SM2	√	1	1	√	222	B3
N65.14.40 GM3$^+$ ⊕ DT2	√	1	1	√	$mm2$	B2
N65.14.41 GM3$^+$ ⊕ SM3	√	1	1	√	222	B3
N65.14.42 GM3$^+$ ⊕ DT3	√	1	1	√	$mm2$	B2
N65.14.43 GM3$^+$ ⊕ SM4	√	1	1	√	222	B3
N65.14.44 GM3$^+$ ⊕ DT4	√	1	1	√	$mm2$	B2
N65.14.45 GM3$^+$ ⊕ A1	√	1	1	×	-	-
N65.14.46 GM3$^+$ ⊕ B1	√	1	1	×	-	-

Non-coplanar SSGs with parent space group $Cmmm$ (No. 65) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N65.14.47 GM3$^+$ ⊕ A2	√	1	1	×	-	-
N65.14.48 GM3$^+$ ⊕ B2	√	1	1	×	-	-
N65.14.49 GM3$^+$ ⊕ LD1	√	1	1	√	$mm2$	B2
N65.14.50 GM3$^+$ ⊕ LD2	√	1	1	√	$mm2$	B2
N65.14.51 GM3$^+$ ⊕ LD3	√	1	1	√	$mm2$	B2
N65.14.52 GM3$^+$ ⊕ LD4	√	1	1	√	$mm2$	B2
N65.14.53 GM3$^+$ ⊕ H1	√	1	1	×	-	-
N65.14.54 GM3$^+$ ⊕ H2	√	1	1	×	-	-
N65.14.55 GM3$^+$ ⊕ H3	√	1	1	×	-	-
N65.14.56 GM3$^+$ ⊕ H4	√	1	1	×	-	-
N65.14.57 GM3$^-$ ⊕ SM1	√	1	1	√	mmm	$\mathrm{B3_u}$
N65.14.58 GM3$^-$ ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N65.14.59 GM3$^-$ ⊕ SM2	√	1	1	√	mmm	$\mathrm{B3_u}$
N65.14.60 GM3$^-$ ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
N65.14.61 GM3$^-$ ⊕ SM3	√	1	1	√	mmm	$\mathrm{B3_u}$
N65.14.62 GM3$^-$ ⊕ DT3	√	1	1	√	mmm	$\mathrm{B2_u}$
N65.14.63 GM3$^-$ ⊕ SM4	√	1	1	√	mmm	$\mathrm{B3_u}$
N65.14.64 GM3$^-$ ⊕ DT4	√	1	1	√	mmm	$\mathrm{B2_u}$
N65.14.65 GM3$^-$ ⊕ A1	√	1	1	×	-	-
N65.14.66 GM3$^-$ ⊕ B1	√	1	1	×	-	-
N65.14.67 GM3$^-$ ⊕ A2	√	1	1	×	-	-
N65.14.68 GM3$^-$ ⊕ B2	√	1	1	×	-	-
N65.14.69 GM3$^-$ ⊕ LD1	√	1	1	√	mmm	$\mathrm{B1_u}$
N65.14.70 GM3$^-$ ⊕ LD2	√	1	1	√	mmm	$\mathrm{B1_u}$
N65.14.71 GM3$^-$ ⊕ LD3	√	1	1	√	mmm	$\mathrm{B1_u}$
N65.14.72 GM3$^-$ ⊕ LD4	√	1	1	√	mmm	$\mathrm{B1_u}$
N65.14.73 GM3$^-$ ⊕ H1	√	1	1	×	-	-
N65.14.74 GM3$^-$ ⊕ H2	√	1	1	×	-	-
N65.14.75 GM3$^-$ ⊕ H3	√	1	1	×	-	-
N65.14.76 GM3$^-$ ⊕ H4	√	1	1	×	-	-
N65.14.77 T1$^+$ ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N65.14.78 T1$^+$ ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
N65.14.79 T1$^+$ ⊕ DT3	√	1	1	√	mmm	$\mathrm{B2_u}$
N65.14.80 T1$^+$ ⊕ DT4	√	1	1	√	mmm	$\mathrm{B2_u}$
N65.14.81 T1$^+$ ⊕ A1	√	1	1	√	mmm	$\mathrm{B3_u}$
N65.14.82 T1$^+$ ⊕ A3	√	1	1	√	mmm	$\mathrm{B3_u}$
N65.14.83 T1$^+$ ⊕ A2	√	1	1	√	mmm	$\mathrm{B3_u}$
N65.14.84 T1$^+$ ⊕ A4	√	1	1	√	mmm	$\mathrm{B3_u}$
N65.14.85 T1$^+$ ⊕ LD1	√	1	1	√	mmm	$\mathrm{B1_u}$
N65.14.86 T1$^+$ ⊕ LD2	√	1	1	√	mmm	$\mathrm{B1_u}$
N65.14.87 T1$^+$ ⊕ LD3	√	1	1	√	mmm	$\mathrm{B1_u}$
N65.14.88 T1$^+$ ⊕ H1	√	1	1	√	mmm	$\mathrm{B1_u}$
N65.14.89 T1$^+$ ⊕ H2	√	1	1	√	mmm	$\mathrm{B1_u}$
N65.14.90 T1$^+$ ⊕ H3	√	1	1	√	mmm	$\mathrm{B1_u}$
N65.14.91 T1$^-$ ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N65.14.92 T1$^-$ ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$

Non-coplanar SSGs with parent space group $Cmmm$ (No. 65) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N65.14.93 $\mathrm{T1}^{-} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N65.14.94 $\mathrm{T1}^{-} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N65.14.95 $\mathrm{T1}^{-} \oplus \mathrm{A1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N65.14.96 $\mathrm{T1}^{-} \oplus \mathrm{A3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N65.14.97 $\mathrm{T1}^{-} \oplus \mathrm{A2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N65.14.98 $\mathrm{T1}^{-} \oplus \mathrm{A4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N65.14.99 $\mathrm{T1}^{-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.14.100 $\mathrm{T1}^{-} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.14.101 $\mathrm{T1}^{-} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.14.102 $\mathrm{T1}^{-} \oplus \mathrm{H1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.14.103 $\mathrm{T1}^{-} \oplus \mathrm{H2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.14.104 $\mathrm{T1}^{-} \oplus \mathrm{H3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.14.105 $\mathrm{T3}^{+} \oplus \mathrm{SM1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N65.14.106 $\mathrm{T3}^{+} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N65.14.107 $\mathrm{T3}^{+} \oplus \mathrm{SM2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N65.14.108 $\mathrm{T3}^{+} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N65.14.109 $\mathrm{T3}^{+} \oplus \mathrm{SM3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N65.14.110 $\mathrm{T3}^{+} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N65.14.111 $\mathrm{T3}^{+} \oplus \mathrm{SM4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N65.14.112 $\mathrm{T3}^{+} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N65.14.113 $\mathrm{T3}^{+} \oplus \mathrm{A1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N65.14.114 $\mathrm{T3}^{+} \oplus \mathrm{A3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N65.14.115 $\mathrm{T3}^{+} \oplus \mathrm{B1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N65.14.116 $\mathrm{T3}^{+} \oplus \mathrm{B3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N65.14.117 $\mathrm{T3}^{+} \oplus \mathrm{A2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N65.14.118 $\mathrm{T3}^{+} \oplus \mathrm{A4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N65.14.119 $\mathrm{T3}^{+} \oplus \mathrm{B2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N65.14.120 $\mathrm{T3}^{+} \oplus \mathrm{B4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N65.14.121 $\mathrm{T3}^{+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.14.122 $\mathrm{T3}^{+} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.14.123 $\mathrm{T3}^{+} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.14.124 $\mathrm{T3}^{+} \oplus \mathrm{LD4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.14.125 $\mathrm{T3}^{+} \oplus \mathrm{H1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.14.126 $\mathrm{T3}^{+} \oplus \mathrm{H2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.14.127 $\mathrm{T3}^{+} \oplus \mathrm{H3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.14.128 $\mathrm{T3}^{+} \oplus \mathrm{H4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.14.129 $\mathrm{Y1}^{+} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N65.14.130 $\mathrm{Y1}^{+} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N65.14.131 $\mathrm{Y1}^{+} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N65.14.132 $\mathrm{Y1}^{+} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N65.14.133 $\mathrm{Y1}^{+} \oplus \mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N65.14.134 $\mathrm{Y1}^{+} \oplus \mathrm{A2}$	$\surd$	1	1	$\times$	-	-
N65.14.135 $\mathrm{Y1}^{+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.14.136 $\mathrm{Y1}^{+} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.14.137 $\mathrm{Y1}^{+} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.14.138 $\mathrm{Y1}^{+} \oplus \mathrm{H1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$

Non-coplanar SSGs with parent space group $Cmmm$ (No. 65) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N65.14.139 $\mathrm{Y1}^{+} \oplus \mathrm{H2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.14.140 $\mathrm{Y1}^{+} \oplus \mathrm{H3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.14.141 $\mathrm{Y1}^{-} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N65.14.142 $\mathrm{Y1}^{-} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N65.14.143 $\mathrm{Y1}^{-} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N65.14.144 $\mathrm{Y1}^{-} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N65.14.145 $\mathrm{Y1}^{-} \oplus \mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N65.14.146 $\mathrm{Y1}^{-} \oplus \mathrm{A2}$	$\surd$	1	1	$\times$	-	-
N65.14.147 $\mathrm{Y1}^{-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.14.148 $\mathrm{Y1}^{-} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.14.149 $\mathrm{Y1}^{-} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.14.150 $\mathrm{Y1}^{-} \oplus \mathrm{H1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.14.151 $\mathrm{Y1}^{-} \oplus \mathrm{H2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.14.152 $\mathrm{Y1}^{-} \oplus \mathrm{H3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.14.153 $\mathrm{Y2}^{+} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N65.14.154 $\mathrm{Y2}^{+} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N65.14.155 $\mathrm{Y2}^{+} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N65.14.156 $\mathrm{Y2}^{+} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N65.14.157 $\mathrm{Y2}^{+} \oplus \mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N65.14.158 $\mathrm{Y2}^{+} \oplus \mathrm{A2}$	$\surd$	1	1	$\times$	-	-
N65.14.159 $\mathrm{Y2}^{+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.14.160 $\mathrm{Y2}^{+} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.14.161 $\mathrm{Y2}^{+} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.14.162 $\mathrm{Y2}^{+} \oplus \mathrm{H1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.14.163 $\mathrm{Y2}^{+} \oplus \mathrm{H2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.14.164 $\mathrm{Y2}^{+} \oplus \mathrm{H3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.14.165 $\mathrm{Y2}^{-} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N65.14.166 $\mathrm{Y2}^{-} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N65.14.167 $\mathrm{Y2}^{-} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N65.14.168 $\mathrm{Y2}^{-} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N65.14.169 $\mathrm{Y2}^{-} \oplus \mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N65.14.170 $\mathrm{Y2}^{-} \oplus \mathrm{A2}$	$\surd$	1	1	$\times$	-	-
N65.14.171 $\mathrm{Y2}^{-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.14.172 $\mathrm{Y2}^{-} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.14.173 $\mathrm{Y2}^{-} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.14.174 $\mathrm{Y2}^{-} \oplus \mathrm{H1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.14.175 $\mathrm{Y2}^{-} \oplus \mathrm{H2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.14.176 $\mathrm{Y2}^{-} \oplus \mathrm{H3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.14.177 $\mathrm{Y3}^{+} \oplus \mathrm{SM1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N65.14.178 $\mathrm{Y3}^{+} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N65.14.179 $\mathrm{Y3}^{+} \oplus \mathrm{SM2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N65.14.180 $\mathrm{Y3}^{+} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N65.14.181 $\mathrm{Y3}^{+} \oplus \mathrm{SM3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N65.14.182 $\mathrm{Y3}^{+} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N65.14.183 $\mathrm{Y3}^{+} \oplus \mathrm{SM4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N65.14.184 $\mathrm{Y3}^{+} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$

Non-coplanar SSGs with parent space group $Cmmm$ (No. 65) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N65.14.185 $\mathrm{Y3}^{+} \oplus \mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N65.14.186 $\mathrm{Y3}^{+} \oplus \mathrm{B1}$	$\surd$	1	1	$\times$	-	-
N65.14.187 $\mathrm{Y3}^{+} \oplus \mathrm{A2}$	$\surd$	1	1	$\times$	-	-
N65.14.188 $\mathrm{Y3}^{+} \oplus \mathrm{B2}$	$\surd$	1	1	$\times$	-	-
N65.14.189 $\mathrm{Y3}^{+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.14.190 $\mathrm{Y3}^{+} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.14.191 $\mathrm{Y3}^{+} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.14.192 $\mathrm{Y3}^{+} \oplus \mathrm{LD4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.14.193 $\mathrm{Y3}^{+} \oplus \mathrm{H1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.14.194 $\mathrm{Y3}^{+} \oplus \mathrm{H2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.14.195 $\mathrm{Y3}^{+} \oplus \mathrm{H3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.14.196 $\mathrm{Y3}^{+} \oplus \mathrm{H4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.14.197 $\mathrm{Y3}^{-} \oplus \mathrm{SM1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N65.14.198 $\mathrm{Y3}^{-} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N65.14.199 $\mathrm{Y3}^{-} \oplus \mathrm{SM2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N65.14.200 $\mathrm{Y3}^{-} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N65.14.201 $\mathrm{Y3}^{-} \oplus \mathrm{SM3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N65.14.202 $\mathrm{Y3}^{-} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N65.14.203 $\mathrm{Y3}^{-} \oplus \mathrm{SM4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N65.14.204 $\mathrm{Y3}^{-} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N65.14.205 $\mathrm{Y3}^{-} \oplus \mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N65.14.206 $\mathrm{Y3}^{-} \oplus \mathrm{B1}$	$\surd$	1	1	$\times$	-	-
N65.14.207 $\mathrm{Y3}^{-} \oplus \mathrm{A2}$	$\surd$	1	1	$\times$	-	-
N65.14.208 $\mathrm{Y3}^{-} \oplus \mathrm{B2}$	$\surd$	1	1	$\times$	-	-
N65.14.209 $\mathrm{Y3}^{-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.14.210 $\mathrm{Y3}^{-} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.14.211 $\mathrm{Y3}^{-} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.14.212 $\mathrm{Y3}^{-} \oplus \mathrm{LD4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.14.213 $\mathrm{Y3}^{-} \oplus \mathrm{H1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.14.214 $\mathrm{Y3}^{-} \oplus \mathrm{H2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.14.215 $\mathrm{Y3}^{-} \oplus \mathrm{H3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.14.216 $\mathrm{Y3}^{-} \oplus \mathrm{H4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.14.217 $\mathrm{Z1}^{+} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N65.14.218 $\mathrm{Z1}^{+} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N65.14.219 $\mathrm{Z1}^{+} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N65.14.220 $\mathrm{Z1}^{+} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N65.14.221 $\mathrm{Z1}^{+} \oplus \mathrm{A1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N65.14.222 $\mathrm{Z1}^{+} \oplus \mathrm{A3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N65.14.223 $\mathrm{Z1}^{+} \oplus \mathrm{A2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N65.14.224 $\mathrm{Z1}^{+} \oplus \mathrm{A4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N65.14.225 $\mathrm{Z1}^{+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.14.226 $\mathrm{Z1}^{+} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.14.227 $\mathrm{Z1}^{+} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N65.14.228 $\mathrm{Z1}^{+} \oplus \mathrm{H1}$	$\surd$	1	1	$\times$	-	-
N65.14.229 $\mathrm{Z1}^{+} \oplus \mathrm{H2}$	$\surd$	1	1	$\times$	-	-
N65.14.230 $\mathrm{Z1}^{+} \oplus \mathrm{H3}$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $Cmmm$ (No. 65) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N65.14.231 Z1$^-$ ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N65.14.232 Z1$^-$ ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
N65.14.233 Z1$^-$ ⊕ DT3	√	1	1	√	mmm	$\mathrm{B2_u}$
N65.14.234 Z1$^-$ ⊕ DT4	√	1	1	√	mmm	$\mathrm{B2_u}$
N65.14.235 Z1$^-$ ⊕ A1	√	1	1	√	mmm	$\mathrm{B3_u}$
N65.14.236 Z1$^-$ ⊕ A3	√	1	1	√	mmm	$\mathrm{B3_u}$
N65.14.237 Z1$^-$ ⊕ A2	√	1	1	√	mmm	$\mathrm{B3_u}$
N65.14.238 Z1$^-$ ⊕ A4	√	1	1	√	mmm	$\mathrm{B3_u}$
N65.14.239 Z1$^-$ ⊕ LD1	√	1	1	√	mmm	$\mathrm{B1_u}$
N65.14.240 Z1$^-$ ⊕ LD2	√	1	1	√	mmm	$\mathrm{B1_u}$
N65.14.241 Z1$^-$ ⊕ LD3	√	1	1	√	mmm	$\mathrm{B1_u}$
N65.14.242 Z1$^-$ ⊕ H1	√	1	1	×	-	-
N65.14.243 Z1$^-$ ⊕ H2	√	1	1	×	-	-
N65.14.244 Z1$^-$ ⊕ H3	√	1	1	×	-	-
N65.14.245 Z3$^+$ ⊕ SM1	√	1	1	√	mmm	$\mathrm{B3_u}$
N65.14.246 Z3$^+$ ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N65.14.247 Z3$^+$ ⊕ SM2	√	1	1	√	mmm	$\mathrm{B3_u}$
N65.14.248 Z3$^+$ ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
N65.14.249 Z3$^+$ ⊕ SM3	√	1	1	√	mmm	$\mathrm{B3_u}$
N65.14.250 Z3$^+$ ⊕ DT3	√	1	1	√	mmm	$\mathrm{B2_u}$
N65.14.251 Z3$^+$ ⊕ SM4	√	1	1	√	mmm	$\mathrm{B3_u}$
N65.14.252 Z3$^+$ ⊕ DT4	√	1	1	√	mmm	$\mathrm{B2_u}$
N65.14.253 Z3$^+$ ⊕ A1	√	1	1	√	mmm	$\mathrm{B3_u}$
N65.14.254 Z3$^+$ ⊕ A3	√	1	1	√	mmm	$\mathrm{B3_u}$
N65.14.255 Z3$^+$ ⊕ B1	√	1	1	√	mmm	$\mathrm{B2_u}$
N65.14.256 Z3$^+$ ⊕ B3	√	1	1	√	mmm	$\mathrm{B2_u}$
N65.14.257 Z3$^+$ ⊕ A2	√	1	1	√	mmm	$\mathrm{B3_u}$
N65.14.258 Z3$^+$ ⊕ A4	√	1	1	√	mmm	$\mathrm{B3_u}$
N65.14.259 Z3$^+$ ⊕ B2	√	1	1	√	mmm	$\mathrm{B2_u}$
N65.14.260 Z3$^+$ ⊕ B4	√	1	1	√	mmm	$\mathrm{B2_u}$
N65.14.261 Z3$^+$ ⊕ LD1	√	1	1	√	mmm	$\mathrm{B1_u}$
N65.14.262 Z3$^+$ ⊕ LD2	√	1	1	√	mmm	$\mathrm{B1_u}$
N65.14.263 Z3$^+$ ⊕ LD3	√	1	1	√	mmm	$\mathrm{B1_u}$
N65.14.264 Z3$^+$ ⊕ LD4	√	1	1	√	mmm	$\mathrm{B1_u}$
N65.14.265 Z3$^+$ ⊕ H1	√	1	1	×	-	-
N65.14.266 Z3$^+$ ⊕ H2	√	1	1	×	-	-
N65.14.267 Z3$^+$ ⊕ H3	√	1	1	×	-	-
N65.14.268 Z3$^+$ ⊕ H4	√	1	1	×	-	-

TABLE S196: Collinear SSGs with parent space group $Cccm$ (No. 66).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L66.1.1 GM1$^+$	1	mmm	$\mathrm{A_g}$
L66.2.1 GM1$^-$	0	-	-
L66.2.2 GM2$^+$	1	mmm	$\mathrm{B1_g}$
L66.2.3 GM2$^-$	0	-	-

Collinear SSGs with parent space group $Cccm$ (No. 66)(continued)

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L66.2.4 $\mathrm{GM3}^{+}$	1	mmm	$\mathrm{B3_g}$
L66.2.5 $\mathrm{GM3}^{-}$	0	-	-
L66.2.6 $\mathrm{Y1}^{+}$	0	-	-
L66.2.7 $\mathrm{Y1}^{-}$	0	-	-
L66.2.8 $\mathrm{Y2}^{+}$	0	-	-
L66.2.9 $\mathrm{Y2}^{-}$	0	-	-
L66.2.10 $\mathrm{Y3}^{+}$	0	-	-
L66.2.11 $\mathrm{Y3}^{-}$	0	-	-

TABLE S197: Coplanar SSGs with parent space group $Cccm$ (No. 66).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P66.1.1 $\mathrm{GM1}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_g}$
P66.2.1 $\mathrm{GM1}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_u}$
P66.2.2 $\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B1_g}$
P66.2.3 $\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B1_u}$
P66.2.4 $\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}$
P66.2.5 $\mathrm{GM3}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}$
P66.2.6 $\mathrm{Y1}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P66.2.7 $\mathrm{Y1}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P66.2.8 $\mathrm{Y2}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P66.2.9 $\mathrm{Y2}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P66.2.10 $\mathrm{Y3}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P66.2.11 $\mathrm{Y3}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P66.3.1 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}$	$\surd$	0	0	$\surd$	-	-
P66.3.2 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_u}$
P66.3.3 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
P66.3.4 $\mathrm{GM1}^{-}\oplus\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_u}$
P66.3.5 $\mathrm{GM1}^{-}\oplus\mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
P66.3.6 $\mathrm{GM1}^{-}\oplus\mathrm{Y1}^{+}$	$\surd$	1	1	$\times$	-	-
P66.3.7 $\mathrm{GM1}^{-}\oplus\mathrm{Y1}^{-}$	$\surd$	1	1	$\times$	-	-
P66.3.8 $\mathrm{GM1}^{-}\oplus\mathrm{Y2}^{+}$	$\surd$	1	1	$\times$	-	-
P66.3.9 $\mathrm{GM1}^{-}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\times$	-	-
P66.3.10 $\mathrm{GM1}^{-}\oplus\mathrm{Y3}^{+}$	$\surd$	1	1	$\times$	-	-
P66.3.11 $\mathrm{GM1}^{-}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\times$	-	-
P66.3.12 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_g}$
P66.3.13 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B1_g}$
P66.3.14 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B3_g}$
P66.3.15 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B2_u}$
P66.3.16 $\mathrm{GM2}^{+}\oplus\mathrm{Y1}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
P66.3.17 $\mathrm{GM2}^{+}\oplus\mathrm{Y1}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
P66.3.18 $\mathrm{GM2}^{+}\oplus\mathrm{Y2}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
P66.3.19 $\mathrm{GM2}^{+}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
P66.3.20 $\mathrm{GM2}^{+}\oplus\mathrm{Y3}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
P66.3.21 $\mathrm{GM2}^{+}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
P66.3.22 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-

Coplanar SSGs with parent space group $Cccm$ (No. 66) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P66.3.23 $\mathrm{GM2^-} \oplus \mathrm{GM3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
P66.3.24 $\mathrm{GM2^-} \oplus \mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
P66.3.25 $\mathrm{GM2^-} \oplus \mathrm{Y1^+}$	$\surd$	1	1	$\times$	-	-
P66.3.26 $\mathrm{GM2^-} \oplus \mathrm{Y1^-}$	$\surd$	1	1	$\times$	-	-
P66.3.27 $\mathrm{GM2^-} \oplus \mathrm{Y2^+}$	$\surd$	1	1	$\times$	-	-
P66.3.28 $\mathrm{GM2^-} \oplus \mathrm{Y2^-}$	$\surd$	1	1	$\times$	-	-
P66.3.29 $\mathrm{GM2^-} \oplus \mathrm{Y3^+}$	$\surd$	1	1	$\times$	-	-
P66.3.30 $\mathrm{GM2^-} \oplus \mathrm{Y3^-}$	$\surd$	1	1	$\times$	-	-
P66.3.31 $\mathrm{GM3^+} \oplus \mathrm{GM3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
P66.3.32 $\mathrm{GM3^+} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g}$
P66.3.33 $\mathrm{GM3^+} \oplus \mathrm{GM3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
P66.3.34 $\mathrm{GM3^+} \oplus \mathrm{GM4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
P66.3.35 $\mathrm{GM3^+} \oplus \mathrm{Y1^+}$	$\surd$	1	0	$\times$	-	-
P66.3.36 $\mathrm{GM3^+} \oplus \mathrm{Y1^-}$	$\surd$	1	0	$\times$	-	-
P66.3.37 $\mathrm{GM3^+} \oplus \mathrm{Y2^+}$	$\surd$	1	0	$\times$	-	-
P66.3.38 $\mathrm{GM3^+} \oplus \mathrm{Y2^-}$	$\surd$	1	0	$\times$	-	-
P66.3.39 $\mathrm{GM3^+} \oplus \mathrm{Y3^+}$	$\surd$	1	0	$\times$	-	-
P66.3.40 $\mathrm{GM3^+} \oplus \mathrm{Y4^+}$	$\surd$	1	0	$\times$	-	-
P66.3.41 $\mathrm{GM3^+} \oplus \mathrm{Y3^-}$	$\surd$	1	0	$\times$	-	-
P66.3.42 $\mathrm{GM3^+} \oplus \mathrm{Y4^-}$	$\surd$	1	0	$\times$	-	-
P66.3.43 $\mathrm{GM3^-} \oplus \mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
P66.3.44 $\mathrm{GM3^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
P66.3.45 $\mathrm{GM3^-} \oplus \mathrm{Y1^+}$	$\surd$	1	1	$\times$	-	-
P66.3.46 $\mathrm{GM3^-} \oplus \mathrm{Y1^-}$	$\surd$	1	1	$\times$	-	-
P66.3.47 $\mathrm{GM3^-} \oplus \mathrm{Y2^+}$	$\surd$	1	1	$\times$	-	-
P66.3.48 $\mathrm{GM3^-} \oplus \mathrm{Y2^-}$	$\surd$	1	1	$\times$	-	-
P66.3.49 $\mathrm{GM3^-} \oplus \mathrm{Y3^+}$	$\surd$	1	1	$\times$	-	-
P66.3.50 $\mathrm{GM3^-} \oplus \mathrm{Y4^+}$	$\surd$	1	1	$\times$	-	-
P66.3.51 $\mathrm{GM3^-} \oplus \mathrm{Y3^-}$	$\surd$	1	1	$\times$	-	-
P66.3.52 $\mathrm{GM3^-} \oplus \mathrm{Y4^-}$	$\surd$	1	1	$\times$	-	-
P66.3.53 $\mathrm{Y1^+} \oplus \mathrm{Y1^+}$	$\surd$	1	0	$\times$	-	-
P66.3.54 $\mathrm{Y1^+} \oplus \mathrm{Y1^-}$	$\surd$	1	1	$\times$	-	-
P66.3.55 $\mathrm{Y1^+} \oplus \mathrm{Y2^+}$	$\surd$	1	0	$\times$	-	-
P66.3.56 $\mathrm{Y1^+} \oplus \mathrm{Y2^-}$	$\surd$	1	1	$\times$	-	-
P66.3.57 $\mathrm{Y1^+} \oplus \mathrm{Y3^+}$	$\surd$	1	0	$\times$	-	-
P66.3.58 $\mathrm{Y1^+} \oplus \mathrm{Y3^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P66.3.59 $\mathrm{Y1^-} \oplus \mathrm{Y1^-}$	$\surd$	1	0	$\times$	-	-
P66.3.60 $\mathrm{Y1^-} \oplus \mathrm{Y2^+}$	$\surd$	1	1	$\times$	-	-
P66.3.61 $\mathrm{Y1^-} \oplus \mathrm{Y2^-}$	$\surd$	1	0	$\times$	-	-
P66.3.62 $\mathrm{Y1^-} \oplus \mathrm{Y3^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P66.3.63 $\mathrm{Y1^-} \oplus \mathrm{Y3^-}$	$\surd$	1	0	$\times$	-	-
P66.3.64 $\mathrm{Y2^+} \oplus \mathrm{Y2^+}$	$\surd$	1	0	$\times$	-	-
P66.3.65 $\mathrm{Y2^+} \oplus \mathrm{Y2^-}$	$\surd$	1	1	$\times$	-	-
P66.3.66 $\mathrm{Y2^+} \oplus \mathrm{Y3^+}$	$\surd$	1	0	$\times$	-	-
P66.3.67 $\mathrm{Y2^+} \oplus \mathrm{Y3^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P66.3.68 $\mathrm{Y2^-} \oplus \mathrm{Y2^-}$	$\surd$	1	0	$\times$	-	-

Coplanar SSGs with parent space group $Cccm$ (No. 66) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P66.3.69 $\mathrm{Y2}^{-} \oplus \mathrm{Y3}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P66.3.70 $\mathrm{Y2}^{-} \oplus \mathrm{Y3}^{-}$	$\surd$	1	0	$\times$	-	-
P66.3.71 $\mathrm{Y3}^{+} \oplus \mathrm{Y3}^{+}$	$\surd$	1	0	$\times$	-	-
P66.3.72 $\mathrm{Y3}^{+} \oplus \mathrm{Y4}^{+}$	$\surd$	1	0	$\times$	-	-
P66.3.73 $\mathrm{Y3}^{+} \oplus \mathrm{Y3}^{-}$	$\surd$	1	1	$\times$	-	-
P66.3.74 $\mathrm{Y3}^{+} \oplus \mathrm{Y4}^{-}$	$\surd$	1	1	$\times$	-	-
P66.3.75 $\mathrm{Y3}^{-} \oplus \mathrm{Y3}^{-}$	$\surd$	1	0	$\times$	-	-
P66.3.76 $\mathrm{Y3}^{-} \oplus \mathrm{Y4}^{-}$	$\surd$	1	0	$\times$	-	-
P66.6.1 T1	$\surd$	1	1	$\times$	-	-
P66.6.2 T2	$\surd$	1	1	$\times$	-	-
P66.6.3 Z1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P66.6.4 Z2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P66.7.1 $\mathrm{S1}^{+}$	$\times$	-	-	-	-	-
P66.7.2 $\mathrm{S1}^{-}$	$\times$	-	-	-	-	-
P66.7.3 $\mathrm{R1}^{+}$	$\times$	-	-	-	-	-
P66.8.1 DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P66.8.2 DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P66.8.3 DT3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P66.8.4 DT4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P66.8.5 LD1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P66.8.6 LD3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P66.8.7 H1	$\surd$	1	1	$\times$	-	-
P66.8.8 H3	$\surd$	1	1	$\times$	-	-

TABLE S198: Non-coplanar SSGs with parent space group $Cccm$ (No. 66).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N66.1.1 $\mathrm{GM1}^{+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{A_g}$
N66.2.1 $\mathrm{GM1}^{-}$	$\surd$	2	2	$\surd$	222	$\mathrm{A1} \oplus \mathrm{A1}$
N66.2.2 $\mathrm{GM2}^{+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B1_g}$
N66.2.3 $\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{A1}$
N66.2.4 $\mathrm{GM3}^{+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B3_g}$
N66.2.5 $\mathrm{GM3}^{-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{A1}$
N66.2.6 $\mathrm{Y1}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
N66.2.7 $\mathrm{Y1}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
N66.2.8 $\mathrm{Y2}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
N66.2.9 $\mathrm{Y2}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
N66.2.10 $\mathrm{Y3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
N66.2.11 $\mathrm{Y3}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
N66.3.1 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{A_u}$
N66.3.2 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{A2}$
N66.3.3 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N66.3.4 $\mathrm{GM1}^{-} \oplus \mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{A2}$
N66.3.5 $\mathrm{GM1}^{-} \oplus \mathrm{GM3}^{-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B3_u}$
N66.3.6 $\mathrm{GM1}^{-} \oplus \mathrm{Y1}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
N66.3.7 $\mathrm{GM1}^{-} \oplus \mathrm{Y1}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$

Non-coplanar SSGs with parent space group $Cccm$ (No. 66) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N66.3.8 $\mathrm{GM1}^- \oplus \mathrm{Y2}^+$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
N66.3.9 $\mathrm{GM1}^- \oplus \mathrm{Y2}^-$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
N66.3.10 $\mathrm{GM1}^- \oplus \mathrm{Y3}^+$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
N66.3.11 $\mathrm{GM1}^- \oplus \mathrm{Y3}^-$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
N66.3.12 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N66.3.13 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	√	2	2	√	222	$\mathrm{A1} \oplus \mathrm{B1}$
N66.3.14 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+$	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g} \oplus \mathrm{B3_g}$
N66.3.15 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^-$	√	2	2	√	$mm2$	$\mathrm{A1} \oplus \mathrm{B1}$
N66.3.16 $\mathrm{GM2}^+ \oplus \mathrm{Y1}^+$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
N66.3.17 $\mathrm{GM2}^+ \oplus \mathrm{Y1}^-$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
N66.3.18 $\mathrm{GM2}^+ \oplus \mathrm{Y2}^+$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
N66.3.19 $\mathrm{GM2}^+ \oplus \mathrm{Y2}^-$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
N66.3.20 $\mathrm{GM2}^+ \oplus \mathrm{Y3}^+$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
N66.3.21 $\mathrm{GM2}^+ \oplus \mathrm{Y3}^-$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
N66.3.22 $\mathrm{GM2}^- \oplus \mathrm{GM2}^-$	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N66.3.23 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+$	√	2	2	√	$mm2$	$\mathrm{A1} \oplus \mathrm{B2}$
N66.3.24 $\mathrm{GM2}^- \oplus \mathrm{GM3}^-$	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u} \oplus \mathrm{B3_u}$
N66.3.25 $\mathrm{GM2}^- \oplus \mathrm{Y1}^+$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
N66.3.26 $\mathrm{GM2}^- \oplus \mathrm{Y1}^-$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
N66.3.27 $\mathrm{GM2}^- \oplus \mathrm{Y2}^+$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
N66.3.28 $\mathrm{GM2}^- \oplus \mathrm{Y2}^-$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
N66.3.29 $\mathrm{GM2}^- \oplus \mathrm{Y3}^+$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
N66.3.30 $\mathrm{GM2}^- \oplus \mathrm{Y3}^-$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
N66.3.31 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N66.3.32 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N66.3.33 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	√	2	2	√	222	$\mathrm{A1} \oplus \mathrm{B3}$
N66.3.34 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	√	2	2	√	$mm2$	$\mathrm{A1} \oplus \mathrm{B2}$
N66.3.35 $\mathrm{GM3}^+ \oplus \mathrm{Y1}^+$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g}$
N66.3.36 $\mathrm{GM3}^+ \oplus \mathrm{Y1}^-$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g}$
N66.3.37 $\mathrm{GM3}^+ \oplus \mathrm{Y2}^+$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g}$
N66.3.38 $\mathrm{GM3}^+ \oplus \mathrm{Y2}^-$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g}$
N66.3.39 $\mathrm{GM3}^+ \oplus \mathrm{Y3}^+$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g}$
N66.3.40 $\mathrm{GM3}^+ \oplus \mathrm{Y4}^+$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g}$
N66.3.41 $\mathrm{GM3}^+ \oplus \mathrm{Y3}^-$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g}$
N66.3.42 $\mathrm{GM3}^+ \oplus \mathrm{Y4}^-$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g}$
N66.3.43 $\mathrm{GM3}^- \oplus \mathrm{GM3}^-$	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N66.3.44 $\mathrm{GM3}^- \oplus \mathrm{GM4}^-$	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N66.3.45 $\mathrm{GM3}^- \oplus \mathrm{Y1}^+$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u}$
N66.3.46 $\mathrm{GM3}^- \oplus \mathrm{Y1}^-$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u}$
N66.3.47 $\mathrm{GM3}^- \oplus \mathrm{Y2}^+$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u}$
N66.3.48 $\mathrm{GM3}^- \oplus \mathrm{Y2}^-$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u}$
N66.3.49 $\mathrm{GM3}^- \oplus \mathrm{Y3}^+$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u}$
N66.3.50 $\mathrm{GM3}^- \oplus \mathrm{Y4}^+$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u}$
N66.3.51 $\mathrm{GM3}^- \oplus \mathrm{Y3}^-$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u}$
N66.3.52 $\mathrm{GM3}^- \oplus \mathrm{Y4}^-$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u}$
N66.3.53 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^+$	√	1	1	√	mmm	$\mathrm{A_g}$

Non-coplanar SSGs with parent space group $Cccm$ (No. 66) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N66.3.54 $\mathrm{Y1}^{+} \oplus \mathrm{Y1}^{-}$	√	1	1	√	222	A1
N66.3.55 $\mathrm{Y1}^{+} \oplus \mathrm{Y2}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N66.3.56 $\mathrm{Y1}^{+} \oplus \mathrm{Y2}^{-}$	√	1	1	√	$mm2$	A1
N66.3.57 $\mathrm{Y1}^{+} \oplus \mathrm{Y3}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N66.3.58 $\mathrm{Y1}^{+} \oplus \mathrm{Y3}^{-}$	√	1	1	√	$mm2$	A1
N66.3.59 $\mathrm{Y1}^{-} \oplus \mathrm{Y1}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N66.3.60 $\mathrm{Y1}^{-} \oplus \mathrm{Y2}^{+}$	√	1	1	√	$mm2$	A1
N66.3.61 $\mathrm{Y1}^{-} \oplus \mathrm{Y2}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N66.3.62 $\mathrm{Y1}^{-} \oplus \mathrm{Y3}^{+}$	√	1	1	√	$mm2$	A1
N66.3.63 $\mathrm{Y1}^{-} \oplus \mathrm{Y3}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N66.3.64 $\mathrm{Y2}^{+} \oplus \mathrm{Y2}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N66.3.65 $\mathrm{Y2}^{+} \oplus \mathrm{Y2}^{-}$	√	1	1	√	222	A1
N66.3.66 $\mathrm{Y2}^{+} \oplus \mathrm{Y3}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N66.3.67 $\mathrm{Y2}^{+} \oplus \mathrm{Y3}^{-}$	√	1	1	√	$mm2$	A1
N66.3.68 $\mathrm{Y2}^{-} \oplus \mathrm{Y2}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N66.3.69 $\mathrm{Y2}^{-} \oplus \mathrm{Y3}^{+}$	√	1	1	√	$mm2$	A1
N66.3.70 $\mathrm{Y2}^{-} \oplus \mathrm{Y3}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N66.3.71 $\mathrm{Y3}^{+} \oplus \mathrm{Y3}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N66.3.72 $\mathrm{Y3}^{+} \oplus \mathrm{Y4}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N66.3.73 $\mathrm{Y3}^{+} \oplus \mathrm{Y3}^{-}$	√	1	1	√	222	A1
N66.3.74 $\mathrm{Y3}^{+} \oplus \mathrm{Y4}^{-}$	√	1	1	√	$mm2$	A1
N66.3.75 $\mathrm{Y3}^{-} \oplus \mathrm{Y3}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N66.3.76 $\mathrm{Y3}^{-} \oplus \mathrm{Y4}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N66.6.1 T1	√	1	1	√	$mm2$	A1
N66.6.2 T2	√	1	1	√	$mm2$	A1
N66.6.3 Z1	√	1	1	√	$mm2$	A1
N66.6.4 Z2	√	1	1	√	$mm2$	A1
N66.7.1 $\mathrm{S1}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N66.7.2 $\mathrm{S1}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N66.7.3 $\mathrm{R1}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N66.8.1 DT1	√	1	1	√	$mm2$	A1
N66.8.2 DT2	√	1	1	√	$mm2$	A1
N66.8.3 DT3	√	1	1	√	$mm2$	A1
N66.8.4 DT4	√	1	1	√	$mm2$	A1
N66.8.5 LD1	√	1	1	√	$mm2$	A1
N66.8.6 LD3	√	1	1	√	$mm2$	A1
N66.8.7 H1	√	1	1	√	$mm2$	A1
N66.8.8 H3	√	1	1	√	$mm2$	A1
N66.9.1 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-}$	√	0	0	√	-	-
N66.9.2 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-} \oplus \mathrm{GM2}^{+}$	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N66.9.3 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-} \oplus \mathrm{GM2}^{-}$	√	0	0	√	-	-
N66.9.4 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-} \oplus \mathrm{GM3}^{+}$	√	3	3	√	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N66.9.5 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-} \oplus \mathrm{GM3}^{-}$	√	0	0	√	-	-
N66.9.6 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-} \oplus \mathrm{Y1}^{+}$	√	0	0	√	-	-
N66.9.7 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-} \oplus \mathrm{Y1}^{-}$	√	0	0	√	-	-
N66.9.8 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-} \oplus \mathrm{Y2}^{+}$	√	0	0	√	-	-

Non-coplanar SSGs with parent space group $Cccm$ (No. 66) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N66.9.9 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{Y2}^-$	$\surd$	0	0	$\surd$	-	-
N66.9.10 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{Y3}^+$	$\surd$	0	0	$\surd$	-	-
N66.9.11 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{Y3}^-$	$\surd$	0	0	$\surd$	-	-
N66.9.12 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	2	2	$\surd$	222	$\mathrm{B1} \oplus \mathrm{B1}$
N66.9.13 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N66.9.14 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2} \oplus \mathrm{B1}$
N66.9.15 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_u}$
N66.9.16 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N66.9.17 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N66.9.18 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N66.9.19 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N66.9.20 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N66.9.21 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N66.9.22 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
N66.9.23 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N66.9.24 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N66.9.25 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Y1}^+$	$\surd$	0	0	$\surd$	-	-
N66.9.26 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Y1}^-$	$\surd$	0	0	$\surd$	-	-
N66.9.27 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Y2}^+$	$\surd$	0	0	$\surd$	-	-
N66.9.28 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Y2}^-$	$\surd$	0	0	$\surd$	-	-
N66.9.29 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Y3}^+$	$\surd$	0	0	$\surd$	-	-
N66.9.30 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Y3}^-$	$\surd$	0	0	$\surd$	-	-
N66.9.31 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	222	$\mathrm{B3} \oplus \mathrm{B3}$
N66.9.32 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2} \oplus \mathrm{B1}$
N66.9.33 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N66.9.34 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N66.9.35 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u}$
N66.9.36 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u}$
N66.9.37 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u}$
N66.9.38 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u}$
N66.9.39 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u}$
N66.9.40 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Y4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u}$
N66.9.41 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u}$
N66.9.42 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u}$
N66.9.43 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N66.9.44 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N66.9.45 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y1}^+$	$\surd$	0	0	$\surd$	-	-
N66.9.46 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y1}^-$	$\surd$	0	0	$\surd$	-	-
N66.9.47 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y2}^+$	$\surd$	0	0	$\surd$	-	-
N66.9.48 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y2}^-$	$\surd$	0	0	$\surd$	-	-
N66.9.49 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y3}^+$	$\surd$	0	0	$\surd$	-	-
N66.9.50 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y4}^+$	$\surd$	0	0	$\surd$	-	-
N66.9.51 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y3}^-$	$\surd$	0	0	$\surd$	-	-
N66.9.52 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y4}^-$	$\surd$	0	0	$\surd$	-	-
N66.9.53 $\mathrm{GM1}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	0	$\times$	-	-
N66.9.54 $\mathrm{GM1}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^-$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $Cccm$ (No. 66) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N66.9.55 $\mathrm{GM1}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N66.9.56 $\mathrm{GM1}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\times$	-	-
N66.9.57 $\mathrm{GM1}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N66.9.58 $\mathrm{GM1}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N66.9.59 $\mathrm{GM1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y1}^-$	$\surd$	1	0	$\times$	-	-
N66.9.60 $\mathrm{GM1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\times$	-	-
N66.9.61 $\mathrm{GM1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N66.9.62 $\mathrm{GM1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N66.9.63 $\mathrm{GM1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N66.9.64 $\mathrm{GM1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N66.9.65 $\mathrm{GM1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\times$	-	-
N66.9.66 $\mathrm{GM1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N66.9.67 $\mathrm{GM1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N66.9.68 $\mathrm{GM1}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N66.9.69 $\mathrm{GM1}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N66.9.70 $\mathrm{GM1}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N66.9.71 $\mathrm{GM1}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N66.9.72 $\mathrm{GM1}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
N66.9.73 $\mathrm{GM1}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\times$	-	-
N66.9.74 $\mathrm{GM1}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\times$	-	-
N66.9.75 $\mathrm{GM1}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N66.9.76 $\mathrm{GM1}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Y4}^-$	$\surd$	1	0	$\times$	-	-
N66.9.77 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N66.9.78 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{A2}$
N66.9.79 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B3_g}$
N66.9.80 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2} \oplus \mathrm{B2}$
N66.9.81 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N66.9.82 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N66.9.83 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N66.9.84 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N66.9.85 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N66.9.86 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N66.9.87 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$
N66.9.88 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{B2}$
N66.9.89 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g} \oplus \mathrm{B2_u}$
N66.9.90 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
N66.9.91 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
N66.9.92 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
N66.9.93 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
N66.9.94 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
N66.9.95 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
N66.9.96 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N66.9.97 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N66.9.98 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{B2}$
N66.9.99 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	222	$\mathrm{B1} \oplus \mathrm{B3}$
N66.9.100 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$

Non-coplanar SSGs with parent space group $Cccm$ (No. 66) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N66.9.101 $\mathrm{GM2^+} \oplus \mathrm{GM3^+} \oplus \mathrm{Y1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N66.9.102 $\mathrm{GM2^+} \oplus \mathrm{GM3^+} \oplus \mathrm{Y2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N66.9.103 $\mathrm{GM2^+} \oplus \mathrm{GM3^+} \oplus \mathrm{Y2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N66.9.104 $\mathrm{GM2^+} \oplus \mathrm{GM3^+} \oplus \mathrm{Y3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N66.9.105 $\mathrm{GM2^+} \oplus \mathrm{GM3^+} \oplus \mathrm{Y4^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N66.9.106 $\mathrm{GM2^+} \oplus \mathrm{GM3^+} \oplus \mathrm{Y3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N66.9.107 $\mathrm{GM2^+} \oplus \mathrm{GM3^+} \oplus \mathrm{Y4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N66.9.108 $\mathrm{GM2^+} \oplus \mathrm{GM3^-} \oplus \mathrm{GM3^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N66.9.109 $\mathrm{GM2^+} \oplus \mathrm{GM3^-} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N66.9.110 $\mathrm{GM2^+} \oplus \mathrm{GM3^-} \oplus \mathrm{Y1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N66.9.111 $\mathrm{GM2^+} \oplus \mathrm{GM3^-} \oplus \mathrm{Y1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N66.9.112 $\mathrm{GM2^+} \oplus \mathrm{GM3^-} \oplus \mathrm{Y2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N66.9.113 $\mathrm{GM2^+} \oplus \mathrm{GM3^-} \oplus \mathrm{Y2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N66.9.114 $\mathrm{GM2^+} \oplus \mathrm{GM3^-} \oplus \mathrm{Y3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N66.9.115 $\mathrm{GM2^+} \oplus \mathrm{GM3^-} \oplus \mathrm{Y4^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N66.9.116 $\mathrm{GM2^+} \oplus \mathrm{GM3^-} \oplus \mathrm{Y3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N66.9.117 $\mathrm{GM2^+} \oplus \mathrm{GM3^-} \oplus \mathrm{Y4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N66.9.118 $\mathrm{GM2^+} \oplus \mathrm{Y1^+} \oplus \mathrm{Y1^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N66.9.119 $\mathrm{GM2^+} \oplus \mathrm{Y1^+} \oplus \mathrm{Y1^-}$	$\surd$	1	1	$\surd$	$mm2$	A2
N66.9.120 $\mathrm{GM2^+} \oplus \mathrm{Y1^+} \oplus \mathrm{Y2^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N66.9.121 $\mathrm{GM2^+} \oplus \mathrm{Y1^+} \oplus \mathrm{Y2^-}$	$\surd$	1	1	$\surd$	222	B1
N66.9.122 $\mathrm{GM2^+} \oplus \mathrm{Y1^+} \oplus \mathrm{Y3^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N66.9.123 $\mathrm{GM2^+} \oplus \mathrm{Y1^+} \oplus \mathrm{Y3^-}$	$\surd$	1	1	$\surd$	$mm2$	B1
N66.9.124 $\mathrm{GM2^+} \oplus \mathrm{Y1^-} \oplus \mathrm{Y1^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N66.9.125 $\mathrm{GM2^+} \oplus \mathrm{Y1^-} \oplus \mathrm{Y2^+}$	$\surd$	1	1	$\surd$	222	B1
N66.9.126 $\mathrm{GM2^+} \oplus \mathrm{Y1^-} \oplus \mathrm{Y2^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N66.9.127 $\mathrm{GM2^+} \oplus \mathrm{Y1^-} \oplus \mathrm{Y3^+}$	$\surd$	1	1	$\surd$	$mm2$	B1
N66.9.128 $\mathrm{GM2^+} \oplus \mathrm{Y1^-} \oplus \mathrm{Y3^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N66.9.129 $\mathrm{GM2^+} \oplus \mathrm{Y2^+} \oplus \mathrm{Y2^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N66.9.130 $\mathrm{GM2^+} \oplus \mathrm{Y2^+} \oplus \mathrm{Y2^-}$	$\surd$	1	1	$\surd$	$mm2$	A2
N66.9.131 $\mathrm{GM2^+} \oplus \mathrm{Y2^+} \oplus \mathrm{Y3^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N66.9.132 $\mathrm{GM2^+} \oplus \mathrm{Y2^+} \oplus \mathrm{Y3^-}$	$\surd$	1	1	$\surd$	$mm2$	B2
N66.9.133 $\mathrm{GM2^+} \oplus \mathrm{Y2^-} \oplus \mathrm{Y2^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N66.9.134 $\mathrm{GM2^+} \oplus \mathrm{Y2^-} \oplus \mathrm{Y3^+}$	$\surd$	1	1	$\surd$	$mm2$	B2
N66.9.135 $\mathrm{GM2^+} \oplus \mathrm{Y2^-} \oplus \mathrm{Y3^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N66.9.136 $\mathrm{GM2^+} \oplus \mathrm{Y3^+} \oplus \mathrm{Y3^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N66.9.137 $\mathrm{GM2^+} \oplus \mathrm{Y3^+} \oplus \mathrm{Y4^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N66.9.138 $\mathrm{GM2^+} \oplus \mathrm{Y3^+} \oplus \mathrm{Y3^-}$	$\surd$	1	1	$\surd$	$mm2$	A2
N66.9.139 $\mathrm{GM2^+} \oplus \mathrm{Y3^+} \oplus \mathrm{Y4^-}$	$\surd$	1	1	$\surd$	222	B1
N66.9.140 $\mathrm{GM2^+} \oplus \mathrm{Y3^-} \oplus \mathrm{Y3^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N66.9.141 $\mathrm{GM2^+} \oplus \mathrm{Y3^-} \oplus \mathrm{Y4^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N66.9.142 $\mathrm{GM2^-} \oplus \mathrm{GM2^-} \oplus \mathrm{GM2^-}$	$\surd$	0	0	$\surd$	-	-
N66.9.143 $\mathrm{GM2^-} \oplus \mathrm{GM2^-} \oplus \mathrm{GM3^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N66.9.144 $\mathrm{GM2^-} \oplus \mathrm{GM2^-} \oplus \mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
N66.9.145 $\mathrm{GM2^-} \oplus \mathrm{GM2^-} \oplus \mathrm{Y1^+}$	$\surd$	0	0	$\surd$	-	-
N66.9.146 $\mathrm{GM2^-} \oplus \mathrm{GM2^-} \oplus \mathrm{Y1^-}$	$\surd$	0	0	$\surd$	-	-

Non-coplanar SSGs with parent space group $Cccm$ (No. 66) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N66.9.147 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Y2}^+$	$\surd$	0	0	$\surd$	-	-
N66.9.148 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Y2}^-$	$\surd$	0	0	$\surd$	-	-
N66.9.149 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Y3}^+$	$\surd$	0	0	$\surd$	-	-
N66.9.150 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Y3}^-$	$\surd$	0	0	$\surd$	-	-
N66.9.151 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2} \oplus \mathrm{B2}$
N66.9.152 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	222	$\mathrm{B3} \oplus \mathrm{B2}$
N66.9.153 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N66.9.154 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N66.9.155 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N66.9.156 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N66.9.157 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N66.9.158 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N66.9.159 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N66.9.160 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Y4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N66.9.161 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N66.9.162 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N66.9.163 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N66.9.164 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N66.9.165 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y1}^+$	$\surd$	0	0	$\surd$	-	-
N66.9.166 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y1}^-$	$\surd$	0	0	$\surd$	-	-
N66.9.167 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y2}^+$	$\surd$	0	0	$\surd$	-	-
N66.9.168 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y2}^-$	$\surd$	0	0	$\surd$	-	-
N66.9.169 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y3}^+$	$\surd$	0	0	$\surd$	-	-
N66.9.170 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y4}^+$	$\surd$	0	0	$\surd$	-	-
N66.9.171 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y3}^-$	$\surd$	0	0	$\surd$	-	-
N66.9.172 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y4}^-$	$\surd$	0	0	$\surd$	-	-
N66.9.173 $\mathrm{GM2}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	0	$\times$	-	-
N66.9.174 $\mathrm{GM2}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^-$	$\surd$	1	1	$\times$	-	-
N66.9.175 $\mathrm{GM2}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N66.9.176 $\mathrm{GM2}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\times$	-	-
N66.9.177 $\mathrm{GM2}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N66.9.178 $\mathrm{GM2}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N66.9.179 $\mathrm{GM2}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y1}^-$	$\surd$	1	0	$\times$	-	-
N66.9.180 $\mathrm{GM2}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\times$	-	-
N66.9.181 $\mathrm{GM2}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N66.9.182 $\mathrm{GM2}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N66.9.183 $\mathrm{GM2}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N66.9.184 $\mathrm{GM2}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N66.9.185 $\mathrm{GM2}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\times$	-	-
N66.9.186 $\mathrm{GM2}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N66.9.187 $\mathrm{GM2}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N66.9.188 $\mathrm{GM2}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N66.9.189 $\mathrm{GM2}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N66.9.190 $\mathrm{GM2}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N66.9.191 $\mathrm{GM2}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N66.9.192 $\mathrm{GM2}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $Cccm$ (No. 66) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N66.9.193 $\mathrm{GM2^-} \oplus \mathrm{Y3^+} \oplus \mathrm{Y3^-}$	$\surd$	1	1	$\times$	-	-
N66.9.194 $\mathrm{GM2^-} \oplus \mathrm{Y3^+} \oplus \mathrm{Y4^-}$	$\surd$	1	1	$\times$	-	-
N66.9.195 $\mathrm{GM2^-} \oplus \mathrm{Y3^-} \oplus \mathrm{Y3^-}$	$\surd$	1	0	$\times$	-	-
N66.9.196 $\mathrm{GM2^-} \oplus \mathrm{Y3^-} \oplus \mathrm{Y4^-}$	$\surd$	1	0	$\times$	-	-
N66.9.197 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{GM3^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N66.9.198 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{GM4^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N66.9.199 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{GM3^-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{A2}$
N66.9.200 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2} \oplus \mathrm{B2}$
N66.9.201 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{GM3^-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{B2}$
N66.9.202 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{Y1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
N66.9.203 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{Y1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g}$
N66.9.204 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{Y1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
N66.9.205 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{Y1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g}$
N66.9.206 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{Y2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
N66.9.207 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{Y2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g}$
N66.9.208 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{Y2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
N66.9.209 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{Y2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g}$
N66.9.210 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{Y3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
N66.9.211 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{Y4^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
N66.9.212 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{Y3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g}$
N66.9.213 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{Y3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
N66.9.214 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{Y4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
N66.9.215 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{Y3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g}$
N66.9.216 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{GM3^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B3_g}$
N66.9.217 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u} \oplus \mathrm{B3_g}$
N66.9.218 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B3_g}$
N66.9.219 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{Y1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N66.9.220 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Y1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N66.9.221 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{Y1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N66.9.222 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Y1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N66.9.223 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{Y2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N66.9.224 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Y2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N66.9.225 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{Y2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N66.9.226 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Y2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N66.9.227 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{Y3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N66.9.228 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{Y4^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N66.9.229 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Y3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N66.9.230 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Y4^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N66.9.231 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{Y3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N66.9.232 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{Y4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N66.9.233 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Y3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N66.9.234 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Y4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N66.9.235 $\mathrm{GM3^+} \oplus \mathrm{Y1^+} \oplus \mathrm{Y1^+}$	$\surd$	1	1	$\times$	-	-
N66.9.236 $\mathrm{GM3^+} \oplus \mathrm{Y1^+} \oplus \mathrm{Y1^-}$	$\surd$	1	1	$\times$	-	-
N66.9.237 $\mathrm{GM3^+} \oplus \mathrm{Y1^+} \oplus \mathrm{Y2^+}$	$\surd$	1	1	$\times$	-	-
N66.9.238 $\mathrm{GM3^+} \oplus \mathrm{Y1^+} \oplus \mathrm{Y2^-}$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $Cccm$ (No. 66) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N66.9.239 $\mathrm{GM3}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\times$	-	-
N66.9.240 $\mathrm{GM3}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\times$	-	-
N66.9.241 $\mathrm{GM3}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\surd$	222	B3
N66.9.242 $\mathrm{GM3}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\surd$	$mm2$	B2
N66.9.243 $\mathrm{GM3}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y1}^-$	$\surd$	1	1	$\times$	-	-
N66.9.244 $\mathrm{GM3}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\times$	-	-
N66.9.245 $\mathrm{GM3}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\times$	-	-
N66.9.246 $\mathrm{GM3}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\surd$	222	B3
N66.9.247 $\mathrm{GM3}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\surd$	$mm2$	B2
N66.9.248 $\mathrm{GM3}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\times$	-	-
N66.9.249 $\mathrm{GM3}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\times$	-	-
N66.9.250 $\mathrm{GM3}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\times$	-	-
N66.9.251 $\mathrm{GM3}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\times$	-	-
N66.9.252 $\mathrm{GM3}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\times$	-	-
N66.9.253 $\mathrm{GM3}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\times$	-	-
N66.9.254 $\mathrm{GM3}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\surd$	$mm2$	B2
N66.9.255 $\mathrm{GM3}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\surd$	222	B3
N66.9.256 $\mathrm{GM3}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\times$	-	-
N66.9.257 $\mathrm{GM3}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\surd$	$mm2$	B2
N66.9.258 $\mathrm{GM3}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\surd$	222	B3
N66.9.259 $\mathrm{GM3}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\times$	-	-
N66.9.260 $\mathrm{GM3}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\times$	-	-
N66.9.261 $\mathrm{GM3}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\times$	-	-
N66.9.262 $\mathrm{GM3}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\times$	-	-
N66.9.263 $\mathrm{GM3}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\times$	-	-
N66.9.264 $\mathrm{GM3}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\times$	-	-
N66.9.265 $\mathrm{GM3}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\times$	-	-
N66.9.266 $\mathrm{GM3}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\times$	-	-
N66.9.267 $\mathrm{GM3}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\times$	-	-
N66.9.268 $\mathrm{GM3}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\times$	-	-
N66.9.269 $\mathrm{GM3}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\times$	-	-
N66.9.270 $\mathrm{GM3}^+ \oplus \mathrm{Y4}^- \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\times$	-	-
N66.9.271 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N66.9.272 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N66.9.273 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y1}^+$	$\surd$	0	0	$\surd$	-	-
N66.9.274 $\mathrm{GM3}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Y1}^+$	$\surd$	0	0	$\surd$	-	-
N66.9.275 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y1}^-$	$\surd$	0	0	$\surd$	-	-
N66.9.276 $\mathrm{GM3}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Y1}^-$	$\surd$	0	0	$\surd$	-	-
N66.9.277 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y2}^+$	$\surd$	0	0	$\surd$	-	-
N66.9.278 $\mathrm{GM3}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Y2}^+$	$\surd$	0	0	$\surd$	-	-
N66.9.279 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y2}^-$	$\surd$	0	0	$\surd$	-	-
N66.9.280 $\mathrm{GM3}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Y2}^-$	$\surd$	0	0	$\surd$	-	-
N66.9.281 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y3}^+$	$\surd$	0	0	$\surd$	-	-
N66.9.282 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y4}^+$	$\surd$	0	0	$\surd$	-	-
N66.9.283 $\mathrm{GM3}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Y3}^+$	$\surd$	0	0	$\surd$	-	-
N66.9.284 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y3}^-$	$\surd$	0	0	$\surd$	-	-

Non-coplanar SSGs with parent space group $Cccm$ (No. 66) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N66.9.285 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y4}^-$	$\surd$	0	0	$\surd$	-	-
N66.9.286 $\mathrm{GM3}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Y3}^-$	$\surd$	0	0	$\surd$	-	-
N66.9.287 $\mathrm{GM3}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	0	$\times$	-	-
N66.9.288 $\mathrm{GM3}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^-$	$\surd$	1	1	$\times$	-	-
N66.9.289 $\mathrm{GM3}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N66.9.290 $\mathrm{GM3}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\times$	-	-
N66.9.291 $\mathrm{GM3}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N66.9.292 $\mathrm{GM3}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
N66.9.293 $\mathrm{GM3}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N66.9.294 $\mathrm{GM3}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N66.9.295 $\mathrm{GM3}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y1}^-$	$\surd$	1	0	$\times$	-	-
N66.9.296 $\mathrm{GM3}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\times$	-	-
N66.9.297 $\mathrm{GM3}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N66.9.298 $\mathrm{GM3}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N66.9.299 $\mathrm{GM3}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N66.9.300 $\mathrm{GM3}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N66.9.301 $\mathrm{GM3}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y4}^-$	$\surd$	1	0	$\times$	-	-
N66.9.302 $\mathrm{GM3}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N66.9.303 $\mathrm{GM3}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\times$	-	-
N66.9.304 $\mathrm{GM3}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N66.9.305 $\mathrm{GM3}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
N66.9.306 $\mathrm{GM3}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N66.9.307 $\mathrm{GM3}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N66.9.308 $\mathrm{GM3}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N66.9.309 $\mathrm{GM3}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N66.9.310 $\mathrm{GM3}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N66.9.311 $\mathrm{GM3}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N66.9.312 $\mathrm{GM3}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y4}^-$	$\surd$	1	0	$\times$	-	-
N66.9.313 $\mathrm{GM3}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N66.9.314 $\mathrm{GM3}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
N66.9.315 $\mathrm{GM3}^- \oplus \mathrm{Y4}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
N66.9.316 $\mathrm{GM3}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\times$	-	-
N66.9.317 $\mathrm{GM3}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\times$	-	-
N66.9.318 $\mathrm{GM3}^- \oplus \mathrm{Y4}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\times$	-	-
N66.9.319 $\mathrm{GM3}^- \oplus \mathrm{Y4}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\times$	-	-
N66.9.320 $\mathrm{GM3}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N66.9.321 $\mathrm{GM3}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Y4}^-$	$\surd$	1	0	$\times$	-	-
N66.9.322 $\mathrm{GM3}^- \oplus \mathrm{Y4}^- \oplus \mathrm{Y4}^-$	$\surd$	1	0	$\times$	-	-
N66.9.323 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^+$	$\surd$	0	0	$\surd$	-	-
N66.9.324 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u}$
N66.9.325 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^+$	$\surd$	0	0	$\surd$	-	-
N66.9.326 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N66.9.327 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y3}^+$	$\surd$	0	0	$\surd$	-	-
N66.9.328 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B3_u}$
N66.9.329 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u}$
N66.9.330 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u}$

Non-coplanar SSGs with parent space group $Cccm$ (No. 66) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N66.9.331 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u}$
N66.9.332 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u}$
N66.9.333 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u}$
N66.9.334 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^+$	$\surd$	0	0	$\surd$	-	-
N66.9.335 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u}$
N66.9.336 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^+$	$\surd$	0	0	$\surd$	-	-
N66.9.337 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_u}$
N66.9.338 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N66.9.339 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N66.9.340 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u}$
N66.9.341 $\mathrm{Y1}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^+$	$\surd$	0	0	$\surd$	-	-
N66.9.342 $\mathrm{Y1}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y4}^+$	$\surd$	0	0	$\surd$	-	-
N66.9.343 $\mathrm{Y1}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u}$
N66.9.344 $\mathrm{Y1}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N66.9.345 $\mathrm{Y1}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B3_u}$
N66.9.346 $\mathrm{Y1}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_u}$
N66.9.347 $\mathrm{Y1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y1}^-$	$\surd$	0	0	$\surd$	-	-
N66.9.348 $\mathrm{Y1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N66.9.349 $\mathrm{Y1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y2}^-$	$\surd$	0	0	$\surd$	-	-
N66.9.350 $\mathrm{Y1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B3_u}$
N66.9.351 $\mathrm{Y1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y3}^-$	$\surd$	0	0	$\surd$	-	-
N66.9.352 $\mathrm{Y1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N66.9.353 $\mathrm{Y1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u}$
N66.9.354 $\mathrm{Y1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u}$
N66.9.355 $\mathrm{Y1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N66.9.356 $\mathrm{Y1}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y2}^-$	$\surd$	0	0	$\surd$	-	-
N66.9.357 $\mathrm{Y1}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_u}$
N66.9.358 $\mathrm{Y1}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y3}^-$	$\surd$	0	0	$\surd$	-	-
N66.9.359 $\mathrm{Y1}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B3_u}$
N66.9.360 $\mathrm{Y1}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Y4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_u}$
N66.9.361 $\mathrm{Y1}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u}$
N66.9.362 $\mathrm{Y1}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u}$
N66.9.363 $\mathrm{Y1}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Y3}^-$	$\surd$	0	0	$\surd$	-	-
N66.9.364 $\mathrm{Y1}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Y4}^-$	$\surd$	0	0	$\surd$	-	-
N66.9.365 $\mathrm{Y2}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^+$	$\surd$	0	0	$\surd$	-	-
N66.9.366 $\mathrm{Y2}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u}$
N66.9.367 $\mathrm{Y2}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^+$	$\surd$	0	0	$\surd$	-	-
N66.9.368 $\mathrm{Y2}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_u} \oplus \mathrm{B2_u}$
N66.9.369 $\mathrm{Y2}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u}$
N66.9.370 $\mathrm{Y2}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B2_u}$
N66.9.371 $\mathrm{Y2}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B2_u}$
N66.9.372 $\mathrm{Y2}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^+$	$\surd$	0	0	$\surd$	-	-
N66.9.373 $\mathrm{Y2}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y4}^+$	$\surd$	0	0	$\surd$	-	-
N66.9.374 $\mathrm{Y2}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B2_u}$
N66.9.375 $\mathrm{Y2}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u}$
N66.9.376 $\mathrm{Y2}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_u} \oplus \mathrm{B2_u}$

Non-coplanar SSGs with parent space group $Cccm$ (No. 66) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N66.9.377 $\mathrm{Y2}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_u}$
N66.9.378 $\mathrm{Y2}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y2}^-$	$\surd$	0	0	$\surd$	-	-
N66.9.379 $\mathrm{Y2}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_u} \oplus \mathrm{B2_u}$
N66.9.380 $\mathrm{Y2}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y3}^-$	$\surd$	0	0	$\surd$	-	-
N66.9.381 $\mathrm{Y2}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_u} \oplus \mathrm{B2_u}$
N66.9.382 $\mathrm{Y2}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Y4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_u}$
N66.9.383 $\mathrm{Y2}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B2_u}$
N66.9.384 $\mathrm{Y2}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N66.9.385 $\mathrm{Y2}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Y3}^-$	$\surd$	0	0	$\surd$	-	-
N66.9.386 $\mathrm{Y2}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Y4}^-$	$\surd$	0	0	$\surd$	-	-
N66.9.387 $\mathrm{Y3}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^+$	$\surd$	0	0	$\surd$	-	-
N66.9.388 $\mathrm{Y3}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y4}^+$	$\surd$	0	0	$\surd$	-	-
N66.9.389 $\mathrm{Y3}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u}$
N66.9.390 $\mathrm{Y3}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N66.9.391 $\mathrm{Y3}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u}$
N66.9.392 $\mathrm{Y3}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u}$
N66.9.393 $\mathrm{Y3}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u}$
N66.9.394 $\mathrm{Y3}^+ \oplus \mathrm{Y4}^- \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N66.9.395 $\mathrm{Y3}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Y3}^-$	$\surd$	0	0	$\surd$	-	-
N66.9.396 $\mathrm{Y3}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Y4}^-$	$\surd$	0	0	$\surd$	-	-
N66.12.1 $\mathrm{GM1}^- \oplus \mathrm{T1}$	$\surd$	1	1	$\times$	-	-
N66.12.2 $\mathrm{GM1}^- \oplus \mathrm{T2}$	$\surd$	1	1	$\times$	-	-
N66.12.3 $\mathrm{GM1}^- \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N66.12.4 $\mathrm{GM1}^- \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N66.12.5 $\mathrm{GM2}^+ \oplus \mathrm{T1}$	$\surd$	1	1	$\surd$	222	B1
N66.12.6 $\mathrm{GM2}^+ \oplus \mathrm{T2}$	$\surd$	1	1	$\surd$	222	B1
N66.12.7 $\mathrm{GM2}^+ \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	222	B1
N66.12.8 $\mathrm{GM2}^+ \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	222	B1
N66.12.9 $\mathrm{GM2}^- \oplus \mathrm{T1}$	$\surd$	1	1	$\times$	-	-
N66.12.10 $\mathrm{GM2}^- \oplus \mathrm{T2}$	$\surd$	1	1	$\times$	-	-
N66.12.11 $\mathrm{GM2}^- \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N66.12.12 $\mathrm{GM2}^- \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N66.12.13 $\mathrm{GM3}^+ \oplus \mathrm{T1}$	$\surd$	1	1	$\times$	-	-
N66.12.14 $\mathrm{GM3}^+ \oplus \mathrm{T2}$	$\surd$	1	1	$\times$	-	-
N66.12.15 $\mathrm{GM3}^+ \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$mm2$	B2
N66.12.16 $\mathrm{GM3}^+ \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	$mm2$	B2
N66.12.17 $\mathrm{GM3}^- \oplus \mathrm{T1}$	$\surd$	1	1	$\times$	-	-
N66.12.18 $\mathrm{GM3}^- \oplus \mathrm{T2}$	$\surd$	1	1	$\times$	-	-
N66.12.19 $\mathrm{GM3}^- \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N66.12.20 $\mathrm{GM3}^- \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N66.12.21 $\mathrm{Y1}^+ \oplus \mathrm{T1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N66.12.22 $\mathrm{Y1}^+ \oplus \mathrm{T2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N66.12.23 $\mathrm{Y1}^+ \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N66.12.24 $\mathrm{Y1}^+ \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N66.12.25 $\mathrm{Y1}^- \oplus \mathrm{T1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N66.12.26 $\mathrm{Y1}^- \oplus \mathrm{T2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$

Non-coplanar SSGs with parent space group $Cccm$ (No. 66) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N66.12.27 $\mathrm{Y1}^{-} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N66.12.28 $\mathrm{Y1}^{-} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N66.12.29 $\mathrm{Y2}^{+} \oplus \mathrm{T1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N66.12.30 $\mathrm{Y2}^{+} \oplus \mathrm{T2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N66.12.31 $\mathrm{Y2}^{+} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N66.12.32 $\mathrm{Y2}^{+} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N66.12.33 $\mathrm{Y2}^{-} \oplus \mathrm{T1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N66.12.34 $\mathrm{Y2}^{-} \oplus \mathrm{T2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N66.12.35 $\mathrm{Y2}^{-} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N66.12.36 $\mathrm{Y2}^{-} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N66.12.37 $\mathrm{Y3}^{+} \oplus \mathrm{T1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N66.12.38 $\mathrm{Y3}^{+} \oplus \mathrm{T2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N66.12.39 $\mathrm{Y3}^{+} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N66.12.40 $\mathrm{Y3}^{+} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N66.12.41 $\mathrm{Y3}^{-} \oplus \mathrm{T1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N66.12.42 $\mathrm{Y3}^{-} \oplus \mathrm{T2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N66.12.43 $\mathrm{Y3}^{-} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N66.12.44 $\mathrm{Y3}^{-} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N66.13.1 $\mathrm{GM1}^{-} \oplus \mathrm{S1}^{+}$	$\surd$	1	0	$\times$	-	-
N66.13.2 $\mathrm{GM1}^{-} \oplus \mathrm{S1}^{-}$	$\surd$	1	0	$\times$	-	-
N66.13.3 $\mathrm{GM1}^{-} \oplus \mathrm{R1}^{+}$	$\surd$	1	0	$\times$	-	-
N66.13.4 $\mathrm{GM2}^{+} \oplus \mathrm{S1}^{+}$	$\surd$	1	1	$\times$	-	-
N66.13.5 $\mathrm{GM2}^{+} \oplus \mathrm{S1}^{-}$	$\surd$	1	1	$\times$	-	-
N66.13.6 $\mathrm{GM2}^{+} \oplus \mathrm{R1}^{+}$	$\surd$	1	1	$\times$	-	-
N66.13.7 $\mathrm{GM2}^{-} \oplus \mathrm{S1}^{+}$	$\surd$	1	0	$\times$	-	-
N66.13.8 $\mathrm{GM2}^{-} \oplus \mathrm{S1}^{-}$	$\surd$	1	0	$\times$	-	-
N66.13.9 $\mathrm{GM2}^{-} \oplus \mathrm{R1}^{+}$	$\surd$	1	0	$\times$	-	-
N66.13.10 $\mathrm{GM3}^{+} \oplus \mathrm{S1}^{+}$	$\surd$	1	1	$\times$	-	-
N66.13.11 $\mathrm{GM3}^{+} \oplus \mathrm{S1}^{-}$	$\surd$	1	1	$\times$	-	-
N66.13.12 $\mathrm{GM3}^{+} \oplus \mathrm{R1}^{+}$	$\surd$	1	1	$\times$	-	-
N66.13.13 $\mathrm{GM3}^{-} \oplus \mathrm{S1}^{+}$	$\surd$	1	0	$\times$	-	-
N66.13.14 $\mathrm{GM3}^{-} \oplus \mathrm{S1}^{-}$	$\surd$	1	0	$\times$	-	-
N66.13.15 $\mathrm{GM3}^{-} \oplus \mathrm{R1}^{+}$	$\surd$	1	0	$\times$	-	-
N66.13.16 $\mathrm{Y1}^{+} \oplus \mathrm{S1}^{+}$	$\times$	-	-	-	-	-
N66.13.17 $\mathrm{Y1}^{+} \oplus \mathrm{S1}^{-}$	$\times$	-	-	-	-	-
N66.13.18 $\mathrm{Y1}^{+} \oplus \mathrm{R1}^{+}$	$\times$	-	-	-	-	-
N66.13.19 $\mathrm{Y1}^{-} \oplus \mathrm{S1}^{+}$	$\times$	-	-	-	-	-
N66.13.20 $\mathrm{Y1}^{-} \oplus \mathrm{S1}^{-}$	$\times$	-	-	-	-	-
N66.13.21 $\mathrm{Y1}^{-} \oplus \mathrm{R1}^{+}$	$\times$	-	-	-	-	-
N66.13.22 $\mathrm{Y2}^{+} \oplus \mathrm{S1}^{+}$	$\times$	-	-	-	-	-
N66.13.23 $\mathrm{Y2}^{+} \oplus \mathrm{S1}^{-}$	$\times$	-	-	-	-	-
N66.13.24 $\mathrm{Y2}^{+} \oplus \mathrm{R1}^{+}$	$\times$	-	-	-	-	-
N66.13.25 $\mathrm{Y2}^{-} \oplus \mathrm{S1}^{+}$	$\times$	-	-	-	-	-
N66.13.26 $\mathrm{Y2}^{-} \oplus \mathrm{S1}^{-}$	$\times$	-	-	-	-	-
N66.13.27 $\mathrm{Y2}^{-} \oplus \mathrm{R1}^{+}$	$\times$	-	-	-	-	-
N66.13.28 $\mathrm{Y3}^{+} \oplus \mathrm{S1}^{+}$	$\times$	-	-	-	-	-

Non-coplanar SSGs with parent space group $Cccm$ (No. 66) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N66.13.29 $\mathrm{Y3}^{+} \oplus \mathrm{S1}^{-}$	$\times$	-	-	-	-	-
N66.13.30 $\mathrm{Y3}^{+} \oplus \mathrm{R1}^{+}$	$\times$	-	-	-	-	-
N66.13.31 $\mathrm{Y3}^{-} \oplus \mathrm{S1}^{+}$	$\times$	-	-	-	-	-
N66.13.32 $\mathrm{Y3}^{-} \oplus \mathrm{S1}^{-}$	$\times$	-	-	-	-	-
N66.13.33 $\mathrm{Y3}^{-} \oplus \mathrm{R1}^{+}$	$\times$	-	-	-	-	-
N66.14.1 $\mathrm{GM1}^{-} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N66.14.2 $\mathrm{GM1}^{-} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N66.14.3 $\mathrm{GM1}^{-} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N66.14.4 $\mathrm{GM1}^{-} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N66.14.5 $\mathrm{GM1}^{-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N66.14.6 $\mathrm{GM1}^{-} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N66.14.7 $\mathrm{GM1}^{-} \oplus \mathrm{H1}$	$\surd$	1	1	$\times$	-	-
N66.14.8 $\mathrm{GM1}^{-} \oplus \mathrm{H3}$	$\surd$	1	1	$\times$	-	-
N66.14.9 $\mathrm{GM2}^{+} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	$mm2$	B2
N66.14.10 $\mathrm{GM2}^{+} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	$mm2$	B2
N66.14.11 $\mathrm{GM2}^{+} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	$mm2$	B2
N66.14.12 $\mathrm{GM2}^{+} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	$mm2$	B2
N66.14.13 $\mathrm{GM2}^{+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	222	B1
N66.14.14 $\mathrm{GM2}^{+} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	222	B1
N66.14.15 $\mathrm{GM2}^{+} \oplus \mathrm{H1}$	$\surd$	1	1	$\surd$	222	B1
N66.14.16 $\mathrm{GM2}^{+} \oplus \mathrm{H3}$	$\surd$	1	1	$\surd$	222	B1
N66.14.17 $\mathrm{GM2}^{-} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N66.14.18 $\mathrm{GM2}^{-} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N66.14.19 $\mathrm{GM2}^{-} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N66.14.20 $\mathrm{GM2}^{-} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N66.14.21 $\mathrm{GM2}^{-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N66.14.22 $\mathrm{GM2}^{-} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N66.14.23 $\mathrm{GM2}^{-} \oplus \mathrm{H1}$	$\surd$	1	1	$\times$	-	-
N66.14.24 $\mathrm{GM2}^{-} \oplus \mathrm{H3}$	$\surd$	1	1	$\times$	-	-
N66.14.25 $\mathrm{GM3}^{+} \oplus \mathrm{SM1}$	$\surd$	1	1	$\surd$	222	B3
N66.14.26 $\mathrm{GM3}^{+} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	$mm2$	B2
N66.14.27 $\mathrm{GM3}^{+} \oplus \mathrm{SM2}$	$\surd$	1	1	$\surd$	222	B3
N66.14.28 $\mathrm{GM3}^{+} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	$mm2$	B2
N66.14.29 $\mathrm{GM3}^{+} \oplus \mathrm{SM3}$	$\surd$	1	1	$\surd$	222	B3
N66.14.30 $\mathrm{GM3}^{+} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	$mm2$	B2
N66.14.31 $\mathrm{GM3}^{+} \oplus \mathrm{SM4}$	$\surd$	1	1	$\surd$	222	B3
N66.14.32 $\mathrm{GM3}^{+} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	$mm2$	B2
N66.14.33 $\mathrm{GM3}^{+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$mm2$	B2
N66.14.34 $\mathrm{GM3}^{+} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	$mm2$	B2
N66.14.35 $\mathrm{GM3}^{+} \oplus \mathrm{H1}$	$\surd$	1	1	$\times$	-	-
N66.14.36 $\mathrm{GM3}^{+} \oplus \mathrm{H3}$	$\surd$	1	1	$\times$	-	-
N66.14.37 $\mathrm{GM3}^{-} \oplus \mathrm{SM1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N66.14.38 $\mathrm{GM3}^{-} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N66.14.39 $\mathrm{GM3}^{-} \oplus \mathrm{SM2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N66.14.40 $\mathrm{GM3}^{-} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N66.14.41 $\mathrm{GM3}^{-} \oplus \mathrm{SM3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$

Non-coplanar SSGs with parent space group $Cccm$ (No. 66) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N66.14.42 $\mathrm{GM3}^{-} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N66.14.43 $\mathrm{GM3}^{-} \oplus \mathrm{SM4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N66.14.44 $\mathrm{GM3}^{-} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N66.14.45 $\mathrm{GM3}^{-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N66.14.46 $\mathrm{GM3}^{-} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N66.14.47 $\mathrm{GM3}^{-} \oplus \mathrm{H1}$	$\surd$	1	1	$\times$	-	-
N66.14.48 $\mathrm{GM3}^{-} \oplus \mathrm{H3}$	$\surd$	1	1	$\times$	-	-
N66.14.49 $\mathrm{Y1}^{+} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N66.14.50 $\mathrm{Y1}^{+} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N66.14.51 $\mathrm{Y1}^{+} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N66.14.52 $\mathrm{Y1}^{+} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N66.14.53 $\mathrm{Y1}^{+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N66.14.54 $\mathrm{Y1}^{+} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N66.14.55 $\mathrm{Y1}^{+} \oplus \mathrm{H1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N66.14.56 $\mathrm{Y1}^{+} \oplus \mathrm{H3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N66.14.57 $\mathrm{Y1}^{-} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N66.14.58 $\mathrm{Y1}^{-} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N66.14.59 $\mathrm{Y1}^{-} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N66.14.60 $\mathrm{Y1}^{-} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N66.14.61 $\mathrm{Y1}^{-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N66.14.62 $\mathrm{Y1}^{-} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N66.14.63 $\mathrm{Y1}^{-} \oplus \mathrm{H1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N66.14.64 $\mathrm{Y1}^{-} \oplus \mathrm{H3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N66.14.65 $\mathrm{Y2}^{+} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N66.14.66 $\mathrm{Y2}^{+} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N66.14.67 $\mathrm{Y2}^{+} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N66.14.68 $\mathrm{Y2}^{+} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N66.14.69 $\mathrm{Y2}^{+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N66.14.70 $\mathrm{Y2}^{+} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N66.14.71 $\mathrm{Y2}^{+} \oplus \mathrm{H1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N66.14.72 $\mathrm{Y2}^{+} \oplus \mathrm{H3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N66.14.73 $\mathrm{Y2}^{-} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N66.14.74 $\mathrm{Y2}^{-} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N66.14.75 $\mathrm{Y2}^{-} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N66.14.76 $\mathrm{Y2}^{-} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N66.14.77 $\mathrm{Y2}^{-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N66.14.78 $\mathrm{Y2}^{-} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N66.14.79 $\mathrm{Y2}^{-} \oplus \mathrm{H1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N66.14.80 $\mathrm{Y2}^{-} \oplus \mathrm{H3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N66.14.81 $\mathrm{Y3}^{+} \oplus \mathrm{SM1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N66.14.82 $\mathrm{Y3}^{+} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N66.14.83 $\mathrm{Y3}^{+} \oplus \mathrm{SM2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N66.14.84 $\mathrm{Y3}^{+} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N66.14.85 $\mathrm{Y3}^{+} \oplus \mathrm{SM3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N66.14.86 $\mathrm{Y3}^{+} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N66.14.87 $\mathrm{Y3}^{+} \oplus \mathrm{SM4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$

Non-coplanar SSGs with parent space group $Cccm$ (No. 66) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N66.14.88 $\mathrm{Y3}^{+} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N66.14.89 $\mathrm{Y3}^{+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N66.14.90 $\mathrm{Y3}^{+} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N66.14.91 $\mathrm{Y3}^{+} \oplus \mathrm{H1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N66.14.92 $\mathrm{Y3}^{+} \oplus \mathrm{H3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N66.14.93 $\mathrm{Y3}^{-} \oplus \mathrm{SM1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N66.14.94 $\mathrm{Y3}^{-} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N66.14.95 $\mathrm{Y3}^{-} \oplus \mathrm{SM2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N66.14.96 $\mathrm{Y3}^{-} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N66.14.97 $\mathrm{Y3}^{-} \oplus \mathrm{SM3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N66.14.98 $\mathrm{Y3}^{-} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N66.14.99 $\mathrm{Y3}^{-} \oplus \mathrm{SM4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N66.14.100 $\mathrm{Y3}^{-} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N66.14.101 $\mathrm{Y3}^{-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N66.14.102 $\mathrm{Y3}^{-} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N66.14.103 $\mathrm{Y3}^{-} \oplus \mathrm{H1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N66.14.104 $\mathrm{Y3}^{-} \oplus \mathrm{H3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$

TABLE S199: Collinear SSGs with parent space group $Cmme$ (No. 67).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L67.1.1 $\mathrm{GM1}^{+}$	1	mmm	$\mathrm{A_g}$
L67.2.1 $\mathrm{GM1}^{-}$	0	-	-
L67.2.2 $\mathrm{GM2}^{+}$	1	mmm	$\mathrm{B1_g}$
L67.2.3 $\mathrm{GM2}^{-}$	0	-	-
L67.2.4 $\mathrm{GM3}^{+}$	1	mmm	$\mathrm{B3_g}$
L67.2.5 $\mathrm{GM3}^{-}$	0	-	-
L67.2.6 $\mathrm{T1}^{+}$	0	-	-
L67.2.7 $\mathrm{T3}^{+}$	0	-	-
L67.2.8 $\mathrm{T3}^{-}$	0	-	-
L67.2.9 $\mathrm{Y1}^{+}$	0	-	-
L67.2.10 $\mathrm{Y2}^{+}$	0	-	-
L67.2.11 $\mathrm{Y3}^{+}$	0	-	-
L67.2.12 $\mathrm{Y3}^{-}$	0	-	-
L67.2.13 $\mathrm{Z1}^{+}$	0	-	-
L67.2.14 $\mathrm{Z1}^{-}$	0	-	-
L67.2.15 $\mathrm{Z3}^{+}$	0	-	-

TABLE S200: Coplanar SSGs with parent space group $Cmme$ (No. 67).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P67.1.1 $\mathrm{GM1}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
P67.2.1 $\mathrm{GM1}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
P67.2.2 $\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
P67.2.3 $\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
P67.2.4 $\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g}$

Coplanar SSGs with parent space group $Cmme$ (No. 67) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P67.2.5 $\mathrm{GM3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u}$
P67.2.6 $\mathrm{T1}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P67.2.7 $\mathrm{T3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P67.2.8 $\mathrm{T3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P67.2.9 $\mathrm{Y1}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P67.2.10 $\mathrm{Y2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P67.2.11 $\mathrm{Y3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P67.2.12 $\mathrm{Y3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P67.2.13 $\mathrm{Z1}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P67.2.14 $\mathrm{Z1}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P67.2.15 $\mathrm{Z3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P67.3.1 $\mathrm{GM1}^- \oplus \mathrm{GM1}^-$	$\surd$	0	0	$\surd$	-	-
P67.3.2 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
P67.3.3 $\mathrm{GM1}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
P67.3.4 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u}$
P67.3.5 $\mathrm{GM1}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
P67.3.6 $\mathrm{GM1}^- \oplus \mathrm{T1}^+$	$\surd$	1	1	$\times$	-	-
P67.3.7 $\mathrm{GM1}^- \oplus \mathrm{T3}^+$	$\surd$	1	1	$\times$	-	-
P67.3.8 $\mathrm{GM1}^- \oplus \mathrm{T3}^-$	$\surd$	1	1	$\times$	-	-
P67.3.9 $\mathrm{GM1}^- \oplus \mathrm{Y1}^+$	$\surd$	1	1	$\times$	-	-
P67.3.10 $\mathrm{GM1}^- \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\times$	-	-
P67.3.11 $\mathrm{GM1}^- \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\times$	-	-
P67.3.12 $\mathrm{GM1}^- \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\times$	-	-
P67.3.13 $\mathrm{GM1}^- \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\times$	-	-
P67.3.14 $\mathrm{GM1}^- \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
P67.3.15 $\mathrm{GM1}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
P67.3.16 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
P67.3.17 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
P67.3.18 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
P67.3.19 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
P67.3.20 $\mathrm{GM2}^+ \oplus \mathrm{T1}^+$	$\surd$	1	0	$\times$	-	-
P67.3.21 $\mathrm{GM2}^+ \oplus \mathrm{T3}^+$	$\surd$	1	0	$\times$	-	-
P67.3.22 $\mathrm{GM2}^+ \oplus \mathrm{T3}^-$	$\surd$	1	0	$\times$	-	-
P67.3.23 $\mathrm{GM2}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
P67.3.24 $\mathrm{GM2}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
P67.3.25 $\mathrm{GM2}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
P67.3.26 $\mathrm{GM2}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
P67.3.27 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
P67.3.28 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
P67.3.29 $\mathrm{GM2}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
P67.3.30 $\mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
P67.3.31 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
P67.3.32 $\mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
P67.3.33 $\mathrm{GM2}^- \oplus \mathrm{T1}^+$	$\surd$	1	1	$\times$	-	-
P67.3.34 $\mathrm{GM2}^- \oplus \mathrm{T3}^+$	$\surd$	1	1	$\times$	-	-
P67.3.35 $\mathrm{GM2}^- \oplus \mathrm{T3}^-$	$\surd$	1	1	$\times$	-	-

Coplanar SSGs with parent space group $Cmme$ (No. 67) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P67.3.36 $\mathrm{GM2^-} \oplus \mathrm{Y1^+}$	$\surd$	1	1	$\times$	-	-
P67.3.37 $\mathrm{GM2^-} \oplus \mathrm{Y2^+}$	$\surd$	1	1	$\times$	-	-
P67.3.38 $\mathrm{GM2^-} \oplus \mathrm{Y3^+}$	$\surd$	1	1	$\times$	-	-
P67.3.39 $\mathrm{GM2^-} \oplus \mathrm{Y3^-}$	$\surd$	1	1	$\times$	-	-
P67.3.40 $\mathrm{GM2^-} \oplus \mathrm{Z1^+}$	$\surd$	1	1	$\times$	-	-
P67.3.41 $\mathrm{GM2^-} \oplus \mathrm{Z1^-}$	$\surd$	1	1	$\times$	-	-
P67.3.42 $\mathrm{GM2^-} \oplus \mathrm{Z3^+}$	$\surd$	1	1	$\times$	-	-
P67.3.43 $\mathrm{GM3^+} \oplus \mathrm{GM3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
P67.3.44 $\mathrm{GM3^+} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g}$
P67.3.45 $\mathrm{GM3^+} \oplus \mathrm{GM3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
P67.3.46 $\mathrm{GM3^+} \oplus \mathrm{GM4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
P67.3.47 $\mathrm{GM3^+} \oplus \mathrm{T1^+}$	$\surd$	1	0	$\times$	-	-
P67.3.48 $\mathrm{GM3^+} \oplus \mathrm{T1^-}$	$\surd$	1	0	$\times$	-	-
P67.3.49 $\mathrm{GM3^+} \oplus \mathrm{T3^+}$	$\surd$	1	0	$\times$	-	-
P67.3.50 $\mathrm{GM3^+} \oplus \mathrm{T3^-}$	$\surd$	1	0	$\times$	-	-
P67.3.51 $\mathrm{GM3^+} \oplus \mathrm{Y1^+}$	$\surd$	1	0	$\times$	-	-
P67.3.52 $\mathrm{GM3^+} \oplus \mathrm{Y1^-}$	$\surd$	1	0	$\times$	-	-
P67.3.53 $\mathrm{GM3^+} \oplus \mathrm{Y2^+}$	$\surd$	1	0	$\times$	-	-
P67.3.54 $\mathrm{GM3^+} \oplus \mathrm{Y2^-}$	$\surd$	1	0	$\times$	-	-
P67.3.55 $\mathrm{GM3^+} \oplus \mathrm{Y3^+}$	$\surd$	1	0	$\times$	-	-
P67.3.56 $\mathrm{GM3^+} \oplus \mathrm{Y4^-}$	$\surd$	1	0	$\times$	-	-
P67.3.57 $\mathrm{GM3^+} \oplus \mathrm{Y3^-}$	$\surd$	1	0	$\times$	-	-
P67.3.58 $\mathrm{GM3^+} \oplus \mathrm{Y4^+}$	$\surd$	1	0	$\times$	-	-
P67.3.59 $\mathrm{GM3^+} \oplus \mathrm{Z1^+}$	$\surd$	1	0	$\times$	-	-
P67.3.60 $\mathrm{GM3^+} \oplus \mathrm{Z1^-}$	$\surd$	1	0	$\times$	-	-
P67.3.61 $\mathrm{GM3^+} \oplus \mathrm{Z3^+}$	$\surd$	1	0	$\times$	-	-
P67.3.62 $\mathrm{GM3^+} \oplus \mathrm{Z3^-}$	$\surd$	1	0	$\times$	-	-
P67.3.63 $\mathrm{GM3^-} \oplus \mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
P67.3.64 $\mathrm{GM3^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
P67.3.65 $\mathrm{GM3^-} \oplus \mathrm{T1^+}$	$\surd$	1	1	$\times$	-	-
P67.3.66 $\mathrm{GM3^-} \oplus \mathrm{T1^-}$	$\surd$	1	1	$\times$	-	-
P67.3.67 $\mathrm{GM3^-} \oplus \mathrm{T3^+}$	$\surd$	1	1	$\times$	-	-
P67.3.68 $\mathrm{GM3^-} \oplus \mathrm{T3^-}$	$\surd$	1	1	$\times$	-	-
P67.3.69 $\mathrm{GM3^-} \oplus \mathrm{Y1^+}$	$\surd$	1	1	$\times$	-	-
P67.3.70 $\mathrm{GM3^-} \oplus \mathrm{Y1^-}$	$\surd$	1	1	$\times$	-	-
P67.3.71 $\mathrm{GM3^-} \oplus \mathrm{Y2^+}$	$\surd$	1	1	$\times$	-	-
P67.3.72 $\mathrm{GM3^-} \oplus \mathrm{Y2^-}$	$\surd$	1	1	$\times$	-	-
P67.3.73 $\mathrm{GM3^-} \oplus \mathrm{Y3^+}$	$\surd$	1	1	$\times$	-	-
P67.3.74 $\mathrm{GM3^-} \oplus \mathrm{Y4^-}$	$\surd$	1	1	$\times$	-	-
P67.3.75 $\mathrm{GM3^-} \oplus \mathrm{Y3^-}$	$\surd$	1	1	$\times$	-	-
P67.3.76 $\mathrm{GM3^-} \oplus \mathrm{Y4^+}$	$\surd$	1	1	$\times$	-	-
P67.3.77 $\mathrm{GM3^-} \oplus \mathrm{Z1^+}$	$\surd$	1	1	$\times$	-	-
P67.3.78 $\mathrm{GM3^-} \oplus \mathrm{Z1^-}$	$\surd$	1	1	$\times$	-	-
P67.3.79 $\mathrm{GM3^-} \oplus \mathrm{Z3^+}$	$\surd$	1	1	$\times$	-	-
P67.3.80 $\mathrm{GM3^-} \oplus \mathrm{Z3^-}$	$\surd$	1	1	$\times$	-	-
P67.3.81 $\mathrm{T1^+} \oplus \mathrm{T1^+}$	$\surd$	1	0	$\times$	-	-

Coplanar SSGs with parent space group $Cmme$ (No. 67) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P67.3.82 $\mathrm{T1}^+ \oplus \mathrm{T1}^-$	$\surd$	1	1	$\times$	-	-
P67.3.83 $\mathrm{T1}^+ \oplus \mathrm{T2}^+$	$\surd$	1	0	$\times$	-	-
P67.3.84 $\mathrm{T1}^+ \oplus \mathrm{T2}^-$	$\surd$	1	1	$\times$	-	-
P67.3.85 $\mathrm{T1}^+ \oplus \mathrm{T3}^+$	$\surd$	1	0	$\times$	-	-
P67.3.86 $\mathrm{T1}^+ \oplus \mathrm{T4}^-$	$\surd$	1	1	$\times$	-	-
P67.3.87 $\mathrm{T1}^+ \oplus \mathrm{T3}^-$	$\surd$	1	1	$\times$	-	-
P67.3.88 $\mathrm{T1}^+ \oplus \mathrm{T4}^+$	$\surd$	1	0	$\times$	-	-
P67.3.89 $\mathrm{T1}^+ \oplus \mathrm{Y1}^+$	$\times$	-	-	-	-	-
P67.3.90 $\mathrm{T1}^+ \oplus \mathrm{Y1}^-$	$\times$	-	-	-	-	-
P67.3.91 $\mathrm{T1}^+ \oplus \mathrm{Y2}^+$	$\times$	-	-	-	-	-
P67.3.92 $\mathrm{T1}^+ \oplus \mathrm{Y2}^-$	$\times$	-	-	-	-	-
P67.3.93 $\mathrm{T1}^+ \oplus \mathrm{Y3}^+$	$\times$	-	-	-	-	-
P67.3.94 $\mathrm{T1}^+ \oplus \mathrm{Y4}^-$	$\times$	-	-	-	-	-
P67.3.95 $\mathrm{T1}^+ \oplus \mathrm{Y3}^-$	$\times$	-	-	-	-	-
P67.3.96 $\mathrm{T1}^+ \oplus \mathrm{Y4}^+$	$\times$	-	-	-	-	-
P67.3.97 $\mathrm{T1}^+ \oplus \mathrm{Z1}^+$	$\times$	-	-	-	-	-
P67.3.98 $\mathrm{T1}^+ \oplus \mathrm{Z2}^-$	$\times$	-	-	-	-	-
P67.3.99 $\mathrm{T1}^+ \oplus \mathrm{Z1}^-$	$\times$	-	-	-	-	-
P67.3.100 $\mathrm{T1}^+ \oplus \mathrm{Z2}^+$	$\times$	-	-	-	-	-
P67.3.101 $\mathrm{T1}^+ \oplus \mathrm{Z3}^+$	$\times$	-	-	-	-	-
P67.3.102 $\mathrm{T1}^+ \oplus \mathrm{Z3}^-$	$\times$	-	-	-	-	-
P67.3.103 $\mathrm{T1}^+ \oplus \mathrm{Z4}^+$	$\times$	-	-	-	-	-
P67.3.104 $\mathrm{T1}^+ \oplus \mathrm{Z4}^-$	$\times$	-	-	-	-	-
P67.3.105 $\mathrm{T3}^+ \oplus \mathrm{T3}^+$	$\surd$	1	0	$\times$	-	-
P67.3.106 $\mathrm{T3}^+ \oplus \mathrm{T4}^-$	$\surd$	1	1	$\times$	-	-
P67.3.107 $\mathrm{T3}^+ \oplus \mathrm{T3}^-$	$\surd$	1	1	$\times$	-	-
P67.3.108 $\mathrm{T3}^+ \oplus \mathrm{T4}^+$	$\surd$	1	0	$\times$	-	-
P67.3.109 $\mathrm{T3}^+ \oplus \mathrm{Y1}^+$	$\times$	-	-	-	-	-
P67.3.110 $\mathrm{T3}^+ \oplus \mathrm{Y2}^+$	$\times$	-	-	-	-	-
P67.3.111 $\mathrm{T3}^+ \oplus \mathrm{Y3}^+$	$\times$	-	-	-	-	-
P67.3.112 $\mathrm{T3}^+ \oplus \mathrm{Y3}^-$	$\times$	-	-	-	-	-
P67.3.113 $\mathrm{T3}^+ \oplus \mathrm{Z1}^+$	$\times$	-	-	-	-	-
P67.3.114 $\mathrm{T3}^+ \oplus \mathrm{Z1}^-$	$\times$	-	-	-	-	-
P67.3.115 $\mathrm{T3}^+ \oplus \mathrm{Z3}^+$	$\times$	-	-	-	-	-
P67.3.116 $\mathrm{T3}^+ \oplus \mathrm{Z4}^+$	$\times$	-	-	-	-	-
P67.3.117 $\mathrm{T3}^- \oplus \mathrm{T3}^-$	$\surd$	1	0	$\times$	-	-
P67.3.118 $\mathrm{T3}^- \oplus \mathrm{T4}^+$	$\surd$	1	1	$\times$	-	-
P67.3.119 $\mathrm{T3}^- \oplus \mathrm{Y1}^+$	$\times$	-	-	-	-	-
P67.3.120 $\mathrm{T3}^- \oplus \mathrm{Y2}^+$	$\times$	-	-	-	-	-
P67.3.121 $\mathrm{T3}^- \oplus \mathrm{Y3}^+$	$\times$	-	-	-	-	-
P67.3.122 $\mathrm{T3}^- \oplus \mathrm{Y3}^-$	$\times$	-	-	-	-	-
P67.3.123 $\mathrm{T3}^- \oplus \mathrm{Z1}^+$	$\times$	-	-	-	-	-
P67.3.124 $\mathrm{T3}^- \oplus \mathrm{Z1}^-$	$\times$	-	-	-	-	-
P67.3.125 $\mathrm{T3}^- \oplus \mathrm{Z3}^+$	$\times$	-	-	-	-	-
P67.3.126 $\mathrm{T3}^- \oplus \mathrm{Z4}^+$	$\times$	-	-	-	-	-
P67.3.127 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	0	$\times$	-	-

Coplanar SSGs with parent space group $Cmme$ (No. 67) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P67.3.128 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^-$	$\surd$	1	1	$\times$	-	-
P67.3.129 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
P67.3.130 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\times$	-	-
P67.3.131 $\mathrm{Y1}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
P67.3.132 $\mathrm{Y1}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P67.3.133 $\mathrm{Y1}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P67.3.134 $\mathrm{Y1}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
P67.3.135 $\mathrm{Y1}^+ \oplus \mathrm{Z1}^+$	$\times$	-	-	-	-	-
P67.3.136 $\mathrm{Y1}^+ \oplus \mathrm{Z1}^-$	$\times$	-	-	-	-	-
P67.3.137 $\mathrm{Y1}^+ \oplus \mathrm{Z3}^+$	$\times$	-	-	-	-	-
P67.3.138 $\mathrm{Y1}^+ \oplus \mathrm{Z3}^-$	$\times$	-	-	-	-	-
P67.3.139 $\mathrm{Y2}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
P67.3.140 $\mathrm{Y2}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\times$	-	-
P67.3.141 $\mathrm{Y2}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
P67.3.142 $\mathrm{Y2}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P67.3.143 $\mathrm{Y2}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P67.3.144 $\mathrm{Y2}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
P67.3.145 $\mathrm{Y2}^+ \oplus \mathrm{Z1}^+$	$\times$	-	-	-	-	-
P67.3.146 $\mathrm{Y2}^+ \oplus \mathrm{Z1}^-$	$\times$	-	-	-	-	-
P67.3.147 $\mathrm{Y2}^+ \oplus \mathrm{Z3}^+$	$\times$	-	-	-	-	-
P67.3.148 $\mathrm{Y2}^+ \oplus \mathrm{Z3}^-$	$\times$	-	-	-	-	-
P67.3.149 $\mathrm{Y3}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
P67.3.150 $\mathrm{Y3}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\times$	-	-
P67.3.151 $\mathrm{Y3}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\times$	-	-
P67.3.152 $\mathrm{Y3}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
P67.3.153 $\mathrm{Y3}^+ \oplus \mathrm{Z1}^+$	$\times$	-	-	-	-	-
P67.3.154 $\mathrm{Y3}^+ \oplus \mathrm{Z1}^-$	$\times$	-	-	-	-	-
P67.3.155 $\mathrm{Y3}^+ \oplus \mathrm{Z3}^+$	$\times$	-	-	-	-	-
P67.3.156 $\mathrm{Y3}^+ \oplus \mathrm{Z3}^-$	$\times$	-	-	-	-	-
P67.3.157 $\mathrm{Y3}^- \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
P67.3.158 $\mathrm{Y3}^- \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\times$	-	-
P67.3.159 $\mathrm{Y3}^- \oplus \mathrm{Z1}^+$	$\times$	-	-	-	-	-
P67.3.160 $\mathrm{Y3}^- \oplus \mathrm{Z1}^-$	$\times$	-	-	-	-	-
P67.3.161 $\mathrm{Y3}^- \oplus \mathrm{Z3}^+$	$\times$	-	-	-	-	-
P67.3.162 $\mathrm{Y3}^- \oplus \mathrm{Z3}^-$	$\times$	-	-	-	-	-
P67.3.163 $\mathrm{Z1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
P67.3.164 $\mathrm{Z1}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P67.3.165 $\mathrm{Z1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
P67.3.166 $\mathrm{Z1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
P67.3.167 $\mathrm{Z1}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
P67.3.168 $\mathrm{Z1}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
P67.3.169 $\mathrm{Z1}^- \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
P67.3.170 $\mathrm{Z1}^- \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P67.3.171 $\mathrm{Z1}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
P67.3.172 $\mathrm{Z1}^- \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
P67.3.173 $\mathrm{Z3}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-

Coplanar SSGs with parent space group $Cmme$ (No. 67) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P67.3.174 Z3$^+$ ⊕ Z3$^-$	√	1	1	×	-	-
P67.3.175 Z3$^+$ ⊕ Z4$^+$	√	1	0	×	-	-
P67.3.176 Z3$^+$ ⊕ Z4$^-$	√	1	1	√	mmm	$\mathrm{B1_u}$
P67.8.1 DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
P67.8.2 DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
P67.8.3 DT3	√	1	1	√	mmm	$\mathrm{B2_u}$
P67.8.4 DT4	√	1	1	√	mmm	$\mathrm{B2_u}$
P67.8.5 A1	√	1	1	×	-	-
P67.8.6 A2	√	1	1	×	-	-
P67.8.7 LD1	√	1	1	√	mmm	$\mathrm{B1_u}$
P67.8.8 LD2	√	1	1	√	mmm	$\mathrm{B1_u}$
P67.8.9 LD3	√	1	1	√	mmm	$\mathrm{B1_u}$
P67.8.10 H3	√	1	1	×	-	-
P67.8.11 H4	√	1	1	×	-	-
P67.8.12 H1	√	1	1	×	-	-

TABLE S201: Non-coplanar SSGs with parent space group $Cmme$ (No. 67).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N67.1.1 GM1$^+$	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{A_g}$
N67.2.1 GM1$^-$	√	2	2	√	222	$\mathrm{A1} \oplus \mathrm{A1}$
N67.2.2 GM2$^+$	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B1_g}$
N67.2.3 GM2$^-$	√	2	2	√	$mm2$	$\mathrm{A1} \oplus \mathrm{A1}$
N67.2.4 GM3$^+$	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B3_g}$
N67.2.5 GM3$^-$	√	2	2	√	$mm2$	$\mathrm{A1} \oplus \mathrm{A1}$
N67.2.6 T1$^+$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
N67.2.7 T3$^+$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
N67.2.8 T3$^-$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
N67.2.9 Y1$^+$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
N67.2.10 Y2$^+$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
N67.2.11 Y3$^+$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
N67.2.12 Y3$^-$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
N67.2.13 Z1$^+$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
N67.2.14 Z1$^-$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
N67.2.15 Z3$^+$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
N67.3.1 GM1$^-$ ⊕ GM1$^-$	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{A_u}$
N67.3.2 GM1$^-$ ⊕ GM2$^+$	√	2	2	√	$mm2$	$\mathrm{A1} \oplus \mathrm{A2}$
N67.3.3 GM1$^-$ ⊕ GM2$^-$	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N67.3.4 GM1$^-$ ⊕ GM3$^+$	√	2	2	√	$mm2$	$\mathrm{A1} \oplus \mathrm{A2}$
N67.3.5 GM1$^-$ ⊕ GM3$^-$	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B3_u}$
N67.3.6 GM1$^-$ ⊕ T1$^+$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
N67.3.7 GM1$^-$ ⊕ T3$^+$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
N67.3.8 GM1$^-$ ⊕ T3$^-$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
N67.3.9 GM1$^-$ ⊕ Y1$^+$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
N67.3.10 GM1$^-$ ⊕ Y2$^+$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
N67.3.11 GM1$^-$ ⊕ Y3$^+$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$

Non-coplanar SSGs with parent space group $Cmme$ (No. 67) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N67.3.12 $\mathrm{GM1}^- \oplus \mathrm{Y3}^-$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
N67.3.13 $\mathrm{GM1}^- \oplus \mathrm{Z1}^+$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
N67.3.14 $\mathrm{GM1}^- \oplus \mathrm{Z1}^-$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
N67.3.15 $\mathrm{GM1}^- \oplus \mathrm{Z3}^+$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
N67.3.16 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N67.3.17 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	√	2	2	√	222	$\mathrm{A1} \oplus \mathrm{B1}$
N67.3.18 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+$	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g} \oplus \mathrm{B3_g}$
N67.3.19 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^-$	√	2	2	√	$mm2$	$\mathrm{A1} \oplus \mathrm{B1}$
N67.3.20 $\mathrm{GM2}^+ \oplus \mathrm{T1}^+$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
N67.3.21 $\mathrm{GM2}^+ \oplus \mathrm{T3}^+$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
N67.3.22 $\mathrm{GM2}^+ \oplus \mathrm{T3}^-$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
N67.3.23 $\mathrm{GM2}^+ \oplus \mathrm{Y1}^+$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
N67.3.24 $\mathrm{GM2}^+ \oplus \mathrm{Y2}^+$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
N67.3.25 $\mathrm{GM2}^+ \oplus \mathrm{Y3}^+$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
N67.3.26 $\mathrm{GM2}^+ \oplus \mathrm{Y3}^-$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
N67.3.27 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^+$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
N67.3.28 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^-$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
N67.3.29 $\mathrm{GM2}^+ \oplus \mathrm{Z3}^+$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
N67.3.30 $\mathrm{GM2}^- \oplus \mathrm{GM2}^-$	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N67.3.31 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+$	√	2	2	√	$mm2$	$\mathrm{A1} \oplus \mathrm{B2}$
N67.3.32 $\mathrm{GM2}^- \oplus \mathrm{GM3}^-$	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u} \oplus \mathrm{B3_u}$
N67.3.33 $\mathrm{GM2}^- \oplus \mathrm{T1}^+$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
N67.3.34 $\mathrm{GM2}^- \oplus \mathrm{T3}^+$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
N67.3.35 $\mathrm{GM2}^- \oplus \mathrm{T3}^-$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
N67.3.36 $\mathrm{GM2}^- \oplus \mathrm{Y1}^+$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
N67.3.37 $\mathrm{GM2}^- \oplus \mathrm{Y2}^+$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
N67.3.38 $\mathrm{GM2}^- \oplus \mathrm{Y3}^+$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
N67.3.39 $\mathrm{GM2}^- \oplus \mathrm{Y3}^-$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
N67.3.40 $\mathrm{GM2}^- \oplus \mathrm{Z1}^+$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
N67.3.41 $\mathrm{GM2}^- \oplus \mathrm{Z1}^-$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
N67.3.42 $\mathrm{GM2}^- \oplus \mathrm{Z3}^+$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
N67.3.43 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N67.3.44 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N67.3.45 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	√	2	2	√	222	$\mathrm{A1} \oplus \mathrm{B3}$
N67.3.46 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	√	2	2	√	$mm2$	$\mathrm{A1} \oplus \mathrm{B2}$
N67.3.47 $\mathrm{GM3}^+ \oplus \mathrm{T1}^+$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g}$
N67.3.48 $\mathrm{GM3}^+ \oplus \mathrm{T1}^-$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g}$
N67.3.49 $\mathrm{GM3}^+ \oplus \mathrm{T3}^+$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g}$
N67.3.50 $\mathrm{GM3}^+ \oplus \mathrm{T3}^-$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g}$
N67.3.51 $\mathrm{GM3}^+ \oplus \mathrm{Y1}^+$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g}$
N67.3.52 $\mathrm{GM3}^+ \oplus \mathrm{Y1}^-$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g}$
N67.3.53 $\mathrm{GM3}^+ \oplus \mathrm{Y2}^+$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g}$
N67.3.54 $\mathrm{GM3}^+ \oplus \mathrm{Y2}^-$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g}$
N67.3.55 $\mathrm{GM3}^+ \oplus \mathrm{Y3}^+$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g}$
N67.3.56 $\mathrm{GM3}^+ \oplus \mathrm{Y4}^-$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g}$
N67.3.57 $\mathrm{GM3}^+ \oplus \mathrm{Y3}^-$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g}$

Non-coplanar SSGs with parent space group $Cmme$ (No. 67) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N67.3.58 $\mathrm{GM3^+} \oplus \mathrm{Y4^+}$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g}$
N67.3.59 $\mathrm{GM3^+} \oplus \mathrm{Z1^+}$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g}$
N67.3.60 $\mathrm{GM3^+} \oplus \mathrm{Z1^-}$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g}$
N67.3.61 $\mathrm{GM3^+} \oplus \mathrm{Z3^+}$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g}$
N67.3.62 $\mathrm{GM3^+} \oplus \mathrm{Z3^-}$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g}$
N67.3.63 $\mathrm{GM3^-} \oplus \mathrm{GM3^-}$	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N67.3.64 $\mathrm{GM3^-} \oplus \mathrm{GM4^-}$	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N67.3.65 $\mathrm{GM3^-} \oplus \mathrm{T1^+}$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u}$
N67.3.66 $\mathrm{GM3^-} \oplus \mathrm{T1^-}$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u}$
N67.3.67 $\mathrm{GM3^-} \oplus \mathrm{T3^+}$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u}$
N67.3.68 $\mathrm{GM3^-} \oplus \mathrm{T3^-}$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u}$
N67.3.69 $\mathrm{GM3^-} \oplus \mathrm{Y1^+}$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u}$
N67.3.70 $\mathrm{GM3^-} \oplus \mathrm{Y1^-}$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u}$
N67.3.71 $\mathrm{GM3^-} \oplus \mathrm{Y2^+}$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u}$
N67.3.72 $\mathrm{GM3^-} \oplus \mathrm{Y2^-}$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u}$
N67.3.73 $\mathrm{GM3^-} \oplus \mathrm{Y3^+}$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u}$
N67.3.74 $\mathrm{GM3^-} \oplus \mathrm{Y4^-}$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u}$
N67.3.75 $\mathrm{GM3^-} \oplus \mathrm{Y3^-}$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u}$
N67.3.76 $\mathrm{GM3^-} \oplus \mathrm{Y4^+}$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u}$
N67.3.77 $\mathrm{GM3^-} \oplus \mathrm{Z1^+}$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u}$
N67.3.78 $\mathrm{GM3^-} \oplus \mathrm{Z1^-}$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u}$
N67.3.79 $\mathrm{GM3^-} \oplus \mathrm{Z3^+}$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u}$
N67.3.80 $\mathrm{GM3^-} \oplus \mathrm{Z3^-}$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u}$
N67.3.81 $\mathrm{T1^+} \oplus \mathrm{T1^+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N67.3.82 $\mathrm{T1^+} \oplus \mathrm{T1^-}$	√	1	1	√	222	A1
N67.3.83 $\mathrm{T1^+} \oplus \mathrm{T2^+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N67.3.84 $\mathrm{T1^+} \oplus \mathrm{T2^-}$	√	1	1	√	$mm2$	A1
N67.3.85 $\mathrm{T1^+} \oplus \mathrm{T3^+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N67.3.86 $\mathrm{T1^+} \oplus \mathrm{T4^-}$	√	1	1	√	$mm2$	A1
N67.3.87 $\mathrm{T1^+} \oplus \mathrm{T3^-}$	√	1	1	√	$mm2$	A1
N67.3.88 $\mathrm{T1^+} \oplus \mathrm{T4^+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N67.3.89 $\mathrm{T1^+} \oplus \mathrm{Y1^+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N67.3.90 $\mathrm{T1^+} \oplus \mathrm{Y1^-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N67.3.91 $\mathrm{T1^+} \oplus \mathrm{Y2^+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N67.3.92 $\mathrm{T1^+} \oplus \mathrm{Y2^-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N67.3.93 $\mathrm{T1^+} \oplus \mathrm{Y3^+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N67.3.94 $\mathrm{T1^+} \oplus \mathrm{Y4^-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N67.3.95 $\mathrm{T1^+} \oplus \mathrm{Y3^-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N67.3.96 $\mathrm{T1^+} \oplus \mathrm{Y4^+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N67.3.97 $\mathrm{T1^+} \oplus \mathrm{Z1^+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N67.3.98 $\mathrm{T1^+} \oplus \mathrm{Z2^-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N67.3.99 $\mathrm{T1^+} \oplus \mathrm{Z1^-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N67.3.100 $\mathrm{T1^+} \oplus \mathrm{Z2^+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N67.3.101 $\mathrm{T1^+} \oplus \mathrm{Z3^+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N67.3.102 $\mathrm{T1^+} \oplus \mathrm{Z3^-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N67.3.103 $\mathrm{T1^+} \oplus \mathrm{Z4^+}$	√	1	1	√	mmm	$\mathrm{A_g}$

Non-coplanar SSGs with parent space group $Cmme$ (No. 67) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N67.3.104 $\mathrm{T1}^+ \oplus \mathrm{Z4}^-$	√	1	1	√	mmm	$\mathrm{A_g}$
N67.3.105 $\mathrm{T3}^+ \oplus \mathrm{T3}^+$	√	1	1	√	mmm	$\mathrm{A_g}$
N67.3.106 $\mathrm{T3}^+ \oplus \mathrm{T4}^-$	√	1	1	√	$mm2$	A1
N67.3.107 $\mathrm{T3}^+ \oplus \mathrm{T3}^-$	√	1	1	√	222	A1
N67.3.108 $\mathrm{T3}^+ \oplus \mathrm{T4}^+$	√	1	1	√	mmm	$\mathrm{A_g}$
N67.3.109 $\mathrm{T3}^+ \oplus \mathrm{Y1}^+$	√	1	1	√	mmm	$\mathrm{A_g}$
N67.3.110 $\mathrm{T3}^+ \oplus \mathrm{Y2}^+$	√	1	1	√	mmm	$\mathrm{A_g}$
N67.3.111 $\mathrm{T3}^+ \oplus \mathrm{Y3}^+$	√	1	1	√	mmm	$\mathrm{A_g}$
N67.3.112 $\mathrm{T3}^+ \oplus \mathrm{Y3}^-$	√	1	1	√	mmm	$\mathrm{A_g}$
N67.3.113 $\mathrm{T3}^+ \oplus \mathrm{Z1}^+$	√	1	1	√	mmm	$\mathrm{A_g}$
N67.3.114 $\mathrm{T3}^+ \oplus \mathrm{Z1}^-$	√	1	1	√	mmm	$\mathrm{A_g}$
N67.3.115 $\mathrm{T3}^+ \oplus \mathrm{Z3}^+$	√	1	1	√	mmm	$\mathrm{A_g}$
N67.3.116 $\mathrm{T3}^+ \oplus \mathrm{Z4}^+$	√	1	1	√	mmm	$\mathrm{A_g}$
N67.3.117 $\mathrm{T3}^- \oplus \mathrm{T3}^-$	√	1	1	√	mmm	$\mathrm{A_g}$
N67.3.118 $\mathrm{T3}^- \oplus \mathrm{T4}^+$	√	1	1	√	$mm2$	A1
N67.3.119 $\mathrm{T3}^- \oplus \mathrm{Y1}^+$	√	1	1	√	mmm	$\mathrm{A_g}$
N67.3.120 $\mathrm{T3}^- \oplus \mathrm{Y2}^+$	√	1	1	√	mmm	$\mathrm{A_g}$
N67.3.121 $\mathrm{T3}^- \oplus \mathrm{Y3}^+$	√	1	1	√	mmm	$\mathrm{A_g}$
N67.3.122 $\mathrm{T3}^- \oplus \mathrm{Y3}^-$	√	1	1	√	mmm	$\mathrm{A_g}$
N67.3.123 $\mathrm{T3}^- \oplus \mathrm{Z1}^+$	√	1	1	√	mmm	$\mathrm{A_g}$
N67.3.124 $\mathrm{T3}^- \oplus \mathrm{Z1}^-$	√	1	1	√	mmm	$\mathrm{A_g}$
N67.3.125 $\mathrm{T3}^- \oplus \mathrm{Z3}^+$	√	1	1	√	mmm	$\mathrm{A_g}$
N67.3.126 $\mathrm{T3}^- \oplus \mathrm{Z4}^+$	√	1	1	√	mmm	$\mathrm{A_g}$
N67.3.127 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^+$	√	1	1	√	mmm	$\mathrm{A_g}$
N67.3.128 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^-$	√	1	1	√	222	A1
N67.3.129 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^+$	√	1	1	√	mmm	$\mathrm{A_g}$
N67.3.130 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^-$	√	1	1	√	$mm2$	A1
N67.3.131 $\mathrm{Y1}^+ \oplus \mathrm{Y3}^+$	√	1	1	√	mmm	$\mathrm{A_g}$
N67.3.132 $\mathrm{Y1}^+ \oplus \mathrm{Y4}^-$	√	1	1	√	$mm2$	A1
N67.3.133 $\mathrm{Y1}^+ \oplus \mathrm{Y3}^-$	√	1	1	√	$mm2$	A1
N67.3.134 $\mathrm{Y1}^+ \oplus \mathrm{Y4}^+$	√	1	1	√	mmm	$\mathrm{A_g}$
N67.3.135 $\mathrm{Y1}^+ \oplus \mathrm{Z1}^+$	√	1	1	√	mmm	$\mathrm{A_g}$
N67.3.136 $\mathrm{Y1}^+ \oplus \mathrm{Z1}^-$	√	1	1	√	mmm	$\mathrm{A_g}$
N67.3.137 $\mathrm{Y1}^+ \oplus \mathrm{Z3}^+$	√	1	1	√	mmm	$\mathrm{A_g}$
N67.3.138 $\mathrm{Y1}^+ \oplus \mathrm{Z3}^-$	√	1	1	√	mmm	$\mathrm{A_g}$
N67.3.139 $\mathrm{Y2}^+ \oplus \mathrm{Y2}^+$	√	1	1	√	mmm	$\mathrm{A_g}$
N67.3.140 $\mathrm{Y2}^+ \oplus \mathrm{Y2}^-$	√	1	1	√	222	A1
N67.3.141 $\mathrm{Y2}^+ \oplus \mathrm{Y3}^+$	√	1	1	√	mmm	$\mathrm{A_g}$
N67.3.142 $\mathrm{Y2}^+ \oplus \mathrm{Y4}^-$	√	1	1	√	$mm2$	A1
N67.3.143 $\mathrm{Y2}^+ \oplus \mathrm{Y3}^-$	√	1	1	√	$mm2$	A1
N67.3.144 $\mathrm{Y2}^+ \oplus \mathrm{Y4}^+$	√	1	1	√	mmm	$\mathrm{A_g}$
N67.3.145 $\mathrm{Y2}^+ \oplus \mathrm{Z1}^+$	√	1	1	√	mmm	$\mathrm{A_g}$
N67.3.146 $\mathrm{Y2}^+ \oplus \mathrm{Z1}^-$	√	1	1	√	mmm	$\mathrm{A_g}$
N67.3.147 $\mathrm{Y2}^+ \oplus \mathrm{Z3}^+$	√	1	1	√	mmm	$\mathrm{A_g}$
N67.3.148 $\mathrm{Y2}^+ \oplus \mathrm{Z3}^-$	√	1	1	√	mmm	$\mathrm{A_g}$
N67.3.149 $\mathrm{Y3}^+ \oplus \mathrm{Y3}^+$	√	1	1	√	mmm	$\mathrm{A_g}$

Non-coplanar SSGs with parent space group $Cmme$ (No. 67) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N67.3.150 $\mathrm{Y3^+} \oplus \mathrm{Y4^-}$	√	1	1	√	$mm2$	A1
N67.3.151 $\mathrm{Y3^+} \oplus \mathrm{Y3^-}$	√	1	1	√	222	A1
N67.3.152 $\mathrm{Y3^+} \oplus \mathrm{Y4^+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N67.3.153 $\mathrm{Y3^+} \oplus \mathrm{Z1^+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N67.3.154 $\mathrm{Y3^+} \oplus \mathrm{Z1^-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N67.3.155 $\mathrm{Y3^+} \oplus \mathrm{Z3^+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N67.3.156 $\mathrm{Y3^+} \oplus \mathrm{Z3^-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N67.3.157 $\mathrm{Y3^-} \oplus \mathrm{Y3^-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N67.3.158 $\mathrm{Y3^-} \oplus \mathrm{Y4^+}$	√	1	1	√	$mm2$	A1
N67.3.159 $\mathrm{Y3^-} \oplus \mathrm{Z1^+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N67.3.160 $\mathrm{Y3^-} \oplus \mathrm{Z1^-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N67.3.161 $\mathrm{Y3^-} \oplus \mathrm{Z3^+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N67.3.162 $\mathrm{Y3^-} \oplus \mathrm{Z3^-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N67.3.163 $\mathrm{Z1^+} \oplus \mathrm{Z1^+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N67.3.164 $\mathrm{Z1^+} \oplus \mathrm{Z2^-}$	√	1	1	√	$mm2$	A1
N67.3.165 $\mathrm{Z1^+} \oplus \mathrm{Z1^-}$	√	1	1	√	222	A1
N67.3.166 $\mathrm{Z1^+} \oplus \mathrm{Z2^+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N67.3.167 $\mathrm{Z1^+} \oplus \mathrm{Z3^+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N67.3.168 $\mathrm{Z1^+} \oplus \mathrm{Z3^-}$	√	1	1	√	$mm2$	A1
N67.3.169 $\mathrm{Z1^-} \oplus \mathrm{Z1^-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N67.3.170 $\mathrm{Z1^-} \oplus \mathrm{Z2^+}$	√	1	1	√	$mm2$	A1
N67.3.171 $\mathrm{Z1^-} \oplus \mathrm{Z3^+}$	√	1	1	√	$mm2$	A1
N67.3.172 $\mathrm{Z1^-} \oplus \mathrm{Z3^-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N67.3.173 $\mathrm{Z3^+} \oplus \mathrm{Z3^+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N67.3.174 $\mathrm{Z3^+} \oplus \mathrm{Z3^-}$	√	1	1	√	222	A1
N67.3.175 $\mathrm{Z3^+} \oplus \mathrm{Z4^+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N67.3.176 $\mathrm{Z3^+} \oplus \mathrm{Z4^-}$	√	1	1	√	$mm2$	A1
N67.8.1 DT1	√	1	1	√	$mm2$	A1
N67.8.2 DT2	√	1	1	√	$mm2$	A1
N67.8.3 DT3	√	1	1	√	$mm2$	A1
N67.8.4 DT4	√	1	1	√	$mm2$	A1
N67.8.5 A1	√	1	1	√	$mm2$	A1
N67.8.6 A2	√	1	1	√	$mm2$	A1
N67.8.7 LD1	√	1	1	√	$mm2$	A1
N67.8.8 LD2	√	1	1	√	$mm2$	A1
N67.8.9 LD3	√	1	1	√	$mm2$	A1
N67.8.10 H3	√	1	1	√	$mm2$	A1
N67.8.11 H4	√	1	1	√	$mm2$	A1
N67.8.12 H1	√	1	1	√	$mm2$	A1
N67.9.1 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM1^-}$	√	0	0	√	-	-
N67.9.2 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM2^+}$	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N67.9.3 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM2^-}$	√	0	0	√	-	-
N67.9.4 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM3^+}$	√	3	3	√	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N67.9.5 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM3^-}$	√	0	0	√	-	-
N67.9.6 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{T1^+}$	√	0	0	√	-	-
N67.9.7 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{T3^+}$	√	0	0	√	-	-

Non-coplanar SSGs with parent space group $Cmme$ (No. 67) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N67.9.8 $\mathrm{GM1^-}\oplus\mathrm{GM1^-}\oplus\mathrm{T3^-}$	$\surd$	0	0	$\surd$	-	-
N67.9.9 $\mathrm{GM1^-}\oplus\mathrm{GM1^-}\oplus\mathrm{Y1^+}$	$\surd$	0	0	$\surd$	-	-
N67.9.10 $\mathrm{GM1^-}\oplus\mathrm{GM1^-}\oplus\mathrm{Y2^+}$	$\surd$	0	0	$\surd$	-	-
N67.9.11 $\mathrm{GM1^-}\oplus\mathrm{GM1^-}\oplus\mathrm{Y3^+}$	$\surd$	0	0	$\surd$	-	-
N67.9.12 $\mathrm{GM1^-}\oplus\mathrm{GM1^-}\oplus\mathrm{Y3^-}$	$\surd$	0	0	$\surd$	-	-
N67.9.13 $\mathrm{GM1^-}\oplus\mathrm{GM1^-}\oplus\mathrm{Z1^+}$	$\surd$	0	0	$\surd$	-	-
N67.9.14 $\mathrm{GM1^-}\oplus\mathrm{GM1^-}\oplus\mathrm{Z1^-}$	$\surd$	0	0	$\surd$	-	-
N67.9.15 $\mathrm{GM1^-}\oplus\mathrm{GM1^-}\oplus\mathrm{Z3^+}$	$\surd$	0	0	$\surd$	-	-
N67.9.16 $\mathrm{GM1^-}\oplus\mathrm{GM2^+}\oplus\mathrm{GM2^+}$	$\surd$	2	2	$\surd$	222	$\mathrm{B1}\oplus\mathrm{B1}$
N67.9.17 $\mathrm{GM1^-}\oplus\mathrm{GM2^+}\oplus\mathrm{GM2^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B1_g}\oplus\mathrm{B1_u}$
N67.9.18 $\mathrm{GM1^-}\oplus\mathrm{GM2^+}\oplus\mathrm{GM3^+}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2}\oplus\mathrm{B1}$
N67.9.19 $\mathrm{GM1^-}\oplus\mathrm{GM2^+}\oplus\mathrm{GM3^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_u}\oplus\mathrm{B2_u}$
N67.9.20 $\mathrm{GM1^-}\oplus\mathrm{GM2^+}\oplus\mathrm{T1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_u}$
N67.9.21 $\mathrm{GM1^-}\oplus\mathrm{GM2^+}\oplus\mathrm{T3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_u}$
N67.9.22 $\mathrm{GM1^-}\oplus\mathrm{GM2^+}\oplus\mathrm{T3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_u}$
N67.9.23 $\mathrm{GM1^-}\oplus\mathrm{GM2^+}\oplus\mathrm{Y1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_u}$
N67.9.24 $\mathrm{GM1^-}\oplus\mathrm{GM2^+}\oplus\mathrm{Y2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_u}$
N67.9.25 $\mathrm{GM1^-}\oplus\mathrm{GM2^+}\oplus\mathrm{Y3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_u}$
N67.9.26 $\mathrm{GM1^-}\oplus\mathrm{GM2^+}\oplus\mathrm{Y3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_u}$
N67.9.27 $\mathrm{GM1^-}\oplus\mathrm{GM2^+}\oplus\mathrm{Z1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_u}$
N67.9.28 $\mathrm{GM1^-}\oplus\mathrm{GM2^+}\oplus\mathrm{Z1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_u}$
N67.9.29 $\mathrm{GM1^-}\oplus\mathrm{GM2^+}\oplus\mathrm{Z3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_u}$
N67.9.30 $\mathrm{GM1^-}\oplus\mathrm{GM2^-}\oplus\mathrm{GM2^-}$	$\surd$	0	0	$\surd$	-	-
N67.9.31 $\mathrm{GM1^-}\oplus\mathrm{GM2^-}\oplus\mathrm{GM3^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_u}\oplus\mathrm{B2_u}$
N67.9.32 $\mathrm{GM1^-}\oplus\mathrm{GM2^-}\oplus\mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
N67.9.33 $\mathrm{GM1^-}\oplus\mathrm{GM2^-}\oplus\mathrm{T1^+}$	$\surd$	0	0	$\surd$	-	-
N67.9.34 $\mathrm{GM1^-}\oplus\mathrm{GM2^-}\oplus\mathrm{T3^+}$	$\surd$	0	0	$\surd$	-	-
N67.9.35 $\mathrm{GM1^-}\oplus\mathrm{GM2^-}\oplus\mathrm{T3^-}$	$\surd$	0	0	$\surd$	-	-
N67.9.36 $\mathrm{GM1^-}\oplus\mathrm{GM2^-}\oplus\mathrm{Y1^+}$	$\surd$	0	0	$\surd$	-	-
N67.9.37 $\mathrm{GM1^-}\oplus\mathrm{GM2^-}\oplus\mathrm{Y2^+}$	$\surd$	0	0	$\surd$	-	-
N67.9.38 $\mathrm{GM1^-}\oplus\mathrm{GM2^-}\oplus\mathrm{Y3^+}$	$\surd$	0	0	$\surd$	-	-
N67.9.39 $\mathrm{GM1^-}\oplus\mathrm{GM2^-}\oplus\mathrm{Y3^-}$	$\surd$	0	0	$\surd$	-	-
N67.9.40 $\mathrm{GM1^-}\oplus\mathrm{GM2^-}\oplus\mathrm{Z1^+}$	$\surd$	0	0	$\surd$	-	-
N67.9.41 $\mathrm{GM1^-}\oplus\mathrm{GM2^-}\oplus\mathrm{Z1^-}$	$\surd$	0	0	$\surd$	-	-
N67.9.42 $\mathrm{GM1^-}\oplus\mathrm{GM2^-}\oplus\mathrm{Z3^+}$	$\surd$	0	0	$\surd$	-	-
N67.9.43 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{GM3^+}$	$\surd$	2	2	$\surd$	222	$\mathrm{B3}\oplus\mathrm{B3}$
N67.9.44 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2}\oplus\mathrm{B1}$
N67.9.45 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{GM3^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B3_g}\oplus\mathrm{B3_u}$
N67.9.46 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{GM4^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B3_g}\oplus\mathrm{B3_u}$
N67.9.47 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{T1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_u}$
N67.9.48 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{T1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_u}$
N67.9.49 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{T3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_u}$
N67.9.50 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{T3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_u}$
N67.9.51 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{Y1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_u}$
N67.9.52 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{Y1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_u}$
N67.9.53 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{Y2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_u}$

Non-coplanar SSGs with parent space group $Cmme$ (No. 67) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N67.9.54 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{Y2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_u}$
N67.9.55 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{Y3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_u}$
N67.9.56 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{Y4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_u}$
N67.9.57 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{Y3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_u}$
N67.9.58 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{Y4^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_u}$
N67.9.59 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{Z1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_u}$
N67.9.60 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{Z1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_u}$
N67.9.61 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{Z3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_u}$
N67.9.62 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{Z3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_u}$
N67.9.63 $\mathrm{GM1^-}\oplus\mathrm{GM3^-}\oplus\mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
N67.9.64 $\mathrm{GM1^-}\oplus\mathrm{GM3^-}\oplus\mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N67.9.65 $\mathrm{GM1^-}\oplus\mathrm{GM3^-}\oplus\mathrm{T1^+}$	$\surd$	0	0	$\surd$	-	-
N67.9.66 $\mathrm{GM1^-}\oplus\mathrm{GM3^-}\oplus\mathrm{T1^-}$	$\surd$	0	0	$\surd$	-	-
N67.9.67 $\mathrm{GM1^-}\oplus\mathrm{GM3^-}\oplus\mathrm{T3^+}$	$\surd$	0	0	$\surd$	-	-
N67.9.68 $\mathrm{GM1^-}\oplus\mathrm{GM3^-}\oplus\mathrm{T3^-}$	$\surd$	0	0	$\surd$	-	-
N67.9.69 $\mathrm{GM1^-}\oplus\mathrm{GM3^-}\oplus\mathrm{Y1^+}$	$\surd$	0	0	$\surd$	-	-
N67.9.70 $\mathrm{GM1^-}\oplus\mathrm{GM3^-}\oplus\mathrm{Y1^-}$	$\surd$	0	0	$\surd$	-	-
N67.9.71 $\mathrm{GM1^-}\oplus\mathrm{GM3^-}\oplus\mathrm{Y2^+}$	$\surd$	0	0	$\surd$	-	-
N67.9.72 $\mathrm{GM1^-}\oplus\mathrm{GM3^-}\oplus\mathrm{Y2^-}$	$\surd$	0	0	$\surd$	-	-
N67.9.73 $\mathrm{GM1^-}\oplus\mathrm{GM3^-}\oplus\mathrm{Y3^+}$	$\surd$	0	0	$\surd$	-	-
N67.9.74 $\mathrm{GM1^-}\oplus\mathrm{GM3^-}\oplus\mathrm{Y4^-}$	$\surd$	0	0	$\surd$	-	-
N67.9.75 $\mathrm{GM1^-}\oplus\mathrm{GM3^-}\oplus\mathrm{Y3^-}$	$\surd$	0	0	$\surd$	-	-
N67.9.76 $\mathrm{GM1^-}\oplus\mathrm{GM3^-}\oplus\mathrm{Y4^+}$	$\surd$	0	0	$\surd$	-	-
N67.9.77 $\mathrm{GM1^-}\oplus\mathrm{GM3^-}\oplus\mathrm{Z1^+}$	$\surd$	0	0	$\surd$	-	-
N67.9.78 $\mathrm{GM1^-}\oplus\mathrm{GM3^-}\oplus\mathrm{Z1^-}$	$\surd$	0	0	$\surd$	-	-
N67.9.79 $\mathrm{GM1^-}\oplus\mathrm{GM3^-}\oplus\mathrm{Z3^+}$	$\surd$	0	0	$\surd$	-	-
N67.9.80 $\mathrm{GM1^-}\oplus\mathrm{GM3^-}\oplus\mathrm{Z3^-}$	$\surd$	0	0	$\surd$	-	-
N67.9.81 $\mathrm{GM1^-}\oplus\mathrm{T1^+}\oplus\mathrm{T1^+}$	$\surd$	1	0	$\times$	-	-
N67.9.82 $\mathrm{GM1^-}\oplus\mathrm{T1^+}\oplus\mathrm{T1^-}$	$\surd$	1	1	$\times$	-	-
N67.9.83 $\mathrm{GM1^-}\oplus\mathrm{T1^+}\oplus\mathrm{T2^+}$	$\surd$	1	0	$\times$	-	-
N67.9.84 $\mathrm{GM1^-}\oplus\mathrm{T1^+}\oplus\mathrm{T2^-}$	$\surd$	1	1	$\times$	-	-
N67.9.85 $\mathrm{GM1^-}\oplus\mathrm{T1^+}\oplus\mathrm{T3^+}$	$\surd$	1	0	$\times$	-	-
N67.9.86 $\mathrm{GM1^-}\oplus\mathrm{T1^+}\oplus\mathrm{T4^-}$	$\surd$	1	1	$\times$	-	-
N67.9.87 $\mathrm{GM1^-}\oplus\mathrm{T1^+}\oplus\mathrm{T3^-}$	$\surd$	1	1	$\times$	-	-
N67.9.88 $\mathrm{GM1^-}\oplus\mathrm{T1^+}\oplus\mathrm{T4^+}$	$\surd$	1	0	$\times$	-	-
N67.9.89 $\mathrm{GM1^-}\oplus\mathrm{T1^+}\oplus\mathrm{Y1^+}$	$\surd$	1	0	$\times$	-	-
N67.9.90 $\mathrm{GM1^-}\oplus\mathrm{T1^+}\oplus\mathrm{Y1^-}$	$\surd$	1	0	$\times$	-	-
N67.9.91 $\mathrm{GM1^-}\oplus\mathrm{T1^+}\oplus\mathrm{Y2^+}$	$\surd$	1	0	$\times$	-	-
N67.9.92 $\mathrm{GM1^-}\oplus\mathrm{T1^+}\oplus\mathrm{Y2^-}$	$\surd$	1	0	$\times$	-	-
N67.9.93 $\mathrm{GM1^-}\oplus\mathrm{T1^+}\oplus\mathrm{Y3^+}$	$\surd$	1	0	$\times$	-	-
N67.9.94 $\mathrm{GM1^-}\oplus\mathrm{T1^+}\oplus\mathrm{Y4^-}$	$\surd$	1	0	$\times$	-	-
N67.9.95 $\mathrm{GM1^-}\oplus\mathrm{T1^+}\oplus\mathrm{Y3^-}$	$\surd$	1	0	$\times$	-	-
N67.9.96 $\mathrm{GM1^-}\oplus\mathrm{T1^+}\oplus\mathrm{Y4^+}$	$\surd$	1	0	$\times$	-	-
N67.9.97 $\mathrm{GM1^-}\oplus\mathrm{T1^+}\oplus\mathrm{Z1^+}$	$\surd$	1	0	$\times$	-	-
N67.9.98 $\mathrm{GM1^-}\oplus\mathrm{T1^+}\oplus\mathrm{Z2^-}$	$\surd$	1	0	$\times$	-	-
N67.9.99 $\mathrm{GM1^-}\oplus\mathrm{T1^+}\oplus\mathrm{Z1^-}$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $Cmme$ (No. 67) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N67.9.100 $\mathrm{GM1}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N67.9.101 $\mathrm{GM1}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N67.9.102 $\mathrm{GM1}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N67.9.103 $\mathrm{GM1}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N67.9.104 $\mathrm{GM1}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	0	$\times$	-	-
N67.9.105 $\mathrm{GM1}^- \oplus \mathrm{T3}^+ \oplus \mathrm{T3}^+$	$\surd$	1	0	$\times$	-	-
N67.9.106 $\mathrm{GM1}^- \oplus \mathrm{T3}^+ \oplus \mathrm{T4}^-$	$\surd$	1	1	$\times$	-	-
N67.9.107 $\mathrm{GM1}^- \oplus \mathrm{T3}^+ \oplus \mathrm{T3}^-$	$\surd$	1	1	$\times$	-	-
N67.9.108 $\mathrm{GM1}^- \oplus \mathrm{T3}^+ \oplus \mathrm{T4}^+$	$\surd$	1	0	$\times$	-	-
N67.9.109 $\mathrm{GM1}^- \oplus \mathrm{T3}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	0	$\times$	-	-
N67.9.110 $\mathrm{GM1}^- \oplus \mathrm{T3}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N67.9.111 $\mathrm{GM1}^- \oplus \mathrm{T3}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N67.9.112 $\mathrm{GM1}^- \oplus \mathrm{T3}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N67.9.113 $\mathrm{GM1}^- \oplus \mathrm{T3}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N67.9.114 $\mathrm{GM1}^- \oplus \mathrm{T3}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N67.9.115 $\mathrm{GM1}^- \oplus \mathrm{T3}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N67.9.116 $\mathrm{GM1}^- \oplus \mathrm{T3}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N67.9.117 $\mathrm{GM1}^- \oplus \mathrm{T3}^- \oplus \mathrm{T3}^-$	$\surd$	1	0	$\times$	-	-
N67.9.118 $\mathrm{GM1}^- \oplus \mathrm{T3}^- \oplus \mathrm{T4}^+$	$\surd$	1	1	$\times$	-	-
N67.9.119 $\mathrm{GM1}^- \oplus \mathrm{T3}^- \oplus \mathrm{Y1}^+$	$\surd$	1	0	$\times$	-	-
N67.9.120 $\mathrm{GM1}^- \oplus \mathrm{T3}^- \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N67.9.121 $\mathrm{GM1}^- \oplus \mathrm{T3}^- \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N67.9.122 $\mathrm{GM1}^- \oplus \mathrm{T3}^- \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N67.9.123 $\mathrm{GM1}^- \oplus \mathrm{T3}^- \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N67.9.124 $\mathrm{GM1}^- \oplus \mathrm{T3}^- \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N67.9.125 $\mathrm{GM1}^- \oplus \mathrm{T3}^- \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N67.9.126 $\mathrm{GM1}^- \oplus \mathrm{T3}^- \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N67.9.127 $\mathrm{GM1}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	0	$\times$	-	-
N67.9.128 $\mathrm{GM1}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^-$	$\surd$	1	1	$\times$	-	-
N67.9.129 $\mathrm{GM1}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N67.9.130 $\mathrm{GM1}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\times$	-	-
N67.9.131 $\mathrm{GM1}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N67.9.132 $\mathrm{GM1}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N67.9.133 $\mathrm{GM1}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N67.9.134 $\mathrm{GM1}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
N67.9.135 $\mathrm{GM1}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N67.9.136 $\mathrm{GM1}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N67.9.137 $\mathrm{GM1}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N67.9.138 $\mathrm{GM1}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N67.9.139 $\mathrm{GM1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N67.9.140 $\mathrm{GM1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\times$	-	-
N67.9.141 $\mathrm{GM1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N67.9.142 $\mathrm{GM1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N67.9.143 $\mathrm{GM1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N67.9.144 $\mathrm{GM1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
N67.9.145 $\mathrm{GM1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $Cmme$ (No. 67) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N67.9.146 $\mathrm{GM1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N67.9.147 $\mathrm{GM1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N67.9.148 $\mathrm{GM1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N67.9.149 $\mathrm{GM1}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N67.9.150 $\mathrm{GM1}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\times$	-	-
N67.9.151 $\mathrm{GM1}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\times$	-	-
N67.9.152 $\mathrm{GM1}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
N67.9.153 $\mathrm{GM1}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N67.9.154 $\mathrm{GM1}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N67.9.155 $\mathrm{GM1}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N67.9.156 $\mathrm{GM1}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N67.9.157 $\mathrm{GM1}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N67.9.158 $\mathrm{GM1}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\times$	-	-
N67.9.159 $\mathrm{GM1}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N67.9.160 $\mathrm{GM1}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N67.9.161 $\mathrm{GM1}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N67.9.162 $\mathrm{GM1}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N67.9.163 $\mathrm{GM1}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N67.9.164 $\mathrm{GM1}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.9.165 $\mathrm{GM1}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
N67.9.166 $\mathrm{GM1}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N67.9.167 $\mathrm{GM1}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N67.9.168 $\mathrm{GM1}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N67.9.169 $\mathrm{GM1}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N67.9.170 $\mathrm{GM1}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.9.171 $\mathrm{GM1}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
N67.9.172 $\mathrm{GM1}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N67.9.173 $\mathrm{GM1}^- \oplus \mathrm{Z3}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N67.9.174 $\mathrm{GM1}^- \oplus \mathrm{Z3}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N67.9.175 $\mathrm{GM1}^- \oplus \mathrm{Z3}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N67.9.176 $\mathrm{GM1}^- \oplus \mathrm{Z3}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.9.177 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N67.9.178 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{A2}$
N67.9.179 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B3_g}$
N67.9.180 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2} \oplus \mathrm{B2}$
N67.9.181 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{T1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N67.9.182 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{T3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N67.9.183 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{T3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N67.9.184 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N67.9.185 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N67.9.186 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N67.9.187 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N67.9.188 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{Z1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N67.9.189 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{Z1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N67.9.190 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{Z3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N67.9.191 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$

Non-coplanar SSGs with parent space group $Cmme$ (No. 67) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N67.9.192 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{B2}$
N67.9.193 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g} \oplus \mathrm{B2_u}$
N67.9.194 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{T1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
N67.9.195 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{T3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
N67.9.196 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{T3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
N67.9.197 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
N67.9.198 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
N67.9.199 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
N67.9.200 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
N67.9.201 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{Z1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
N67.9.202 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{Z1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
N67.9.203 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{Z3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
N67.9.204 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N67.9.205 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N67.9.206 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{B2}$
N67.9.207 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	222	$\mathrm{B1} \oplus \mathrm{B3}$
N67.9.208 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{T1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N67.9.209 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{T1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N67.9.210 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{T3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N67.9.211 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{T3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N67.9.212 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N67.9.213 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N67.9.214 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N67.9.215 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N67.9.216 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N67.9.217 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N67.9.218 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N67.9.219 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Y4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N67.9.220 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Z1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N67.9.221 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Z1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N67.9.222 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Z3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N67.9.223 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Z3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N67.9.224 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N67.9.225 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N67.9.226 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{T1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N67.9.227 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{T1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N67.9.228 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{T3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N67.9.229 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{T3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N67.9.230 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N67.9.231 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N67.9.232 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N67.9.233 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N67.9.234 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N67.9.235 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N67.9.236 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N67.9.237 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Y4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$

Non-coplanar SSGs with parent space group $Cmme$ (No. 67) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N67.9.238 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Z1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N67.9.239 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Z1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N67.9.240 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Z3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N67.9.241 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Z3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N67.9.242 $\mathrm{GM2}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{T1}^+$	$\surd$	1	1	$\times$	-	-
N67.9.243 $\mathrm{GM2}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{T1}^-$	$\surd$	1	1	$\times$	-	-
N67.9.244 $\mathrm{GM2}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{T2}^+$	$\surd$	1	1	$\times$	-	-
N67.9.245 $\mathrm{GM2}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{T2}^-$	$\surd$	1	1	$\surd$	222	B1
N67.9.246 $\mathrm{GM2}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{T3}^+$	$\surd$	1	1	$\times$	-	-
N67.9.247 $\mathrm{GM2}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{T4}^-$	$\surd$	1	1	$\times$	-	-
N67.9.248 $\mathrm{GM2}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{T3}^-$	$\surd$	1	1	$\times$	-	-
N67.9.249 $\mathrm{GM2}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{T4}^+$	$\surd$	1	1	$\times$	-	-
N67.9.250 $\mathrm{GM2}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N67.9.251 $\mathrm{GM2}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Y1}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N67.9.252 $\mathrm{GM2}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N67.9.253 $\mathrm{GM2}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N67.9.254 $\mathrm{GM2}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N67.9.255 $\mathrm{GM2}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N67.9.256 $\mathrm{GM2}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N67.9.257 $\mathrm{GM2}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N67.9.258 $\mathrm{GM2}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\times$	-	-
N67.9.259 $\mathrm{GM2}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\times$	-	-
N67.9.260 $\mathrm{GM2}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
N67.9.261 $\mathrm{GM2}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\times$	-	-
N67.9.262 $\mathrm{GM2}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
N67.9.263 $\mathrm{GM2}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N67.9.264 $\mathrm{GM2}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\times$	-	-
N67.9.265 $\mathrm{GM2}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\times$	-	-
N67.9.266 $\mathrm{GM2}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{T3}^+$	$\surd$	1	1	$\times$	-	-
N67.9.267 $\mathrm{GM2}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{T4}^-$	$\surd$	1	1	$\surd$	222	B1
N67.9.268 $\mathrm{GM2}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{T3}^-$	$\surd$	1	1	$\times$	-	-
N67.9.269 $\mathrm{GM2}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{T4}^+$	$\surd$	1	1	$\times$	-	-
N67.9.270 $\mathrm{GM2}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N67.9.271 $\mathrm{GM2}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N67.9.272 $\mathrm{GM2}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N67.9.273 $\mathrm{GM2}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N67.9.274 $\mathrm{GM2}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\times$	-	-
N67.9.275 $\mathrm{GM2}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
N67.9.276 $\mathrm{GM2}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
N67.9.277 $\mathrm{GM2}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\times$	-	-
N67.9.278 $\mathrm{GM2}^+ \oplus \mathrm{T3}^- \oplus \mathrm{T3}^-$	$\surd$	1	1	$\times$	-	-
N67.9.279 $\mathrm{GM2}^+ \oplus \mathrm{T3}^- \oplus \mathrm{T4}^+$	$\surd$	1	1	$\surd$	222	B1
N67.9.280 $\mathrm{GM2}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Y1}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N67.9.281 $\mathrm{GM2}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N67.9.282 $\mathrm{GM2}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N67.9.283 $\mathrm{GM2}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$

Non-coplanar SSGs with parent space group $Cmme$ (No. 67) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N67.9.284 $\mathrm{GM2}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\times$	-	-
N67.9.285 $\mathrm{GM2}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
N67.9.286 $\mathrm{GM2}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
N67.9.287 $\mathrm{GM2}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\times$	-	-
N67.9.288 $\mathrm{GM2}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N67.9.289 $\mathrm{GM2}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^-$	$\surd$	1	1	$\surd$	$mm2$	A2
N67.9.290 $\mathrm{GM2}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N67.9.291 $\mathrm{GM2}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\surd$	222	B1
N67.9.292 $\mathrm{GM2}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N67.9.293 $\mathrm{GM2}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\surd$	$mm2$	B2
N67.9.294 $\mathrm{GM2}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\surd$	$mm2$	B1
N67.9.295 $\mathrm{GM2}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N67.9.296 $\mathrm{GM2}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N67.9.297 $\mathrm{GM2}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N67.9.298 $\mathrm{GM2}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N67.9.299 $\mathrm{GM2}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N67.9.300 $\mathrm{GM2}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N67.9.301 $\mathrm{GM2}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\surd$	$mm2$	A2
N67.9.302 $\mathrm{GM2}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N67.9.303 $\mathrm{GM2}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\surd$	$mm2$	B1
N67.9.304 $\mathrm{GM2}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\surd$	$mm2$	B2
N67.9.305 $\mathrm{GM2}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N67.9.306 $\mathrm{GM2}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N67.9.307 $\mathrm{GM2}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N67.9.308 $\mathrm{GM2}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N67.9.309 $\mathrm{GM2}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N67.9.310 $\mathrm{GM2}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N67.9.311 $\mathrm{GM2}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\surd$	222	B1
N67.9.312 $\mathrm{GM2}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\surd$	$mm2$	A2
N67.9.313 $\mathrm{GM2}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N67.9.314 $\mathrm{GM2}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N67.9.315 $\mathrm{GM2}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N67.9.316 $\mathrm{GM2}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N67.9.317 $\mathrm{GM2}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N67.9.318 $\mathrm{GM2}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N67.9.319 $\mathrm{GM2}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\surd$	222	B1
N67.9.320 $\mathrm{GM2}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N67.9.321 $\mathrm{GM2}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N67.9.322 $\mathrm{GM2}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N67.9.323 $\mathrm{GM2}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N67.9.324 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\times$	-	-
N67.9.325 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\surd$	222	B1
N67.9.326 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
N67.9.327 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\times$	-	-
N67.9.328 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
N67.9.329 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $Cmme$ (No. 67) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N67.9.330 $\mathrm{GM2^+} \oplus \mathrm{Z1^-} \oplus \mathrm{Z1^-}$	$\surd$	1	1	$\times$	-	-
N67.9.331 $\mathrm{GM2^+} \oplus \mathrm{Z1^-} \oplus \mathrm{Z2^+}$	$\surd$	1	1	$\surd$	222	B1
N67.9.332 $\mathrm{GM2^+} \oplus \mathrm{Z1^-} \oplus \mathrm{Z3^+}$	$\surd$	1	1	$\times$	-	-
N67.9.333 $\mathrm{GM2^+} \oplus \mathrm{Z1^-} \oplus \mathrm{Z3^-}$	$\surd$	1	1	$\times$	-	-
N67.9.334 $\mathrm{GM2^+} \oplus \mathrm{Z3^+} \oplus \mathrm{Z3^+}$	$\surd$	1	1	$\times$	-	-
N67.9.335 $\mathrm{GM2^+} \oplus \mathrm{Z3^+} \oplus \mathrm{Z3^-}$	$\surd$	1	1	$\times$	-	-
N67.9.336 $\mathrm{GM2^+} \oplus \mathrm{Z3^+} \oplus \mathrm{Z4^+}$	$\surd$	1	1	$\times$	-	-
N67.9.337 $\mathrm{GM2^+} \oplus \mathrm{Z3^+} \oplus \mathrm{Z4^-}$	$\surd$	1	1	$\surd$	222	B1
N67.9.338 $\mathrm{GM2^-} \oplus \mathrm{GM2^-} \oplus \mathrm{GM2^-}$	$\surd$	0	0	$\surd$	-	-
N67.9.339 $\mathrm{GM2^-} \oplus \mathrm{GM2^-} \oplus \mathrm{GM3^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N67.9.340 $\mathrm{GM2^-} \oplus \mathrm{GM2^-} \oplus \mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
N67.9.341 $\mathrm{GM2^-} \oplus \mathrm{GM2^-} \oplus \mathrm{T1^+}$	$\surd$	0	0	$\surd$	-	-
N67.9.342 $\mathrm{GM2^-} \oplus \mathrm{GM2^-} \oplus \mathrm{T3^+}$	$\surd$	0	0	$\surd$	-	-
N67.9.343 $\mathrm{GM2^-} \oplus \mathrm{GM2^-} \oplus \mathrm{T3^-}$	$\surd$	0	0	$\surd$	-	-
N67.9.344 $\mathrm{GM2^-} \oplus \mathrm{GM2^-} \oplus \mathrm{Y1^+}$	$\surd$	0	0	$\surd$	-	-
N67.9.345 $\mathrm{GM2^-} \oplus \mathrm{GM2^-} \oplus \mathrm{Y2^+}$	$\surd$	0	0	$\surd$	-	-
N67.9.346 $\mathrm{GM2^-} \oplus \mathrm{GM2^-} \oplus \mathrm{Y3^+}$	$\surd$	0	0	$\surd$	-	-
N67.9.347 $\mathrm{GM2^-} \oplus \mathrm{GM2^-} \oplus \mathrm{Y3^-}$	$\surd$	0	0	$\surd$	-	-
N67.9.348 $\mathrm{GM2^-} \oplus \mathrm{GM2^-} \oplus \mathrm{Z1^+}$	$\surd$	0	0	$\surd$	-	-
N67.9.349 $\mathrm{GM2^-} \oplus \mathrm{GM2^-} \oplus \mathrm{Z1^-}$	$\surd$	0	0	$\surd$	-	-
N67.9.350 $\mathrm{GM2^-} \oplus \mathrm{GM2^-} \oplus \mathrm{Z3^+}$	$\surd$	0	0	$\surd$	-	-
N67.9.351 $\mathrm{GM2^-} \oplus \mathrm{GM3^+} \oplus \mathrm{GM3^+}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2} \oplus \mathrm{B2}$
N67.9.352 $\mathrm{GM2^-} \oplus \mathrm{GM3^+} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	222	$\mathrm{B3} \oplus \mathrm{B2}$
N67.9.353 $\mathrm{GM2^-} \oplus \mathrm{GM3^+} \oplus \mathrm{GM3^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N67.9.354 $\mathrm{GM2^-} \oplus \mathrm{GM3^+} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N67.9.355 $\mathrm{GM2^-} \oplus \mathrm{GM3^+} \oplus \mathrm{T1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N67.9.356 $\mathrm{GM2^-} \oplus \mathrm{GM3^+} \oplus \mathrm{T1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N67.9.357 $\mathrm{GM2^-} \oplus \mathrm{GM3^+} \oplus \mathrm{T3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N67.9.358 $\mathrm{GM2^-} \oplus \mathrm{GM3^+} \oplus \mathrm{T3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N67.9.359 $\mathrm{GM2^-} \oplus \mathrm{GM3^+} \oplus \mathrm{Y1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N67.9.360 $\mathrm{GM2^-} \oplus \mathrm{GM3^+} \oplus \mathrm{Y1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N67.9.361 $\mathrm{GM2^-} \oplus \mathrm{GM3^+} \oplus \mathrm{Y2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N67.9.362 $\mathrm{GM2^-} \oplus \mathrm{GM3^+} \oplus \mathrm{Y2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N67.9.363 $\mathrm{GM2^-} \oplus \mathrm{GM3^+} \oplus \mathrm{Y3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N67.9.364 $\mathrm{GM2^-} \oplus \mathrm{GM3^+} \oplus \mathrm{Y4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N67.9.365 $\mathrm{GM2^-} \oplus \mathrm{GM3^+} \oplus \mathrm{Y3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N67.9.366 $\mathrm{GM2^-} \oplus \mathrm{GM3^+} \oplus \mathrm{Y4^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N67.9.367 $\mathrm{GM2^-} \oplus \mathrm{GM3^+} \oplus \mathrm{Z1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N67.9.368 $\mathrm{GM2^-} \oplus \mathrm{GM3^+} \oplus \mathrm{Z1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N67.9.369 $\mathrm{GM2^-} \oplus \mathrm{GM3^+} \oplus \mathrm{Z3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N67.9.370 $\mathrm{GM2^-} \oplus \mathrm{GM3^+} \oplus \mathrm{Z3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N67.9.371 $\mathrm{GM2^-} \oplus \mathrm{GM3^-} \oplus \mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
N67.9.372 $\mathrm{GM2^-} \oplus \mathrm{GM3^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N67.9.373 $\mathrm{GM2^-} \oplus \mathrm{GM3^-} \oplus \mathrm{T1^+}$	$\surd$	0	0	$\surd$	-	-
N67.9.374 $\mathrm{GM2^-} \oplus \mathrm{GM3^-} \oplus \mathrm{T1^-}$	$\surd$	0	0	$\surd$	-	-
N67.9.375 $\mathrm{GM2^-} \oplus \mathrm{GM3^-} \oplus \mathrm{T3^+}$	$\surd$	0	0	$\surd$	-	-

Non-coplanar SSGs with parent space group $Cmme$ (No. 67) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N67.9.376 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{T3}^-$	$\surd$	0	0	$\surd$	-	-
N67.9.377 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y1}^+$	$\surd$	0	0	$\surd$	-	-
N67.9.378 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y1}^-$	$\surd$	0	0	$\surd$	-	-
N67.9.379 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y2}^+$	$\surd$	0	0	$\surd$	-	-
N67.9.380 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y2}^-$	$\surd$	0	0	$\surd$	-	-
N67.9.381 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y3}^+$	$\surd$	0	0	$\surd$	-	-
N67.9.382 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y4}^-$	$\surd$	0	0	$\surd$	-	-
N67.9.383 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y3}^-$	$\surd$	0	0	$\surd$	-	-
N67.9.384 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y4}^+$	$\surd$	0	0	$\surd$	-	-
N67.9.385 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Z1}^+$	$\surd$	0	0	$\surd$	-	-
N67.9.386 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Z1}^-$	$\surd$	0	0	$\surd$	-	-
N67.9.387 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Z3}^+$	$\surd$	0	0	$\surd$	-	-
N67.9.388 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Z3}^-$	$\surd$	0	0	$\surd$	-	-
N67.9.389 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{T1}^+$	$\surd$	1	0	$\times$	-	-
N67.9.390 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{T1}^-$	$\surd$	1	1	$\times$	-	-
N67.9.391 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{T2}^+$	$\surd$	1	0	$\times$	-	-
N67.9.392 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{T2}^-$	$\surd$	1	1	$\times$	-	-
N67.9.393 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{T3}^+$	$\surd$	1	0	$\times$	-	-
N67.9.394 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{T4}^-$	$\surd$	1	1	$\times$	-	-
N67.9.395 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{T3}^-$	$\surd$	1	1	$\times$	-	-
N67.9.396 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{T4}^+$	$\surd$	1	0	$\times$	-	-
N67.9.397 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	0	$\times$	-	-
N67.9.398 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Y1}^-$	$\surd$	1	0	$\times$	-	-
N67.9.399 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N67.9.400 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N67.9.401 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N67.9.402 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	0	$\times$	-	-
N67.9.403 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N67.9.404 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
N67.9.405 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N67.9.406 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-
N67.9.407 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N67.9.408 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N67.9.409 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N67.9.410 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N67.9.411 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N67.9.412 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	0	$\times$	-	-
N67.9.413 $\mathrm{GM2}^- \oplus \mathrm{T3}^+ \oplus \mathrm{T3}^+$	$\surd$	1	0	$\times$	-	-
N67.9.414 $\mathrm{GM2}^- \oplus \mathrm{T3}^+ \oplus \mathrm{T4}^-$	$\surd$	1	1	$\times$	-	-
N67.9.415 $\mathrm{GM2}^- \oplus \mathrm{T3}^+ \oplus \mathrm{T3}^-$	$\surd$	1	1	$\times$	-	-
N67.9.416 $\mathrm{GM2}^- \oplus \mathrm{T3}^+ \oplus \mathrm{T4}^+$	$\surd$	1	0	$\times$	-	-
N67.9.417 $\mathrm{GM2}^- \oplus \mathrm{T3}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	0	$\times$	-	-
N67.9.418 $\mathrm{GM2}^- \oplus \mathrm{T3}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N67.9.419 $\mathrm{GM2}^- \oplus \mathrm{T3}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N67.9.420 $\mathrm{GM2}^- \oplus \mathrm{T3}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N67.9.421 $\mathrm{GM2}^- \oplus \mathrm{T3}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $Cmme$ (No. 67) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N67.9.422 $\mathrm{GM2}^- \oplus \mathrm{T3}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N67.9.423 $\mathrm{GM2}^- \oplus \mathrm{T3}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N67.9.424 $\mathrm{GM2}^- \oplus \mathrm{T3}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N67.9.425 $\mathrm{GM2}^- \oplus \mathrm{T3}^- \oplus \mathrm{T3}^-$	$\surd$	1	0	$\times$	-	-
N67.9.426 $\mathrm{GM2}^- \oplus \mathrm{T3}^- \oplus \mathrm{T4}^+$	$\surd$	1	1	$\times$	-	-
N67.9.427 $\mathrm{GM2}^- \oplus \mathrm{T3}^- \oplus \mathrm{Y1}^+$	$\surd$	1	0	$\times$	-	-
N67.9.428 $\mathrm{GM2}^- \oplus \mathrm{T3}^- \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N67.9.429 $\mathrm{GM2}^- \oplus \mathrm{T3}^- \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N67.9.430 $\mathrm{GM2}^- \oplus \mathrm{T3}^- \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N67.9.431 $\mathrm{GM2}^- \oplus \mathrm{T3}^- \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N67.9.432 $\mathrm{GM2}^- \oplus \mathrm{T3}^- \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N67.9.433 $\mathrm{GM2}^- \oplus \mathrm{T3}^- \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N67.9.434 $\mathrm{GM2}^- \oplus \mathrm{T3}^- \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N67.9.435 $\mathrm{GM2}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	0	$\times$	-	-
N67.9.436 $\mathrm{GM2}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^-$	$\surd$	1	1	$\times$	-	-
N67.9.437 $\mathrm{GM2}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N67.9.438 $\mathrm{GM2}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\times$	-	-
N67.9.439 $\mathrm{GM2}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N67.9.440 $\mathrm{GM2}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N67.9.441 $\mathrm{GM2}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N67.9.442 $\mathrm{GM2}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
N67.9.443 $\mathrm{GM2}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N67.9.444 $\mathrm{GM2}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N67.9.445 $\mathrm{GM2}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N67.9.446 $\mathrm{GM2}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N67.9.447 $\mathrm{GM2}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N67.9.448 $\mathrm{GM2}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\times$	-	-
N67.9.449 $\mathrm{GM2}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N67.9.450 $\mathrm{GM2}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N67.9.451 $\mathrm{GM2}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N67.9.452 $\mathrm{GM2}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
N67.9.453 $\mathrm{GM2}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N67.9.454 $\mathrm{GM2}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N67.9.455 $\mathrm{GM2}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N67.9.456 $\mathrm{GM2}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N67.9.457 $\mathrm{GM2}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N67.9.458 $\mathrm{GM2}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\times$	-	-
N67.9.459 $\mathrm{GM2}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\times$	-	-
N67.9.460 $\mathrm{GM2}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
N67.9.461 $\mathrm{GM2}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N67.9.462 $\mathrm{GM2}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N67.9.463 $\mathrm{GM2}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N67.9.464 $\mathrm{GM2}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N67.9.465 $\mathrm{GM2}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N67.9.466 $\mathrm{GM2}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\times$	-	-
N67.9.467 $\mathrm{GM2}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $Cmme$ (No. 67) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N67.9.468 $\mathrm{GM2}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N67.9.469 $\mathrm{GM2}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N67.9.470 $\mathrm{GM2}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N67.9.471 $\mathrm{GM2}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N67.9.472 $\mathrm{GM2}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.9.473 $\mathrm{GM2}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
N67.9.474 $\mathrm{GM2}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N67.9.475 $\mathrm{GM2}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N67.9.476 $\mathrm{GM2}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N67.9.477 $\mathrm{GM2}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N67.9.478 $\mathrm{GM2}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.9.479 $\mathrm{GM2}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
N67.9.480 $\mathrm{GM2}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N67.9.481 $\mathrm{GM2}^- \oplus \mathrm{Z3}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N67.9.482 $\mathrm{GM2}^- \oplus \mathrm{Z3}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N67.9.483 $\mathrm{GM2}^- \oplus \mathrm{Z3}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N67.9.484 $\mathrm{GM2}^- \oplus \mathrm{Z3}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.9.485 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N67.9.486 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N67.9.487 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{A2}$
N67.9.488 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2} \oplus \mathrm{B2}$
N67.9.489 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{B2}$
N67.9.490 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{T1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
N67.9.491 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{T1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
N67.9.492 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{T1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g}$
N67.9.493 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{T3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
N67.9.494 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{T3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g}$
N67.9.495 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{T3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
N67.9.496 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{T3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g}$
N67.9.497 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
N67.9.498 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
N67.9.499 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g}$
N67.9.500 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
N67.9.501 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
N67.9.502 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g}$
N67.9.503 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
N67.9.504 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
N67.9.505 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g}$
N67.9.506 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
N67.9.507 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Y4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
N67.9.508 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g}$
N67.9.509 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Z1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
N67.9.510 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{Z1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g}$
N67.9.511 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Z1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
N67.9.512 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{Z1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g}$
N67.9.513 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Z3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$

Non-coplanar SSGs with parent space group $Cmme$ (No. 67) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N67.9.514 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{Z3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
N67.9.515 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{Z3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g}$
N67.9.516 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{GM3^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B3_g}$
N67.9.517 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u} \oplus \mathrm{B3_g}$
N67.9.518 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B3_g}$
N67.9.519 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{T1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N67.9.520 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{T1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N67.9.521 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{T1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N67.9.522 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{T1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N67.9.523 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{T3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N67.9.524 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{T3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N67.9.525 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{T3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N67.9.526 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{T3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N67.9.527 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{Y1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N67.9.528 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{Y1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N67.9.529 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Y1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N67.9.530 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Y1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N67.9.531 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{Y2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N67.9.532 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{Y2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N67.9.533 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Y2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N67.9.534 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Y2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N67.9.535 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{Y3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N67.9.536 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{Y4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N67.9.537 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Y3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N67.9.538 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Y4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N67.9.539 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{Y3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N67.9.540 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{Y4^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N67.9.541 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Y3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N67.9.542 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Y4^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N67.9.543 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{Z1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N67.9.544 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Z1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N67.9.545 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{Z1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N67.9.546 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Z1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N67.9.547 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{Z3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N67.9.548 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{Z3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N67.9.549 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Z3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N67.9.550 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Z3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N67.9.551 $\mathrm{GM3^+} \oplus \mathrm{T1^+} \oplus \mathrm{T1^+}$	$\surd$	1	1	$\times$	-	-
N67.9.552 $\mathrm{GM3^+} \oplus \mathrm{T1^+} \oplus \mathrm{T1^-}$	$\surd$	1	1	$\times$	-	-
N67.9.553 $\mathrm{GM3^+} \oplus \mathrm{T1^+} \oplus \mathrm{T2^+}$	$\surd$	1	1	$\times$	-	-
N67.9.554 $\mathrm{GM3^+} \oplus \mathrm{T1^+} \oplus \mathrm{T2^-}$	$\surd$	1	1	$\times$	-	-
N67.9.555 $\mathrm{GM3^+} \oplus \mathrm{T1^-} \oplus \mathrm{T1^-}$	$\surd$	1	1	$\times$	-	-
N67.9.556 $\mathrm{GM3^+} \oplus \mathrm{T1^-} \oplus \mathrm{T2^+}$	$\surd$	1	1	$\times$	-	-
N67.9.557 $\mathrm{GM3^+} \oplus \mathrm{T1^+} \oplus \mathrm{T3^+}$	$\surd$	1	1	$\times$	-	-
N67.9.558 $\mathrm{GM3^+} \oplus \mathrm{T1^+} \oplus \mathrm{T4^-}$	$\surd$	1	1	$\times$	-	-
N67.9.559 $\mathrm{GM3^+} \oplus \mathrm{T1^-} \oplus \mathrm{T3^+}$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $Cmme$ (No. 67) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N67.9.560 $\mathrm{GM3}^{+} \oplus \mathrm{T1}^{-} \oplus \mathrm{T4}^{-}$	$\surd$	1	1	$\times$	-	-
N67.9.561 $\mathrm{GM3}^{+} \oplus \mathrm{T1}^{+} \oplus \mathrm{T3}^{-}$	$\surd$	1	1	$\times$	-	-
N67.9.562 $\mathrm{GM3}^{+} \oplus \mathrm{T1}^{+} \oplus \mathrm{T4}^{+}$	$\surd$	1	1	$\times$	-	-
N67.9.563 $\mathrm{GM3}^{+} \oplus \mathrm{T1}^{-} \oplus \mathrm{T3}^{-}$	$\surd$	1	1	$\times$	-	-
N67.9.564 $\mathrm{GM3}^{+} \oplus \mathrm{T1}^{-} \oplus \mathrm{T4}^{+}$	$\surd$	1	1	$\times$	-	-
N67.9.565 $\mathrm{GM3}^{+} \oplus \mathrm{T1}^{+} \oplus \mathrm{Y1}^{+}$	$\surd$	1	1	$\times$	-	-
N67.9.566 $\mathrm{GM3}^{+} \oplus \mathrm{T1}^{+} \oplus \mathrm{Y1}^{-}$	$\surd$	1	1	$\times$	-	-
N67.9.567 $\mathrm{GM3}^{+} \oplus \mathrm{T1}^{-} \oplus \mathrm{Y1}^{+}$	$\surd$	1	1	$\times$	-	-
N67.9.568 $\mathrm{GM3}^{+} \oplus \mathrm{T1}^{-} \oplus \mathrm{Y1}^{-}$	$\surd$	1	1	$\times$	-	-
N67.9.569 $\mathrm{GM3}^{+} \oplus \mathrm{T1}^{+} \oplus \mathrm{Y2}^{+}$	$\surd$	1	1	$\times$	-	-
N67.9.570 $\mathrm{GM3}^{+} \oplus \mathrm{T1}^{+} \oplus \mathrm{Y2}^{-}$	$\surd$	1	1	$\times$	-	-
N67.9.571 $\mathrm{GM3}^{+} \oplus \mathrm{T1}^{-} \oplus \mathrm{Y2}^{+}$	$\surd$	1	1	$\times$	-	-
N67.9.572 $\mathrm{GM3}^{+} \oplus \mathrm{T1}^{-} \oplus \mathrm{Y2}^{-}$	$\surd$	1	1	$\times$	-	-
N67.9.573 $\mathrm{GM3}^{+} \oplus \mathrm{T1}^{+} \oplus \mathrm{Y3}^{+}$	$\surd$	1	1	$\times$	-	-
N67.9.574 $\mathrm{GM3}^{+} \oplus \mathrm{T1}^{+} \oplus \mathrm{Y4}^{-}$	$\surd$	1	1	$\times$	-	-
N67.9.575 $\mathrm{GM3}^{+} \oplus \mathrm{T1}^{-} \oplus \mathrm{Y3}^{+}$	$\surd$	1	1	$\times$	-	-
N67.9.576 $\mathrm{GM3}^{+} \oplus \mathrm{T1}^{-} \oplus \mathrm{Y4}^{-}$	$\surd$	1	1	$\times$	-	-
N67.9.577 $\mathrm{GM3}^{+} \oplus \mathrm{T1}^{+} \oplus \mathrm{Y3}^{-}$	$\surd$	1	1	$\times$	-	-
N67.9.578 $\mathrm{GM3}^{+} \oplus \mathrm{T1}^{+} \oplus \mathrm{Y4}^{+}$	$\surd$	1	1	$\times$	-	-
N67.9.579 $\mathrm{GM3}^{+} \oplus \mathrm{T1}^{-} \oplus \mathrm{Y3}^{-}$	$\surd$	1	1	$\times$	-	-
N67.9.580 $\mathrm{GM3}^{+} \oplus \mathrm{T1}^{-} \oplus \mathrm{Y4}^{+}$	$\surd$	1	1	$\times$	-	-
N67.9.581 $\mathrm{GM3}^{+} \oplus \mathrm{T1}^{+} \oplus \mathrm{Z1}^{+}$	$\surd$	1	1	$\times$	-	-
N67.9.582 $\mathrm{GM3}^{+} \oplus \mathrm{T1}^{+} \oplus \mathrm{Z2}^{-}$	$\surd$	1	1	$\times$	-	-
N67.9.583 $\mathrm{GM3}^{+} \oplus \mathrm{T1}^{-} \oplus \mathrm{Z1}^{+}$	$\surd$	1	1	$\times$	-	-
N67.9.584 $\mathrm{GM3}^{+} \oplus \mathrm{T1}^{-} \oplus \mathrm{Z2}^{-}$	$\surd$	1	1	$\times$	-	-
N67.9.585 $\mathrm{GM3}^{+} \oplus \mathrm{T1}^{+} \oplus \mathrm{Z1}^{-}$	$\surd$	1	1	$\times$	-	-
N67.9.586 $\mathrm{GM3}^{+} \oplus \mathrm{T1}^{+} \oplus \mathrm{Z2}^{+}$	$\surd$	1	1	$\times$	-	-
N67.9.587 $\mathrm{GM3}^{+} \oplus \mathrm{T1}^{-} \oplus \mathrm{Z1}^{-}$	$\surd$	1	1	$\times$	-	-
N67.9.588 $\mathrm{GM3}^{+} \oplus \mathrm{T1}^{-} \oplus \mathrm{Z2}^{+}$	$\surd$	1	1	$\times$	-	-
N67.9.589 $\mathrm{GM3}^{+} \oplus \mathrm{T1}^{+} \oplus \mathrm{Z3}^{+}$	$\surd$	1	1	$\times$	-	-
N67.9.590 $\mathrm{GM3}^{+} \oplus \mathrm{T1}^{+} \oplus \mathrm{Z3}^{-}$	$\surd$	1	1	$\times$	-	-
N67.9.591 $\mathrm{GM3}^{+} \oplus \mathrm{T1}^{+} \oplus \mathrm{Z4}^{+}$	$\surd$	1	1	$\times$	-	-
N67.9.592 $\mathrm{GM3}^{+} \oplus \mathrm{T1}^{+} \oplus \mathrm{Z4}^{-}$	$\surd$	1	1	$\times$	-	-
N67.9.593 $\mathrm{GM3}^{+} \oplus \mathrm{T1}^{-} \oplus \mathrm{Z3}^{+}$	$\surd$	1	1	$\times$	-	-
N67.9.594 $\mathrm{GM3}^{+} \oplus \mathrm{T1}^{-} \oplus \mathrm{Z3}^{-}$	$\surd$	1	1	$\times$	-	-
N67.9.595 $\mathrm{GM3}^{+} \oplus \mathrm{T1}^{-} \oplus \mathrm{Z4}^{+}$	$\surd$	1	1	$\times$	-	-
N67.9.596 $\mathrm{GM3}^{+} \oplus \mathrm{T1}^{-} \oplus \mathrm{Z4}^{-}$	$\surd$	1	1	$\times$	-	-
N67.9.597 $\mathrm{GM3}^{+} \oplus \mathrm{T3}^{+} \oplus \mathrm{T3}^{+}$	$\surd$	1	1	$\times$	-	-
N67.9.598 $\mathrm{GM3}^{+} \oplus \mathrm{T3}^{+} \oplus \mathrm{T4}^{-}$	$\surd$	1	1	$\times$	-	-
N67.9.599 $\mathrm{GM3}^{+} \oplus \mathrm{T3}^{+} \oplus \mathrm{T3}^{-}$	$\surd$	1	1	$\times$	-	-
N67.9.600 $\mathrm{GM3}^{+} \oplus \mathrm{T3}^{+} \oplus \mathrm{T4}^{+}$	$\surd$	1	1	$\times$	-	-
N67.9.601 $\mathrm{GM3}^{+} \oplus \mathrm{T3}^{+} \oplus \mathrm{Y1}^{+}$	$\surd$	1	1	$\times$	-	-
N67.9.602 $\mathrm{GM3}^{+} \oplus \mathrm{T3}^{+} \oplus \mathrm{Y1}^{-}$	$\surd$	1	1	$\times$	-	-
N67.9.603 $\mathrm{GM3}^{+} \oplus \mathrm{T3}^{+} \oplus \mathrm{Y2}^{+}$	$\surd$	1	1	$\times$	-	-
N67.9.604 $\mathrm{GM3}^{+} \oplus \mathrm{T3}^{+} \oplus \mathrm{Y2}^{-}$	$\surd$	1	1	$\times$	-	-
N67.9.605 $\mathrm{GM3}^{+} \oplus \mathrm{T3}^{+} \oplus \mathrm{Y3}^{+}$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $Cmme$ (No. 67) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N67.9.606 $\mathrm{GM3}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\times$	-	-
N67.9.607 $\mathrm{GM3}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\times$	-	-
N67.9.608 $\mathrm{GM3}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\times$	-	-
N67.9.609 $\mathrm{GM3}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\times$	-	-
N67.9.610 $\mathrm{GM3}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\times$	-	-
N67.9.611 $\mathrm{GM3}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
N67.9.612 $\mathrm{GM3}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\times$	-	-
N67.9.613 $\mathrm{GM3}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
N67.9.614 $\mathrm{GM3}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N67.9.615 $\mathrm{GM3}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\times$	-	-
N67.9.616 $\mathrm{GM3}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\times$	-	-
N67.9.617 $\mathrm{GM3}^+ \oplus \mathrm{T3}^- \oplus \mathrm{T3}^-$	$\surd$	1	1	$\times$	-	-
N67.9.618 $\mathrm{GM3}^+ \oplus \mathrm{T3}^- \oplus \mathrm{T4}^+$	$\surd$	1	1	$\times$	-	-
N67.9.619 $\mathrm{GM3}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Y1}^+$	$\surd$	1	1	$\times$	-	-
N67.9.620 $\mathrm{GM3}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Y1}^-$	$\surd$	1	1	$\times$	-	-
N67.9.621 $\mathrm{GM3}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\times$	-	-
N67.9.622 $\mathrm{GM3}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\times$	-	-
N67.9.623 $\mathrm{GM3}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\times$	-	-
N67.9.624 $\mathrm{GM3}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\times$	-	-
N67.9.625 $\mathrm{GM3}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\times$	-	-
N67.9.626 $\mathrm{GM3}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\times$	-	-
N67.9.627 $\mathrm{GM3}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\times$	-	-
N67.9.628 $\mathrm{GM3}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\times$	-	-
N67.9.629 $\mathrm{GM3}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
N67.9.630 $\mathrm{GM3}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\times$	-	-
N67.9.631 $\mathrm{GM3}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
N67.9.632 $\mathrm{GM3}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N67.9.633 $\mathrm{GM3}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\times$	-	-
N67.9.634 $\mathrm{GM3}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\times$	-	-
N67.9.635 $\mathrm{GM3}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	1	$\times$	-	-
N67.9.636 $\mathrm{GM3}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^-$	$\surd$	1	1	$\times$	-	-
N67.9.637 $\mathrm{GM3}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y1}^-$	$\surd$	1	1	$\times$	-	-
N67.9.638 $\mathrm{GM3}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\times$	-	-
N67.9.639 $\mathrm{GM3}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\times$	-	-
N67.9.640 $\mathrm{GM3}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\times$	-	-
N67.9.641 $\mathrm{GM3}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\times$	-	-
N67.9.642 $\mathrm{GM3}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\times$	-	-
N67.9.643 $\mathrm{GM3}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\surd$	$mm2$	B2
N67.9.644 $\mathrm{GM3}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\surd$	222	B3
N67.9.645 $\mathrm{GM3}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\times$	-	-
N67.9.646 $\mathrm{GM3}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\surd$	222	B3
N67.9.647 $\mathrm{GM3}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\times$	-	-
N67.9.648 $\mathrm{GM3}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\times$	-	-
N67.9.649 $\mathrm{GM3}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\surd$	$mm2$	B2
N67.9.650 $\mathrm{GM3}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N67.9.651 $\mathrm{GM3}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$

Non-coplanar SSGs with parent space group $Cmme$ (No. 67) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N67.9.652 $\mathrm{GM3}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N67.9.653 $\mathrm{GM3}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N67.9.654 $\mathrm{GM3}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N67.9.655 $\mathrm{GM3}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N67.9.656 $\mathrm{GM3}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N67.9.657 $\mathrm{GM3}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N67.9.658 $\mathrm{GM3}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\times$	-	-
N67.9.659 $\mathrm{GM3}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\times$	-	-
N67.9.660 $\mathrm{GM3}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\times$	-	-
N67.9.661 $\mathrm{GM3}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\times$	-	-
N67.9.662 $\mathrm{GM3}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\surd$	222	B3
N67.9.663 $\mathrm{GM3}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\surd$	$mm2$	B2
N67.9.664 $\mathrm{GM3}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\times$	-	-
N67.9.665 $\mathrm{GM3}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\surd$	$mm2$	B2
N67.9.666 $\mathrm{GM3}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\times$	-	-
N67.9.667 $\mathrm{GM3}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\times$	-	-
N67.9.668 $\mathrm{GM3}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\surd$	222	B3
N67.9.669 $\mathrm{GM3}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N67.9.670 $\mathrm{GM3}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N67.9.671 $\mathrm{GM3}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N67.9.672 $\mathrm{GM3}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N67.9.673 $\mathrm{GM3}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N67.9.674 $\mathrm{GM3}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N67.9.675 $\mathrm{GM3}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N67.9.676 $\mathrm{GM3}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N67.9.677 $\mathrm{GM3}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\times$	-	-
N67.9.678 $\mathrm{GM3}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\times$	-	-
N67.9.679 $\mathrm{GM3}^+ \oplus \mathrm{Y4}^- \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\times$	-	-
N67.9.680 $\mathrm{GM3}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\times$	-	-
N67.9.681 $\mathrm{GM3}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\times$	-	-
N67.9.682 $\mathrm{GM3}^+ \oplus \mathrm{Y4}^- \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\times$	-	-
N67.9.683 $\mathrm{GM3}^+ \oplus \mathrm{Y4}^- \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\times$	-	-
N67.9.684 $\mathrm{GM3}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N67.9.685 $\mathrm{GM3}^+ \oplus \mathrm{Y4}^- \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N67.9.686 $\mathrm{GM3}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N67.9.687 $\mathrm{GM3}^+ \oplus \mathrm{Y4}^- \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N67.9.688 $\mathrm{GM3}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N67.9.689 $\mathrm{GM3}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N67.9.690 $\mathrm{GM3}^+ \oplus \mathrm{Y4}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N67.9.691 $\mathrm{GM3}^+ \oplus \mathrm{Y4}^- \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N67.9.692 $\mathrm{GM3}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\times$	-	-
N67.9.693 $\mathrm{GM3}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\times$	-	-
N67.9.694 $\mathrm{GM3}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\times$	-	-
N67.9.695 $\mathrm{GM3}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N67.9.696 $\mathrm{GM3}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N67.9.697 $\mathrm{GM3}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$

Non-coplanar SSGs with parent space group $Cmme$ (No. 67) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N67.9.698 $\mathrm{GM3}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N67.9.699 $\mathrm{GM3}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N67.9.700 $\mathrm{GM3}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N67.9.701 $\mathrm{GM3}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N67.9.702 $\mathrm{GM3}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N67.9.703 $\mathrm{GM3}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\times$	-	-
N67.9.704 $\mathrm{GM3}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\surd$	$mm2$	B2
N67.9.705 $\mathrm{GM3}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
N67.9.706 $\mathrm{GM3}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\times$	-	-
N67.9.707 $\mathrm{GM3}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
N67.9.708 $\mathrm{GM3}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N67.9.709 $\mathrm{GM3}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\times$	-	-
N67.9.710 $\mathrm{GM3}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\times$	-	-
N67.9.711 $\mathrm{GM3}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
N67.9.712 $\mathrm{GM3}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\surd$	$mm2$	B2
N67.9.713 $\mathrm{GM3}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
N67.9.714 $\mathrm{GM3}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N67.9.715 $\mathrm{GM3}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\times$	-	-
N67.9.716 $\mathrm{GM3}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\times$	-	-
N67.9.717 $\mathrm{GM3}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
N67.9.718 $\mathrm{GM3}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N67.9.719 $\mathrm{GM3}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\times$	-	-
N67.9.720 $\mathrm{GM3}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\surd$	$mm2$	B2
N67.9.721 $\mathrm{GM3}^+ \oplus \mathrm{Z3}^- \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N67.9.722 $\mathrm{GM3}^+ \oplus \mathrm{Z3}^- \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\surd$	$mm2$	B2
N67.9.723 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N67.9.724 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N67.9.725 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{T1}^+$	$\surd$	0	0	$\surd$	-	-
N67.9.726 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{T1}^-$	$\surd$	0	0	$\surd$	-	-
N67.9.727 $\mathrm{GM3}^- \oplus \mathrm{GM4}^- \oplus \mathrm{T1}^+$	$\surd$	0	0	$\surd$	-	-
N67.9.728 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{T3}^+$	$\surd$	0	0	$\surd$	-	-
N67.9.729 $\mathrm{GM3}^- \oplus \mathrm{GM4}^- \oplus \mathrm{T3}^+$	$\surd$	0	0	$\surd$	-	-
N67.9.730 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{T3}^-$	$\surd$	0	0	$\surd$	-	-
N67.9.731 $\mathrm{GM3}^- \oplus \mathrm{GM4}^- \oplus \mathrm{T3}^-$	$\surd$	0	0	$\surd$	-	-
N67.9.732 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y1}^+$	$\surd$	0	0	$\surd$	-	-
N67.9.733 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y1}^-$	$\surd$	0	0	$\surd$	-	-
N67.9.734 $\mathrm{GM3}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Y1}^+$	$\surd$	0	0	$\surd$	-	-
N67.9.735 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y2}^+$	$\surd$	0	0	$\surd$	-	-
N67.9.736 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y2}^-$	$\surd$	0	0	$\surd$	-	-
N67.9.737 $\mathrm{GM3}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Y2}^+$	$\surd$	0	0	$\surd$	-	-
N67.9.738 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y3}^+$	$\surd$	0	0	$\surd$	-	-
N67.9.739 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y4}^-$	$\surd$	0	0	$\surd$	-	-
N67.9.740 $\mathrm{GM3}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Y3}^+$	$\surd$	0	0	$\surd$	-	-
N67.9.741 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y3}^-$	$\surd$	0	0	$\surd$	-	-
N67.9.742 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y4}^+$	$\surd$	0	0	$\surd$	-	-
N67.9.743 $\mathrm{GM3}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Y3}^-$	$\surd$	0	0	$\surd$	-	-

Non-coplanar SSGs with parent space group $Cmme$ (No. 67) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N67.9.744 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Z1}^+$	$\surd$	0	0	$\surd$	-	-
N67.9.745 $\mathrm{GM3}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Z1}^+$	$\surd$	0	0	$\surd$	-	-
N67.9.746 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Z1}^-$	$\surd$	0	0	$\surd$	-	-
N67.9.747 $\mathrm{GM3}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Z1}^-$	$\surd$	0	0	$\surd$	-	-
N67.9.748 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Z3}^+$	$\surd$	0	0	$\surd$	-	-
N67.9.749 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Z3}^-$	$\surd$	0	0	$\surd$	-	-
N67.9.750 $\mathrm{GM3}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Z3}^+$	$\surd$	0	0	$\surd$	-	-
N67.9.751 $\mathrm{GM3}^- \oplus \mathrm{T1}^+ \oplus \mathrm{T1}^+$	$\surd$	1	0	$\times$	-	-
N67.9.752 $\mathrm{GM3}^- \oplus \mathrm{T1}^+ \oplus \mathrm{T1}^-$	$\surd$	1	1	$\times$	-	-
N67.9.753 $\mathrm{GM3}^- \oplus \mathrm{T1}^+ \oplus \mathrm{T2}^+$	$\surd$	1	0	$\times$	-	-
N67.9.754 $\mathrm{GM3}^- \oplus \mathrm{T1}^+ \oplus \mathrm{T2}^-$	$\surd$	1	1	$\times$	-	-
N67.9.755 $\mathrm{GM3}^- \oplus \mathrm{T1}^- \oplus \mathrm{T1}^-$	$\surd$	1	0	$\times$	-	-
N67.9.756 $\mathrm{GM3}^- \oplus \mathrm{T1}^- \oplus \mathrm{T2}^+$	$\surd$	1	1	$\times$	-	-
N67.9.757 $\mathrm{GM3}^- \oplus \mathrm{T1}^+ \oplus \mathrm{T3}^+$	$\surd$	1	0	$\times$	-	-
N67.9.758 $\mathrm{GM3}^- \oplus \mathrm{T1}^+ \oplus \mathrm{T4}^-$	$\surd$	1	1	$\times$	-	-
N67.9.759 $\mathrm{GM3}^- \oplus \mathrm{T1}^- \oplus \mathrm{T3}^+$	$\surd$	1	1	$\times$	-	-
N67.9.760 $\mathrm{GM3}^- \oplus \mathrm{T1}^- \oplus \mathrm{T4}^-$	$\surd$	1	0	$\times$	-	-
N67.9.761 $\mathrm{GM3}^- \oplus \mathrm{T1}^+ \oplus \mathrm{T3}^-$	$\surd$	1	1	$\times$	-	-
N67.9.762 $\mathrm{GM3}^- \oplus \mathrm{T1}^+ \oplus \mathrm{T4}^+$	$\surd$	1	0	$\times$	-	-
N67.9.763 $\mathrm{GM3}^- \oplus \mathrm{T1}^- \oplus \mathrm{T3}^-$	$\surd$	1	0	$\times$	-	-
N67.9.764 $\mathrm{GM3}^- \oplus \mathrm{T1}^- \oplus \mathrm{T4}^+$	$\surd$	1	1	$\times$	-	-
N67.9.765 $\mathrm{GM3}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	0	$\times$	-	-
N67.9.766 $\mathrm{GM3}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Y1}^-$	$\surd$	1	0	$\times$	-	-
N67.9.767 $\mathrm{GM3}^- \oplus \mathrm{T1}^- \oplus \mathrm{Y1}^+$	$\surd$	1	0	$\times$	-	-
N67.9.768 $\mathrm{GM3}^- \oplus \mathrm{T1}^- \oplus \mathrm{Y1}^-$	$\surd$	1	0	$\times$	-	-
N67.9.769 $\mathrm{GM3}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N67.9.770 $\mathrm{GM3}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N67.9.771 $\mathrm{GM3}^- \oplus \mathrm{T1}^- \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N67.9.772 $\mathrm{GM3}^- \oplus \mathrm{T1}^- \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N67.9.773 $\mathrm{GM3}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N67.9.774 $\mathrm{GM3}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	0	$\times$	-	-
N67.9.775 $\mathrm{GM3}^- \oplus \mathrm{T1}^- \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N67.9.776 $\mathrm{GM3}^- \oplus \mathrm{T1}^- \oplus \mathrm{Y4}^-$	$\surd$	1	0	$\times$	-	-
N67.9.777 $\mathrm{GM3}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N67.9.778 $\mathrm{GM3}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
N67.9.779 $\mathrm{GM3}^- \oplus \mathrm{T1}^- \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N67.9.780 $\mathrm{GM3}^- \oplus \mathrm{T1}^- \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
N67.9.781 $\mathrm{GM3}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N67.9.782 $\mathrm{GM3}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-
N67.9.783 $\mathrm{GM3}^- \oplus \mathrm{T1}^- \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N67.9.784 $\mathrm{GM3}^- \oplus \mathrm{T1}^- \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-
N67.9.785 $\mathrm{GM3}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N67.9.786 $\mathrm{GM3}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N67.9.787 $\mathrm{GM3}^- \oplus \mathrm{T1}^- \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N67.9.788 $\mathrm{GM3}^- \oplus \mathrm{T1}^- \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N67.9.789 $\mathrm{GM3}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $Cmme$ (No. 67) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N67.9.790 $\mathrm{GM3}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N67.9.791 $\mathrm{GM3}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N67.9.792 $\mathrm{GM3}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	0	$\times$	-	-
N67.9.793 $\mathrm{GM3}^- \oplus \mathrm{T1}^- \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N67.9.794 $\mathrm{GM3}^- \oplus \mathrm{T1}^- \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N67.9.795 $\mathrm{GM3}^- \oplus \mathrm{T1}^- \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N67.9.796 $\mathrm{GM3}^- \oplus \mathrm{T1}^- \oplus \mathrm{Z4}^-$	$\surd$	1	0	$\times$	-	-
N67.9.797 $\mathrm{GM3}^- \oplus \mathrm{T3}^+ \oplus \mathrm{T3}^+$	$\surd$	1	0	$\times$	-	-
N67.9.798 $\mathrm{GM3}^- \oplus \mathrm{T3}^+ \oplus \mathrm{T4}^-$	$\surd$	1	1	$\times$	-	-
N67.9.799 $\mathrm{GM3}^- \oplus \mathrm{T3}^+ \oplus \mathrm{T3}^-$	$\surd$	1	1	$\times$	-	-
N67.9.800 $\mathrm{GM3}^- \oplus \mathrm{T3}^+ \oplus \mathrm{T4}^+$	$\surd$	1	0	$\times$	-	-
N67.9.801 $\mathrm{GM3}^- \oplus \mathrm{T3}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	0	$\times$	-	-
N67.9.802 $\mathrm{GM3}^- \oplus \mathrm{T3}^+ \oplus \mathrm{Y1}^-$	$\surd$	1	0	$\times$	-	-
N67.9.803 $\mathrm{GM3}^- \oplus \mathrm{T3}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N67.9.804 $\mathrm{GM3}^- \oplus \mathrm{T3}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N67.9.805 $\mathrm{GM3}^- \oplus \mathrm{T3}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N67.9.806 $\mathrm{GM3}^- \oplus \mathrm{T3}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	0	$\times$	-	-
N67.9.807 $\mathrm{GM3}^- \oplus \mathrm{T3}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N67.9.808 $\mathrm{GM3}^- \oplus \mathrm{T3}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
N67.9.809 $\mathrm{GM3}^- \oplus \mathrm{T3}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N67.9.810 $\mathrm{GM3}^- \oplus \mathrm{T3}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-
N67.9.811 $\mathrm{GM3}^- \oplus \mathrm{T3}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N67.9.812 $\mathrm{GM3}^- \oplus \mathrm{T3}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N67.9.813 $\mathrm{GM3}^- \oplus \mathrm{T3}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N67.9.814 $\mathrm{GM3}^- \oplus \mathrm{T3}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N67.9.815 $\mathrm{GM3}^- \oplus \mathrm{T3}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N67.9.816 $\mathrm{GM3}^- \oplus \mathrm{T3}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	0	$\times$	-	-
N67.9.817 $\mathrm{GM3}^- \oplus \mathrm{T3}^- \oplus \mathrm{T3}^-$	$\surd$	1	0	$\times$	-	-
N67.9.818 $\mathrm{GM3}^- \oplus \mathrm{T3}^- \oplus \mathrm{T4}^+$	$\surd$	1	1	$\times$	-	-
N67.9.819 $\mathrm{GM3}^- \oplus \mathrm{T3}^- \oplus \mathrm{Y1}^+$	$\surd$	1	0	$\times$	-	-
N67.9.820 $\mathrm{GM3}^- \oplus \mathrm{T3}^- \oplus \mathrm{Y1}^-$	$\surd$	1	0	$\times$	-	-
N67.9.821 $\mathrm{GM3}^- \oplus \mathrm{T3}^- \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N67.9.822 $\mathrm{GM3}^- \oplus \mathrm{T3}^- \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N67.9.823 $\mathrm{GM3}^- \oplus \mathrm{T3}^- \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N67.9.824 $\mathrm{GM3}^- \oplus \mathrm{T3}^- \oplus \mathrm{Y4}^-$	$\surd$	1	0	$\times$	-	-
N67.9.825 $\mathrm{GM3}^- \oplus \mathrm{T3}^- \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N67.9.826 $\mathrm{GM3}^- \oplus \mathrm{T3}^- \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
N67.9.827 $\mathrm{GM3}^- \oplus \mathrm{T3}^- \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N67.9.828 $\mathrm{GM3}^- \oplus \mathrm{T3}^- \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-
N67.9.829 $\mathrm{GM3}^- \oplus \mathrm{T3}^- \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N67.9.830 $\mathrm{GM3}^- \oplus \mathrm{T3}^- \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N67.9.831 $\mathrm{GM3}^- \oplus \mathrm{T3}^- \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N67.9.832 $\mathrm{GM3}^- \oplus \mathrm{T3}^- \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N67.9.833 $\mathrm{GM3}^- \oplus \mathrm{T3}^- \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N67.9.834 $\mathrm{GM3}^- \oplus \mathrm{T3}^- \oplus \mathrm{Z4}^-$	$\surd$	1	0	$\times$	-	-
N67.9.835 $\mathrm{GM3}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $Cmme$ (No. 67) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N67.9.836 $\mathrm{GM3}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^-$	$\surd$	1	1	$\times$	-	-
N67.9.837 $\mathrm{GM3}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y1}^-$	$\surd$	1	0	$\times$	-	-
N67.9.838 $\mathrm{GM3}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N67.9.839 $\mathrm{GM3}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\times$	-	-
N67.9.840 $\mathrm{GM3}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\times$	-	-
N67.9.841 $\mathrm{GM3}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N67.9.842 $\mathrm{GM3}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N67.9.843 $\mathrm{GM3}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N67.9.844 $\mathrm{GM3}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N67.9.845 $\mathrm{GM3}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y4}^-$	$\surd$	1	0	$\times$	-	-
N67.9.846 $\mathrm{GM3}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N67.9.847 $\mathrm{GM3}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
N67.9.848 $\mathrm{GM3}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N67.9.849 $\mathrm{GM3}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N67.9.850 $\mathrm{GM3}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N67.9.851 $\mathrm{GM3}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N67.9.852 $\mathrm{GM3}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N67.9.853 $\mathrm{GM3}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N67.9.854 $\mathrm{GM3}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N67.9.855 $\mathrm{GM3}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N67.9.856 $\mathrm{GM3}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N67.9.857 $\mathrm{GM3}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N67.9.858 $\mathrm{GM3}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N67.9.859 $\mathrm{GM3}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\times$	-	-
N67.9.860 $\mathrm{GM3}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N67.9.861 $\mathrm{GM3}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N67.9.862 $\mathrm{GM3}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N67.9.863 $\mathrm{GM3}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N67.9.864 $\mathrm{GM3}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y4}^-$	$\surd$	1	0	$\times$	-	-
N67.9.865 $\mathrm{GM3}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N67.9.866 $\mathrm{GM3}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
N67.9.867 $\mathrm{GM3}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N67.9.868 $\mathrm{GM3}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N67.9.869 $\mathrm{GM3}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N67.9.870 $\mathrm{GM3}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N67.9.871 $\mathrm{GM3}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N67.9.872 $\mathrm{GM3}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N67.9.873 $\mathrm{GM3}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N67.9.874 $\mathrm{GM3}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N67.9.875 $\mathrm{GM3}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N67.9.876 $\mathrm{GM3}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N67.9.877 $\mathrm{GM3}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N67.9.878 $\mathrm{GM3}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\times$	-	-
N67.9.879 $\mathrm{GM3}^- \oplus \mathrm{Y4}^- \oplus \mathrm{Y4}^-$	$\surd$	1	0	$\times$	-	-
N67.9.880 $\mathrm{GM3}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\times$	-	-
N67.9.881 $\mathrm{GM3}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $Cmme$ (No. 67) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N67.9.882 $\mathrm{GM3^-} \oplus \mathrm{Y4^-} \oplus \mathrm{Y3^-}$	$\surd$	1	0	$\times$	-	-
N67.9.883 $\mathrm{GM3^-} \oplus \mathrm{Y4^-} \oplus \mathrm{Y4^+}$	$\surd$	1	1	$\times$	-	-
N67.9.884 $\mathrm{GM3^-} \oplus \mathrm{Y3^+} \oplus \mathrm{Z1^+}$	$\surd$	1	0	$\times$	-	-
N67.9.885 $\mathrm{GM3^-} \oplus \mathrm{Y4^-} \oplus \mathrm{Z1^+}$	$\surd$	1	0	$\times$	-	-
N67.9.886 $\mathrm{GM3^-} \oplus \mathrm{Y3^+} \oplus \mathrm{Z1^-}$	$\surd$	1	0	$\times$	-	-
N67.9.887 $\mathrm{GM3^-} \oplus \mathrm{Y4^-} \oplus \mathrm{Z1^-}$	$\surd$	1	0	$\times$	-	-
N67.9.888 $\mathrm{GM3^-} \oplus \mathrm{Y3^+} \oplus \mathrm{Z3^+}$	$\surd$	1	0	$\times$	-	-
N67.9.889 $\mathrm{GM3^-} \oplus \mathrm{Y3^+} \oplus \mathrm{Z3^-}$	$\surd$	1	0	$\times$	-	-
N67.9.890 $\mathrm{GM3^-} \oplus \mathrm{Y4^-} \oplus \mathrm{Z3^+}$	$\surd$	1	0	$\times$	-	-
N67.9.891 $\mathrm{GM3^-} \oplus \mathrm{Y4^-} \oplus \mathrm{Z3^-}$	$\surd$	1	0	$\times$	-	-
N67.9.892 $\mathrm{GM3^-} \oplus \mathrm{Y3^-} \oplus \mathrm{Y3^-}$	$\surd$	1	0	$\times$	-	-
N67.9.893 $\mathrm{GM3^-} \oplus \mathrm{Y3^-} \oplus \mathrm{Y4^+}$	$\surd$	1	1	$\times$	-	-
N67.9.894 $\mathrm{GM3^-} \oplus \mathrm{Y4^+} \oplus \mathrm{Y4^+}$	$\surd$	1	0	$\times$	-	-
N67.9.895 $\mathrm{GM3^-} \oplus \mathrm{Y3^-} \oplus \mathrm{Z1^+}$	$\surd$	1	0	$\times$	-	-
N67.9.896 $\mathrm{GM3^-} \oplus \mathrm{Y4^+} \oplus \mathrm{Z1^+}$	$\surd$	1	0	$\times$	-	-
N67.9.897 $\mathrm{GM3^-} \oplus \mathrm{Y3^-} \oplus \mathrm{Z1^-}$	$\surd$	1	0	$\times$	-	-
N67.9.898 $\mathrm{GM3^-} \oplus \mathrm{Y4^+} \oplus \mathrm{Z1^-}$	$\surd$	1	0	$\times$	-	-
N67.9.899 $\mathrm{GM3^-} \oplus \mathrm{Y3^-} \oplus \mathrm{Z3^+}$	$\surd$	1	0	$\times$	-	-
N67.9.900 $\mathrm{GM3^-} \oplus \mathrm{Y3^-} \oplus \mathrm{Z3^-}$	$\surd$	1	0	$\times$	-	-
N67.9.901 $\mathrm{GM3^-} \oplus \mathrm{Y4^+} \oplus \mathrm{Z3^+}$	$\surd$	1	0	$\times$	-	-
N67.9.902 $\mathrm{GM3^-} \oplus \mathrm{Y4^+} \oplus \mathrm{Z3^-}$	$\surd$	1	0	$\times$	-	-
N67.9.903 $\mathrm{GM3^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z1^+}$	$\surd$	1	0	$\times$	-	-
N67.9.904 $\mathrm{GM3^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.9.905 $\mathrm{GM3^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z1^-}$	$\surd$	1	1	$\times$	-	-
N67.9.906 $\mathrm{GM3^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z2^+}$	$\surd$	1	0	$\times$	-	-
N67.9.907 $\mathrm{GM3^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z3^+}$	$\surd$	1	0	$\times$	-	-
N67.9.908 $\mathrm{GM3^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z3^-}$	$\surd$	1	1	$\times$	-	-
N67.9.909 $\mathrm{GM3^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z4^+}$	$\surd$	1	0	$\times$	-	-
N67.9.910 $\mathrm{GM3^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z4^-}$	$\surd$	1	1	$\times$	-	-
N67.9.911 $\mathrm{GM3^-} \oplus \mathrm{Z1^-} \oplus \mathrm{Z1^-}$	$\surd$	1	0	$\times$	-	-
N67.9.912 $\mathrm{GM3^-} \oplus \mathrm{Z1^-} \oplus \mathrm{Z2^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.9.913 $\mathrm{GM3^-} \oplus \mathrm{Z1^-} \oplus \mathrm{Z3^+}$	$\surd$	1	1	$\times$	-	-
N67.9.914 $\mathrm{GM3^-} \oplus \mathrm{Z1^-} \oplus \mathrm{Z3^-}$	$\surd$	1	0	$\times$	-	-
N67.9.915 $\mathrm{GM3^-} \oplus \mathrm{Z1^-} \oplus \mathrm{Z4^+}$	$\surd$	1	1	$\times$	-	-
N67.9.916 $\mathrm{GM3^-} \oplus \mathrm{Z1^-} \oplus \mathrm{Z4^-}$	$\surd$	1	0	$\times$	-	-
N67.9.917 $\mathrm{GM3^-} \oplus \mathrm{Z3^+} \oplus \mathrm{Z3^+}$	$\surd$	1	0	$\times$	-	-
N67.9.918 $\mathrm{GM3^-} \oplus \mathrm{Z3^+} \oplus \mathrm{Z3^-}$	$\surd$	1	1	$\times$	-	-
N67.9.919 $\mathrm{GM3^-} \oplus \mathrm{Z3^+} \oplus \mathrm{Z4^+}$	$\surd$	1	0	$\times$	-	-
N67.9.920 $\mathrm{GM3^-} \oplus \mathrm{Z3^+} \oplus \mathrm{Z4^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.9.921 $\mathrm{GM3^-} \oplus \mathrm{Z3^-} \oplus \mathrm{Z3^-}$	$\surd$	1	0	$\times$	-	-
N67.9.922 $\mathrm{GM3^-} \oplus \mathrm{Z3^-} \oplus \mathrm{Z4^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.9.923 $\mathrm{T1^+} \oplus \mathrm{T1^+} \oplus \mathrm{T1^+}$	$\surd$	0	0	$\surd$	-	-
N67.9.924 $\mathrm{T1^+} \oplus \mathrm{T1^+} \oplus \mathrm{T1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u}$
N67.9.925 $\mathrm{T1^+} \oplus \mathrm{T1^+} \oplus \mathrm{T2^+}$	$\surd$	0	0	$\surd$	-	-
N67.9.926 $\mathrm{T1^+} \oplus \mathrm{T1^+} \oplus \mathrm{T2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N67.9.927 $\mathrm{T1^+} \oplus \mathrm{T1^-} \oplus \mathrm{T2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u}$

Non-coplanar SSGs with parent space group $Cmme$ (No. 67) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N67.9.928 $\mathrm{T1}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{T3}^+$	$\surd$	0	0	$\surd$	-	-
N67.9.929 $\mathrm{T1}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{T4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_u} \oplus \mathrm{B2_u}$
N67.9.930 $\mathrm{T1}^+ \oplus \mathrm{T1}^- \oplus \mathrm{T3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u}$
N67.9.931 $\mathrm{T1}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{T3}^+$	$\surd$	0	0	$\surd$	-	-
N67.9.932 $\mathrm{T1}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{T4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_u}$
N67.9.933 $\mathrm{T1}^+ \oplus \mathrm{T2}^- \oplus \mathrm{T3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N67.9.934 $\mathrm{T1}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{T3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B3_u}$
N67.9.935 $\mathrm{T1}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{T4}^+$	$\surd$	0	0	$\surd$	-	-
N67.9.936 $\mathrm{T1}^+ \oplus \mathrm{T1}^- \oplus \mathrm{T3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u}$
N67.9.937 $\mathrm{T1}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{T3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_u}$
N67.9.938 $\mathrm{T1}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{T4}^+$	$\surd$	0	0	$\surd$	-	-
N67.9.939 $\mathrm{T1}^+ \oplus \mathrm{T2}^- \oplus \mathrm{T3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u}$
N67.9.940 $\mathrm{T1}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	0	$\times$	-	-
N67.9.941 $\mathrm{T1}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Y1}^-$	$\surd$	1	0	$\times$	-	-
N67.9.942 $\mathrm{T1}^+ \oplus \mathrm{T1}^- \oplus \mathrm{Y1}^+$	$\surd$	1	1	$\times$	-	-
N67.9.943 $\mathrm{T1}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	0	$\times$	-	-
N67.9.944 $\mathrm{T1}^+ \oplus \mathrm{T2}^- \oplus \mathrm{Y1}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.9.945 $\mathrm{T1}^+ \oplus \mathrm{T2}^- \oplus \mathrm{Y1}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.9.946 $\mathrm{T1}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N67.9.947 $\mathrm{T1}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N67.9.948 $\mathrm{T1}^+ \oplus \mathrm{T1}^- \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\times$	-	-
N67.9.949 $\mathrm{T1}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N67.9.950 $\mathrm{T1}^+ \oplus \mathrm{T2}^- \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.9.951 $\mathrm{T1}^+ \oplus \mathrm{T2}^- \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.9.952 $\mathrm{T1}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N67.9.953 $\mathrm{T1}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	0	$\times$	-	-
N67.9.954 $\mathrm{T1}^+ \oplus \mathrm{T1}^- \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\times$	-	-
N67.9.955 $\mathrm{T1}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N67.9.956 $\mathrm{T1}^+ \oplus \mathrm{T2}^- \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.9.957 $\mathrm{T1}^+ \oplus \mathrm{T2}^- \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.9.958 $\mathrm{T1}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N67.9.959 $\mathrm{T1}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
N67.9.960 $\mathrm{T1}^+ \oplus \mathrm{T1}^- \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\times$	-	-
N67.9.961 $\mathrm{T1}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N67.9.962 $\mathrm{T1}^+ \oplus \mathrm{T2}^- \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.9.963 $\mathrm{T1}^+ \oplus \mathrm{T2}^- \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.9.964 $\mathrm{T1}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N67.9.965 $\mathrm{T1}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-
N67.9.966 $\mathrm{T1}^+ \oplus \mathrm{T1}^- \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\times$	-	-
N67.9.967 $\mathrm{T1}^+ \oplus \mathrm{T1}^- \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\times$	-	-
N67.9.968 $\mathrm{T1}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N67.9.969 $\mathrm{T1}^+ \oplus \mathrm{T2}^- \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\times$	-	-
N67.9.970 $\mathrm{T1}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N67.9.971 $\mathrm{T1}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N67.9.972 $\mathrm{T1}^+ \oplus \mathrm{T1}^- \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
N67.9.973 $\mathrm{T1}^+ \oplus \mathrm{T1}^- \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $Cmme$ (No. 67) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N67.9.974 $\mathrm{T1}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N67.9.975 $\mathrm{T1}^+ \oplus \mathrm{T2}^- \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
N67.9.976 $\mathrm{T1}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N67.9.977 $\mathrm{T1}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N67.9.978 $\mathrm{T1}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N67.9.979 $\mathrm{T1}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	0	$\times$	-	-
N67.9.980 $\mathrm{T1}^+ \oplus \mathrm{T1}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
N67.9.981 $\mathrm{T1}^+ \oplus \mathrm{T1}^- \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N67.9.982 $\mathrm{T1}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N67.9.983 $\mathrm{T1}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N67.9.984 $\mathrm{T1}^+ \oplus \mathrm{T2}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
N67.9.985 $\mathrm{T1}^+ \oplus \mathrm{T2}^- \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N67.9.986 $\mathrm{T1}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{T3}^+$	$\surd$	0	0	$\surd$	-	-
N67.9.987 $\mathrm{T1}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{T4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N67.9.988 $\mathrm{T1}^+ \oplus \mathrm{T4}^- \oplus \mathrm{T4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_u} \oplus \mathrm{B2_u}$
N67.9.989 $\mathrm{T1}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{T3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u}$
N67.9.990 $\mathrm{T1}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{T4}^+$	$\surd$	0	0	$\surd$	-	-
N67.9.991 $\mathrm{T1}^+ \oplus \mathrm{T4}^- \oplus \mathrm{T3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_u}$
N67.9.992 $\mathrm{T1}^+ \oplus \mathrm{T4}^- \oplus \mathrm{T4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B2_u}$
N67.9.993 $\mathrm{T1}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	0	$\times$	-	-
N67.9.994 $\mathrm{T1}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{Y1}^-$	$\surd$	1	0	$\times$	-	-
N67.9.995 $\mathrm{T1}^+ \oplus \mathrm{T4}^- \oplus \mathrm{Y1}^+$	$\surd$	1	1	$\times$	-	-
N67.9.996 $\mathrm{T1}^+ \oplus \mathrm{T4}^- \oplus \mathrm{Y1}^-$	$\surd$	1	1	$\times$	-	-
N67.9.997 $\mathrm{T1}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N67.9.998 $\mathrm{T1}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N67.9.999 $\mathrm{T1}^+ \oplus \mathrm{T4}^- \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\times$	-	-
N67.9.1000 $\mathrm{T1}^+ \oplus \mathrm{T4}^- \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\times$	-	-
N67.9.1001 $\mathrm{T1}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N67.9.1002 $\mathrm{T1}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	0	$\times$	-	-
N67.9.1003 $\mathrm{T1}^+ \oplus \mathrm{T4}^- \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\times$	-	-
N67.9.1004 $\mathrm{T1}^+ \oplus \mathrm{T4}^- \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\times$	-	-
N67.9.1005 $\mathrm{T1}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N67.9.1006 $\mathrm{T1}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
N67.9.1007 $\mathrm{T1}^+ \oplus \mathrm{T4}^- \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\times$	-	-
N67.9.1008 $\mathrm{T1}^+ \oplus \mathrm{T4}^- \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\times$	-	-
N67.9.1009 $\mathrm{T1}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N67.9.1010 $\mathrm{T1}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-
N67.9.1011 $\mathrm{T1}^+ \oplus \mathrm{T4}^- \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N67.9.1012 $\mathrm{T1}^+ \oplus \mathrm{T4}^- \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N67.9.1013 $\mathrm{T1}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N67.9.1014 $\mathrm{T1}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N67.9.1015 $\mathrm{T1}^+ \oplus \mathrm{T4}^- \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N67.9.1016 $\mathrm{T1}^+ \oplus \mathrm{T4}^- \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N67.9.1017 $\mathrm{T1}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N67.9.1018 $\mathrm{T1}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N67.9.1019 $\mathrm{T1}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $Cmme$ (No. 67) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N67.9.1020 $\mathrm{T1}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	0	$\times$	-	-
N67.9.1021 $\mathrm{T1}^+ \oplus \mathrm{T4}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N67.9.1022 $\mathrm{T1}^+ \oplus \mathrm{T4}^- \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N67.9.1023 $\mathrm{T1}^+ \oplus \mathrm{T4}^- \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N67.9.1024 $\mathrm{T1}^+ \oplus \mathrm{T4}^- \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N67.9.1025 $\mathrm{T1}^+ \oplus \mathrm{T3}^- \oplus \mathrm{T3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B3_u}$
N67.9.1026 $\mathrm{T1}^+ \oplus \mathrm{T3}^- \oplus \mathrm{T4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u}$
N67.9.1027 $\mathrm{T1}^+ \oplus \mathrm{T4}^+ \oplus \mathrm{T4}^+$	$\surd$	0	0	$\surd$	-	-
N67.9.1028 $\mathrm{T1}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Y1}^+$	$\surd$	1	1	$\times$	-	-
N67.9.1029 $\mathrm{T1}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Y1}^-$	$\surd$	1	1	$\times$	-	-
N67.9.1030 $\mathrm{T1}^+ \oplus \mathrm{T4}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	0	$\times$	-	-
N67.9.1031 $\mathrm{T1}^+ \oplus \mathrm{T4}^+ \oplus \mathrm{Y1}^-$	$\surd$	1	0	$\times$	-	-
N67.9.1032 $\mathrm{T1}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\times$	-	-
N67.9.1033 $\mathrm{T1}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\times$	-	-
N67.9.1034 $\mathrm{T1}^+ \oplus \mathrm{T4}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N67.9.1035 $\mathrm{T1}^+ \oplus \mathrm{T4}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N67.9.1036 $\mathrm{T1}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\times$	-	-
N67.9.1037 $\mathrm{T1}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\times$	-	-
N67.9.1038 $\mathrm{T1}^+ \oplus \mathrm{T4}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N67.9.1039 $\mathrm{T1}^+ \oplus \mathrm{T4}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	0	$\times$	-	-
N67.9.1040 $\mathrm{T1}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\times$	-	-
N67.9.1041 $\mathrm{T1}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\times$	-	-
N67.9.1042 $\mathrm{T1}^+ \oplus \mathrm{T4}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N67.9.1043 $\mathrm{T1}^+ \oplus \mathrm{T4}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
N67.9.1044 $\mathrm{T1}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N67.9.1045 $\mathrm{T1}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N67.9.1046 $\mathrm{T1}^+ \oplus \mathrm{T4}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N67.9.1047 $\mathrm{T1}^+ \oplus \mathrm{T4}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-
N67.9.1048 $\mathrm{T1}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N67.9.1049 $\mathrm{T1}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N67.9.1050 $\mathrm{T1}^+ \oplus \mathrm{T4}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N67.9.1051 $\mathrm{T1}^+ \oplus \mathrm{T4}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N67.9.1052 $\mathrm{T1}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N67.9.1053 $\mathrm{T1}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N67.9.1054 $\mathrm{T1}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N67.9.1055 $\mathrm{T1}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N67.9.1056 $\mathrm{T1}^+ \oplus \mathrm{T4}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N67.9.1057 $\mathrm{T1}^+ \oplus \mathrm{T4}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N67.9.1058 $\mathrm{T1}^+ \oplus \mathrm{T4}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N67.9.1059 $\mathrm{T1}^+ \oplus \mathrm{T4}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	0	$\times$	-	-
N67.9.1060 $\mathrm{T1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	0	$\times$	-	-
N67.9.1061 $\mathrm{T1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_u}$
N67.9.1062 $\mathrm{T1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y1}^-$	$\surd$	1	0	$\times$	-	-
N67.9.1063 $\mathrm{T1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N67.9.1064 $\mathrm{T1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.9.1065 $\mathrm{T1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$

Non-coplanar SSGs with parent space group $Cmme$ (No. 67) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N67.9.1066 $\mathrm{T1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N67.9.1067 $\mathrm{T1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N67.9.1068 $\mathrm{T1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N67.9.1069 $\mathrm{T1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N67.9.1070 $\mathrm{T1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y4}^-$	$\surd$	1	0	$\times$	-	-
N67.9.1071 $\mathrm{T1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N67.9.1072 $\mathrm{T1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
N67.9.1073 $\mathrm{T1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N67.9.1074 $\mathrm{T1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N67.9.1075 $\mathrm{T1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Z1}^+$	$\times$	-	-	-	-	-
N67.9.1076 $\mathrm{T1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Z2}^-$	$\times$	-	-	-	-	-
N67.9.1077 $\mathrm{T1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Z1}^+$	$\times$	-	-	-	-	-
N67.9.1078 $\mathrm{T1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Z2}^-$	$\times$	-	-	-	-	-
N67.9.1079 $\mathrm{T1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Z1}^-$	$\times$	-	-	-	-	-
N67.9.1080 $\mathrm{T1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Z2}^+$	$\times$	-	-	-	-	-
N67.9.1081 $\mathrm{T1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Z1}^-$	$\times$	-	-	-	-	-
N67.9.1082 $\mathrm{T1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Z2}^+$	$\times$	-	-	-	-	-
N67.9.1083 $\mathrm{T1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Z3}^+$	$\times$	-	-	-	-	-
N67.9.1084 $\mathrm{T1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Z3}^-$	$\times$	-	-	-	-	-
N67.9.1085 $\mathrm{T1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Z4}^+$	$\times$	-	-	-	-	-
N67.9.1086 $\mathrm{T1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Z4}^-$	$\times$	-	-	-	-	-
N67.9.1087 $\mathrm{T1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Z3}^+$	$\times$	-	-	-	-	-
N67.9.1088 $\mathrm{T1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Z3}^-$	$\times$	-	-	-	-	-
N67.9.1089 $\mathrm{T1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Z4}^+$	$\times$	-	-	-	-	-
N67.9.1090 $\mathrm{T1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Z4}^-$	$\times$	-	-	-	-	-
N67.9.1091 $\mathrm{T1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N67.9.1092 $\mathrm{T1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_u}$
N67.9.1093 $\mathrm{T1}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N67.9.1094 $\mathrm{T1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N67.9.1095 $\mathrm{T1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N67.9.1096 $\mathrm{T1}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N67.9.1097 $\mathrm{T1}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y4}^-$	$\surd$	1	0	$\times$	-	-
N67.9.1098 $\mathrm{T1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N67.9.1099 $\mathrm{T1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
N67.9.1100 $\mathrm{T1}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N67.9.1101 $\mathrm{T1}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N67.9.1102 $\mathrm{T1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Z1}^+$	$\times$	-	-	-	-	-
N67.9.1103 $\mathrm{T1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Z2}^-$	$\times$	-	-	-	-	-
N67.9.1104 $\mathrm{T1}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Z1}^+$	$\times$	-	-	-	-	-
N67.9.1105 $\mathrm{T1}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Z2}^-$	$\times$	-	-	-	-	-
N67.9.1106 $\mathrm{T1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Z1}^-$	$\times$	-	-	-	-	-
N67.9.1107 $\mathrm{T1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Z2}^+$	$\times$	-	-	-	-	-
N67.9.1108 $\mathrm{T1}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Z1}^-$	$\times$	-	-	-	-	-
N67.9.1109 $\mathrm{T1}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Z2}^+$	$\times$	-	-	-	-	-
N67.9.1110 $\mathrm{T1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Z3}^+$	$\times$	-	-	-	-	-
N67.9.1111 $\mathrm{T1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Z3}^-$	$\times$	-	-	-	-	-

Non-coplanar SSGs with parent space group $Cmme$ (No. 67) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N67.9.1112 $\mathrm{T1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Z4}^+$	$\times$	-	-	-	-	-
N67.9.1113 $\mathrm{T1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Z4}^-$	$\times$	-	-	-	-	-
N67.9.1114 $\mathrm{T1}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Z3}^+$	$\times$	-	-	-	-	-
N67.9.1115 $\mathrm{T1}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Z3}^-$	$\times$	-	-	-	-	-
N67.9.1116 $\mathrm{T1}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Z4}^+$	$\times$	-	-	-	-	-
N67.9.1117 $\mathrm{T1}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Z4}^-$	$\times$	-	-	-	-	-
N67.9.1118 $\mathrm{T1}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N67.9.1119 $\mathrm{T1}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.9.1120 $\mathrm{T1}^+ \oplus \mathrm{Y4}^- \oplus \mathrm{Y4}^-$	$\surd$	1	0	$\times$	-	-
N67.9.1121 $\mathrm{T1}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_u}$
N67.9.1122 $\mathrm{T1}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
N67.9.1123 $\mathrm{T1}^+ \oplus \mathrm{Y4}^- \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N67.9.1124 $\mathrm{T1}^+ \oplus \mathrm{Y4}^- \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_u}$
N67.9.1125 $\mathrm{T1}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Z1}^+$	$\times$	-	-	-	-	-
N67.9.1126 $\mathrm{T1}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Z2}^-$	$\times$	-	-	-	-	-
N67.9.1127 $\mathrm{T1}^+ \oplus \mathrm{Y4}^- \oplus \mathrm{Z1}^+$	$\times$	-	-	-	-	-
N67.9.1128 $\mathrm{T1}^+ \oplus \mathrm{Y4}^- \oplus \mathrm{Z2}^-$	$\times$	-	-	-	-	-
N67.9.1129 $\mathrm{T1}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Z1}^-$	$\times$	-	-	-	-	-
N67.9.1130 $\mathrm{T1}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Z2}^+$	$\times$	-	-	-	-	-
N67.9.1131 $\mathrm{T1}^+ \oplus \mathrm{Y4}^- \oplus \mathrm{Z1}^-$	$\times$	-	-	-	-	-
N67.9.1132 $\mathrm{T1}^+ \oplus \mathrm{Y4}^- \oplus \mathrm{Z2}^+$	$\times$	-	-	-	-	-
N67.9.1133 $\mathrm{T1}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Z3}^+$	$\times$	-	-	-	-	-
N67.9.1134 $\mathrm{T1}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Z3}^-$	$\times$	-	-	-	-	-
N67.9.1135 $\mathrm{T1}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Z4}^+$	$\times$	-	-	-	-	-
N67.9.1136 $\mathrm{T1}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Z4}^-$	$\times$	-	-	-	-	-
N67.9.1137 $\mathrm{T1}^+ \oplus \mathrm{Y4}^- \oplus \mathrm{Z3}^+$	$\times$	-	-	-	-	-
N67.9.1138 $\mathrm{T1}^+ \oplus \mathrm{Y4}^- \oplus \mathrm{Z3}^-$	$\times$	-	-	-	-	-
N67.9.1139 $\mathrm{T1}^+ \oplus \mathrm{Y4}^- \oplus \mathrm{Z4}^+$	$\times$	-	-	-	-	-
N67.9.1140 $\mathrm{T1}^+ \oplus \mathrm{Y4}^- \oplus \mathrm{Z4}^-$	$\times$	-	-	-	-	-
N67.9.1141 $\mathrm{T1}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N67.9.1142 $\mathrm{T1}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.9.1143 $\mathrm{T1}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
N67.9.1144 $\mathrm{T1}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Z1}^+$	$\times$	-	-	-	-	-
N67.9.1145 $\mathrm{T1}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Z2}^-$	$\times$	-	-	-	-	-
N67.9.1146 $\mathrm{T1}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{Z1}^+$	$\times$	-	-	-	-	-
N67.9.1147 $\mathrm{T1}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{Z2}^-$	$\times$	-	-	-	-	-
N67.9.1148 $\mathrm{T1}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Z1}^-$	$\times$	-	-	-	-	-
N67.9.1149 $\mathrm{T1}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Z2}^+$	$\times$	-	-	-	-	-
N67.9.1150 $\mathrm{T1}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{Z1}^-$	$\times$	-	-	-	-	-
N67.9.1151 $\mathrm{T1}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{Z2}^+$	$\times$	-	-	-	-	-
N67.9.1152 $\mathrm{T1}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Z3}^+$	$\times$	-	-	-	-	-
N67.9.1153 $\mathrm{T1}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Z3}^-$	$\times$	-	-	-	-	-
N67.9.1154 $\mathrm{T1}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Z4}^+$	$\times$	-	-	-	-	-
N67.9.1155 $\mathrm{T1}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Z4}^-$	$\times$	-	-	-	-	-
N67.9.1156 $\mathrm{T1}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{Z3}^+$	$\times$	-	-	-	-	-
N67.9.1157 $\mathrm{T1}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{Z3}^-$	$\times$	-	-	-	-	-

Non-coplanar SSGs with parent space group $Cmme$ (No. 67) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N67.9.1158 $\mathrm{T1}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{Z4}^+$	$\times$	-	-	-	-	-
N67.9.1159 $\mathrm{T1}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{Z4}^-$	$\times$	-	-	-	-	-
N67.9.1160 $\mathrm{T1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N67.9.1161 $\mathrm{T1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.9.1162 $\mathrm{T1}^+ \oplus \mathrm{Z2}^- \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-
N67.9.1163 $\mathrm{T1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_u}$
N67.9.1164 $\mathrm{T1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N67.9.1165 $\mathrm{T1}^+ \oplus \mathrm{Z2}^- \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N67.9.1166 $\mathrm{T1}^+ \oplus \mathrm{Z2}^- \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_u}$
N67.9.1167 $\mathrm{T1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N67.9.1168 $\mathrm{T1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N67.9.1169 $\mathrm{T1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N67.9.1170 $\mathrm{T1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N67.9.1171 $\mathrm{T1}^+ \oplus \mathrm{Z2}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N67.9.1172 $\mathrm{T1}^+ \oplus \mathrm{Z2}^- \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N67.9.1173 $\mathrm{T1}^+ \oplus \mathrm{Z2}^- \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N67.9.1174 $\mathrm{T1}^+ \oplus \mathrm{Z2}^- \oplus \mathrm{Z4}^-$	$\surd$	1	0	$\times$	-	-
N67.9.1175 $\mathrm{T1}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N67.9.1176 $\mathrm{T1}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.9.1177 $\mathrm{T1}^+ \oplus \mathrm{Z2}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N67.9.1178 $\mathrm{T1}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N67.9.1179 $\mathrm{T1}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N67.9.1180 $\mathrm{T1}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N67.9.1181 $\mathrm{T1}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z4}^-$	$\surd$	1	0	$\times$	-	-
N67.9.1182 $\mathrm{T1}^+ \oplus \mathrm{Z2}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N67.9.1183 $\mathrm{T1}^+ \oplus \mathrm{Z2}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N67.9.1184 $\mathrm{T1}^+ \oplus \mathrm{Z2}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N67.9.1185 $\mathrm{T1}^+ \oplus \mathrm{Z2}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N67.9.1186 $\mathrm{T1}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N67.9.1187 $\mathrm{T1}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_u}$
N67.9.1188 $\mathrm{T1}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N67.9.1189 $\mathrm{T1}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.9.1190 $\mathrm{T1}^+ \oplus \mathrm{Z3}^- \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N67.9.1191 $\mathrm{T1}^+ \oplus \mathrm{Z3}^- \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.9.1192 $\mathrm{T1}^+ \oplus \mathrm{Z3}^- \oplus \mathrm{Z4}^-$	$\surd$	1	0	$\times$	-	-
N67.9.1193 $\mathrm{T1}^+ \oplus \mathrm{Z4}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N67.9.1194 $\mathrm{T1}^+ \oplus \mathrm{Z4}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_u}$
N67.9.1195 $\mathrm{T1}^+ \oplus \mathrm{Z4}^- \oplus \mathrm{Z4}^-$	$\surd$	1	0	$\times$	-	-
N67.9.1196 $\mathrm{T3}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{T3}^+$	$\surd$	0	0	$\surd$	-	-
N67.9.1197 $\mathrm{T3}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{T4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N67.9.1198 $\mathrm{T3}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{T3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u}$
N67.9.1199 $\mathrm{T3}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{T4}^+$	$\surd$	0	0	$\surd$	-	-
N67.9.1200 $\mathrm{T3}^+ \oplus \mathrm{T4}^- \oplus \mathrm{T3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u}$
N67.9.1201 $\mathrm{T3}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	0	$\times$	-	-
N67.9.1202 $\mathrm{T3}^+ \oplus \mathrm{T4}^- \oplus \mathrm{Y1}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.9.1203 $\mathrm{T3}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $Cmme$ (No. 67) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N67.9.1204 $\mathrm{T3}^{+}\oplus\mathrm{T4}^{-}\oplus\mathrm{Y2}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.9.1205 $\mathrm{T3}^{+}\oplus\mathrm{T3}^{+}\oplus\mathrm{Y3}^{+}$	$\surd$	1	0	$\times$	-	-
N67.9.1206 $\mathrm{T3}^{+}\oplus\mathrm{T4}^{-}\oplus\mathrm{Y3}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.9.1207 $\mathrm{T3}^{+}\oplus\mathrm{T3}^{+}\oplus\mathrm{Y3}^{-}$	$\surd$	1	0	$\times$	-	-
N67.9.1208 $\mathrm{T3}^{+}\oplus\mathrm{T4}^{-}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.9.1209 $\mathrm{T3}^{+}\oplus\mathrm{T3}^{+}\oplus\mathrm{Z1}^{+}$	$\surd$	1	0	$\times$	-	-
N67.9.1210 $\mathrm{T3}^{+}\oplus\mathrm{T4}^{-}\oplus\mathrm{Z1}^{+}$	$\surd$	1	1	$\times$	-	-
N67.9.1211 $\mathrm{T3}^{+}\oplus\mathrm{T3}^{+}\oplus\mathrm{Z1}^{-}$	$\surd$	1	0	$\times$	-	-
N67.9.1212 $\mathrm{T3}^{+}\oplus\mathrm{T4}^{-}\oplus\mathrm{Z1}^{-}$	$\surd$	1	1	$\times$	-	-
N67.9.1213 $\mathrm{T3}^{+}\oplus\mathrm{T3}^{+}\oplus\mathrm{Z3}^{+}$	$\surd$	1	0	$\times$	-	-
N67.9.1214 $\mathrm{T3}^{+}\oplus\mathrm{T3}^{+}\oplus\mathrm{Z4}^{+}$	$\surd$	1	0	$\times$	-	-
N67.9.1215 $\mathrm{T3}^{+}\oplus\mathrm{T4}^{-}\oplus\mathrm{Z3}^{+}$	$\surd$	1	1	$\times$	-	-
N67.9.1216 $\mathrm{T3}^{+}\oplus\mathrm{T3}^{-}\oplus\mathrm{T3}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{A_u}$
N67.9.1217 $\mathrm{T3}^{+}\oplus\mathrm{T3}^{-}\oplus\mathrm{T4}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B1_u}$
N67.9.1218 $\mathrm{T3}^{+}\oplus\mathrm{T4}^{+}\oplus\mathrm{T4}^{+}$	$\surd$	0	0	$\surd$	-	-
N67.9.1219 $\mathrm{T3}^{+}\oplus\mathrm{T3}^{-}\oplus\mathrm{Y1}^{+}$	$\surd$	1	1	$\times$	-	-
N67.9.1220 $\mathrm{T3}^{+}\oplus\mathrm{T4}^{+}\oplus\mathrm{Y1}^{+}$	$\surd$	1	0	$\times$	-	-
N67.9.1221 $\mathrm{T3}^{+}\oplus\mathrm{T3}^{-}\oplus\mathrm{Y2}^{+}$	$\surd$	1	1	$\times$	-	-
N67.9.1222 $\mathrm{T3}^{+}\oplus\mathrm{T4}^{+}\oplus\mathrm{Y2}^{+}$	$\surd$	1	0	$\times$	-	-
N67.9.1223 $\mathrm{T3}^{+}\oplus\mathrm{T3}^{-}\oplus\mathrm{Y3}^{+}$	$\surd$	1	1	$\times$	-	-
N67.9.1224 $\mathrm{T3}^{+}\oplus\mathrm{T4}^{+}\oplus\mathrm{Y3}^{+}$	$\surd$	1	0	$\times$	-	-
N67.9.1225 $\mathrm{T3}^{+}\oplus\mathrm{T3}^{-}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\times$	-	-
N67.9.1226 $\mathrm{T3}^{+}\oplus\mathrm{T4}^{+}\oplus\mathrm{Y3}^{-}$	$\surd$	1	0	$\times$	-	-
N67.9.1227 $\mathrm{T3}^{+}\oplus\mathrm{T3}^{-}\oplus\mathrm{Z1}^{+}$	$\surd$	1	1	$\times$	-	-
N67.9.1228 $\mathrm{T3}^{+}\oplus\mathrm{T4}^{+}\oplus\mathrm{Z1}^{+}$	$\surd$	1	0	$\times$	-	-
N67.9.1229 $\mathrm{T3}^{+}\oplus\mathrm{T3}^{-}\oplus\mathrm{Z1}^{-}$	$\surd$	1	1	$\times$	-	-
N67.9.1230 $\mathrm{T3}^{+}\oplus\mathrm{T4}^{+}\oplus\mathrm{Z1}^{-}$	$\surd$	1	0	$\times$	-	-
N67.9.1231 $\mathrm{T3}^{+}\oplus\mathrm{T3}^{-}\oplus\mathrm{Z3}^{+}$	$\surd$	1	1	$\times$	-	-
N67.9.1232 $\mathrm{T3}^{+}\oplus\mathrm{T3}^{-}\oplus\mathrm{Z4}^{+}$	$\surd$	1	1	$\times$	-	-
N67.9.1233 $\mathrm{T3}^{+}\oplus\mathrm{T4}^{+}\oplus\mathrm{Z3}^{+}$	$\surd$	1	0	$\times$	-	-
N67.9.1234 $\mathrm{T3}^{+}\oplus\mathrm{T4}^{+}\oplus\mathrm{Z4}^{+}$	$\surd$	1	0	$\times$	-	-
N67.9.1235 $\mathrm{T3}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y1}^{+}$	$\surd$	1	0	$\times$	-	-
N67.9.1236 $\mathrm{T3}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y1}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_u}$
N67.9.1237 $\mathrm{T3}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y2}^{+}$	$\surd$	1	0	$\times$	-	-
N67.9.1238 $\mathrm{T3}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.9.1239 $\mathrm{T3}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y3}^{+}$	$\surd$	1	0	$\times$	-	-
N67.9.1240 $\mathrm{T3}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y4}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N67.9.1241 $\mathrm{T3}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N67.9.1242 $\mathrm{T3}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y4}^{+}$	$\surd$	1	0	$\times$	-	-
N67.9.1243 $\mathrm{T3}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Z1}^{+}$	$\times$	-	-	-	-	-
N67.9.1244 $\mathrm{T3}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Z2}^{-}$	$\times$	-	-	-	-	-
N67.9.1245 $\mathrm{T3}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Z1}^{-}$	$\times$	-	-	-	-	-
N67.9.1246 $\mathrm{T3}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Z2}^{+}$	$\times$	-	-	-	-	-
N67.9.1247 $\mathrm{T3}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Z3}^{+}$	$\times$	-	-	-	-	-
N67.9.1248 $\mathrm{T3}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Z3}^{-}$	$\times$	-	-	-	-	-
N67.9.1249 $\mathrm{T3}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Z4}^{+}$	$\times$	-	-	-	-	-

Non-coplanar SSGs with parent space group $Cmme$ (No. 67) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N67.9.1250 $\mathrm{T3}^{+}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Z4}^{-}$	$\times$	-	-	-	-	-
N67.9.1251 $\mathrm{T3}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Y2}^{+}$	$\surd$	1	0	$\times$	-	-
N67.9.1252 $\mathrm{T3}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_u}$
N67.9.1253 $\mathrm{T3}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Y3}^{+}$	$\surd$	1	0	$\times$	-	-
N67.9.1254 $\mathrm{T3}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Y4}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N67.9.1255 $\mathrm{T3}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N67.9.1256 $\mathrm{T3}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Y4}^{+}$	$\surd$	1	0	$\times$	-	-
N67.9.1257 $\mathrm{T3}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Z1}^{+}$	$\times$	-	-	-	-	-
N67.9.1258 $\mathrm{T3}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Z2}^{-}$	$\times$	-	-	-	-	-
N67.9.1259 $\mathrm{T3}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Z1}^{-}$	$\times$	-	-	-	-	-
N67.9.1260 $\mathrm{T3}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Z2}^{+}$	$\times$	-	-	-	-	-
N67.9.1261 $\mathrm{T3}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Z3}^{+}$	$\times$	-	-	-	-	-
N67.9.1262 $\mathrm{T3}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Z3}^{-}$	$\times$	-	-	-	-	-
N67.9.1263 $\mathrm{T3}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Z4}^{+}$	$\times$	-	-	-	-	-
N67.9.1264 $\mathrm{T3}^{+}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Z4}^{-}$	$\times$	-	-	-	-	-
N67.9.1265 $\mathrm{T3}^{+}\oplus\mathrm{Y3}^{+}\oplus\mathrm{Y3}^{+}$	$\surd$	1	0	$\times$	-	-
N67.9.1266 $\mathrm{T3}^{+}\oplus\mathrm{Y3}^{+}\oplus\mathrm{Y4}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.9.1267 $\mathrm{T3}^{+}\oplus\mathrm{Y3}^{+}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_u}$
N67.9.1268 $\mathrm{T3}^{+}\oplus\mathrm{Y3}^{+}\oplus\mathrm{Y4}^{+}$	$\surd$	1	0	$\times$	-	-
N67.9.1269 $\mathrm{T3}^{+}\oplus\mathrm{Y3}^{+}\oplus\mathrm{Z1}^{+}$	$\times$	-	-	-	-	-
N67.9.1270 $\mathrm{T3}^{+}\oplus\mathrm{Y3}^{+}\oplus\mathrm{Z2}^{-}$	$\times$	-	-	-	-	-
N67.9.1271 $\mathrm{T3}^{+}\oplus\mathrm{Y3}^{+}\oplus\mathrm{Z1}^{-}$	$\times$	-	-	-	-	-
N67.9.1272 $\mathrm{T3}^{+}\oplus\mathrm{Y3}^{+}\oplus\mathrm{Z2}^{+}$	$\times$	-	-	-	-	-
N67.9.1273 $\mathrm{T3}^{+}\oplus\mathrm{Y3}^{+}\oplus\mathrm{Z3}^{+}$	$\times$	-	-	-	-	-
N67.9.1274 $\mathrm{T3}^{+}\oplus\mathrm{Y3}^{+}\oplus\mathrm{Z3}^{-}$	$\times$	-	-	-	-	-
N67.9.1275 $\mathrm{T3}^{+}\oplus\mathrm{Y3}^{+}\oplus\mathrm{Z4}^{+}$	$\times$	-	-	-	-	-
N67.9.1276 $\mathrm{T3}^{+}\oplus\mathrm{Y3}^{+}\oplus\mathrm{Z4}^{-}$	$\times$	-	-	-	-	-
N67.9.1277 $\mathrm{T3}^{+}\oplus\mathrm{Y3}^{-}\oplus\mathrm{Y3}^{-}$	$\surd$	1	0	$\times$	-	-
N67.9.1278 $\mathrm{T3}^{+}\oplus\mathrm{Y3}^{-}\oplus\mathrm{Y4}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.9.1279 $\mathrm{T3}^{+}\oplus\mathrm{Y3}^{-}\oplus\mathrm{Z1}^{+}$	$\times$	-	-	-	-	-
N67.9.1280 $\mathrm{T3}^{+}\oplus\mathrm{Y3}^{-}\oplus\mathrm{Z2}^{-}$	$\times$	-	-	-	-	-
N67.9.1281 $\mathrm{T3}^{+}\oplus\mathrm{Y3}^{-}\oplus\mathrm{Z1}^{-}$	$\times$	-	-	-	-	-
N67.9.1282 $\mathrm{T3}^{+}\oplus\mathrm{Y3}^{-}\oplus\mathrm{Z2}^{+}$	$\times$	-	-	-	-	-
N67.9.1283 $\mathrm{T3}^{+}\oplus\mathrm{Y3}^{-}\oplus\mathrm{Z3}^{+}$	$\times$	-	-	-	-	-
N67.9.1284 $\mathrm{T3}^{+}\oplus\mathrm{Y3}^{-}\oplus\mathrm{Z3}^{-}$	$\times$	-	-	-	-	-
N67.9.1285 $\mathrm{T3}^{+}\oplus\mathrm{Y3}^{-}\oplus\mathrm{Z4}^{+}$	$\times$	-	-	-	-	-
N67.9.1286 $\mathrm{T3}^{+}\oplus\mathrm{Y3}^{-}\oplus\mathrm{Z4}^{-}$	$\times$	-	-	-	-	-
N67.9.1287 $\mathrm{T3}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z1}^{+}$	$\surd$	1	0	$\times$	-	-
N67.9.1288 $\mathrm{T3}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z2}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.9.1289 $\mathrm{T3}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z1}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_u}$
N67.9.1290 $\mathrm{T3}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z2}^{+}$	$\surd$	1	0	$\times$	-	-
N67.9.1291 $\mathrm{T3}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z3}^{+}$	$\surd$	1	0	$\times$	-	-
N67.9.1292 $\mathrm{T3}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z3}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N67.9.1293 $\mathrm{T3}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z4}^{+}$	$\surd$	1	0	$\times$	-	-
N67.9.1294 $\mathrm{T3}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z4}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N67.9.1295 $\mathrm{T3}^{+}\oplus\mathrm{Z1}^{-}\oplus\mathrm{Z1}^{-}$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $Cmme$ (No. 67) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N67.9.1296 $\mathrm{T3}^{+}\oplus\mathrm{Z1}^{-}\oplus\mathrm{Z2}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.9.1297 $\mathrm{T3}^{+}\oplus\mathrm{Z1}^{-}\oplus\mathrm{Z3}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N67.9.1298 $\mathrm{T3}^{+}\oplus\mathrm{Z1}^{-}\oplus\mathrm{Z3}^{-}$	$\surd$	1	0	$\times$	-	-
N67.9.1299 $\mathrm{T3}^{+}\oplus\mathrm{Z1}^{-}\oplus\mathrm{Z4}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N67.9.1300 $\mathrm{T3}^{+}\oplus\mathrm{Z1}^{-}\oplus\mathrm{Z4}^{-}$	$\surd$	1	0	$\times$	-	-
N67.9.1301 $\mathrm{T3}^{+}\oplus\mathrm{Z3}^{+}\oplus\mathrm{Z3}^{+}$	$\surd$	1	0	$\times$	-	-
N67.9.1302 $\mathrm{T3}^{+}\oplus\mathrm{Z3}^{+}\oplus\mathrm{Z3}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_u}$
N67.9.1303 $\mathrm{T3}^{+}\oplus\mathrm{Z3}^{+}\oplus\mathrm{Z4}^{+}$	$\surd$	1	0	$\times$	-	-
N67.9.1304 $\mathrm{T3}^{+}\oplus\mathrm{Z3}^{+}\oplus\mathrm{Z4}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.9.1305 $\mathrm{T3}^{+}\oplus\mathrm{Z4}^{+}\oplus\mathrm{Z4}^{+}$	$\surd$	1	0	$\times$	-	-
N67.9.1306 $\mathrm{T3}^{+}\oplus\mathrm{Z4}^{+}\oplus\mathrm{Z4}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_u}$
N67.9.1307 $\mathrm{T3}^{-}\oplus\mathrm{T3}^{-}\oplus\mathrm{T3}^{-}$	$\surd$	0	0	$\surd$	-	-
N67.9.1308 $\mathrm{T3}^{-}\oplus\mathrm{T3}^{-}\oplus\mathrm{T4}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B1_u}$
N67.9.1309 $\mathrm{T3}^{-}\oplus\mathrm{T3}^{-}\oplus\mathrm{Y1}^{+}$	$\surd$	1	0	$\times$	-	-
N67.9.1310 $\mathrm{T3}^{-}\oplus\mathrm{T4}^{+}\oplus\mathrm{Y1}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.9.1311 $\mathrm{T3}^{-}\oplus\mathrm{T3}^{-}\oplus\mathrm{Y2}^{+}$	$\surd$	1	0	$\times$	-	-
N67.9.1312 $\mathrm{T3}^{-}\oplus\mathrm{T4}^{+}\oplus\mathrm{Y2}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.9.1313 $\mathrm{T3}^{-}\oplus\mathrm{T3}^{-}\oplus\mathrm{Y3}^{+}$	$\surd$	1	0	$\times$	-	-
N67.9.1314 $\mathrm{T3}^{-}\oplus\mathrm{T4}^{+}\oplus\mathrm{Y3}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.9.1315 $\mathrm{T3}^{-}\oplus\mathrm{T3}^{-}\oplus\mathrm{Y3}^{-}$	$\surd$	1	0	$\times$	-	-
N67.9.1316 $\mathrm{T3}^{-}\oplus\mathrm{T4}^{+}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.9.1317 $\mathrm{T3}^{-}\oplus\mathrm{T3}^{-}\oplus\mathrm{Z1}^{+}$	$\surd$	1	0	$\times$	-	-
N67.9.1318 $\mathrm{T3}^{-}\oplus\mathrm{T4}^{+}\oplus\mathrm{Z1}^{+}$	$\surd$	1	1	$\times$	-	-
N67.9.1319 $\mathrm{T3}^{-}\oplus\mathrm{T3}^{-}\oplus\mathrm{Z1}^{-}$	$\surd$	1	0	$\times$	-	-
N67.9.1320 $\mathrm{T3}^{-}\oplus\mathrm{T4}^{+}\oplus\mathrm{Z1}^{-}$	$\surd$	1	1	$\times$	-	-
N67.9.1321 $\mathrm{T3}^{-}\oplus\mathrm{T3}^{-}\oplus\mathrm{Z3}^{+}$	$\surd$	1	0	$\times$	-	-
N67.9.1322 $\mathrm{T3}^{-}\oplus\mathrm{T3}^{-}\oplus\mathrm{Z4}^{+}$	$\surd$	1	0	$\times$	-	-
N67.9.1323 $\mathrm{T3}^{-}\oplus\mathrm{T4}^{+}\oplus\mathrm{Z3}^{+}$	$\surd$	1	1	$\times$	-	-
N67.9.1324 $\mathrm{T3}^{-}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y1}^{+}$	$\surd$	1	0	$\times$	-	-
N67.9.1325 $\mathrm{T3}^{-}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y1}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_u}$
N67.9.1326 $\mathrm{T3}^{-}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y2}^{+}$	$\surd$	1	0	$\times$	-	-
N67.9.1327 $\mathrm{T3}^{-}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.9.1328 $\mathrm{T3}^{-}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y3}^{+}$	$\surd$	1	0	$\times$	-	-
N67.9.1329 $\mathrm{T3}^{-}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y4}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N67.9.1330 $\mathrm{T3}^{-}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N67.9.1331 $\mathrm{T3}^{-}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Y4}^{+}$	$\surd$	1	0	$\times$	-	-
N67.9.1332 $\mathrm{T3}^{-}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Z1}^{+}$	$\times$	-	-	-	-	-
N67.9.1333 $\mathrm{T3}^{-}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Z2}^{-}$	$\times$	-	-	-	-	-
N67.9.1334 $\mathrm{T3}^{-}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Z1}^{-}$	$\times$	-	-	-	-	-
N67.9.1335 $\mathrm{T3}^{-}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Z2}^{+}$	$\times$	-	-	-	-	-
N67.9.1336 $\mathrm{T3}^{-}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Z3}^{+}$	$\times$	-	-	-	-	-
N67.9.1337 $\mathrm{T3}^{-}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Z3}^{-}$	$\times$	-	-	-	-	-
N67.9.1338 $\mathrm{T3}^{-}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Z4}^{+}$	$\times$	-	-	-	-	-
N67.9.1339 $\mathrm{T3}^{-}\oplus\mathrm{Y1}^{+}\oplus\mathrm{Z4}^{-}$	$\times$	-	-	-	-	-
N67.9.1340 $\mathrm{T3}^{-}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Y2}^{+}$	$\surd$	1	0	$\times$	-	-
N67.9.1341 $\mathrm{T3}^{-}\oplus\mathrm{Y2}^{+}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_u}$

Non-coplanar SSGs with parent space group $Cmme$ (No. 67) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N67.9.1342 $\mathrm{T3}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N67.9.1343 $\mathrm{T3}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N67.9.1344 $\mathrm{T3}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N67.9.1345 $\mathrm{T3}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
N67.9.1346 $\mathrm{T3}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Z1}^+$	$\times$	-	-	-	-	-
N67.9.1347 $\mathrm{T3}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Z2}^-$	$\times$	-	-	-	-	-
N67.9.1348 $\mathrm{T3}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Z1}^-$	$\times$	-	-	-	-	-
N67.9.1349 $\mathrm{T3}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Z2}^+$	$\times$	-	-	-	-	-
N67.9.1350 $\mathrm{T3}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Z3}^+$	$\times$	-	-	-	-	-
N67.9.1351 $\mathrm{T3}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Z3}^-$	$\times$	-	-	-	-	-
N67.9.1352 $\mathrm{T3}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Z4}^+$	$\times$	-	-	-	-	-
N67.9.1353 $\mathrm{T3}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Z4}^-$	$\times$	-	-	-	-	-
N67.9.1354 $\mathrm{T3}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N67.9.1355 $\mathrm{T3}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.9.1356 $\mathrm{T3}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_u}$
N67.9.1357 $\mathrm{T3}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
N67.9.1358 $\mathrm{T3}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Z1}^+$	$\times$	-	-	-	-	-
N67.9.1359 $\mathrm{T3}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Z2}^-$	$\times$	-	-	-	-	-
N67.9.1360 $\mathrm{T3}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Z1}^-$	$\times$	-	-	-	-	-
N67.9.1361 $\mathrm{T3}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Z2}^+$	$\times$	-	-	-	-	-
N67.9.1362 $\mathrm{T3}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Z3}^+$	$\times$	-	-	-	-	-
N67.9.1363 $\mathrm{T3}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Z3}^-$	$\times$	-	-	-	-	-
N67.9.1364 $\mathrm{T3}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Z4}^+$	$\times$	-	-	-	-	-
N67.9.1365 $\mathrm{T3}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Z4}^-$	$\times$	-	-	-	-	-
N67.9.1366 $\mathrm{T3}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N67.9.1367 $\mathrm{T3}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.9.1368 $\mathrm{T3}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Z1}^+$	$\times$	-	-	-	-	-
N67.9.1369 $\mathrm{T3}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Z2}^-$	$\times$	-	-	-	-	-
N67.9.1370 $\mathrm{T3}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Z1}^-$	$\times$	-	-	-	-	-
N67.9.1371 $\mathrm{T3}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Z2}^+$	$\times$	-	-	-	-	-
N67.9.1372 $\mathrm{T3}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Z3}^+$	$\times$	-	-	-	-	-
N67.9.1373 $\mathrm{T3}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Z3}^-$	$\times$	-	-	-	-	-
N67.9.1374 $\mathrm{T3}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Z4}^+$	$\times$	-	-	-	-	-
N67.9.1375 $\mathrm{T3}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Z4}^-$	$\times$	-	-	-	-	-
N67.9.1376 $\mathrm{T3}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N67.9.1377 $\mathrm{T3}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.9.1378 $\mathrm{T3}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_u}$
N67.9.1379 $\mathrm{T3}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N67.9.1380 $\mathrm{T3}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N67.9.1381 $\mathrm{T3}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N67.9.1382 $\mathrm{T3}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N67.9.1383 $\mathrm{T3}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N67.9.1384 $\mathrm{T3}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N67.9.1385 $\mathrm{T3}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.9.1386 $\mathrm{T3}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N67.9.1387 $\mathrm{T3}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $Cmme$ (No. 67) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N67.9.1388 $\mathrm{T3}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N67.9.1389 $\mathrm{T3}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z4}^-$	$\surd$	1	0	$\times$	-	-
N67.9.1390 $\mathrm{T3}^- \oplus \mathrm{Z3}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N67.9.1391 $\mathrm{T3}^- \oplus \mathrm{Z3}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_u}$
N67.9.1392 $\mathrm{T3}^- \oplus \mathrm{Z3}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N67.9.1393 $\mathrm{T3}^- \oplus \mathrm{Z3}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.9.1394 $\mathrm{T3}^- \oplus \mathrm{Z4}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N67.9.1395 $\mathrm{T3}^- \oplus \mathrm{Z4}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_u}$
N67.9.1396 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^+$	$\surd$	0	0	$\surd$	-	-
N67.9.1397 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u}$
N67.9.1398 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^+$	$\surd$	0	0	$\surd$	-	-
N67.9.1399 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N67.9.1400 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u}$
N67.9.1401 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y3}^+$	$\surd$	0	0	$\surd$	-	-
N67.9.1402 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_u} \oplus \mathrm{B2_u}$
N67.9.1403 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u}$
N67.9.1404 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B3_u}$
N67.9.1405 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y4}^+$	$\surd$	0	0	$\surd$	-	-
N67.9.1406 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u}$
N67.9.1407 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N67.9.1408 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\times$	-	-
N67.9.1409 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N67.9.1410 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
N67.9.1411 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N67.9.1412 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N67.9.1413 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
N67.9.1414 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^+$	$\surd$	0	0	$\surd$	-	-
N67.9.1415 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u}$
N67.9.1416 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N67.9.1417 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^+$	$\surd$	0	0	$\surd$	-	-
N67.9.1418 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_u}$
N67.9.1419 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N67.9.1420 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N67.9.1421 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_u}$
N67.9.1422 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y4}^+$	$\surd$	0	0	$\surd$	-	-
N67.9.1423 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u}$
N67.9.1424 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u}$
N67.9.1425 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N67.9.1426 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\times$	-	-
N67.9.1427 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N67.9.1428 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
N67.9.1429 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N67.9.1430 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N67.9.1431 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
N67.9.1432 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N67.9.1433 $\mathrm{Y1}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^+$	$\surd$	0	0	$\surd$	-	-

Non-coplanar SSGs with parent space group $Cmme$ (No. 67) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N67.9.1434 $\mathrm{Y1}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N67.9.1435 $\mathrm{Y1}^+ \oplus \mathrm{Y4}^- \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_u} \oplus \mathrm{B2_u}$
N67.9.1436 $\mathrm{Y1}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u}$
N67.9.1437 $\mathrm{Y1}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y4}^+$	$\surd$	0	0	$\surd$	-	-
N67.9.1438 $\mathrm{Y1}^+ \oplus \mathrm{Y4}^- \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_u}$
N67.9.1439 $\mathrm{Y1}^+ \oplus \mathrm{Y4}^- \oplus \mathrm{Y4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B2_u}$
N67.9.1440 $\mathrm{Y1}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N67.9.1441 $\mathrm{Y1}^+ \oplus \mathrm{Y4}^- \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N67.9.1442 $\mathrm{Y1}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N67.9.1443 $\mathrm{Y1}^+ \oplus \mathrm{Y4}^- \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N67.9.1444 $\mathrm{Y1}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N67.9.1445 $\mathrm{Y1}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N67.9.1446 $\mathrm{Y1}^+ \oplus \mathrm{Y4}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N67.9.1447 $\mathrm{Y1}^+ \oplus \mathrm{Y4}^- \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N67.9.1448 $\mathrm{Y1}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B3_u}$
N67.9.1449 $\mathrm{Y1}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Y4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u}$
N67.9.1450 $\mathrm{Y1}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{Y4}^+$	$\surd$	0	0	$\surd$	-	-
N67.9.1451 $\mathrm{Y1}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N67.9.1452 $\mathrm{Y1}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N67.9.1453 $\mathrm{Y1}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N67.9.1454 $\mathrm{Y1}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N67.9.1455 $\mathrm{Y1}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N67.9.1456 $\mathrm{Y1}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N67.9.1457 $\mathrm{Y1}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N67.9.1458 $\mathrm{Y1}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N67.9.1459 $\mathrm{Y1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N67.9.1460 $\mathrm{Y1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.9.1461 $\mathrm{Y1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
N67.9.1462 $\mathrm{Y1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N67.9.1463 $\mathrm{Y1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N67.9.1464 $\mathrm{Y1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N67.9.1465 $\mathrm{Y1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N67.9.1466 $\mathrm{Y1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\times$	-	-
N67.9.1467 $\mathrm{Y1}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N67.9.1468 $\mathrm{Y1}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.9.1469 $\mathrm{Y1}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
N67.9.1470 $\mathrm{Y1}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N67.9.1471 $\mathrm{Y1}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\times$	-	-
N67.9.1472 $\mathrm{Y1}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z4}^-$	$\surd$	1	0	$\times$	-	-
N67.9.1473 $\mathrm{Y1}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N67.9.1474 $\mathrm{Y1}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N67.9.1475 $\mathrm{Y1}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N67.9.1476 $\mathrm{Y1}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.9.1477 $\mathrm{Y1}^+ \oplus \mathrm{Z3}^- \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N67.9.1478 $\mathrm{Y1}^+ \oplus \mathrm{Z3}^- \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.9.1479 $\mathrm{Y2}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^+$	$\surd$	0	0	$\surd$	-	-

Non-coplanar SSGs with parent space group $Cmme$ (No. 67) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N67.9.1480 $\mathrm{Y2}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u}$
N67.9.1481 $\mathrm{Y2}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^+$	$\surd$	0	0	$\surd$	-	-
N67.9.1482 $\mathrm{Y2}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B3_u}$
N67.9.1483 $\mathrm{Y2}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B2_u}$
N67.9.1484 $\mathrm{Y2}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_u} \oplus \mathrm{B2_u}$
N67.9.1485 $\mathrm{Y2}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y4}^+$	$\surd$	0	0	$\surd$	-	-
N67.9.1486 $\mathrm{Y2}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B2_u}$
N67.9.1487 $\mathrm{Y2}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N67.9.1488 $\mathrm{Y2}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\times$	-	-
N67.9.1489 $\mathrm{Y2}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N67.9.1490 $\mathrm{Y2}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
N67.9.1491 $\mathrm{Y2}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N67.9.1492 $\mathrm{Y2}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N67.9.1493 $\mathrm{Y2}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
N67.9.1494 $\mathrm{Y2}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^+$	$\surd$	0	0	$\surd$	-	-
N67.9.1495 $\mathrm{Y2}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u}$
N67.9.1496 $\mathrm{Y2}^+ \oplus \mathrm{Y4}^- \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B3_u}$
N67.9.1497 $\mathrm{Y2}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B2_u}$
N67.9.1498 $\mathrm{Y2}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y4}^+$	$\surd$	0	0	$\surd$	-	-
N67.9.1499 $\mathrm{Y2}^+ \oplus \mathrm{Y4}^- \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_u}$
N67.9.1500 $\mathrm{Y2}^+ \oplus \mathrm{Y4}^- \oplus \mathrm{Y4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u}$
N67.9.1501 $\mathrm{Y2}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N67.9.1502 $\mathrm{Y2}^+ \oplus \mathrm{Y4}^- \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N67.9.1503 $\mathrm{Y2}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N67.9.1504 $\mathrm{Y2}^+ \oplus \mathrm{Y4}^- \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N67.9.1505 $\mathrm{Y2}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N67.9.1506 $\mathrm{Y2}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N67.9.1507 $\mathrm{Y2}^+ \oplus \mathrm{Y4}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N67.9.1508 $\mathrm{Y2}^+ \oplus \mathrm{Y4}^- \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N67.9.1509 $\mathrm{Y2}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_u} \oplus \mathrm{B2_u}$
N67.9.1510 $\mathrm{Y2}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Y4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N67.9.1511 $\mathrm{Y2}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{Y4}^+$	$\surd$	0	0	$\surd$	-	-
N67.9.1512 $\mathrm{Y2}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N67.9.1513 $\mathrm{Y2}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N67.9.1514 $\mathrm{Y2}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N67.9.1515 $\mathrm{Y2}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N67.9.1516 $\mathrm{Y2}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N67.9.1517 $\mathrm{Y2}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N67.9.1518 $\mathrm{Y2}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N67.9.1519 $\mathrm{Y2}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N67.9.1520 $\mathrm{Y2}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N67.9.1521 $\mathrm{Y2}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.9.1522 $\mathrm{Y2}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
N67.9.1523 $\mathrm{Y2}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N67.9.1524 $\mathrm{Y2}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N67.9.1525 $\mathrm{Y2}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $Cmme$ (No. 67) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N67.9.1526 $\mathrm{Y2}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N67.9.1527 $\mathrm{Y2}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\times$	-	-
N67.9.1528 $\mathrm{Y2}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N67.9.1529 $\mathrm{Y2}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.9.1530 $\mathrm{Y2}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
N67.9.1531 $\mathrm{Y2}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N67.9.1532 $\mathrm{Y2}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\times$	-	-
N67.9.1533 $\mathrm{Y2}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z4}^-$	$\surd$	1	0	$\times$	-	-
N67.9.1534 $\mathrm{Y2}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N67.9.1535 $\mathrm{Y2}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N67.9.1536 $\mathrm{Y2}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N67.9.1537 $\mathrm{Y2}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.9.1538 $\mathrm{Y2}^+ \oplus \mathrm{Z3}^- \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N67.9.1539 $\mathrm{Y2}^+ \oplus \mathrm{Z3}^- \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.9.1540 $\mathrm{Y3}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^+$	$\surd$	0	0	$\surd$	-	-
N67.9.1541 $\mathrm{Y3}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N67.9.1542 $\mathrm{Y3}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u}$
N67.9.1543 $\mathrm{Y3}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y4}^+$	$\surd$	0	0	$\surd$	-	-
N67.9.1544 $\mathrm{Y3}^+ \oplus \mathrm{Y4}^- \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u}$
N67.9.1545 $\mathrm{Y3}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N67.9.1546 $\mathrm{Y3}^+ \oplus \mathrm{Y4}^- \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\times$	-	-
N67.9.1547 $\mathrm{Y3}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N67.9.1548 $\mathrm{Y3}^+ \oplus \mathrm{Y4}^- \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
N67.9.1549 $\mathrm{Y3}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N67.9.1550 $\mathrm{Y3}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N67.9.1551 $\mathrm{Y3}^+ \oplus \mathrm{Y4}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
N67.9.1552 $\mathrm{Y3}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u}$
N67.9.1553 $\mathrm{Y3}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Y4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u}$
N67.9.1554 $\mathrm{Y3}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{Y4}^+$	$\surd$	0	0	$\surd$	-	-
N67.9.1555 $\mathrm{Y3}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\times$	-	-
N67.9.1556 $\mathrm{Y3}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N67.9.1557 $\mathrm{Y3}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
N67.9.1558 $\mathrm{Y3}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N67.9.1559 $\mathrm{Y3}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
N67.9.1560 $\mathrm{Y3}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N67.9.1561 $\mathrm{Y3}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N67.9.1562 $\mathrm{Y3}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N67.9.1563 $\mathrm{Y3}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N67.9.1564 $\mathrm{Y3}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.9.1565 $\mathrm{Y3}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
N67.9.1566 $\mathrm{Y3}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N67.9.1567 $\mathrm{Y3}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N67.9.1568 $\mathrm{Y3}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N67.9.1569 $\mathrm{Y3}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N67.9.1570 $\mathrm{Y3}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\times$	-	-
N67.9.1571 $\mathrm{Y3}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $Cmme$ (No. 67) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N67.9.1572 $\mathrm{Y3}^{+}\oplus\mathrm{Z1}^{-}\oplus\mathrm{Z2}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.9.1573 $\mathrm{Y3}^{+}\oplus\mathrm{Z1}^{-}\oplus\mathrm{Z3}^{+}$	$\surd$	1	1	$\times$	-	-
N67.9.1574 $\mathrm{Y3}^{+}\oplus\mathrm{Z1}^{-}\oplus\mathrm{Z3}^{-}$	$\surd$	1	0	$\times$	-	-
N67.9.1575 $\mathrm{Y3}^{+}\oplus\mathrm{Z1}^{-}\oplus\mathrm{Z4}^{+}$	$\surd$	1	1	$\times$	-	-
N67.9.1576 $\mathrm{Y3}^{+}\oplus\mathrm{Z1}^{-}\oplus\mathrm{Z4}^{-}$	$\surd$	1	0	$\times$	-	-
N67.9.1577 $\mathrm{Y3}^{+}\oplus\mathrm{Z3}^{+}\oplus\mathrm{Z3}^{+}$	$\surd$	1	0	$\times$	-	-
N67.9.1578 $\mathrm{Y3}^{+}\oplus\mathrm{Z3}^{+}\oplus\mathrm{Z3}^{-}$	$\surd$	1	1	$\times$	-	-
N67.9.1579 $\mathrm{Y3}^{+}\oplus\mathrm{Z3}^{+}\oplus\mathrm{Z4}^{+}$	$\surd$	1	0	$\times$	-	-
N67.9.1580 $\mathrm{Y3}^{+}\oplus\mathrm{Z3}^{+}\oplus\mathrm{Z4}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.9.1581 $\mathrm{Y3}^{+}\oplus\mathrm{Z3}^{-}\oplus\mathrm{Z3}^{-}$	$\surd$	1	0	$\times$	-	-
N67.9.1582 $\mathrm{Y3}^{+}\oplus\mathrm{Z3}^{-}\oplus\mathrm{Z4}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.9.1583 $\mathrm{Y3}^{-}\oplus\mathrm{Y3}^{-}\oplus\mathrm{Y3}^{-}$	$\surd$	0	0	$\surd$	-	-
N67.9.1584 $\mathrm{Y3}^{-}\oplus\mathrm{Y3}^{-}\oplus\mathrm{Y4}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B1_u}$
N67.9.1585 $\mathrm{Y3}^{-}\oplus\mathrm{Y3}^{-}\oplus\mathrm{Z1}^{+}$	$\surd$	1	0	$\times$	-	-
N67.9.1586 $\mathrm{Y3}^{-}\oplus\mathrm{Y4}^{+}\oplus\mathrm{Z1}^{+}$	$\surd$	1	1	$\times$	-	-
N67.9.1587 $\mathrm{Y3}^{-}\oplus\mathrm{Y3}^{-}\oplus\mathrm{Z1}^{-}$	$\surd$	1	0	$\times$	-	-
N67.9.1588 $\mathrm{Y3}^{-}\oplus\mathrm{Y4}^{+}\oplus\mathrm{Z1}^{-}$	$\surd$	1	1	$\times$	-	-
N67.9.1589 $\mathrm{Y3}^{-}\oplus\mathrm{Y3}^{-}\oplus\mathrm{Z3}^{+}$	$\surd$	1	0	$\times$	-	-
N67.9.1590 $\mathrm{Y3}^{-}\oplus\mathrm{Y3}^{-}\oplus\mathrm{Z3}^{-}$	$\surd$	1	0	$\times$	-	-
N67.9.1591 $\mathrm{Y3}^{-}\oplus\mathrm{Y4}^{+}\oplus\mathrm{Z3}^{+}$	$\surd$	1	1	$\times$	-	-
N67.9.1592 $\mathrm{Y3}^{-}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z1}^{+}$	$\surd$	1	0	$\times$	-	-
N67.9.1593 $\mathrm{Y3}^{-}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z2}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.9.1594 $\mathrm{Y3}^{-}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z1}^{-}$	$\surd$	1	1	$\times$	-	-
N67.9.1595 $\mathrm{Y3}^{-}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z2}^{+}$	$\surd$	1	0	$\times$	-	-
N67.9.1596 $\mathrm{Y3}^{-}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z3}^{+}$	$\surd$	1	0	$\times$	-	-
N67.9.1597 $\mathrm{Y3}^{-}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z3}^{-}$	$\surd$	1	1	$\times$	-	-
N67.9.1598 $\mathrm{Y3}^{-}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z4}^{+}$	$\surd$	1	0	$\times$	-	-
N67.9.1599 $\mathrm{Y3}^{-}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z4}^{-}$	$\surd$	1	1	$\times$	-	-
N67.9.1600 $\mathrm{Y3}^{-}\oplus\mathrm{Z1}^{-}\oplus\mathrm{Z1}^{-}$	$\surd$	1	0	$\times$	-	-
N67.9.1601 $\mathrm{Y3}^{-}\oplus\mathrm{Z1}^{-}\oplus\mathrm{Z2}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.9.1602 $\mathrm{Y3}^{-}\oplus\mathrm{Z1}^{-}\oplus\mathrm{Z3}^{+}$	$\surd$	1	1	$\times$	-	-
N67.9.1603 $\mathrm{Y3}^{-}\oplus\mathrm{Z1}^{-}\oplus\mathrm{Z3}^{-}$	$\surd$	1	0	$\times$	-	-
N67.9.1604 $\mathrm{Y3}^{-}\oplus\mathrm{Z1}^{-}\oplus\mathrm{Z4}^{+}$	$\surd$	1	1	$\times$	-	-
N67.9.1605 $\mathrm{Y3}^{-}\oplus\mathrm{Z1}^{-}\oplus\mathrm{Z4}^{-}$	$\surd$	1	0	$\times$	-	-
N67.9.1606 $\mathrm{Y3}^{-}\oplus\mathrm{Z3}^{+}\oplus\mathrm{Z3}^{+}$	$\surd$	1	0	$\times$	-	-
N67.9.1607 $\mathrm{Y3}^{-}\oplus\mathrm{Z3}^{+}\oplus\mathrm{Z3}^{-}$	$\surd$	1	1	$\times$	-	-
N67.9.1608 $\mathrm{Y3}^{-}\oplus\mathrm{Z3}^{+}\oplus\mathrm{Z4}^{+}$	$\surd$	1	0	$\times$	-	-
N67.9.1609 $\mathrm{Y3}^{-}\oplus\mathrm{Z3}^{+}\oplus\mathrm{Z4}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.9.1610 $\mathrm{Y3}^{-}\oplus\mathrm{Z3}^{-}\oplus\mathrm{Z3}^{-}$	$\surd$	1	0	$\times$	-	-
N67.9.1611 $\mathrm{Y3}^{-}\oplus\mathrm{Z3}^{-}\oplus\mathrm{Z4}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.9.1612 $\mathrm{Z1}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z1}^{+}$	$\surd$	0	0	$\surd$	-	-
N67.9.1613 $\mathrm{Z1}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z2}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B1_u}$
N67.9.1614 $\mathrm{Z1}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z1}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{A_u}$
N67.9.1615 $\mathrm{Z1}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z2}^{+}$	$\surd$	0	0	$\surd$	-	-
N67.9.1616 $\mathrm{Z1}^{+}\oplus\mathrm{Z2}^{-}\oplus\mathrm{Z1}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B1_u}$
N67.9.1617 $\mathrm{Z1}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z3}^{+}$	$\surd$	0	0	$\surd$	-	-

Non-coplanar SSGs with parent space group $Cmme$ (No. 67) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N67.9.1618 $\mathrm{Z1}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z3}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u}\oplus\mathrm{B3_u}$
N67.9.1619 $\mathrm{Z1}^{+}\oplus\mathrm{Z2}^{-}\oplus\mathrm{Z3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B2_u}$
N67.9.1620 $\mathrm{Z1}^{+}\oplus\mathrm{Z1}^{-}\oplus\mathrm{Z1}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{A_u}$
N67.9.1621 $\mathrm{Z1}^{+}\oplus\mathrm{Z1}^{-}\oplus\mathrm{Z2}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B1_u}$
N67.9.1622 $\mathrm{Z1}^{+}\oplus\mathrm{Z2}^{+}\oplus\mathrm{Z2}^{+}$	$\surd$	0	0	$\surd$	-	-
N67.9.1623 $\mathrm{Z1}^{+}\oplus\mathrm{Z1}^{-}\oplus\mathrm{Z3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B3_u}$
N67.9.1624 $\mathrm{Z1}^{+}\oplus\mathrm{Z1}^{-}\oplus\mathrm{Z3}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B3_u}$
N67.9.1625 $\mathrm{Z1}^{+}\oplus\mathrm{Z2}^{+}\oplus\mathrm{Z3}^{+}$	$\surd$	0	0	$\surd$	-	-
N67.9.1626 $\mathrm{Z1}^{+}\oplus\mathrm{Z2}^{+}\oplus\mathrm{Z3}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u}\oplus\mathrm{B2_u}$
N67.9.1627 $\mathrm{Z1}^{+}\oplus\mathrm{Z3}^{+}\oplus\mathrm{Z3}^{+}$	$\surd$	0	0	$\surd$	-	-
N67.9.1628 $\mathrm{Z1}^{+}\oplus\mathrm{Z3}^{+}\oplus\mathrm{Z3}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B3_u}$
N67.9.1629 $\mathrm{Z1}^{+}\oplus\mathrm{Z3}^{+}\oplus\mathrm{Z4}^{+}$	$\surd$	0	0	$\surd$	-	-
N67.9.1630 $\mathrm{Z1}^{+}\oplus\mathrm{Z3}^{+}\oplus\mathrm{Z4}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B2_u}$
N67.9.1631 $\mathrm{Z1}^{+}\oplus\mathrm{Z3}^{-}\oplus\mathrm{Z3}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u}\oplus\mathrm{B3_u}$
N67.9.1632 $\mathrm{Z1}^{+}\oplus\mathrm{Z3}^{-}\oplus\mathrm{Z4}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u}\oplus\mathrm{B2_u}$
N67.9.1633 $\mathrm{Z1}^{-}\oplus\mathrm{Z1}^{-}\oplus\mathrm{Z1}^{-}$	$\surd$	0	0	$\surd$	-	-
N67.9.1634 $\mathrm{Z1}^{-}\oplus\mathrm{Z1}^{-}\oplus\mathrm{Z2}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B1_u}$
N67.9.1635 $\mathrm{Z1}^{-}\oplus\mathrm{Z1}^{-}\oplus\mathrm{Z3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u}\oplus\mathrm{B3_u}$
N67.9.1636 $\mathrm{Z1}^{-}\oplus\mathrm{Z1}^{-}\oplus\mathrm{Z3}^{-}$	$\surd$	0	0	$\surd$	-	-
N67.9.1637 $\mathrm{Z1}^{-}\oplus\mathrm{Z2}^{+}\oplus\mathrm{Z3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B3_u}$
N67.9.1638 $\mathrm{Z1}^{-}\oplus\mathrm{Z3}^{+}\oplus\mathrm{Z3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u}\oplus\mathrm{B3_u}$
N67.9.1639 $\mathrm{Z1}^{-}\oplus\mathrm{Z3}^{+}\oplus\mathrm{Z3}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B3_u}$
N67.9.1640 $\mathrm{Z1}^{-}\oplus\mathrm{Z3}^{+}\oplus\mathrm{Z4}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u}\oplus\mathrm{B2_u}$
N67.9.1641 $\mathrm{Z1}^{-}\oplus\mathrm{Z3}^{+}\oplus\mathrm{Z4}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B3_u}$
N67.9.1642 $\mathrm{Z1}^{-}\oplus\mathrm{Z3}^{-}\oplus\mathrm{Z3}^{-}$	$\surd$	0	0	$\surd$	-	-
N67.9.1643 $\mathrm{Z1}^{-}\oplus\mathrm{Z3}^{-}\oplus\mathrm{Z4}^{-}$	$\surd$	0	0	$\surd$	-	-
N67.9.1644 $\mathrm{Z3}^{+}\oplus\mathrm{Z3}^{+}\oplus\mathrm{Z3}^{+}$	$\surd$	0	0	$\surd$	-	-
N67.9.1645 $\mathrm{Z3}^{+}\oplus\mathrm{Z3}^{+}\oplus\mathrm{Z3}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{A_u}$
N67.9.1646 $\mathrm{Z3}^{+}\oplus\mathrm{Z3}^{+}\oplus\mathrm{Z4}^{+}$	$\surd$	0	0	$\surd$	-	-
N67.9.1647 $\mathrm{Z3}^{+}\oplus\mathrm{Z3}^{+}\oplus\mathrm{Z4}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B1_u}$
N67.9.1648 $\mathrm{Z3}^{+}\oplus\mathrm{Z3}^{-}\oplus\mathrm{Z4}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B1_u}$
N67.14.1 $\mathrm{GM1}^{-}\oplus\mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N67.14.2 $\mathrm{GM1}^{-}\oplus\mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N67.14.3 $\mathrm{GM1}^{-}\oplus\mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N67.14.4 $\mathrm{GM1}^{-}\oplus\mathrm{DT4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N67.14.5 $\mathrm{GM1}^{-}\oplus\mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N67.14.6 $\mathrm{GM1}^{-}\oplus\mathrm{A2}$	$\surd$	1	1	$\times$	-	-
N67.14.7 $\mathrm{GM1}^{-}\oplus\mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.14.8 $\mathrm{GM1}^{-}\oplus\mathrm{LD2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.14.9 $\mathrm{GM1}^{-}\oplus\mathrm{LD3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.14.10 $\mathrm{GM1}^{-}\oplus\mathrm{H3}$	$\surd$	1	1	$\times$	-	-
N67.14.11 $\mathrm{GM1}^{-}\oplus\mathrm{H4}$	$\surd$	1	1	$\times$	-	-
N67.14.12 $\mathrm{GM1}^{-}\oplus\mathrm{H1}$	$\surd$	1	1	$\times$	-	-
N67.14.13 $\mathrm{GM2}^{+}\oplus\mathrm{DT1}$	$\surd$	1	1	$\surd$	$mm2$	B2
N67.14.14 $\mathrm{GM2}^{+}\oplus\mathrm{DT2}$	$\surd$	1	1	$\surd$	$mm2$	B2
N67.14.15 $\mathrm{GM2}^{+}\oplus\mathrm{DT3}$	$\surd$	1	1	$\surd$	$mm2$	B2

Non-coplanar SSGs with parent space group $Cmme$ (No. 67) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N67.14.16 GM2$^+$ ⊕ DT4	√	1	1	√	$mm2$	B2
N67.14.17 GM2$^+$ ⊕ A1	√	1	1	×	-	-
N67.14.18 GM2$^+$ ⊕ A2	√	1	1	×	-	-
N67.14.19 GM2$^+$ ⊕ LD1	√	1	1	√	222	B1
N67.14.20 GM2$^+$ ⊕ LD2	√	1	1	√	222	B1
N67.14.21 GM2$^+$ ⊕ LD3	√	1	1	√	222	B1
N67.14.22 GM2$^+$ ⊕ H3	√	1	1	√	222	B1
N67.14.23 GM2$^+$ ⊕ H4	√	1	1	√	222	B1
N67.14.24 GM2$^+$ ⊕ H1	√	1	1	√	222	B1
N67.14.25 GM2$^-$ ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N67.14.26 GM2$^-$ ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
N67.14.27 GM2$^-$ ⊕ DT3	√	1	1	√	mmm	$\mathrm{B2_u}$
N67.14.28 GM2$^-$ ⊕ DT4	√	1	1	√	mmm	$\mathrm{B2_u}$
N67.14.29 GM2$^-$ ⊕ A1	√	1	1	×	-	-
N67.14.30 GM2$^-$ ⊕ A2	√	1	1	×	-	-
N67.14.31 GM2$^-$ ⊕ LD1	√	1	1	√	mmm	$\mathrm{B1_u}$
N67.14.32 GM2$^-$ ⊕ LD2	√	1	1	√	mmm	$\mathrm{B1_u}$
N67.14.33 GM2$^-$ ⊕ LD3	√	1	1	√	mmm	$\mathrm{B1_u}$
N67.14.34 GM2$^-$ ⊕ H3	√	1	1	×	-	-
N67.14.35 GM2$^-$ ⊕ H4	√	1	1	×	-	-
N67.14.36 GM2$^-$ ⊕ H1	√	1	1	×	-	-
N67.14.37 GM3$^+$ ⊕ SM1	√	1	1	√	222	B3
N67.14.38 GM3$^+$ ⊕ DT1	√	1	1	√	$mm2$	B2
N67.14.39 GM3$^+$ ⊕ SM2	√	1	1	√	222	B3
N67.14.40 GM3$^+$ ⊕ DT2	√	1	1	√	$mm2$	B2
N67.14.41 GM3$^+$ ⊕ SM3	√	1	1	√	222	B3
N67.14.42 GM3$^+$ ⊕ DT3	√	1	1	√	$mm2$	B2
N67.14.43 GM3$^+$ ⊕ SM4	√	1	1	√	222	B3
N67.14.44 GM3$^+$ ⊕ DT4	√	1	1	√	$mm2$	B2
N67.14.45 GM3$^+$ ⊕ A1	√	1	1	×	-	-
N67.14.46 GM3$^+$ ⊕ B1	√	1	1	×	-	-
N67.14.47 GM3$^+$ ⊕ A2	√	1	1	×	-	-
N67.14.48 GM3$^+$ ⊕ B2	√	1	1	×	-	-
N67.14.49 GM3$^+$ ⊕ LD1	√	1	1	√	$mm2$	B2
N67.14.50 GM3$^+$ ⊕ LD2	√	1	1	√	$mm2$	B2
N67.14.51 GM3$^+$ ⊕ LD3	√	1	1	√	$mm2$	B2
N67.14.52 GM3$^+$ ⊕ LD4	√	1	1	√	$mm2$	B2
N67.14.53 GM3$^+$ ⊕ H3	√	1	1	×	-	-
N67.14.54 GM3$^+$ ⊕ H4	√	1	1	×	-	-
N67.14.55 GM3$^+$ ⊕ H1	√	1	1	×	-	-
N67.14.56 GM3$^+$ ⊕ H2	√	1	1	×	-	-
N67.14.57 GM3$^-$ ⊕ SM1	√	1	1	√	mmm	$\mathrm{B3_u}$
N67.14.58 GM3$^-$ ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N67.14.59 GM3$^-$ ⊕ SM2	√	1	1	√	mmm	$\mathrm{B3_u}$
N67.14.60 GM3$^-$ ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
N67.14.61 GM3$^-$ ⊕ SM3	√	1	1	√	mmm	$\mathrm{B3_u}$

Non-coplanar SSGs with parent space group $Cmme$ (No. 67) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N67.14.62 GM3$^-$ ⊕ DT3	√	1	1	√	mmm	$\mathrm{B2_u}$
N67.14.63 GM3$^-$ ⊕ SM4	√	1	1	√	mmm	$\mathrm{B3_u}$
N67.14.64 GM3$^-$ ⊕ DT4	√	1	1	√	mmm	$\mathrm{B2_u}$
N67.14.65 GM3$^-$ ⊕ A1	√	1	1	×	-	-
N67.14.66 GM3$^-$ ⊕ B1	√	1	1	×	-	-
N67.14.67 GM3$^-$ ⊕ A2	√	1	1	×	-	-
N67.14.68 GM3$^-$ ⊕ B2	√	1	1	×	-	-
N67.14.69 GM3$^-$ ⊕ LD1	√	1	1	√	mmm	$\mathrm{B1_u}$
N67.14.70 GM3$^-$ ⊕ LD2	√	1	1	√	mmm	$\mathrm{B1_u}$
N67.14.71 GM3$^-$ ⊕ LD3	√	1	1	√	mmm	$\mathrm{B1_u}$
N67.14.72 GM3$^-$ ⊕ LD4	√	1	1	√	mmm	$\mathrm{B1_u}$
N67.14.73 GM3$^-$ ⊕ H3	√	1	1	×	-	-
N67.14.74 GM3$^-$ ⊕ H4	√	1	1	×	-	-
N67.14.75 GM3$^-$ ⊕ H1	√	1	1	×	-	-
N67.14.76 GM3$^-$ ⊕ H2	√	1	1	×	-	-
N67.14.77 T1$^+$ ⊕ SM1	√	1	1	√	mmm	$\mathrm{B3_u}$
N67.14.78 T1$^+$ ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N67.14.79 T1$^+$ ⊕ SM2	√	1	1	√	mmm	$\mathrm{B3_u}$
N67.14.80 T1$^+$ ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
N67.14.81 T1$^+$ ⊕ SM3	√	1	1	√	mmm	$\mathrm{B3_u}$
N67.14.82 T1$^+$ ⊕ DT3	√	1	1	√	mmm	$\mathrm{B2_u}$
N67.14.83 T1$^+$ ⊕ SM4	√	1	1	√	mmm	$\mathrm{B3_u}$
N67.14.84 T1$^+$ ⊕ DT4	√	1	1	√	mmm	$\mathrm{B2_u}$
N67.14.85 T1$^+$ ⊕ A1	√	1	1	√	mmm	$\mathrm{B3_u}$
N67.14.86 T1$^+$ ⊕ A3	√	1	1	√	mmm	$\mathrm{B3_u}$
N67.14.87 T1$^+$ ⊕ B1	√	1	1	√	mmm	$\mathrm{B2_u}$
N67.14.88 T1$^+$ ⊕ B3	√	1	1	√	mmm	$\mathrm{B2_u}$
N67.14.89 T1$^+$ ⊕ A2	√	1	1	√	mmm	$\mathrm{B3_u}$
N67.14.90 T1$^+$ ⊕ A4	√	1	1	√	mmm	$\mathrm{B3_u}$
N67.14.91 T1$^+$ ⊕ B2	√	1	1	√	mmm	$\mathrm{B2_u}$
N67.14.92 T1$^+$ ⊕ B4	√	1	1	√	mmm	$\mathrm{B2_u}$
N67.14.93 T1$^+$ ⊕ LD1	√	1	1	√	mmm	$\mathrm{B1_u}$
N67.14.94 T1$^+$ ⊕ LD2	√	1	1	√	mmm	$\mathrm{B1_u}$
N67.14.95 T1$^+$ ⊕ LD3	√	1	1	√	mmm	$\mathrm{B1_u}$
N67.14.96 T1$^+$ ⊕ LD4	√	1	1	√	mmm	$\mathrm{B1_u}$
N67.14.97 T1$^+$ ⊕ H3	√	1	1	√	mmm	$\mathrm{B1_u}$
N67.14.98 T1$^+$ ⊕ H4	√	1	1	√	mmm	$\mathrm{B1_u}$
N67.14.99 T1$^+$ ⊕ H1	√	1	1	√	mmm	$\mathrm{B1_u}$
N67.14.100 T1$^+$ ⊕ H2	√	1	1	√	mmm	$\mathrm{B1_u}$
N67.14.101 T3$^+$ ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N67.14.102 T3$^+$ ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
N67.14.103 T3$^+$ ⊕ DT3	√	1	1	√	mmm	$\mathrm{B2_u}$
N67.14.104 T3$^+$ ⊕ DT4	√	1	1	√	mmm	$\mathrm{B2_u}$
N67.14.105 T3$^+$ ⊕ A1	√	1	1	√	mmm	$\mathrm{B3_u}$
N67.14.106 T3$^+$ ⊕ A3	√	1	1	√	mmm	$\mathrm{B3_u}$
N67.14.107 T3$^+$ ⊕ A2	√	1	1	√	mmm	$\mathrm{B3_u}$

Non-coplanar SSGs with parent space group $Cmme$ (No. 67) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N67.14.108 $\mathrm{T3}^{+} \oplus \mathrm{A4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N67.14.109 $\mathrm{T3}^{+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.14.110 $\mathrm{T3}^{+} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.14.111 $\mathrm{T3}^{+} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.14.112 $\mathrm{T3}^{+} \oplus \mathrm{H3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.14.113 $\mathrm{T3}^{+} \oplus \mathrm{H4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.14.114 $\mathrm{T3}^{+} \oplus \mathrm{H1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.14.115 $\mathrm{T3}^{-} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N67.14.116 $\mathrm{T3}^{-} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N67.14.117 $\mathrm{T3}^{-} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N67.14.118 $\mathrm{T3}^{-} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N67.14.119 $\mathrm{T3}^{-} \oplus \mathrm{A1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N67.14.120 $\mathrm{T3}^{-} \oplus \mathrm{A3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N67.14.121 $\mathrm{T3}^{-} \oplus \mathrm{A2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N67.14.122 $\mathrm{T3}^{-} \oplus \mathrm{A4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N67.14.123 $\mathrm{T3}^{-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.14.124 $\mathrm{T3}^{-} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.14.125 $\mathrm{T3}^{-} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.14.126 $\mathrm{T3}^{-} \oplus \mathrm{H3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.14.127 $\mathrm{T3}^{-} \oplus \mathrm{H4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.14.128 $\mathrm{T3}^{-} \oplus \mathrm{H1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.14.129 $\mathrm{Y1}^{+} \oplus \mathrm{SM1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N67.14.130 $\mathrm{Y1}^{+} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N67.14.131 $\mathrm{Y1}^{+} \oplus \mathrm{SM2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N67.14.132 $\mathrm{Y1}^{+} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N67.14.133 $\mathrm{Y1}^{+} \oplus \mathrm{SM3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N67.14.134 $\mathrm{Y1}^{+} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N67.14.135 $\mathrm{Y1}^{+} \oplus \mathrm{SM4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N67.14.136 $\mathrm{Y1}^{+} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N67.14.137 $\mathrm{Y1}^{+} \oplus \mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N67.14.138 $\mathrm{Y1}^{+} \oplus \mathrm{B1}$	$\surd$	1	1	$\times$	-	-
N67.14.139 $\mathrm{Y1}^{+} \oplus \mathrm{A2}$	$\surd$	1	1	$\times$	-	-
N67.14.140 $\mathrm{Y1}^{+} \oplus \mathrm{B2}$	$\surd$	1	1	$\times$	-	-
N67.14.141 $\mathrm{Y1}^{+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.14.142 $\mathrm{Y1}^{+} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.14.143 $\mathrm{Y1}^{+} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.14.144 $\mathrm{Y1}^{+} \oplus \mathrm{LD4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.14.145 $\mathrm{Y1}^{+} \oplus \mathrm{H3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.14.146 $\mathrm{Y1}^{+} \oplus \mathrm{H4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.14.147 $\mathrm{Y1}^{+} \oplus \mathrm{H1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.14.148 $\mathrm{Y1}^{+} \oplus \mathrm{H2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.14.149 $\mathrm{Y2}^{+} \oplus \mathrm{SM1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N67.14.150 $\mathrm{Y2}^{+} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N67.14.151 $\mathrm{Y2}^{+} \oplus \mathrm{SM2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N67.14.152 $\mathrm{Y2}^{+} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N67.14.153 $\mathrm{Y2}^{+} \oplus \mathrm{SM3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$

Non-coplanar SSGs with parent space group $Cmme$ (No. 67) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N67.14.154 $\mathrm{Y2}^{+} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N67.14.155 $\mathrm{Y2}^{+} \oplus \mathrm{SM4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N67.14.156 $\mathrm{Y2}^{+} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N67.14.157 $\mathrm{Y2}^{+} \oplus \mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N67.14.158 $\mathrm{Y2}^{+} \oplus \mathrm{B1}$	$\surd$	1	1	$\times$	-	-
N67.14.159 $\mathrm{Y2}^{+} \oplus \mathrm{A2}$	$\surd$	1	1	$\times$	-	-
N67.14.160 $\mathrm{Y2}^{+} \oplus \mathrm{B2}$	$\surd$	1	1	$\times$	-	-
N67.14.161 $\mathrm{Y2}^{+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.14.162 $\mathrm{Y2}^{+} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.14.163 $\mathrm{Y2}^{+} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.14.164 $\mathrm{Y2}^{+} \oplus \mathrm{LD4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.14.165 $\mathrm{Y2}^{+} \oplus \mathrm{H3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.14.166 $\mathrm{Y2}^{+} \oplus \mathrm{H4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.14.167 $\mathrm{Y2}^{+} \oplus \mathrm{H1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.14.168 $\mathrm{Y2}^{+} \oplus \mathrm{H2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.14.169 $\mathrm{Y3}^{+} \oplus \mathrm{SM1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N67.14.170 $\mathrm{Y3}^{+} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N67.14.171 $\mathrm{Y3}^{+} \oplus \mathrm{SM2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N67.14.172 $\mathrm{Y3}^{+} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N67.14.173 $\mathrm{Y3}^{+} \oplus \mathrm{SM3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N67.14.174 $\mathrm{Y3}^{+} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N67.14.175 $\mathrm{Y3}^{+} \oplus \mathrm{SM4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N67.14.176 $\mathrm{Y3}^{+} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N67.14.177 $\mathrm{Y3}^{+} \oplus \mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N67.14.178 $\mathrm{Y3}^{+} \oplus \mathrm{B1}$	$\surd$	1	1	$\times$	-	-
N67.14.179 $\mathrm{Y3}^{+} \oplus \mathrm{A2}$	$\surd$	1	1	$\times$	-	-
N67.14.180 $\mathrm{Y3}^{+} \oplus \mathrm{B2}$	$\surd$	1	1	$\times$	-	-
N67.14.181 $\mathrm{Y3}^{+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.14.182 $\mathrm{Y3}^{+} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.14.183 $\mathrm{Y3}^{+} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.14.184 $\mathrm{Y3}^{+} \oplus \mathrm{LD4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.14.185 $\mathrm{Y3}^{+} \oplus \mathrm{H3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.14.186 $\mathrm{Y3}^{+} \oplus \mathrm{H4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.14.187 $\mathrm{Y3}^{+} \oplus \mathrm{H1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.14.188 $\mathrm{Y3}^{+} \oplus \mathrm{H2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.14.189 $\mathrm{Y3}^{-} \oplus \mathrm{SM1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N67.14.190 $\mathrm{Y3}^{-} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N67.14.191 $\mathrm{Y3}^{-} \oplus \mathrm{SM2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N67.14.192 $\mathrm{Y3}^{-} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N67.14.193 $\mathrm{Y3}^{-} \oplus \mathrm{SM3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N67.14.194 $\mathrm{Y3}^{-} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N67.14.195 $\mathrm{Y3}^{-} \oplus \mathrm{SM4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N67.14.196 $\mathrm{Y3}^{-} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N67.14.197 $\mathrm{Y3}^{-} \oplus \mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N67.14.198 $\mathrm{Y3}^{-} \oplus \mathrm{B1}$	$\surd$	1	1	$\times$	-	-
N67.14.199 $\mathrm{Y3}^{-} \oplus \mathrm{A2}$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $Cmme$ (No. 67) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N67.14.200 $\mathrm{Y3}^{-} \oplus \mathrm{B2}$	$\surd$	1	1	$\times$	-	-
N67.14.201 $\mathrm{Y3}^{-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.14.202 $\mathrm{Y3}^{-} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.14.203 $\mathrm{Y3}^{-} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.14.204 $\mathrm{Y3}^{-} \oplus \mathrm{LD4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.14.205 $\mathrm{Y3}^{-} \oplus \mathrm{H3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.14.206 $\mathrm{Y3}^{-} \oplus \mathrm{H4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.14.207 $\mathrm{Y3}^{-} \oplus \mathrm{H1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.14.208 $\mathrm{Y3}^{-} \oplus \mathrm{H2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.14.209 $\mathrm{Z1}^{+} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N67.14.210 $\mathrm{Z1}^{+} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N67.14.211 $\mathrm{Z1}^{+} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N67.14.212 $\mathrm{Z1}^{+} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N67.14.213 $\mathrm{Z1}^{+} \oplus \mathrm{A1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N67.14.214 $\mathrm{Z1}^{+} \oplus \mathrm{A3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N67.14.215 $\mathrm{Z1}^{+} \oplus \mathrm{A2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N67.14.216 $\mathrm{Z1}^{+} \oplus \mathrm{A4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N67.14.217 $\mathrm{Z1}^{+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.14.218 $\mathrm{Z1}^{+} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.14.219 $\mathrm{Z1}^{+} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.14.220 $\mathrm{Z1}^{+} \oplus \mathrm{H3}$	$\surd$	1	1	$\times$	-	-
N67.14.221 $\mathrm{Z1}^{+} \oplus \mathrm{H4}$	$\surd$	1	1	$\times$	-	-
N67.14.222 $\mathrm{Z1}^{+} \oplus \mathrm{H1}$	$\surd$	1	1	$\times$	-	-
N67.14.223 $\mathrm{Z1}^{-} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N67.14.224 $\mathrm{Z1}^{-} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N67.14.225 $\mathrm{Z1}^{-} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N67.14.226 $\mathrm{Z1}^{-} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N67.14.227 $\mathrm{Z1}^{-} \oplus \mathrm{A1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N67.14.228 $\mathrm{Z1}^{-} \oplus \mathrm{A3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N67.14.229 $\mathrm{Z1}^{-} \oplus \mathrm{A2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N67.14.230 $\mathrm{Z1}^{-} \oplus \mathrm{A4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N67.14.231 $\mathrm{Z1}^{-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.14.232 $\mathrm{Z1}^{-} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.14.233 $\mathrm{Z1}^{-} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N67.14.234 $\mathrm{Z1}^{-} \oplus \mathrm{H3}$	$\surd$	1	1	$\times$	-	-
N67.14.235 $\mathrm{Z1}^{-} \oplus \mathrm{H4}$	$\surd$	1	1	$\times$	-	-
N67.14.236 $\mathrm{Z1}^{-} \oplus \mathrm{H1}$	$\surd$	1	1	$\times$	-	-
N67.14.237 $\mathrm{Z3}^{+} \oplus \mathrm{SM1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N67.14.238 $\mathrm{Z3}^{+} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N67.14.239 $\mathrm{Z3}^{+} \oplus \mathrm{SM2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N67.14.240 $\mathrm{Z3}^{+} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N67.14.241 $\mathrm{Z3}^{+} \oplus \mathrm{SM3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N67.14.242 $\mathrm{Z3}^{+} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N67.14.243 $\mathrm{Z3}^{+} \oplus \mathrm{SM4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N67.14.244 $\mathrm{Z3}^{+} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N67.14.245 $\mathrm{Z3}^{+} \oplus \mathrm{A1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$

Non-coplanar SSGs with parent space group $Cmme$ (No. 67) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N67.14.246 Z3$^+$ ⊕ A3	√	1	1	√	mmm	$\mathrm{B3_u}$
N67.14.247 Z3$^+$ ⊕ B1	√	1	1	√	mmm	$\mathrm{B2_u}$
N67.14.248 Z3$^+$ ⊕ B3	√	1	1	√	mmm	$\mathrm{B2_u}$
N67.14.249 Z3$^+$ ⊕ A2	√	1	1	√	mmm	$\mathrm{B3_u}$
N67.14.250 Z3$^+$ ⊕ A4	√	1	1	√	mmm	$\mathrm{B3_u}$
N67.14.251 Z3$^+$ ⊕ B2	√	1	1	√	mmm	$\mathrm{B2_u}$
N67.14.252 Z3$^+$ ⊕ B4	√	1	1	√	mmm	$\mathrm{B2_u}$
N67.14.253 Z3$^+$ ⊕ LD1	√	1	1	√	mmm	$\mathrm{B1_u}$
N67.14.254 Z3$^+$ ⊕ LD2	√	1	1	√	mmm	$\mathrm{B1_u}$
N67.14.255 Z3$^+$ ⊕ LD3	√	1	1	√	mmm	$\mathrm{B1_u}$
N67.14.256 Z3$^+$ ⊕ LD4	√	1	1	√	mmm	$\mathrm{B1_u}$
N67.14.257 Z3$^+$ ⊕ H3	√	1	1	×	-	-
N67.14.258 Z3$^+$ ⊕ H4	√	1	1	×	-	-
N67.14.259 Z3$^+$ ⊕ H1	√	1	1	×	-	-
N67.14.260 Z3$^+$ ⊕ H2	√	1	1	×	-	-

TABLE S202: Collinear SSGs with parent space group $Ccce$ (No. 68).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L68.1.1 GM1$^+$	1	mmm	$\mathrm{A_g}$
L68.2.1 GM1$^-$	0	-	-
L68.2.2 GM2$^+$	1	mmm	$\mathrm{B1_g}$
L68.2.3 GM2$^-$	0	-	-
L68.2.4 GM3$^+$	1	mmm	$\mathrm{B3_g}$
L68.2.5 GM3$^-$	0	-	-
L68.2.6 Y1$^+$	0	-	-
L68.2.7 Y2$^+$	0	-	-
L68.2.8 Y3$^+$	0	-	-
L68.2.9 Y3$^-$	0	-	-

TABLE S203: Coplanar SSGs with parent space group $Ccce$ (No. 68).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P68.1.1 GM1$^+$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
P68.2.1 GM1$^-$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
P68.2.2 GM2$^+$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
P68.2.3 GM2$^-$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
P68.2.4 GM3$^+$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g}$
P68.2.5 GM3$^-$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u}$
P68.2.6 Y1$^+$	√	1	1	√	mmm	$\mathrm{A_g}$
P68.2.7 Y2$^+$	√	1	1	√	mmm	$\mathrm{A_g}$
P68.2.8 Y3$^+$	√	1	1	√	mmm	$\mathrm{A_g}$
P68.2.9 Y3$^-$	√	1	1	√	mmm	$\mathrm{A_g}$
P68.3.1 GM1$^-$ ⊕ GM1$^-$	√	0	0	√	-	-
P68.3.2 GM1$^-$ ⊕ GM2$^+$	√	2	2	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$

Coplanar SSGs with parent space group $Ccce$ (No. 68) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P68.3.3 $\mathrm{GM1^-} \oplus \mathrm{GM2^-}$	$\surd$	0	0	$\surd$	-	-
P68.3.4 $\mathrm{GM1^-} \oplus \mathrm{GM3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u}$
P68.3.5 $\mathrm{GM1^-} \oplus \mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
P68.3.6 $\mathrm{GM1^-} \oplus \mathrm{Y1^+}$	$\surd$	1	1	$\times$	-	-
P68.3.7 $\mathrm{GM1^-} \oplus \mathrm{Y2^+}$	$\surd$	1	1	$\times$	-	-
P68.3.8 $\mathrm{GM1^-} \oplus \mathrm{Y3^+}$	$\surd$	1	1	$\times$	-	-
P68.3.9 $\mathrm{GM1^-} \oplus \mathrm{Y3^-}$	$\surd$	1	1	$\times$	-	-
P68.3.10 $\mathrm{GM2^+} \oplus \mathrm{GM2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
P68.3.11 $\mathrm{GM2^+} \oplus \mathrm{GM2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
P68.3.12 $\mathrm{GM2^+} \oplus \mathrm{GM3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
P68.3.13 $\mathrm{GM2^+} \oplus \mathrm{GM3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
P68.3.14 $\mathrm{GM2^+} \oplus \mathrm{Y1^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
P68.3.15 $\mathrm{GM2^+} \oplus \mathrm{Y2^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
P68.3.16 $\mathrm{GM2^+} \oplus \mathrm{Y3^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
P68.3.17 $\mathrm{GM2^+} \oplus \mathrm{Y3^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
P68.3.18 $\mathrm{GM2^-} \oplus \mathrm{GM2^-}$	$\surd$	0	0	$\surd$	-	-
P68.3.19 $\mathrm{GM2^-} \oplus \mathrm{GM3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
P68.3.20 $\mathrm{GM2^-} \oplus \mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
P68.3.21 $\mathrm{GM2^-} \oplus \mathrm{Y1^+}$	$\surd$	1	1	$\times$	-	-
P68.3.22 $\mathrm{GM2^-} \oplus \mathrm{Y2^+}$	$\surd$	1	1	$\times$	-	-
P68.3.23 $\mathrm{GM2^-} \oplus \mathrm{Y3^+}$	$\surd$	1	1	$\times$	-	-
P68.3.24 $\mathrm{GM2^-} \oplus \mathrm{Y3^-}$	$\surd$	1	1	$\times$	-	-
P68.3.25 $\mathrm{GM3^+} \oplus \mathrm{GM3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
P68.3.26 $\mathrm{GM3^+} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g}$
P68.3.27 $\mathrm{GM3^+} \oplus \mathrm{GM3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
P68.3.28 $\mathrm{GM3^+} \oplus \mathrm{GM4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
P68.3.29 $\mathrm{GM3^+} \oplus \mathrm{Y1^+}$	$\surd$	1	0	$\times$	-	-
P68.3.30 $\mathrm{GM3^+} \oplus \mathrm{Y1^-}$	$\surd$	1	0	$\times$	-	-
P68.3.31 $\mathrm{GM3^+} \oplus \mathrm{Y2^+}$	$\surd$	1	0	$\times$	-	-
P68.3.32 $\mathrm{GM3^+} \oplus \mathrm{Y2^-}$	$\surd$	1	0	$\times$	-	-
P68.3.33 $\mathrm{GM3^+} \oplus \mathrm{Y3^+}$	$\surd$	1	0	$\times$	-	-
P68.3.34 $\mathrm{GM3^+} \oplus \mathrm{Y4^-}$	$\surd$	1	0	$\times$	-	-
P68.3.35 $\mathrm{GM3^+} \oplus \mathrm{Y3^-}$	$\surd$	1	0	$\times$	-	-
P68.3.36 $\mathrm{GM3^+} \oplus \mathrm{Y4^+}$	$\surd$	1	0	$\times$	-	-
P68.3.37 $\mathrm{GM3^-} \oplus \mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
P68.3.38 $\mathrm{GM3^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
P68.3.39 $\mathrm{GM3^-} \oplus \mathrm{Y1^+}$	$\surd$	1	1	$\times$	-	-
P68.3.40 $\mathrm{GM3^-} \oplus \mathrm{Y1^-}$	$\surd$	1	1	$\times$	-	-
P68.3.41 $\mathrm{GM3^-} \oplus \mathrm{Y2^+}$	$\surd$	1	1	$\times$	-	-
P68.3.42 $\mathrm{GM3^-} \oplus \mathrm{Y2^-}$	$\surd$	1	1	$\times$	-	-
P68.3.43 $\mathrm{GM3^-} \oplus \mathrm{Y3^+}$	$\surd$	1	1	$\times$	-	-
P68.3.44 $\mathrm{GM3^-} \oplus \mathrm{Y4^-}$	$\surd$	1	1	$\times$	-	-
P68.3.45 $\mathrm{GM3^-} \oplus \mathrm{Y3^-}$	$\surd$	1	1	$\times$	-	-
P68.3.46 $\mathrm{GM3^-} \oplus \mathrm{Y4^+}$	$\surd$	1	1	$\times$	-	-
P68.3.47 $\mathrm{Y1^+} \oplus \mathrm{Y1^+}$	$\surd$	1	0	$\times$	-	-
P68.3.48 $\mathrm{Y1^+} \oplus \mathrm{Y1^-}$	$\surd$	1	1	$\times$	-	-

Coplanar SSGs with parent space group $Ccce$ (No. 68) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P68.3.49 $\mathrm{Y1}^{+} \oplus \mathrm{Y2}^{+}$	$\surd$	1	0	$\times$	-	-
P68.3.50 $\mathrm{Y1}^{+} \oplus \mathrm{Y2}^{-}$	$\surd$	1	1	$\times$	-	-
P68.3.51 $\mathrm{Y1}^{+} \oplus \mathrm{Y3}^{+}$	$\surd$	1	0	$\times$	-	-
P68.3.52 $\mathrm{Y1}^{+} \oplus \mathrm{Y4}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P68.3.53 $\mathrm{Y1}^{+} \oplus \mathrm{Y3}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P68.3.54 $\mathrm{Y1}^{+} \oplus \mathrm{Y4}^{+}$	$\surd$	1	0	$\times$	-	-
P68.3.55 $\mathrm{Y2}^{+} \oplus \mathrm{Y2}^{+}$	$\surd$	1	0	$\times$	-	-
P68.3.56 $\mathrm{Y2}^{+} \oplus \mathrm{Y2}^{-}$	$\surd$	1	1	$\times$	-	-
P68.3.57 $\mathrm{Y2}^{+} \oplus \mathrm{Y3}^{+}$	$\surd$	1	0	$\times$	-	-
P68.3.58 $\mathrm{Y2}^{+} \oplus \mathrm{Y4}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P68.3.59 $\mathrm{Y2}^{+} \oplus \mathrm{Y3}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P68.3.60 $\mathrm{Y2}^{+} \oplus \mathrm{Y4}^{+}$	$\surd$	1	0	$\times$	-	-
P68.3.61 $\mathrm{Y3}^{+} \oplus \mathrm{Y3}^{+}$	$\surd$	1	0	$\times$	-	-
P68.3.62 $\mathrm{Y3}^{+} \oplus \mathrm{Y4}^{-}$	$\surd$	1	1	$\times$	-	-
P68.3.63 $\mathrm{Y3}^{+} \oplus \mathrm{Y3}^{-}$	$\surd$	1	1	$\times$	-	-
P68.3.64 $\mathrm{Y3}^{+} \oplus \mathrm{Y4}^{+}$	$\surd$	1	0	$\times$	-	-
P68.3.65 $\mathrm{Y3}^{-} \oplus \mathrm{Y3}^{-}$	$\surd$	1	0	$\times$	-	-
P68.3.66 $\mathrm{Y3}^{-} \oplus \mathrm{Y4}^{+}$	$\surd$	1	1	$\times$	-	-
P68.6.1 T1	$\surd$	1	1	$\times$	-	-
P68.6.2 T2	$\surd$	1	1	$\times$	-	-
P68.6.3 Z1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P68.6.4 Z2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P68.8.1 DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P68.8.2 DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P68.8.3 DT3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P68.8.4 DT4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P68.8.5 LD1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P68.8.6 LD3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P68.8.7 H1	$\surd$	1	1	$\times$	-	-
P68.8.8 H3	$\surd$	1	1	$\times$	-	-

TABLE S204: Non-coplanar SSGs with parent space group $Ccce$ (No. 68).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N68.1.1 $\mathrm{GM1}^{+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{A_g}$
N68.2.1 $\mathrm{GM1}^{-}$	$\surd$	2	2	$\surd$	222	$\mathrm{A1} \oplus \mathrm{A1}$
N68.2.2 $\mathrm{GM2}^{+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B1_g}$
N68.2.3 $\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{A1}$
N68.2.4 $\mathrm{GM3}^{+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B3_g}$
N68.2.5 $\mathrm{GM3}^{-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{A1}$
N68.2.6 $\mathrm{Y1}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
N68.2.7 $\mathrm{Y2}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
N68.2.8 $\mathrm{Y3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
N68.2.9 $\mathrm{Y3}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
N68.3.1 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{A_u}$
N68.3.2 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{A2}$

Non-coplanar SSGs with parent space group $Ccce$ (No. 68) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N68.3.3 $\mathrm{GM1^-} \oplus \mathrm{GM2^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N68.3.4 $\mathrm{GM1^-} \oplus \mathrm{GM3^+}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{A2}$
N68.3.5 $\mathrm{GM1^-} \oplus \mathrm{GM3^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B3_u}$
N68.3.6 $\mathrm{GM1^-} \oplus \mathrm{Y1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
N68.3.7 $\mathrm{GM1^-} \oplus \mathrm{Y2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
N68.3.8 $\mathrm{GM1^-} \oplus \mathrm{Y3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
N68.3.9 $\mathrm{GM1^-} \oplus \mathrm{Y3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
N68.3.10 $\mathrm{GM2^+} \oplus \mathrm{GM2^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N68.3.11 $\mathrm{GM2^+} \oplus \mathrm{GM2^-}$	$\surd$	2	2	$\surd$	222	$\mathrm{A1} \oplus \mathrm{B1}$
N68.3.12 $\mathrm{GM2^+} \oplus \mathrm{GM3^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g} \oplus \mathrm{B3_g}$
N68.3.13 $\mathrm{GM2^+} \oplus \mathrm{GM3^-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{B1}$
N68.3.14 $\mathrm{GM2^+} \oplus \mathrm{Y1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
N68.3.15 $\mathrm{GM2^+} \oplus \mathrm{Y2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
N68.3.16 $\mathrm{GM2^+} \oplus \mathrm{Y3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
N68.3.17 $\mathrm{GM2^+} \oplus \mathrm{Y3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
N68.3.18 $\mathrm{GM2^-} \oplus \mathrm{GM2^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N68.3.19 $\mathrm{GM2^-} \oplus \mathrm{GM3^+}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{B2}$
N68.3.20 $\mathrm{GM2^-} \oplus \mathrm{GM3^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u} \oplus \mathrm{B3_u}$
N68.3.21 $\mathrm{GM2^-} \oplus \mathrm{Y1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
N68.3.22 $\mathrm{GM2^-} \oplus \mathrm{Y2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
N68.3.23 $\mathrm{GM2^-} \oplus \mathrm{Y3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
N68.3.24 $\mathrm{GM2^-} \oplus \mathrm{Y3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
N68.3.25 $\mathrm{GM3^+} \oplus \mathrm{GM3^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N68.3.26 $\mathrm{GM3^+} \oplus \mathrm{GM4^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N68.3.27 $\mathrm{GM3^+} \oplus \mathrm{GM3^-}$	$\surd$	2	2	$\surd$	222	$\mathrm{A1} \oplus \mathrm{B3}$
N68.3.28 $\mathrm{GM3^+} \oplus \mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{B2}$
N68.3.29 $\mathrm{GM3^+} \oplus \mathrm{Y1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g}$
N68.3.30 $\mathrm{GM3^+} \oplus \mathrm{Y1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g}$
N68.3.31 $\mathrm{GM3^+} \oplus \mathrm{Y2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g}$
N68.3.32 $\mathrm{GM3^+} \oplus \mathrm{Y2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g}$
N68.3.33 $\mathrm{GM3^+} \oplus \mathrm{Y3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g}$
N68.3.34 $\mathrm{GM3^+} \oplus \mathrm{Y4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g}$
N68.3.35 $\mathrm{GM3^+} \oplus \mathrm{Y3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g}$
N68.3.36 $\mathrm{GM3^+} \oplus \mathrm{Y4^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g}$
N68.3.37 $\mathrm{GM3^-} \oplus \mathrm{GM3^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N68.3.38 $\mathrm{GM3^-} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N68.3.39 $\mathrm{GM3^-} \oplus \mathrm{Y1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u}$
N68.3.40 $\mathrm{GM3^-} \oplus \mathrm{Y1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u}$
N68.3.41 $\mathrm{GM3^-} \oplus \mathrm{Y2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u}$
N68.3.42 $\mathrm{GM3^-} \oplus \mathrm{Y2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u}$
N68.3.43 $\mathrm{GM3^-} \oplus \mathrm{Y3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u}$
N68.3.44 $\mathrm{GM3^-} \oplus \mathrm{Y4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u}$
N68.3.45 $\mathrm{GM3^-} \oplus \mathrm{Y3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u}$
N68.3.46 $\mathrm{GM3^-} \oplus \mathrm{Y4^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u}$
N68.3.47 $\mathrm{Y1^+} \oplus \mathrm{Y1^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N68.3.48 $\mathrm{Y1^+} \oplus \mathrm{Y1^-}$	$\surd$	1	1	$\surd$	222	A1

Non-coplanar SSGs with parent space group $Ccce$ (No. 68) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N68.3.49 $\mathrm{Y1}^{+} \oplus \mathrm{Y2}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N68.3.50 $\mathrm{Y1}^{+} \oplus \mathrm{Y2}^{-}$	$\surd$	1	1	$\surd$	$mm2$	A1
N68.3.51 $\mathrm{Y1}^{+} \oplus \mathrm{Y3}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N68.3.52 $\mathrm{Y1}^{+} \oplus \mathrm{Y4}^{-}$	$\surd$	1	1	$\surd$	$mm2$	A1
N68.3.53 $\mathrm{Y1}^{+} \oplus \mathrm{Y3}^{-}$	$\surd$	1	1	$\surd$	$mm2$	A1
N68.3.54 $\mathrm{Y1}^{+} \oplus \mathrm{Y4}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N68.3.55 $\mathrm{Y2}^{+} \oplus \mathrm{Y2}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N68.3.56 $\mathrm{Y2}^{+} \oplus \mathrm{Y2}^{-}$	$\surd$	1	1	$\surd$	222	A1
N68.3.57 $\mathrm{Y2}^{+} \oplus \mathrm{Y3}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N68.3.58 $\mathrm{Y2}^{+} \oplus \mathrm{Y4}^{-}$	$\surd$	1	1	$\surd$	$mm2$	A1
N68.3.59 $\mathrm{Y2}^{+} \oplus \mathrm{Y3}^{-}$	$\surd$	1	1	$\surd$	$mm2$	A1
N68.3.60 $\mathrm{Y2}^{+} \oplus \mathrm{Y4}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N68.3.61 $\mathrm{Y3}^{+} \oplus \mathrm{Y3}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N68.3.62 $\mathrm{Y3}^{+} \oplus \mathrm{Y4}^{-}$	$\surd$	1	1	$\surd$	$mm2$	A1
N68.3.63 $\mathrm{Y3}^{+} \oplus \mathrm{Y3}^{-}$	$\surd$	1	1	$\surd$	222	A1
N68.3.64 $\mathrm{Y3}^{+} \oplus \mathrm{Y4}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N68.3.65 $\mathrm{Y3}^{-} \oplus \mathrm{Y3}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N68.3.66 $\mathrm{Y3}^{-} \oplus \mathrm{Y4}^{+}$	$\surd$	1	1	$\surd$	$mm2$	A1
N68.6.1 T1	$\surd$	1	1	$\surd$	$mm2$	A1
N68.6.2 T2	$\surd$	1	1	$\surd$	$mm2$	A1
N68.6.3 Z1	$\surd$	1	1	$\surd$	$mm2$	A1
N68.6.4 Z2	$\surd$	1	1	$\surd$	$mm2$	A1
N68.8.1 DT1	$\surd$	1	1	$\surd$	$mm2$	A1
N68.8.2 DT2	$\surd$	1	1	$\surd$	$mm2$	A1
N68.8.3 DT3	$\surd$	1	1	$\surd$	$mm2$	A1
N68.8.4 DT4	$\surd$	1	1	$\surd$	$mm2$	A1
N68.8.5 LD1	$\surd$	1	1	$\surd$	$mm2$	A1
N68.8.6 LD3	$\surd$	1	1	$\surd$	$mm2$	A1
N68.8.7 H1	$\surd$	1	1	$\surd$	$mm2$	A1
N68.8.8 H3	$\surd$	1	1	$\surd$	$mm2$	A1
N68.9.1 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-}$	$\surd$	0	0	$\surd$	-	-
N68.9.2 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-} \oplus \mathrm{GM2}^{+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N68.9.3 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-} \oplus \mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
N68.9.4 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-} \oplus \mathrm{GM3}^{+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N68.9.5 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-} \oplus \mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
N68.9.6 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-} \oplus \mathrm{Y1}^{+}$	$\surd$	0	0	$\surd$	-	-
N68.9.7 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-} \oplus \mathrm{Y2}^{+}$	$\surd$	0	0	$\surd$	-	-
N68.9.8 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-} \oplus \mathrm{Y3}^{+}$	$\surd$	0	0	$\surd$	-	-
N68.9.9 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-} \oplus \mathrm{Y3}^{-}$	$\surd$	0	0	$\surd$	-	-
N68.9.10 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{+} \oplus \mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	222	$\mathrm{B1} \oplus \mathrm{B1}$
N68.9.11 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{+} \oplus \mathrm{GM2}^{-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N68.9.12 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{+} \oplus \mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2} \oplus \mathrm{B1}$
N68.9.13 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{+} \oplus \mathrm{GM3}^{-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_u}$
N68.9.14 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{+} \oplus \mathrm{Y1}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N68.9.15 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{+} \oplus \mathrm{Y2}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N68.9.16 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{+} \oplus \mathrm{Y3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$

Non-coplanar SSGs with parent space group $Ccce$ (No. 68) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N68.9.17 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{Y3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N68.9.18 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{GM2^-}$	$\surd$	0	0	$\surd$	-	-
N68.9.19 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{GM3^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N68.9.20 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
N68.9.21 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{Y1^+}$	$\surd$	0	0	$\surd$	-	-
N68.9.22 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{Y2^+}$	$\surd$	0	0	$\surd$	-	-
N68.9.23 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{Y3^+}$	$\surd$	0	0	$\surd$	-	-
N68.9.24 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{Y3^-}$	$\surd$	0	0	$\surd$	-	-
N68.9.25 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{GM3^+}$	$\surd$	2	2	$\surd$	222	$\mathrm{B3} \oplus \mathrm{B3}$
N68.9.26 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2} \oplus \mathrm{B1}$
N68.9.27 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{GM3^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N68.9.28 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N68.9.29 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{Y1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u}$
N68.9.30 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{Y1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u}$
N68.9.31 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{Y2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u}$
N68.9.32 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{Y2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u}$
N68.9.33 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{Y3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u}$
N68.9.34 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{Y4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u}$
N68.9.35 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{Y3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u}$
N68.9.36 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{Y4^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u}$
N68.9.37 $\mathrm{GM1^-} \oplus \mathrm{GM3^-} \oplus \mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
N68.9.38 $\mathrm{GM1^-} \oplus \mathrm{GM3^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N68.9.39 $\mathrm{GM1^-} \oplus \mathrm{GM3^-} \oplus \mathrm{Y1^+}$	$\surd$	0	0	$\surd$	-	-
N68.9.40 $\mathrm{GM1^-} \oplus \mathrm{GM3^-} \oplus \mathrm{Y1^-}$	$\surd$	0	0	$\surd$	-	-
N68.9.41 $\mathrm{GM1^-} \oplus \mathrm{GM3^-} \oplus \mathrm{Y2^+}$	$\surd$	0	0	$\surd$	-	-
N68.9.42 $\mathrm{GM1^-} \oplus \mathrm{GM3^-} \oplus \mathrm{Y2^-}$	$\surd$	0	0	$\surd$	-	-
N68.9.43 $\mathrm{GM1^-} \oplus \mathrm{GM3^-} \oplus \mathrm{Y3^+}$	$\surd$	0	0	$\surd$	-	-
N68.9.44 $\mathrm{GM1^-} \oplus \mathrm{GM3^-} \oplus \mathrm{Y4^-}$	$\surd$	0	0	$\surd$	-	-
N68.9.45 $\mathrm{GM1^-} \oplus \mathrm{GM3^-} \oplus \mathrm{Y3^-}$	$\surd$	0	0	$\surd$	-	-
N68.9.46 $\mathrm{GM1^-} \oplus \mathrm{GM3^-} \oplus \mathrm{Y4^+}$	$\surd$	0	0	$\surd$	-	-
N68.9.47 $\mathrm{GM1^-} \oplus \mathrm{Y1^+} \oplus \mathrm{Y1^+}$	$\surd$	1	0	$\times$	-	-
N68.9.48 $\mathrm{GM1^-} \oplus \mathrm{Y1^+} \oplus \mathrm{Y1^-}$	$\surd$	1	1	$\times$	-	-
N68.9.49 $\mathrm{GM1^-} \oplus \mathrm{Y1^+} \oplus \mathrm{Y2^+}$	$\surd$	1	0	$\times$	-	-
N68.9.50 $\mathrm{GM1^-} \oplus \mathrm{Y1^+} \oplus \mathrm{Y2^-}$	$\surd$	1	1	$\times$	-	-
N68.9.51 $\mathrm{GM1^-} \oplus \mathrm{Y1^+} \oplus \mathrm{Y3^+}$	$\surd$	1	0	$\times$	-	-
N68.9.52 $\mathrm{GM1^-} \oplus \mathrm{Y1^+} \oplus \mathrm{Y4^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N68.9.53 $\mathrm{GM1^-} \oplus \mathrm{Y1^+} \oplus \mathrm{Y3^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N68.9.54 $\mathrm{GM1^-} \oplus \mathrm{Y1^+} \oplus \mathrm{Y4^+}$	$\surd$	1	0	$\times$	-	-
N68.9.55 $\mathrm{GM1^-} \oplus \mathrm{Y2^+} \oplus \mathrm{Y2^+}$	$\surd$	1	0	$\times$	-	-
N68.9.56 $\mathrm{GM1^-} \oplus \mathrm{Y2^+} \oplus \mathrm{Y2^-}$	$\surd$	1	1	$\times$	-	-
N68.9.57 $\mathrm{GM1^-} \oplus \mathrm{Y2^+} \oplus \mathrm{Y3^+}$	$\surd$	1	0	$\times$	-	-
N68.9.58 $\mathrm{GM1^-} \oplus \mathrm{Y2^+} \oplus \mathrm{Y4^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N68.9.59 $\mathrm{GM1^-} \oplus \mathrm{Y2^+} \oplus \mathrm{Y3^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N68.9.60 $\mathrm{GM1^-} \oplus \mathrm{Y2^+} \oplus \mathrm{Y4^+}$	$\surd$	1	0	$\times$	-	-
N68.9.61 $\mathrm{GM1^-} \oplus \mathrm{Y3^+} \oplus \mathrm{Y3^+}$	$\surd$	1	0	$\times$	-	-
N68.9.62 $\mathrm{GM1^-} \oplus \mathrm{Y3^+} \oplus \mathrm{Y4^-}$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $Ccce$ (No. 68) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N68.9.63 $\mathrm{GM1}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\times$	-	-
N68.9.64 $\mathrm{GM1}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
N68.9.65 $\mathrm{GM1}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N68.9.66 $\mathrm{GM1}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\times$	-	-
N68.9.67 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N68.9.68 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{A2}$
N68.9.69 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B3_g}$
N68.9.70 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2} \oplus \mathrm{B2}$
N68.9.71 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N68.9.72 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N68.9.73 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N68.9.74 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N68.9.75 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$
N68.9.76 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{B2}$
N68.9.77 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g} \oplus \mathrm{B2_u}$
N68.9.78 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
N68.9.79 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
N68.9.80 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
N68.9.81 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
N68.9.82 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N68.9.83 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N68.9.84 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{B2}$
N68.9.85 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	222	$\mathrm{B1} \oplus \mathrm{B3}$
N68.9.86 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N68.9.87 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N68.9.88 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N68.9.89 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N68.9.90 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N68.9.91 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N68.9.92 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N68.9.93 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Y4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N68.9.94 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N68.9.95 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N68.9.96 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N68.9.97 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N68.9.98 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N68.9.99 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N68.9.100 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N68.9.101 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N68.9.102 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N68.9.103 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Y4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N68.9.104 $\mathrm{GM2}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N68.9.105 $\mathrm{GM2}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^-$	$\surd$	1	1	$\surd$	$mm2$	A2
N68.9.106 $\mathrm{GM2}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N68.9.107 $\mathrm{GM2}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\surd$	222	B1
N68.9.108 $\mathrm{GM2}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$

Non-coplanar SSGs with parent space group $Ccce$ (No. 68) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N68.9.109 $\mathrm{GM2}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\surd$	$mm2$	$\mathrm{B2}$
N68.9.110 $\mathrm{GM2}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\surd$	$mm2$	$\mathrm{B1}$
N68.9.111 $\mathrm{GM2}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N68.9.112 $\mathrm{GM2}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N68.9.113 $\mathrm{GM2}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\surd$	$mm2$	$\mathrm{A2}$
N68.9.114 $\mathrm{GM2}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N68.9.115 $\mathrm{GM2}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\surd$	$mm2$	$\mathrm{B1}$
N68.9.116 $\mathrm{GM2}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\surd$	$mm2$	$\mathrm{B2}$
N68.9.117 $\mathrm{GM2}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N68.9.118 $\mathrm{GM2}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N68.9.119 $\mathrm{GM2}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\surd$	222	$\mathrm{B1}$
N68.9.120 $\mathrm{GM2}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\surd$	$mm2$	$\mathrm{A2}$
N68.9.121 $\mathrm{GM2}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N68.9.122 $\mathrm{GM2}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N68.9.123 $\mathrm{GM2}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\surd$	222	$\mathrm{B1}$
N68.9.124 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
N68.9.125 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N68.9.126 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N68.9.127 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Y1}^+$	$\surd$	0	0	$\surd$	-	-
N68.9.128 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Y2}^+$	$\surd$	0	0	$\surd$	-	-
N68.9.129 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Y3}^+$	$\surd$	0	0	$\surd$	-	-
N68.9.130 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Y3}^-$	$\surd$	0	0	$\surd$	-	-
N68.9.131 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2} \oplus \mathrm{B2}$
N68.9.132 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	222	$\mathrm{B3} \oplus \mathrm{B2}$
N68.9.133 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N68.9.134 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B2_u}$
N68.9.135 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N68.9.136 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N68.9.137 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N68.9.138 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N68.9.139 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N68.9.140 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N68.9.141 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N68.9.142 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Y4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
N68.9.143 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N68.9.144 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N68.9.145 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y1}^+$	$\surd$	0	0	$\surd$	-	-
N68.9.146 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y1}^-$	$\surd$	0	0	$\surd$	-	-
N68.9.147 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y2}^+$	$\surd$	0	0	$\surd$	-	-
N68.9.148 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y2}^-$	$\surd$	0	0	$\surd$	-	-
N68.9.149 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y3}^+$	$\surd$	0	0	$\surd$	-	-
N68.9.150 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y4}^-$	$\surd$	0	0	$\surd$	-	-
N68.9.151 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y3}^-$	$\surd$	0	0	$\surd$	-	-
N68.9.152 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y4}^+$	$\surd$	0	0	$\surd$	-	-
N68.9.153 $\mathrm{GM2}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	0	$\times$	-	-
N68.9.154 $\mathrm{GM2}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^-$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $Ccce$ (No. 68) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N68.9.155 $\mathrm{GM2^-} \oplus \mathrm{Y1^+} \oplus \mathrm{Y2^+}$	$\surd$	1	0	$\times$	-	-
N68.9.156 $\mathrm{GM2^-} \oplus \mathrm{Y1^+} \oplus \mathrm{Y2^-}$	$\surd$	1	1	$\times$	-	-
N68.9.157 $\mathrm{GM2^-} \oplus \mathrm{Y1^+} \oplus \mathrm{Y3^+}$	$\surd$	1	0	$\times$	-	-
N68.9.158 $\mathrm{GM2^-} \oplus \mathrm{Y1^+} \oplus \mathrm{Y4^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N68.9.159 $\mathrm{GM2^-} \oplus \mathrm{Y1^+} \oplus \mathrm{Y3^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N68.9.160 $\mathrm{GM2^-} \oplus \mathrm{Y1^+} \oplus \mathrm{Y4^+}$	$\surd$	1	0	$\times$	-	-
N68.9.161 $\mathrm{GM2^-} \oplus \mathrm{Y2^+} \oplus \mathrm{Y2^+}$	$\surd$	1	0	$\times$	-	-
N68.9.162 $\mathrm{GM2^-} \oplus \mathrm{Y2^+} \oplus \mathrm{Y2^-}$	$\surd$	1	1	$\times$	-	-
N68.9.163 $\mathrm{GM2^-} \oplus \mathrm{Y2^+} \oplus \mathrm{Y3^+}$	$\surd$	1	0	$\times$	-	-
N68.9.164 $\mathrm{GM2^-} \oplus \mathrm{Y2^+} \oplus \mathrm{Y4^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N68.9.165 $\mathrm{GM2^-} \oplus \mathrm{Y2^+} \oplus \mathrm{Y3^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N68.9.166 $\mathrm{GM2^-} \oplus \mathrm{Y2^+} \oplus \mathrm{Y4^+}$	$\surd$	1	0	$\times$	-	-
N68.9.167 $\mathrm{GM2^-} \oplus \mathrm{Y3^+} \oplus \mathrm{Y3^+}$	$\surd$	1	0	$\times$	-	-
N68.9.168 $\mathrm{GM2^-} \oplus \mathrm{Y3^+} \oplus \mathrm{Y4^-}$	$\surd$	1	1	$\times$	-	-
N68.9.169 $\mathrm{GM2^-} \oplus \mathrm{Y3^+} \oplus \mathrm{Y3^-}$	$\surd$	1	1	$\times$	-	-
N68.9.170 $\mathrm{GM2^-} \oplus \mathrm{Y3^+} \oplus \mathrm{Y4^+}$	$\surd$	1	0	$\times$	-	-
N68.9.171 $\mathrm{GM2^-} \oplus \mathrm{Y3^-} \oplus \mathrm{Y3^-}$	$\surd$	1	0	$\times$	-	-
N68.9.172 $\mathrm{GM2^-} \oplus \mathrm{Y3^-} \oplus \mathrm{Y4^+}$	$\surd$	1	1	$\times$	-	-
N68.9.173 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{GM3^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N68.9.174 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{GM4^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N68.9.175 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{GM3^-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{A2}$
N68.9.176 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2} \oplus \mathrm{B2}$
N68.9.177 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{GM3^-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{B2}$
N68.9.178 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{Y1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
N68.9.179 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{Y1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
N68.9.180 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{Y1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g}$
N68.9.181 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{Y2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
N68.9.182 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{Y2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
N68.9.183 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{Y2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g}$
N68.9.184 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{Y3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
N68.9.185 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{Y4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
N68.9.186 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{Y3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g}$
N68.9.187 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{Y3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
N68.9.188 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{Y4^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
N68.9.189 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{Y3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g}$
N68.9.190 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{GM3^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B3_g}$
N68.9.191 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u} \oplus \mathrm{B3_g}$
N68.9.192 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B3_g}$
N68.9.193 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{Y1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N68.9.194 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{Y1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N68.9.195 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Y1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N68.9.196 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Y1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N68.9.197 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{Y2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N68.9.198 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{Y2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N68.9.199 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Y2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N68.9.200 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Y2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$

Non-coplanar SSGs with parent space group $Ccce$ (No. 68) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N68.9.201 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N68.9.202 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N68.9.203 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{Y3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N68.9.204 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N68.9.205 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N68.9.206 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Y4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N68.9.207 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{Y3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N68.9.208 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{Y4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N68.9.209 $\mathrm{GM3}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	1	$\times$	-	-
N68.9.210 $\mathrm{GM3}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^-$	$\surd$	1	1	$\times$	-	-
N68.9.211 $\mathrm{GM3}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y1}^-$	$\surd$	1	1	$\times$	-	-
N68.9.212 $\mathrm{GM3}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\times$	-	-
N68.9.213 $\mathrm{GM3}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\times$	-	-
N68.9.214 $\mathrm{GM3}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\times$	-	-
N68.9.215 $\mathrm{GM3}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\times$	-	-
N68.9.216 $\mathrm{GM3}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\times$	-	-
N68.9.217 $\mathrm{GM3}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\surd$	$mm2$	B2
N68.9.218 $\mathrm{GM3}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\surd$	222	B3
N68.9.219 $\mathrm{GM3}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\times$	-	-
N68.9.220 $\mathrm{GM3}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\surd$	222	B3
N68.9.221 $\mathrm{GM3}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\times$	-	-
N68.9.222 $\mathrm{GM3}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\times$	-	-
N68.9.223 $\mathrm{GM3}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\surd$	$mm2$	B2
N68.9.224 $\mathrm{GM3}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\times$	-	-
N68.9.225 $\mathrm{GM3}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\times$	-	-
N68.9.226 $\mathrm{GM3}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\times$	-	-
N68.9.227 $\mathrm{GM3}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\times$	-	-
N68.9.228 $\mathrm{GM3}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\surd$	222	B3
N68.9.229 $\mathrm{GM3}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\surd$	$mm2$	B2
N68.9.230 $\mathrm{GM3}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\times$	-	-
N68.9.231 $\mathrm{GM3}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\surd$	$mm2$	B2
N68.9.232 $\mathrm{GM3}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\times$	-	-
N68.9.233 $\mathrm{GM3}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\times$	-	-
N68.9.234 $\mathrm{GM3}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\surd$	222	B3
N68.9.235 $\mathrm{GM3}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\times$	-	-
N68.9.236 $\mathrm{GM3}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\times$	-	-
N68.9.237 $\mathrm{GM3}^+ \oplus \mathrm{Y4}^- \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\times$	-	-
N68.9.238 $\mathrm{GM3}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\times$	-	-
N68.9.239 $\mathrm{GM3}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\times$	-	-
N68.9.240 $\mathrm{GM3}^+ \oplus \mathrm{Y4}^- \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\times$	-	-
N68.9.241 $\mathrm{GM3}^+ \oplus \mathrm{Y4}^- \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\times$	-	-
N68.9.242 $\mathrm{GM3}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\times$	-	-
N68.9.243 $\mathrm{GM3}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\times$	-	-
N68.9.244 $\mathrm{GM3}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\times$	-	-
N68.9.245 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N68.9.246 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-

Non-coplanar SSGs with parent space group $Ccce$ (No. 68) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N68.9.247 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y1}^+$	$\surd$	0	0	$\surd$	-	-
N68.9.248 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y1}^-$	$\surd$	0	0	$\surd$	-	-
N68.9.249 $\mathrm{GM3}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Y1}^+$	$\surd$	0	0	$\surd$	-	-
N68.9.250 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y2}^+$	$\surd$	0	0	$\surd$	-	-
N68.9.251 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y2}^-$	$\surd$	0	0	$\surd$	-	-
N68.9.252 $\mathrm{GM3}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Y2}^+$	$\surd$	0	0	$\surd$	-	-
N68.9.253 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y3}^+$	$\surd$	0	0	$\surd$	-	-
N68.9.254 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y4}^-$	$\surd$	0	0	$\surd$	-	-
N68.9.255 $\mathrm{GM3}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Y3}^+$	$\surd$	0	0	$\surd$	-	-
N68.9.256 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y3}^-$	$\surd$	0	0	$\surd$	-	-
N68.9.257 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Y4}^+$	$\surd$	0	0	$\surd$	-	-
N68.9.258 $\mathrm{GM3}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Y3}^-$	$\surd$	0	0	$\surd$	-	-
N68.9.259 $\mathrm{GM3}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	0	$\times$	-	-
N68.9.260 $\mathrm{GM3}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y1}^-$	$\surd$	1	1	$\times$	-	-
N68.9.261 $\mathrm{GM3}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y1}^-$	$\surd$	1	0	$\times$	-	-
N68.9.262 $\mathrm{GM3}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N68.9.263 $\mathrm{GM3}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\times$	-	-
N68.9.264 $\mathrm{GM3}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\times$	-	-
N68.9.265 $\mathrm{GM3}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N68.9.266 $\mathrm{GM3}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N68.9.267 $\mathrm{GM3}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N68.9.268 $\mathrm{GM3}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N68.9.269 $\mathrm{GM3}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y4}^-$	$\surd$	1	0	$\times$	-	-
N68.9.270 $\mathrm{GM3}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N68.9.271 $\mathrm{GM3}^- \oplus \mathrm{Y1}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
N68.9.272 $\mathrm{GM3}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N68.9.273 $\mathrm{GM3}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N68.9.274 $\mathrm{GM3}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N68.9.275 $\mathrm{GM3}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\times$	-	-
N68.9.276 $\mathrm{GM3}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N68.9.277 $\mathrm{GM3}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N68.9.278 $\mathrm{GM3}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N68.9.279 $\mathrm{GM3}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N68.9.280 $\mathrm{GM3}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y4}^-$	$\surd$	1	0	$\times$	-	-
N68.9.281 $\mathrm{GM3}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N68.9.282 $\mathrm{GM3}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
N68.9.283 $\mathrm{GM3}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N68.9.284 $\mathrm{GM3}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N68.9.285 $\mathrm{GM3}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N68.9.286 $\mathrm{GM3}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\times$	-	-
N68.9.287 $\mathrm{GM3}^- \oplus \mathrm{Y4}^- \oplus \mathrm{Y4}^-$	$\surd$	1	0	$\times$	-	-
N68.9.288 $\mathrm{GM3}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\times$	-	-
N68.9.289 $\mathrm{GM3}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
N68.9.290 $\mathrm{GM3}^- \oplus \mathrm{Y4}^- \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N68.9.291 $\mathrm{GM3}^- \oplus \mathrm{Y4}^- \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\times$	-	-
N68.9.292 $\mathrm{GM3}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $Ccce$ (No. 68) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N68.9.293 $\mathrm{GM3^-} \oplus \mathrm{Y3^-} \oplus \mathrm{Y4^+}$	$\surd$	1	1	$\times$	-	-
N68.9.294 $\mathrm{GM3^-} \oplus \mathrm{Y4^+} \oplus \mathrm{Y4^+}$	$\surd$	1	0	$\times$	-	-
N68.9.295 $\mathrm{Y1^+} \oplus \mathrm{Y1^+} \oplus \mathrm{Y1^+}$	$\surd$	0	0	$\surd$	-	-
N68.9.296 $\mathrm{Y1^+} \oplus \mathrm{Y1^+} \oplus \mathrm{Y1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u}$
N68.9.297 $\mathrm{Y1^+} \oplus \mathrm{Y1^+} \oplus \mathrm{Y2^+}$	$\surd$	0	0	$\surd$	-	-
N68.9.298 $\mathrm{Y1^+} \oplus \mathrm{Y1^+} \oplus \mathrm{Y2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N68.9.299 $\mathrm{Y1^+} \oplus \mathrm{Y1^-} \oplus \mathrm{Y2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u}$
N68.9.300 $\mathrm{Y1^+} \oplus \mathrm{Y1^+} \oplus \mathrm{Y3^+}$	$\surd$	0	0	$\surd$	-	-
N68.9.301 $\mathrm{Y1^+} \oplus \mathrm{Y1^+} \oplus \mathrm{Y4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_u} \oplus \mathrm{B2_u}$
N68.9.302 $\mathrm{Y1^+} \oplus \mathrm{Y1^-} \oplus \mathrm{Y3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u}$
N68.9.303 $\mathrm{Y1^+} \oplus \mathrm{Y1^+} \oplus \mathrm{Y3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B3_u}$
N68.9.304 $\mathrm{Y1^+} \oplus \mathrm{Y1^+} \oplus \mathrm{Y4^+}$	$\surd$	0	0	$\surd$	-	-
N68.9.305 $\mathrm{Y1^+} \oplus \mathrm{Y1^-} \oplus \mathrm{Y3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u}$
N68.9.306 $\mathrm{Y1^+} \oplus \mathrm{Y2^+} \oplus \mathrm{Y2^+}$	$\surd$	0	0	$\surd$	-	-
N68.9.307 $\mathrm{Y1^+} \oplus \mathrm{Y2^+} \oplus \mathrm{Y2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u}$
N68.9.308 $\mathrm{Y1^+} \oplus \mathrm{Y2^-} \oplus \mathrm{Y2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N68.9.309 $\mathrm{Y1^+} \oplus \mathrm{Y2^+} \oplus \mathrm{Y3^+}$	$\surd$	0	0	$\surd$	-	-
N68.9.310 $\mathrm{Y1^+} \oplus \mathrm{Y2^+} \oplus \mathrm{Y4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_u}$
N68.9.311 $\mathrm{Y1^+} \oplus \mathrm{Y2^-} \oplus \mathrm{Y3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N68.9.312 $\mathrm{Y1^+} \oplus \mathrm{Y2^-} \oplus \mathrm{Y4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N68.9.313 $\mathrm{Y1^+} \oplus \mathrm{Y2^+} \oplus \mathrm{Y3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_u}$
N68.9.314 $\mathrm{Y1^+} \oplus \mathrm{Y2^+} \oplus \mathrm{Y4^+}$	$\surd$	0	0	$\surd$	-	-
N68.9.315 $\mathrm{Y1^+} \oplus \mathrm{Y2^-} \oplus \mathrm{Y3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u}$
N68.9.316 $\mathrm{Y1^+} \oplus \mathrm{Y2^-} \oplus \mathrm{Y4^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u}$
N68.9.317 $\mathrm{Y1^+} \oplus \mathrm{Y3^+} \oplus \mathrm{Y3^+}$	$\surd$	0	0	$\surd$	-	-
N68.9.318 $\mathrm{Y1^+} \oplus \mathrm{Y3^+} \oplus \mathrm{Y4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N68.9.319 $\mathrm{Y1^+} \oplus \mathrm{Y4^-} \oplus \mathrm{Y4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_u} \oplus \mathrm{B2_u}$
N68.9.320 $\mathrm{Y1^+} \oplus \mathrm{Y3^+} \oplus \mathrm{Y3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u}$
N68.9.321 $\mathrm{Y1^+} \oplus \mathrm{Y3^+} \oplus \mathrm{Y4^+}$	$\surd$	0	0	$\surd$	-	-
N68.9.322 $\mathrm{Y1^+} \oplus \mathrm{Y4^-} \oplus \mathrm{Y3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_u}$
N68.9.323 $\mathrm{Y1^+} \oplus \mathrm{Y4^-} \oplus \mathrm{Y4^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B2_u}$
N68.9.324 $\mathrm{Y1^+} \oplus \mathrm{Y3^-} \oplus \mathrm{Y3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B3_u}$
N68.9.325 $\mathrm{Y1^+} \oplus \mathrm{Y3^-} \oplus \mathrm{Y4^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u}$
N68.9.326 $\mathrm{Y1^+} \oplus \mathrm{Y4^+} \oplus \mathrm{Y4^+}$	$\surd$	0	0	$\surd$	-	-
N68.9.327 $\mathrm{Y2^+} \oplus \mathrm{Y2^+} \oplus \mathrm{Y2^+}$	$\surd$	0	0	$\surd$	-	-
N68.9.328 $\mathrm{Y2^+} \oplus \mathrm{Y2^+} \oplus \mathrm{Y2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u}$
N68.9.329 $\mathrm{Y2^+} \oplus \mathrm{Y2^+} \oplus \mathrm{Y3^+}$	$\surd$	0	0	$\surd$	-	-
N68.9.330 $\mathrm{Y2^+} \oplus \mathrm{Y2^+} \oplus \mathrm{Y4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B3_u}$
N68.9.331 $\mathrm{Y2^+} \oplus \mathrm{Y2^-} \oplus \mathrm{Y3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B2_u}$
N68.9.332 $\mathrm{Y2^+} \oplus \mathrm{Y2^+} \oplus \mathrm{Y3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_u} \oplus \mathrm{B2_u}$
N68.9.333 $\mathrm{Y2^+} \oplus \mathrm{Y2^+} \oplus \mathrm{Y4^+}$	$\surd$	0	0	$\surd$	-	-
N68.9.334 $\mathrm{Y2^+} \oplus \mathrm{Y2^-} \oplus \mathrm{Y3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B2_u}$
N68.9.335 $\mathrm{Y2^+} \oplus \mathrm{Y3^+} \oplus \mathrm{Y3^+}$	$\surd$	0	0	$\surd$	-	-
N68.9.336 $\mathrm{Y2^+} \oplus \mathrm{Y3^+} \oplus \mathrm{Y4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u}$
N68.9.337 $\mathrm{Y2^+} \oplus \mathrm{Y4^-} \oplus \mathrm{Y4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B3_u}$
N68.9.338 $\mathrm{Y2^+} \oplus \mathrm{Y3^+} \oplus \mathrm{Y3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B2_u}$

Non-coplanar SSGs with parent space group $Ccce$ (No. 68) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N68.9.339 $\mathrm{Y2}^{+}\oplus\mathrm{Y3}^{+}\oplus\mathrm{Y4}^{+}$	$\surd$	0	0	$\surd$	-	-
N68.9.340 $\mathrm{Y2}^{+}\oplus\mathrm{Y4}^{-}\oplus\mathrm{Y3}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u}\oplus\mathrm{B2_u}$
N68.9.341 $\mathrm{Y2}^{+}\oplus\mathrm{Y4}^{-}\oplus\mathrm{Y4}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B3_u}$
N68.9.342 $\mathrm{Y2}^{+}\oplus\mathrm{Y3}^{-}\oplus\mathrm{Y3}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_u}\oplus\mathrm{B2_u}$
N68.9.343 $\mathrm{Y2}^{+}\oplus\mathrm{Y3}^{-}\oplus\mathrm{Y4}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B2_u}$
N68.9.344 $\mathrm{Y2}^{+}\oplus\mathrm{Y4}^{+}\oplus\mathrm{Y4}^{+}$	$\surd$	0	0	$\surd$	-	-
N68.9.345 $\mathrm{Y3}^{+}\oplus\mathrm{Y3}^{+}\oplus\mathrm{Y3}^{+}$	$\surd$	0	0	$\surd$	-	-
N68.9.346 $\mathrm{Y3}^{+}\oplus\mathrm{Y3}^{+}\oplus\mathrm{Y4}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B1_u}$
N68.9.347 $\mathrm{Y3}^{+}\oplus\mathrm{Y3}^{+}\oplus\mathrm{Y3}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{A_u}$
N68.9.348 $\mathrm{Y3}^{+}\oplus\mathrm{Y3}^{+}\oplus\mathrm{Y4}^{+}$	$\surd$	0	0	$\surd$	-	-
N68.9.349 $\mathrm{Y3}^{+}\oplus\mathrm{Y4}^{-}\oplus\mathrm{Y3}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B1_u}$
N68.9.350 $\mathrm{Y3}^{+}\oplus\mathrm{Y3}^{-}\oplus\mathrm{Y3}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{A_u}$
N68.9.351 $\mathrm{Y3}^{+}\oplus\mathrm{Y3}^{-}\oplus\mathrm{Y4}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B1_u}$
N68.9.352 $\mathrm{Y3}^{+}\oplus\mathrm{Y4}^{+}\oplus\mathrm{Y4}^{+}$	$\surd$	0	0	$\surd$	-	-
N68.9.353 $\mathrm{Y3}^{-}\oplus\mathrm{Y3}^{-}\oplus\mathrm{Y3}^{-}$	$\surd$	0	0	$\surd$	-	-
N68.9.354 $\mathrm{Y3}^{-}\oplus\mathrm{Y3}^{-}\oplus\mathrm{Y4}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B1_u}$
N68.12.1 $\mathrm{GM1}^{-}\oplus\mathrm{T1}$	$\surd$	1	1	$\times$	-	-
N68.12.2 $\mathrm{GM1}^{-}\oplus\mathrm{T2}$	$\surd$	1	1	$\times$	-	-
N68.12.3 $\mathrm{GM1}^{-}\oplus\mathrm{Z1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N68.12.4 $\mathrm{GM1}^{-}\oplus\mathrm{Z2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N68.12.5 $\mathrm{GM2}^{+}\oplus\mathrm{T1}$	$\surd$	1	1	$\surd$	222	B1
N68.12.6 $\mathrm{GM2}^{+}\oplus\mathrm{T2}$	$\surd$	1	1	$\surd$	222	B1
N68.12.7 $\mathrm{GM2}^{+}\oplus\mathrm{Z1}$	$\surd$	1	1	$\surd$	222	B1
N68.12.8 $\mathrm{GM2}^{+}\oplus\mathrm{Z2}$	$\surd$	1	1	$\surd$	222	B1
N68.12.9 $\mathrm{GM2}^{-}\oplus\mathrm{T1}$	$\surd$	1	1	$\times$	-	-
N68.12.10 $\mathrm{GM2}^{-}\oplus\mathrm{T2}$	$\surd$	1	1	$\times$	-	-
N68.12.11 $\mathrm{GM2}^{-}\oplus\mathrm{Z1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N68.12.12 $\mathrm{GM2}^{-}\oplus\mathrm{Z2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N68.12.13 $\mathrm{GM3}^{+}\oplus\mathrm{T1}$	$\surd$	1	1	$\times$	-	-
N68.12.14 $\mathrm{GM3}^{+}\oplus\mathrm{T2}$	$\surd$	1	1	$\times$	-	-
N68.12.15 $\mathrm{GM3}^{+}\oplus\mathrm{Z1}$	$\surd$	1	1	$\surd$	$mm2$	B2
N68.12.16 $\mathrm{GM3}^{+}\oplus\mathrm{Z2}$	$\surd$	1	1	$\surd$	$mm2$	B2
N68.12.17 $\mathrm{GM3}^{-}\oplus\mathrm{T1}$	$\surd$	1	1	$\times$	-	-
N68.12.18 $\mathrm{GM3}^{-}\oplus\mathrm{T2}$	$\surd$	1	1	$\times$	-	-
N68.12.19 $\mathrm{GM3}^{-}\oplus\mathrm{Z1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N68.12.20 $\mathrm{GM3}^{-}\oplus\mathrm{Z2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N68.12.21 $\mathrm{Y1}^{+}\oplus\mathrm{T1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N68.12.22 $\mathrm{Y1}^{+}\oplus\mathrm{T2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N68.12.23 $\mathrm{Y1}^{+}\oplus\mathrm{Z1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N68.12.24 $\mathrm{Y1}^{+}\oplus\mathrm{Z2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N68.12.25 $\mathrm{Y2}^{+}\oplus\mathrm{T1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N68.12.26 $\mathrm{Y2}^{+}\oplus\mathrm{T2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N68.12.27 $\mathrm{Y2}^{+}\oplus\mathrm{Z1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N68.12.28 $\mathrm{Y2}^{+}\oplus\mathrm{Z2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N68.12.29 $\mathrm{Y3}^{+}\oplus\mathrm{T1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N68.12.30 $\mathrm{Y3}^{+}\oplus\mathrm{T2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$

Non-coplanar SSGs with parent space group $Ccce$ (No. 68) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N68.12.31 $\mathrm{Y3}^{+} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N68.12.32 $\mathrm{Y3}^{+} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N68.12.33 $\mathrm{Y3}^{-} \oplus \mathrm{T1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N68.12.34 $\mathrm{Y3}^{-} \oplus \mathrm{T2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N68.12.35 $\mathrm{Y3}^{-} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N68.12.36 $\mathrm{Y3}^{-} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N68.14.1 $\mathrm{GM1}^{-} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N68.14.2 $\mathrm{GM1}^{-} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N68.14.3 $\mathrm{GM1}^{-} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N68.14.4 $\mathrm{GM1}^{-} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N68.14.5 $\mathrm{GM1}^{-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N68.14.6 $\mathrm{GM1}^{-} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N68.14.7 $\mathrm{GM1}^{-} \oplus \mathrm{H1}$	$\surd$	1	1	$\times$	-	-
N68.14.8 $\mathrm{GM1}^{-} \oplus \mathrm{H3}$	$\surd$	1	1	$\times$	-	-
N68.14.9 $\mathrm{GM2}^{+} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	$mm2$	B2
N68.14.10 $\mathrm{GM2}^{+} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	$mm2$	B2
N68.14.11 $\mathrm{GM2}^{+} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	$mm2$	B2
N68.14.12 $\mathrm{GM2}^{+} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	$mm2$	B2
N68.14.13 $\mathrm{GM2}^{+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	222	B1
N68.14.14 $\mathrm{GM2}^{+} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	222	B1
N68.14.15 $\mathrm{GM2}^{+} \oplus \mathrm{H1}$	$\surd$	1	1	$\surd$	222	B1
N68.14.16 $\mathrm{GM2}^{+} \oplus \mathrm{H3}$	$\surd$	1	1	$\surd$	222	B1
N68.14.17 $\mathrm{GM2}^{-} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N68.14.18 $\mathrm{GM2}^{-} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N68.14.19 $\mathrm{GM2}^{-} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N68.14.20 $\mathrm{GM2}^{-} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N68.14.21 $\mathrm{GM2}^{-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N68.14.22 $\mathrm{GM2}^{-} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N68.14.23 $\mathrm{GM2}^{-} \oplus \mathrm{H1}$	$\surd$	1	1	$\times$	-	-
N68.14.24 $\mathrm{GM2}^{-} \oplus \mathrm{H3}$	$\surd$	1	1	$\times$	-	-
N68.14.25 $\mathrm{GM3}^{+} \oplus \mathrm{SM1}$	$\surd$	1	1	$\surd$	222	B3
N68.14.26 $\mathrm{GM3}^{+} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	$mm2$	B2
N68.14.27 $\mathrm{GM3}^{+} \oplus \mathrm{SM2}$	$\surd$	1	1	$\surd$	222	B3
N68.14.28 $\mathrm{GM3}^{+} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	$mm2$	B2
N68.14.29 $\mathrm{GM3}^{+} \oplus \mathrm{SM3}$	$\surd$	1	1	$\surd$	222	B3
N68.14.30 $\mathrm{GM3}^{+} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	$mm2$	B2
N68.14.31 $\mathrm{GM3}^{+} \oplus \mathrm{SM4}$	$\surd$	1	1	$\surd$	222	B3
N68.14.32 $\mathrm{GM3}^{+} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	$mm2$	B2
N68.14.33 $\mathrm{GM3}^{+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$mm2$	B2
N68.14.34 $\mathrm{GM3}^{+} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	$mm2$	B2
N68.14.35 $\mathrm{GM3}^{+} \oplus \mathrm{H1}$	$\surd$	1	1	$\times$	-	-
N68.14.36 $\mathrm{GM3}^{+} \oplus \mathrm{H3}$	$\surd$	1	1	$\times$	-	-
N68.14.37 $\mathrm{GM3}^{-} \oplus \mathrm{SM1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N68.14.38 $\mathrm{GM3}^{-} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N68.14.39 $\mathrm{GM3}^{-} \oplus \mathrm{SM2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N68.14.40 $\mathrm{GM3}^{-} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$

Non-coplanar SSGs with parent space group $Ccce$ (No. 68) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N68.14.41 $\mathrm{GM3}^{-} \oplus \mathrm{SM3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N68.14.42 $\mathrm{GM3}^{-} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N68.14.43 $\mathrm{GM3}^{-} \oplus \mathrm{SM4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N68.14.44 $\mathrm{GM3}^{-} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N68.14.45 $\mathrm{GM3}^{-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N68.14.46 $\mathrm{GM3}^{-} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N68.14.47 $\mathrm{GM3}^{-} \oplus \mathrm{H1}$	$\surd$	1	1	$\times$	-	-
N68.14.48 $\mathrm{GM3}^{-} \oplus \mathrm{H3}$	$\surd$	1	1	$\times$	-	-
N68.14.49 $\mathrm{Y1}^{+} \oplus \mathrm{SM1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N68.14.50 $\mathrm{Y1}^{+} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N68.14.51 $\mathrm{Y1}^{+} \oplus \mathrm{SM2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N68.14.52 $\mathrm{Y1}^{+} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N68.14.53 $\mathrm{Y1}^{+} \oplus \mathrm{SM3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N68.14.54 $\mathrm{Y1}^{+} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N68.14.55 $\mathrm{Y1}^{+} \oplus \mathrm{SM4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N68.14.56 $\mathrm{Y1}^{+} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N68.14.57 $\mathrm{Y1}^{+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N68.14.58 $\mathrm{Y1}^{+} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N68.14.59 $\mathrm{Y1}^{+} \oplus \mathrm{H1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N68.14.60 $\mathrm{Y1}^{+} \oplus \mathrm{H3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N68.14.61 $\mathrm{Y2}^{+} \oplus \mathrm{SM1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N68.14.62 $\mathrm{Y2}^{+} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N68.14.63 $\mathrm{Y2}^{+} \oplus \mathrm{SM2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N68.14.64 $\mathrm{Y2}^{+} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N68.14.65 $\mathrm{Y2}^{+} \oplus \mathrm{SM3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N68.14.66 $\mathrm{Y2}^{+} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N68.14.67 $\mathrm{Y2}^{+} \oplus \mathrm{SM4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N68.14.68 $\mathrm{Y2}^{+} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N68.14.69 $\mathrm{Y2}^{+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N68.14.70 $\mathrm{Y2}^{+} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N68.14.71 $\mathrm{Y2}^{+} \oplus \mathrm{H1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N68.14.72 $\mathrm{Y2}^{+} \oplus \mathrm{H3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N68.14.73 $\mathrm{Y3}^{+} \oplus \mathrm{SM1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N68.14.74 $\mathrm{Y3}^{+} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N68.14.75 $\mathrm{Y3}^{+} \oplus \mathrm{SM2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N68.14.76 $\mathrm{Y3}^{+} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N68.14.77 $\mathrm{Y3}^{+} \oplus \mathrm{SM3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N68.14.78 $\mathrm{Y3}^{+} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N68.14.79 $\mathrm{Y3}^{+} \oplus \mathrm{SM4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N68.14.80 $\mathrm{Y3}^{+} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N68.14.81 $\mathrm{Y3}^{+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N68.14.82 $\mathrm{Y3}^{+} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N68.14.83 $\mathrm{Y3}^{+} \oplus \mathrm{H1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N68.14.84 $\mathrm{Y3}^{+} \oplus \mathrm{H3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N68.14.85 $\mathrm{Y3}^{-} \oplus \mathrm{SM1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N68.14.86 $\mathrm{Y3}^{-} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$

Non-coplanar SSGs with parent space group $Ccce$ (No. 68) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N68.14.87 $\mathrm{Y3}^{-} \oplus \mathrm{SM2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N68.14.88 $\mathrm{Y3}^{-} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N68.14.89 $\mathrm{Y3}^{-} \oplus \mathrm{SM3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N68.14.90 $\mathrm{Y3}^{-} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N68.14.91 $\mathrm{Y3}^{-} \oplus \mathrm{SM4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N68.14.92 $\mathrm{Y3}^{-} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N68.14.93 $\mathrm{Y3}^{-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N68.14.94 $\mathrm{Y3}^{-} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N68.14.95 $\mathrm{Y3}^{-} \oplus \mathrm{H1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N68.14.96 $\mathrm{Y3}^{-} \oplus \mathrm{H3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$

TABLE S205: Collinear SSGs with parent space group $Fmmm$ (No. 69).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L69.1.1 $\mathrm{GM1}^{+}$	1	mmm	$\mathrm{A_g}$
L69.2.1 $\mathrm{GM1}^{-}$	0	-	-
L69.2.2 $\mathrm{GM2}^{+}$	1	mmm	$\mathrm{B1_g}$
L69.2.3 $\mathrm{GM2}^{-}$	0	-	-
L69.2.4 $\mathrm{T1}^{+}$	0	-	-
L69.2.5 $\mathrm{T1}^{-}$	0	-	-
L69.2.6 $\mathrm{T2}^{+}$	0	-	-
L69.2.7 $\mathrm{T2}^{-}$	0	-	-
L69.2.8 $\mathrm{T3}^{+}$	0	-	-
L69.2.9 $\mathrm{T3}^{-}$	0	-	-

TABLE S206: Coplanar SSGs with parent space group $Fmmm$ (No. 69).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P69.1.1 $\mathrm{GM1}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
P69.2.1 $\mathrm{GM1}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
P69.2.2 $\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
P69.2.3 $\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
P69.2.4 $\mathrm{T1}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P69.2.5 $\mathrm{T1}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P69.2.6 $\mathrm{T2}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P69.2.7 $\mathrm{T2}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P69.2.8 $\mathrm{T3}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P69.2.9 $\mathrm{T3}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P69.3.1 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-}$	$\surd$	0	0	$\surd$	-	-
P69.3.2 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
P69.3.3 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
P69.3.4 $\mathrm{GM1}^{-} \oplus \mathrm{T1}^{+}$	$\surd$	1	1	$\times$	-	-
P69.3.5 $\mathrm{GM1}^{-} \oplus \mathrm{T1}^{-}$	$\surd$	1	1	$\times$	-	-
P69.3.6 $\mathrm{GM1}^{-} \oplus \mathrm{T2}^{+}$	$\surd$	1	1	$\times$	-	-
P69.3.7 $\mathrm{GM1}^{-} \oplus \mathrm{T2}^{-}$	$\surd$	1	1	$\times$	-	-

Coplanar SSGs with parent space group $Fmmm$ (No. 69) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P69.3.8 $\mathrm{GM1}^- \oplus \mathrm{T3}^+$	$\surd$	1	1	$\times$	-	-
P69.3.9 $\mathrm{GM1}^- \oplus \mathrm{T3}^-$	$\surd$	1	1	$\times$	-	-
P69.3.10 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
P69.3.11 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
P69.3.12 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
P69.3.13 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
P69.3.14 $\mathrm{GM2}^+ \oplus \mathrm{T1}^+$	$\surd$	1	0	$\times$	-	-
P69.3.15 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
P69.3.16 $\mathrm{GM2}^+ \oplus \mathrm{T1}^-$	$\surd$	1	0	$\times$	-	-
P69.3.17 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
P69.3.18 $\mathrm{GM2}^+ \oplus \mathrm{T2}^+$	$\surd$	1	0	$\times$	-	-
P69.3.19 $\mathrm{GM2}^+ \oplus \mathrm{T4}^+$	$\surd$	1	0	$\times$	-	-
P69.3.20 $\mathrm{GM2}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
P69.3.21 $\mathrm{GM2}^+ \oplus \mathrm{T2}^-$	$\surd$	1	0	$\times$	-	-
P69.3.22 $\mathrm{GM2}^+ \oplus \mathrm{T4}^-$	$\surd$	1	0	$\times$	-	-
P69.3.23 $\mathrm{GM2}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
P69.3.24 $\mathrm{GM2}^+ \oplus \mathrm{T3}^+$	$\surd$	1	0	$\times$	-	-
P69.3.25 $\mathrm{GM2}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
P69.3.26 $\mathrm{GM2}^+ \oplus \mathrm{T3}^-$	$\surd$	1	0	$\times$	-	-
P69.3.27 $\mathrm{GM2}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-
P69.3.28 $\mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
P69.3.29 $\mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
P69.3.30 $\mathrm{GM2}^- \oplus \mathrm{T1}^+$	$\surd$	1	1	$\times$	-	-
P69.3.31 $\mathrm{GM2}^- \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\times$	-	-
P69.3.32 $\mathrm{GM2}^- \oplus \mathrm{T1}^-$	$\surd$	1	1	$\times$	-	-
P69.3.33 $\mathrm{GM2}^- \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
P69.3.34 $\mathrm{GM2}^- \oplus \mathrm{T2}^+$	$\surd$	1	1	$\times$	-	-
P69.3.35 $\mathrm{GM2}^- \oplus \mathrm{T4}^+$	$\surd$	1	1	$\times$	-	-
P69.3.36 $\mathrm{GM2}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
P69.3.37 $\mathrm{GM2}^- \oplus \mathrm{T2}^-$	$\surd$	1	1	$\times$	-	-
P69.3.38 $\mathrm{GM2}^- \oplus \mathrm{T4}^-$	$\surd$	1	1	$\times$	-	-
P69.3.39 $\mathrm{GM2}^- \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
P69.3.40 $\mathrm{GM2}^- \oplus \mathrm{T3}^+$	$\surd$	1	1	$\times$	-	-
P69.3.41 $\mathrm{GM2}^- \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\times$	-	-
P69.3.42 $\mathrm{GM2}^- \oplus \mathrm{T3}^-$	$\surd$	1	1	$\times$	-	-
P69.3.43 $\mathrm{GM2}^- \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\times$	-	-
P69.3.44 $\mathrm{T1}^+ \oplus \mathrm{T1}^+$	$\surd$	1	0	$\times$	-	-
P69.3.45 $\mathrm{T1}^+ \oplus \mathrm{Y1}^+$	$\times$	-	-	-	-	-
P69.3.46 $\mathrm{T1}^+ \oplus \mathrm{T1}^-$	$\surd$	1	1	$\times$	-	-
P69.3.47 $\mathrm{T1}^+ \oplus \mathrm{Y1}^-$	$\times$	-	-	-	-	-
P69.3.48 $\mathrm{T1}^+ \oplus \mathrm{T2}^+$	$\surd$	1	0	$\times$	-	-
P69.3.49 $\mathrm{T1}^+ \oplus \mathrm{Y2}^+$	$\times$	-	-	-	-	-
P69.3.50 $\mathrm{T1}^+ \oplus \mathrm{Y3}^+$	$\times$	-	-	-	-	-
P69.3.51 $\mathrm{T1}^+ \oplus \mathrm{T2}^-$	$\surd$	1	1	$\times$	-	-
P69.3.52 $\mathrm{T1}^+ \oplus \mathrm{Y2}^-$	$\times$	-	-	-	-	-
P69.3.53 $\mathrm{T1}^+ \oplus \mathrm{Y3}^-$	$\times$	-	-	-	-	-

Coplanar SSGs with parent space group $Fmmm$ (No. 69) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P69.3.54 $\mathrm{T1}^{+} \oplus \mathrm{T3}^{+}$	$\surd$	1	0	$\times$	-	-
P69.3.55 $\mathrm{T1}^{+} \oplus \mathrm{Y4}^{+}$	$\times$	-	-	-	-	-
P69.3.56 $\mathrm{T1}^{+} \oplus \mathrm{T3}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P69.3.57 $\mathrm{T1}^{+} \oplus \mathrm{Y4}^{-}$	$\times$	-	-	-	-	-
P69.3.58 $\mathrm{T1}^{-} \oplus \mathrm{T1}^{-}$	$\surd$	1	0	$\times$	-	-
P69.3.59 $\mathrm{T1}^{-} \oplus \mathrm{Y1}^{-}$	$\times$	-	-	-	-	-
P69.3.60 $\mathrm{T1}^{-} \oplus \mathrm{T2}^{+}$	$\surd$	1	1	$\times$	-	-
P69.3.61 $\mathrm{T1}^{-} \oplus \mathrm{Y2}^{+}$	$\times$	-	-	-	-	-
P69.3.62 $\mathrm{T1}^{-} \oplus \mathrm{Y3}^{+}$	$\times$	-	-	-	-	-
P69.3.63 $\mathrm{T1}^{-} \oplus \mathrm{T2}^{-}$	$\surd$	1	0	$\times$	-	-
P69.3.64 $\mathrm{T1}^{-} \oplus \mathrm{Y2}^{-}$	$\times$	-	-	-	-	-
P69.3.65 $\mathrm{T1}^{-} \oplus \mathrm{Y3}^{-}$	$\times$	-	-	-	-	-
P69.3.66 $\mathrm{T1}^{-} \oplus \mathrm{T3}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P69.3.67 $\mathrm{T1}^{-} \oplus \mathrm{Y4}^{+}$	$\times$	-	-	-	-	-
P69.3.68 $\mathrm{T1}^{-} \oplus \mathrm{T3}^{-}$	$\surd$	1	0	$\times$	-	-
P69.3.69 $\mathrm{T1}^{-} \oplus \mathrm{Y4}^{-}$	$\times$	-	-	-	-	-
P69.3.70 $\mathrm{T2}^{+} \oplus \mathrm{T2}^{+}$	$\surd$	1	0	$\times$	-	-
P69.3.71 $\mathrm{T2}^{+} \oplus \mathrm{T4}^{+}$	$\surd$	1	0	$\times$	-	-
P69.3.72 $\mathrm{T2}^{+} \oplus \mathrm{Y2}^{+}$	$\times$	-	-	-	-	-
P69.3.73 $\mathrm{T2}^{+} \oplus \mathrm{Y3}^{+}$	$\times$	-	-	-	-	-
P69.3.74 $\mathrm{T2}^{+} \oplus \mathrm{Z3}^{+}$	$\times$	-	-	-	-	-
P69.3.75 $\mathrm{T2}^{+} \oplus \mathrm{T2}^{-}$	$\surd$	1	1	$\times$	-	-
P69.3.76 $\mathrm{T2}^{+} \oplus \mathrm{T4}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P69.3.77 $\mathrm{T2}^{+} \oplus \mathrm{Y2}^{-}$	$\times$	-	-	-	-	-
P69.3.78 $\mathrm{T2}^{+} \oplus \mathrm{Y3}^{-}$	$\times$	-	-	-	-	-
P69.3.79 $\mathrm{T2}^{+} \oplus \mathrm{Z3}^{-}$	$\times$	-	-	-	-	-
P69.3.80 $\mathrm{T2}^{+} \oplus \mathrm{Z4}^{-}$	$\times$	-	-	-	-	-
P69.3.81 $\mathrm{T2}^{+} \oplus \mathrm{T3}^{+}$	$\surd$	1	0	$\times$	-	-
P69.3.82 $\mathrm{T2}^{+} \oplus \mathrm{Y4}^{+}$	$\times$	-	-	-	-	-
P69.3.83 $\mathrm{T2}^{+} \oplus \mathrm{Z2}^{+}$	$\times$	-	-	-	-	-
P69.3.84 $\mathrm{T2}^{+} \oplus \mathrm{T3}^{-}$	$\surd$	1	1	$\times$	-	-
P69.3.85 $\mathrm{T2}^{+} \oplus \mathrm{Y4}^{-}$	$\times$	-	-	-	-	-
P69.3.86 $\mathrm{T2}^{+} \oplus \mathrm{Z2}^{-}$	$\times$	-	-	-	-	-
P69.3.87 $\mathrm{T2}^{-} \oplus \mathrm{T2}^{-}$	$\surd$	1	0	$\times$	-	-
P69.3.88 $\mathrm{T2}^{-} \oplus \mathrm{T4}^{-}$	$\surd$	1	0	$\times$	-	-
P69.3.89 $\mathrm{T2}^{-} \oplus \mathrm{Y2}^{-}$	$\times$	-	-	-	-	-
P69.3.90 $\mathrm{T2}^{-} \oplus \mathrm{Y3}^{-}$	$\times$	-	-	-	-	-
P69.3.91 $\mathrm{T2}^{-} \oplus \mathrm{Z3}^{-}$	$\times$	-	-	-	-	-
P69.3.92 $\mathrm{T2}^{-} \oplus \mathrm{T3}^{+}$	$\surd$	1	1	$\times$	-	-
P69.3.93 $\mathrm{T2}^{-} \oplus \mathrm{Y4}^{+}$	$\times$	-	-	-	-	-
P69.3.94 $\mathrm{T2}^{-} \oplus \mathrm{Z2}^{+}$	$\times$	-	-	-	-	-
P69.3.95 $\mathrm{T2}^{-} \oplus \mathrm{T3}^{-}$	$\surd$	1	0	$\times$	-	-
P69.3.96 $\mathrm{T2}^{-} \oplus \mathrm{Y4}^{-}$	$\times$	-	-	-	-	-
P69.3.97 $\mathrm{T2}^{-} \oplus \mathrm{Z2}^{-}$	$\times$	-	-	-	-	-
P69.3.98 $\mathrm{T3}^{+} \oplus \mathrm{T3}^{+}$	$\surd$	1	0	$\times$	-	-
P69.3.99 $\mathrm{T3}^{+} \oplus \mathrm{Y4}^{+}$	$\times$	-	-	-	-	-

Coplanar SSGs with parent space group $Fmmm$ (No. 69) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P69.3.100 $\mathrm{T3}^+ \oplus \mathrm{T3}^-$	$\surd$	1	1	$\times$	-	-
P69.3.101 $\mathrm{T3}^+ \oplus \mathrm{Y4}^-$	$\times$	-	-	-	-	-
P69.3.102 $\mathrm{T3}^- \oplus \mathrm{T3}^-$	$\surd$	1	0	$\times$	-	-
P69.3.103 $\mathrm{T3}^- \oplus \mathrm{Y4}^-$	$\times$	-	-	-	-	-
P69.8.1 DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P69.8.2 DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P69.8.3 DT3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P69.8.4 A1	$\surd$	1	1	$\times$	-	-
P69.8.5 A2	$\surd$	1	1	$\times$	-	-
P69.8.6 A3	$\surd$	1	1	$\times$	-	-

TABLE S207: Non-coplanar SSGs with parent space group $Fmmm$ (No. 69).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N69.1.1 $\mathrm{GM1}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{A_g}$
N69.2.1 $\mathrm{GM1}^-$	$\surd$	2	2	$\surd$	222	$\mathrm{A1} \oplus \mathrm{A1}$
N69.2.2 $\mathrm{GM2}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B1_g}$
N69.2.3 $\mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{A1}$
N69.2.4 $\mathrm{T1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
N69.2.5 $\mathrm{T1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
N69.2.6 $\mathrm{T2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
N69.2.7 $\mathrm{T2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
N69.2.8 $\mathrm{T3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
N69.2.9 $\mathrm{T3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
N69.3.1 $\mathrm{GM1}^- \oplus \mathrm{GM1}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{A_u}$
N69.3.2 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{A2}$
N69.3.3 $\mathrm{GM1}^- \oplus \mathrm{GM2}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N69.3.4 $\mathrm{GM1}^- \oplus \mathrm{T1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
N69.3.5 $\mathrm{GM1}^- \oplus \mathrm{T1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
N69.3.6 $\mathrm{GM1}^- \oplus \mathrm{T2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
N69.3.7 $\mathrm{GM1}^- \oplus \mathrm{T2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
N69.3.8 $\mathrm{GM1}^- \oplus \mathrm{T3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
N69.3.9 $\mathrm{GM1}^- \oplus \mathrm{T3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
N69.3.10 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N69.3.11 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g} \oplus \mathrm{B3_g}$
N69.3.12 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	2	2	$\surd$	222	$\mathrm{A1} \oplus \mathrm{B1}$
N69.3.13 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{B1}$
N69.3.14 $\mathrm{GM2}^+ \oplus \mathrm{T1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
N69.3.15 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
N69.3.16 $\mathrm{GM2}^+ \oplus \mathrm{T1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
N69.3.17 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
N69.3.18 $\mathrm{GM2}^+ \oplus \mathrm{T2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
N69.3.19 $\mathrm{GM2}^+ \oplus \mathrm{T4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
N69.3.20 $\mathrm{GM2}^+ \oplus \mathrm{Z3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
N69.3.21 $\mathrm{GM2}^+ \oplus \mathrm{T2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
N69.3.22 $\mathrm{GM2}^+ \oplus \mathrm{T4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$

Non-coplanar SSGs with parent space group $Fmmm$ (No. 69) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N69.3.23 $\mathrm{GM2}^{+}\oplus\mathrm{Z3}^{-}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B1_g}$
N69.3.24 $\mathrm{GM2}^{+}\oplus\mathrm{T3}^{+}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B1_g}$
N69.3.25 $\mathrm{GM2}^{+}\oplus\mathrm{Z2}^{+}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B1_g}$
N69.3.26 $\mathrm{GM2}^{+}\oplus\mathrm{T3}^{-}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B1_g}$
N69.3.27 $\mathrm{GM2}^{+}\oplus\mathrm{Z2}^{-}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B1_g}$
N69.3.28 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}$	√	3	3	√	mmm	$\mathrm{A_g}\oplus\mathrm{B1_u}\oplus\mathrm{B1_u}$
N69.3.29 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}$	√	3	3	√	mmm	$\mathrm{A_g}\oplus\mathrm{B1_u}\oplus\mathrm{B3_u}$
N69.3.30 $\mathrm{GM2}^{-}\oplus\mathrm{T1}^{+}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B1_u}$
N69.3.31 $\mathrm{GM2}^{-}\oplus\mathrm{Z1}^{+}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B1_u}$
N69.3.32 $\mathrm{GM2}^{-}\oplus\mathrm{T1}^{-}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B1_u}$
N69.3.33 $\mathrm{GM2}^{-}\oplus\mathrm{Z1}^{-}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B1_u}$
N69.3.34 $\mathrm{GM2}^{-}\oplus\mathrm{T2}^{+}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B1_u}$
N69.3.35 $\mathrm{GM2}^{-}\oplus\mathrm{T4}^{+}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B1_u}$
N69.3.36 $\mathrm{GM2}^{-}\oplus\mathrm{Z3}^{+}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B1_u}$
N69.3.37 $\mathrm{GM2}^{-}\oplus\mathrm{T2}^{-}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B1_u}$
N69.3.38 $\mathrm{GM2}^{-}\oplus\mathrm{T4}^{-}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B1_u}$
N69.3.39 $\mathrm{GM2}^{-}\oplus\mathrm{Z3}^{-}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B1_u}$
N69.3.40 $\mathrm{GM2}^{-}\oplus\mathrm{T3}^{+}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B1_u}$
N69.3.41 $\mathrm{GM2}^{-}\oplus\mathrm{Z2}^{+}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B1_u}$
N69.3.42 $\mathrm{GM2}^{-}\oplus\mathrm{T3}^{-}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B1_u}$
N69.3.43 $\mathrm{GM2}^{-}\oplus\mathrm{Z2}^{-}$	√	2	2	√	mmm	$\mathrm{A_g}\oplus\mathrm{B1_u}$
N69.3.44 $\mathrm{T1}^{+}\oplus\mathrm{T1}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N69.3.45 $\mathrm{T1}^{+}\oplus\mathrm{Y1}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N69.3.46 $\mathrm{T1}^{+}\oplus\mathrm{T1}^{-}$	√	1	1	√	222	A1
N69.3.47 $\mathrm{T1}^{+}\oplus\mathrm{Y1}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N69.3.48 $\mathrm{T1}^{+}\oplus\mathrm{T2}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N69.3.49 $\mathrm{T1}^{+}\oplus\mathrm{Y2}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N69.3.50 $\mathrm{T1}^{+}\oplus\mathrm{Y3}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N69.3.51 $\mathrm{T1}^{+}\oplus\mathrm{T2}^{-}$	√	1	1	√	$mm2$	A1
N69.3.52 $\mathrm{T1}^{+}\oplus\mathrm{Y2}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N69.3.53 $\mathrm{T1}^{+}\oplus\mathrm{Y3}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N69.3.54 $\mathrm{T1}^{+}\oplus\mathrm{T3}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N69.3.55 $\mathrm{T1}^{+}\oplus\mathrm{Y4}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N69.3.56 $\mathrm{T1}^{+}\oplus\mathrm{T3}^{-}$	√	1	1	√	$mm2$	A1
N69.3.57 $\mathrm{T1}^{+}\oplus\mathrm{Y4}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N69.3.58 $\mathrm{T1}^{-}\oplus\mathrm{T1}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N69.3.59 $\mathrm{T1}^{-}\oplus\mathrm{Y1}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N69.3.60 $\mathrm{T1}^{-}\oplus\mathrm{T2}^{+}$	√	1	1	√	$mm2$	A1
N69.3.61 $\mathrm{T1}^{-}\oplus\mathrm{Y2}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N69.3.62 $\mathrm{T1}^{-}\oplus\mathrm{Y3}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N69.3.63 $\mathrm{T1}^{-}\oplus\mathrm{T2}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N69.3.64 $\mathrm{T1}^{-}\oplus\mathrm{Y2}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N69.3.65 $\mathrm{T1}^{-}\oplus\mathrm{Y3}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N69.3.66 $\mathrm{T1}^{-}\oplus\mathrm{T3}^{+}$	√	1	1	√	$mm2$	A1
N69.3.67 $\mathrm{T1}^{-}\oplus\mathrm{Y4}^{+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N69.3.68 $\mathrm{T1}^{-}\oplus\mathrm{T3}^{-}$	√	1	1	√	mmm	$\mathrm{A_g}$

Non-coplanar SSGs with parent space group $Fmmm$ (No. 69) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N69.3.69 $\mathrm{T1}^- \oplus \mathrm{Y4}^-$	√	1	1	√	mmm	$\mathrm{A_g}$
N69.3.70 $\mathrm{T2}^+ \oplus \mathrm{T2}^+$	√	1	1	√	mmm	$\mathrm{A_g}$
N69.3.71 $\mathrm{T2}^+ \oplus \mathrm{T4}^+$	√	1	1	√	mmm	$\mathrm{A_g}$
N69.3.72 $\mathrm{T2}^+ \oplus \mathrm{Y2}^+$	√	1	1	√	mmm	$\mathrm{A_g}$
N69.3.73 $\mathrm{T2}^+ \oplus \mathrm{Y3}^+$	√	1	1	√	mmm	$\mathrm{A_g}$
N69.3.74 $\mathrm{T2}^+ \oplus \mathrm{Z3}^+$	√	1	1	√	mmm	$\mathrm{A_g}$
N69.3.75 $\mathrm{T2}^+ \oplus \mathrm{T2}^-$	√	1	1	√	222	A1
N69.3.76 $\mathrm{T2}^+ \oplus \mathrm{T4}^-$	√	1	1	√	$mm2$	A1
N69.3.77 $\mathrm{T2}^+ \oplus \mathrm{Y2}^-$	√	1	1	√	mmm	$\mathrm{A_g}$
N69.3.78 $\mathrm{T2}^+ \oplus \mathrm{Y3}^-$	√	1	1	√	mmm	$\mathrm{A_g}$
N69.3.79 $\mathrm{T2}^+ \oplus \mathrm{Z3}^-$	√	1	1	√	mmm	$\mathrm{A_g}$
N69.3.80 $\mathrm{T2}^+ \oplus \mathrm{Z4}^-$	√	1	1	√	mmm	$\mathrm{A_g}$
N69.3.81 $\mathrm{T2}^+ \oplus \mathrm{T3}^+$	√	1	1	√	mmm	$\mathrm{A_g}$
N69.3.82 $\mathrm{T2}^+ \oplus \mathrm{Y4}^+$	√	1	1	√	mmm	$\mathrm{A_g}$
N69.3.83 $\mathrm{T2}^+ \oplus \mathrm{Z2}^+$	√	1	1	√	mmm	$\mathrm{A_g}$
N69.3.84 $\mathrm{T2}^+ \oplus \mathrm{T3}^-$	√	1	1	√	$mm2$	A1
N69.3.85 $\mathrm{T2}^+ \oplus \mathrm{Y4}^-$	√	1	1	√	mmm	$\mathrm{A_g}$
N69.3.86 $\mathrm{T2}^+ \oplus \mathrm{Z2}^-$	√	1	1	√	mmm	$\mathrm{A_g}$
N69.3.87 $\mathrm{T2}^- \oplus \mathrm{T2}^-$	√	1	1	√	mmm	$\mathrm{A_g}$
N69.3.88 $\mathrm{T2}^- \oplus \mathrm{T4}^-$	√	1	1	√	mmm	$\mathrm{A_g}$
N69.3.89 $\mathrm{T2}^- \oplus \mathrm{Y2}^-$	√	1	1	√	mmm	$\mathrm{A_g}$
N69.3.90 $\mathrm{T2}^- \oplus \mathrm{Y3}^-$	√	1	1	√	mmm	$\mathrm{A_g}$
N69.3.91 $\mathrm{T2}^- \oplus \mathrm{Z3}^-$	√	1	1	√	mmm	$\mathrm{A_g}$
N69.3.92 $\mathrm{T2}^- \oplus \mathrm{T3}^+$	√	1	1	√	$mm2$	A1
N69.3.93 $\mathrm{T2}^- \oplus \mathrm{Y4}^+$	√	1	1	√	mmm	$\mathrm{A_g}$
N69.3.94 $\mathrm{T2}^- \oplus \mathrm{Z2}^+$	√	1	1	√	mmm	$\mathrm{A_g}$
N69.3.95 $\mathrm{T2}^- \oplus \mathrm{T3}^-$	√	1	1	√	mmm	$\mathrm{A_g}$
N69.3.96 $\mathrm{T2}^- \oplus \mathrm{Y4}^-$	√	1	1	√	mmm	$\mathrm{A_g}$
N69.3.97 $\mathrm{T2}^- \oplus \mathrm{Z2}^-$	√	1	1	√	mmm	$\mathrm{A_g}$
N69.3.98 $\mathrm{T3}^+ \oplus \mathrm{T3}^+$	√	1	1	√	mmm	$\mathrm{A_g}$
N69.3.99 $\mathrm{T3}^+ \oplus \mathrm{Y4}^+$	√	1	1	√	mmm	$\mathrm{A_g}$
N69.3.100 $\mathrm{T3}^+ \oplus \mathrm{T3}^-$	√	1	1	√	222	A1
N69.3.101 $\mathrm{T3}^+ \oplus \mathrm{Y4}^-$	√	1	1	√	mmm	$\mathrm{A_g}$
N69.3.102 $\mathrm{T3}^- \oplus \mathrm{T3}^-$	√	1	1	√	mmm	$\mathrm{A_g}$
N69.3.103 $\mathrm{T3}^- \oplus \mathrm{Y4}^-$	√	1	1	√	mmm	$\mathrm{A_g}$
N69.8.1 DT1	√	1	1	√	$mm2$	A1
N69.8.2 DT2	√	1	1	√	$mm2$	A1
N69.8.3 DT3	√	1	1	√	$mm2$	A1
N69.8.4 A1	√	1	1	√	$mm2$	A1
N69.8.5 A2	√	1	1	√	$mm2$	A1
N69.8.6 A3	√	1	1	√	$mm2$	A1
N69.9.1 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{GM1}^-$	√	0	0	√	-	-
N69.9.2 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{GM2}^+$	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N69.9.3 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{GM2}^-$	√	0	0	√	-	-
N69.9.4 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{T1}^+$	√	0	0	√	-	-
N69.9.5 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{T1}^-$	√	0	0	√	-	-

Non-coplanar SSGs with parent space group $Fmmm$ (No. 69) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N69.9.6 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{T2}^+$	$\surd$	0	0	$\surd$	-	-
N69.9.7 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{T2}^-$	$\surd$	0	0	$\surd$	-	-
N69.9.8 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{T3}^+$	$\surd$	0	0	$\surd$	-	-
N69.9.9 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{T3}^-$	$\surd$	0	0	$\surd$	-	-
N69.9.10 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	2	2	$\surd$	222	$\mathrm{B1} \oplus \mathrm{B1}$
N69.9.11 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2} \oplus \mathrm{B1}$
N69.9.12 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N69.9.13 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_u}$
N69.9.14 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{T1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N69.9.15 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{Z1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N69.9.16 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{T1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N69.9.17 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{Z1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N69.9.18 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{T2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N69.9.19 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{T4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N69.9.20 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{Z3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N69.9.21 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{T2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N69.9.22 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{T4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N69.9.23 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{Z3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N69.9.24 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{T3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N69.9.25 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{Z2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N69.9.26 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{T3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N69.9.27 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{Z2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N69.9.28 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
N69.9.29 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N69.9.30 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{T1}^+$	$\surd$	0	0	$\surd$	-	-
N69.9.31 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Z1}^+$	$\surd$	0	0	$\surd$	-	-
N69.9.32 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{T1}^-$	$\surd$	0	0	$\surd$	-	-
N69.9.33 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Z1}^-$	$\surd$	0	0	$\surd$	-	-
N69.9.34 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{T2}^+$	$\surd$	0	0	$\surd$	-	-
N69.9.35 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{T4}^+$	$\surd$	0	0	$\surd$	-	-
N69.9.36 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Z3}^+$	$\surd$	0	0	$\surd$	-	-
N69.9.37 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{T2}^-$	$\surd$	0	0	$\surd$	-	-
N69.9.38 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{T4}^-$	$\surd$	0	0	$\surd$	-	-
N69.9.39 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Z3}^-$	$\surd$	0	0	$\surd$	-	-
N69.9.40 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{T3}^+$	$\surd$	0	0	$\surd$	-	-
N69.9.41 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Z2}^+$	$\surd$	0	0	$\surd$	-	-
N69.9.42 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{T3}^-$	$\surd$	0	0	$\surd$	-	-
N69.9.43 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Z2}^-$	$\surd$	0	0	$\surd$	-	-
N69.9.44 $\mathrm{GM1}^- \oplus \mathrm{T1}^+ \oplus \mathrm{T1}^+$	$\surd$	1	0	$\times$	-	-
N69.9.45 $\mathrm{GM1}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	0	$\times$	-	-
N69.9.46 $\mathrm{GM1}^- \oplus \mathrm{T1}^+ \oplus \mathrm{T1}^-$	$\surd$	1	1	$\times$	-	-
N69.9.47 $\mathrm{GM1}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Y1}^-$	$\surd$	1	0	$\times$	-	-
N69.9.48 $\mathrm{GM1}^- \oplus \mathrm{T1}^+ \oplus \mathrm{T2}^+$	$\surd$	1	0	$\times$	-	-
N69.9.49 $\mathrm{GM1}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N69.9.50 $\mathrm{GM1}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N69.9.51 $\mathrm{GM1}^- \oplus \mathrm{T1}^+ \oplus \mathrm{T2}^-$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $Fmmm$ (No. 69) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N69.9.52 $\mathrm{GM1}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N69.9.53 $\mathrm{GM1}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N69.9.54 $\mathrm{GM1}^- \oplus \mathrm{T1}^+ \oplus \mathrm{T3}^+$	$\surd$	1	0	$\times$	-	-
N69.9.55 $\mathrm{GM1}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
N69.9.56 $\mathrm{GM1}^- \oplus \mathrm{T1}^+ \oplus \mathrm{T3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N69.9.57 $\mathrm{GM1}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	0	$\times$	-	-
N69.9.58 $\mathrm{GM1}^- \oplus \mathrm{T1}^- \oplus \mathrm{T1}^-$	$\surd$	1	0	$\times$	-	-
N69.9.59 $\mathrm{GM1}^- \oplus \mathrm{T1}^- \oplus \mathrm{Y1}^-$	$\surd$	1	0	$\times$	-	-
N69.9.60 $\mathrm{GM1}^- \oplus \mathrm{T1}^- \oplus \mathrm{T2}^+$	$\surd$	1	1	$\times$	-	-
N69.9.61 $\mathrm{GM1}^- \oplus \mathrm{T1}^- \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N69.9.62 $\mathrm{GM1}^- \oplus \mathrm{T1}^- \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N69.9.63 $\mathrm{GM1}^- \oplus \mathrm{T1}^- \oplus \mathrm{T2}^-$	$\surd$	1	0	$\times$	-	-
N69.9.64 $\mathrm{GM1}^- \oplus \mathrm{T1}^- \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N69.9.65 $\mathrm{GM1}^- \oplus \mathrm{T1}^- \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N69.9.66 $\mathrm{GM1}^- \oplus \mathrm{T1}^- \oplus \mathrm{T3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N69.9.67 $\mathrm{GM1}^- \oplus \mathrm{T1}^- \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
N69.9.68 $\mathrm{GM1}^- \oplus \mathrm{T1}^- \oplus \mathrm{T3}^-$	$\surd$	1	0	$\times$	-	-
N69.9.69 $\mathrm{GM1}^- \oplus \mathrm{T1}^- \oplus \mathrm{Y4}^-$	$\surd$	1	0	$\times$	-	-
N69.9.70 $\mathrm{GM1}^- \oplus \mathrm{T2}^+ \oplus \mathrm{T2}^+$	$\surd$	1	0	$\times$	-	-
N69.9.71 $\mathrm{GM1}^- \oplus \mathrm{T2}^+ \oplus \mathrm{T4}^+$	$\surd$	1	0	$\times$	-	-
N69.9.72 $\mathrm{GM1}^- \oplus \mathrm{T2}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N69.9.73 $\mathrm{GM1}^- \oplus \mathrm{T2}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N69.9.74 $\mathrm{GM1}^- \oplus \mathrm{T2}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N69.9.75 $\mathrm{GM1}^- \oplus \mathrm{T2}^+ \oplus \mathrm{T2}^-$	$\surd$	1	1	$\times$	-	-
N69.9.76 $\mathrm{GM1}^- \oplus \mathrm{T2}^+ \oplus \mathrm{T4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N69.9.77 $\mathrm{GM1}^- \oplus \mathrm{T2}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N69.9.78 $\mathrm{GM1}^- \oplus \mathrm{T2}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N69.9.79 $\mathrm{GM1}^- \oplus \mathrm{T2}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N69.9.80 $\mathrm{GM1}^- \oplus \mathrm{T2}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	0	$\times$	-	-
N69.9.81 $\mathrm{GM1}^- \oplus \mathrm{T2}^+ \oplus \mathrm{T3}^+$	$\surd$	1	0	$\times$	-	-
N69.9.82 $\mathrm{GM1}^- \oplus \mathrm{T2}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
N69.9.83 $\mathrm{GM1}^- \oplus \mathrm{T2}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N69.9.84 $\mathrm{GM1}^- \oplus \mathrm{T2}^+ \oplus \mathrm{T3}^-$	$\surd$	1	1	$\times$	-	-
N69.9.85 $\mathrm{GM1}^- \oplus \mathrm{T2}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	0	$\times$	-	-
N69.9.86 $\mathrm{GM1}^- \oplus \mathrm{T2}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-
N69.9.87 $\mathrm{GM1}^- \oplus \mathrm{T2}^- \oplus \mathrm{T2}^-$	$\surd$	1	0	$\times$	-	-
N69.9.88 $\mathrm{GM1}^- \oplus \mathrm{T2}^- \oplus \mathrm{T4}^-$	$\surd$	1	0	$\times$	-	-
N69.9.89 $\mathrm{GM1}^- \oplus \mathrm{T2}^- \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N69.9.90 $\mathrm{GM1}^- \oplus \mathrm{T2}^- \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N69.9.91 $\mathrm{GM1}^- \oplus \mathrm{T2}^- \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N69.9.92 $\mathrm{GM1}^- \oplus \mathrm{T2}^- \oplus \mathrm{T3}^+$	$\surd$	1	1	$\times$	-	-
N69.9.93 $\mathrm{GM1}^- \oplus \mathrm{T2}^- \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
N69.9.94 $\mathrm{GM1}^- \oplus \mathrm{T2}^- \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N69.9.95 $\mathrm{GM1}^- \oplus \mathrm{T2}^- \oplus \mathrm{T3}^-$	$\surd$	1	0	$\times$	-	-
N69.9.96 $\mathrm{GM1}^- \oplus \mathrm{T2}^- \oplus \mathrm{Y4}^-$	$\surd$	1	0	$\times$	-	-
N69.9.97 $\mathrm{GM1}^- \oplus \mathrm{T2}^- \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $Fmmm$ (No. 69) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N69.9.98 $\mathrm{GM1}^- \oplus \mathrm{T3}^+ \oplus \mathrm{T3}^+$	$\surd$	1	0	$\times$	-	-
N69.9.99 $\mathrm{GM1}^- \oplus \mathrm{T3}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
N69.9.100 $\mathrm{GM1}^- \oplus \mathrm{T3}^+ \oplus \mathrm{T3}^-$	$\surd$	1	1	$\times$	-	-
N69.9.101 $\mathrm{GM1}^- \oplus \mathrm{T3}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	0	$\times$	-	-
N69.9.102 $\mathrm{GM1}^- \oplus \mathrm{T3}^- \oplus \mathrm{T3}^-$	$\surd$	1	0	$\times$	-	-
N69.9.103 $\mathrm{GM1}^- \oplus \mathrm{T3}^- \oplus \mathrm{Y4}^-$	$\surd$	1	0	$\times$	-	-
N69.9.104 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N69.9.105 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B3_g}$
N69.9.106 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N69.9.107 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{A2}$
N69.9.108 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2} \oplus \mathrm{B2}$
N69.9.109 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{B2}$
N69.9.110 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	222	$\mathrm{B1} \oplus \mathrm{B3}$
N69.9.111 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{T1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N69.9.112 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{Z1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N69.9.113 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{T1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N69.9.114 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Y1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N69.9.115 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{T1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N69.9.116 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{Z1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N69.9.117 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{T1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N69.9.118 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Y1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N69.9.119 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{T2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N69.9.120 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{T4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N69.9.121 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{Z3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N69.9.122 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{T2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N69.9.123 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{T4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N69.9.124 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Y2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N69.9.125 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{T2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N69.9.126 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{T4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N69.9.127 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{Z3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N69.9.128 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{T2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N69.9.129 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{T4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N69.9.130 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Y2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N69.9.131 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{T3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N69.9.132 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{Z2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N69.9.133 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{T3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N69.9.134 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Y4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N69.9.135 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{T3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N69.9.136 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{Z2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N69.9.137 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{T3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N69.9.138 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Y4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N69.9.139 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$
N69.9.140 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g} \oplus \mathrm{B2_u}$
N69.9.141 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N69.9.142 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N69.9.143 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{T1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$

Non-coplanar SSGs with parent space group $Fmmm$ (No. 69) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N69.9.144 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}\oplus\mathrm{Z1}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B1_g}$
N69.9.145 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{-}\oplus\mathrm{T1}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B2_u}$
N69.9.146 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{-}\oplus\mathrm{Y1}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B2_u}$
N69.9.147 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{-}\oplus\mathrm{Z1}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B2_u}$
N69.9.148 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}\oplus\mathrm{T1}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B1_g}$
N69.9.149 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}\oplus\mathrm{Z1}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B1_g}$
N69.9.150 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{-}\oplus\mathrm{T1}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B2_u}$
N69.9.151 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{-}\oplus\mathrm{Y1}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B2_u}$
N69.9.152 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{-}\oplus\mathrm{Z1}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B2_u}$
N69.9.153 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}\oplus\mathrm{T2}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B1_g}$
N69.9.154 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}\oplus\mathrm{T4}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B1_g}$
N69.9.155 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}\oplus\mathrm{Z3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B1_g}$
N69.9.156 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{-}\oplus\mathrm{T2}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B2_u}$
N69.9.157 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{-}\oplus\mathrm{T4}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B2_u}$
N69.9.158 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{-}\oplus\mathrm{Y2}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B2_u}$
N69.9.159 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{-}\oplus\mathrm{Y3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B2_u}$
N69.9.160 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{-}\oplus\mathrm{Z3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B2_u}$
N69.9.161 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{-}\oplus\mathrm{Z4}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B2_u}$
N69.9.162 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}\oplus\mathrm{T2}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B1_g}$
N69.9.163 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}\oplus\mathrm{T4}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B1_g}$
N69.9.164 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}\oplus\mathrm{Z3}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B1_g}$
N69.9.165 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{-}\oplus\mathrm{T2}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B2_u}$
N69.9.166 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{-}\oplus\mathrm{T4}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B2_u}$
N69.9.167 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{-}\oplus\mathrm{Y2}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B2_u}$
N69.9.168 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{-}\oplus\mathrm{Y3}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B2_u}$
N69.9.169 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{-}\oplus\mathrm{Z3}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B2_u}$
N69.9.170 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{-}\oplus\mathrm{Z4}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B2_u}$
N69.9.171 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}\oplus\mathrm{T3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B1_g}$
N69.9.172 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}\oplus\mathrm{Z2}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B1_g}$
N69.9.173 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{-}\oplus\mathrm{T3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B2_u}$
N69.9.174 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{-}\oplus\mathrm{Y4}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B2_u}$
N69.9.175 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{-}\oplus\mathrm{Z2}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B2_u}$
N69.9.176 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}\oplus\mathrm{T3}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B1_g}$
N69.9.177 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}\oplus\mathrm{Z2}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B1_g}$
N69.9.178 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{-}\oplus\mathrm{T3}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B2_u}$
N69.9.179 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{-}\oplus\mathrm{Y4}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B2_u}$
N69.9.180 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{-}\oplus\mathrm{Z2}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B2_u}$
N69.9.181 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{+}\oplus\mathrm{T1}^{+}$	$\surd$	1	1	$\times$	-	-
N69.9.182 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{+}\oplus\mathrm{Y1}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N69.9.183 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{+}\oplus\mathrm{Z1}^{+}$	$\surd$	1	1	$\times$	-	-
N69.9.184 $\mathrm{GM2}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z1}^{+}$	$\surd$	1	1	$\times$	-	-
N69.9.185 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{+}\oplus\mathrm{T1}^{-}$	$\surd$	1	1	$\times$	-	-
N69.9.186 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{+}\oplus\mathrm{Y1}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N69.9.187 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{+}\oplus\mathrm{Z1}^{-}$	$\surd$	1	1	$\times$	-	-
N69.9.188 $\mathrm{GM2}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{T1}^{-}$	$\surd$	1	1	$\times$	-	-
N69.9.189 $\mathrm{GM2}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z1}^{-}$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $Fmmm$ (No. 69) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N69.9.190 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{+}\oplus\mathrm{T2}^{+}$	$\surd$	1	1	$\times$	-	-
N69.9.191 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{+}\oplus\mathrm{T4}^{+}$	$\surd$	1	1	$\times$	-	-
N69.9.192 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{+}\oplus\mathrm{Y2}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N69.9.193 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{+}\oplus\mathrm{Y3}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N69.9.194 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{+}\oplus\mathrm{Z3}^{+}$	$\surd$	1	1	$\times$	-	-
N69.9.195 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{+}\oplus\mathrm{Z4}^{+}$	$\surd$	1	1	$\times$	-	-
N69.9.196 $\mathrm{GM2}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{T2}^{+}$	$\surd$	1	1	$\times$	-	-
N69.9.197 $\mathrm{GM2}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{T4}^{+}$	$\surd$	1	1	$\times$	-	-
N69.9.198 $\mathrm{GM2}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z3}^{+}$	$\surd$	1	1	$\times$	-	-
N69.9.199 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{+}\oplus\mathrm{T2}^{-}$	$\surd$	1	1	$\times$	-	-
N69.9.200 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{+}\oplus\mathrm{T4}^{-}$	$\surd$	1	1	$\times$	-	-
N69.9.201 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{+}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N69.9.202 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{+}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N69.9.203 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{+}\oplus\mathrm{Z3}^{-}$	$\surd$	1	1	$\times$	-	-
N69.9.204 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{+}\oplus\mathrm{Z4}^{-}$	$\surd$	1	1	$\times$	-	-
N69.9.205 $\mathrm{GM2}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{T2}^{-}$	$\surd$	1	1	$\times$	-	-
N69.9.206 $\mathrm{GM2}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{T4}^{-}$	$\surd$	1	1	$\times$	-	-
N69.9.207 $\mathrm{GM2}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z3}^{-}$	$\surd$	1	1	$\times$	-	-
N69.9.208 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{+}\oplus\mathrm{T3}^{+}$	$\surd$	1	1	$\times$	-	-
N69.9.209 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{+}\oplus\mathrm{Y4}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N69.9.210 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{+}\oplus\mathrm{Z2}^{+}$	$\surd$	1	1	$\times$	-	-
N69.9.211 $\mathrm{GM2}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{T3}^{+}$	$\surd$	1	1	$\times$	-	-
N69.9.212 $\mathrm{GM2}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z2}^{+}$	$\surd$	1	1	$\times$	-	-
N69.9.213 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{+}\oplus\mathrm{T3}^{-}$	$\surd$	1	1	$\surd$	$mm2$	B1
N69.9.214 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{+}\oplus\mathrm{Y4}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N69.9.215 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{+}\oplus\mathrm{Z2}^{-}$	$\surd$	1	1	$\times$	-	-
N69.9.216 $\mathrm{GM2}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{T3}^{-}$	$\surd$	1	1	$\times$	-	-
N69.9.217 $\mathrm{GM2}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z2}^{-}$	$\surd$	1	1	$\surd$	222	B1
N69.9.218 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{-}\oplus\mathrm{T1}^{-}$	$\surd$	1	1	$\times$	-	-
N69.9.219 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{-}\oplus\mathrm{Y1}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N69.9.220 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{-}\oplus\mathrm{Z1}^{-}$	$\surd$	1	1	$\times$	-	-
N69.9.221 $\mathrm{GM2}^{+}\oplus\mathrm{Z1}^{-}\oplus\mathrm{Z1}^{-}$	$\surd$	1	1	$\times$	-	-
N69.9.222 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{-}\oplus\mathrm{T2}^{+}$	$\surd$	1	1	$\times$	-	-
N69.9.223 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{-}\oplus\mathrm{T4}^{+}$	$\surd$	1	1	$\times$	-	-
N69.9.224 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{-}\oplus\mathrm{Y2}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N69.9.225 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{-}\oplus\mathrm{Y3}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N69.9.226 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{-}\oplus\mathrm{Z3}^{+}$	$\surd$	1	1	$\times$	-	-
N69.9.227 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{-}\oplus\mathrm{Z4}^{+}$	$\surd$	1	1	$\times$	-	-
N69.9.228 $\mathrm{GM2}^{+}\oplus\mathrm{Z1}^{-}\oplus\mathrm{T2}^{+}$	$\surd$	1	1	$\times$	-	-
N69.9.229 $\mathrm{GM2}^{+}\oplus\mathrm{Z1}^{-}\oplus\mathrm{T4}^{+}$	$\surd$	1	1	$\times$	-	-
N69.9.230 $\mathrm{GM2}^{+}\oplus\mathrm{Z1}^{-}\oplus\mathrm{Z3}^{+}$	$\surd$	1	1	$\times$	-	-
N69.9.231 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{-}\oplus\mathrm{T2}^{-}$	$\surd$	1	1	$\times$	-	-
N69.9.232 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{-}\oplus\mathrm{T4}^{-}$	$\surd$	1	1	$\times$	-	-
N69.9.233 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{-}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N69.9.234 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{-}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N69.9.235 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{-}\oplus\mathrm{Z3}^{-}$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $Fmmm$ (No. 69) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N69.9.236 $\mathrm{GM2}^+ \oplus \mathrm{T1}^- \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\times$	-	-
N69.9.237 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{T2}^-$	$\surd$	1	1	$\times$	-	-
N69.9.238 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{T4}^-$	$\surd$	1	1	$\times$	-	-
N69.9.239 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N69.9.240 $\mathrm{GM2}^+ \oplus \mathrm{T1}^- \oplus \mathrm{T3}^+$	$\surd$	1	1	$\surd$	$mm2$	B1
N69.9.241 $\mathrm{GM2}^+ \oplus \mathrm{T1}^- \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N69.9.242 $\mathrm{GM2}^+ \oplus \mathrm{T1}^- \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\times$	-	-
N69.9.243 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{T3}^+$	$\surd$	1	1	$\times$	-	-
N69.9.244 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\surd$	222	B1
N69.9.245 $\mathrm{GM2}^+ \oplus \mathrm{T1}^- \oplus \mathrm{T3}^-$	$\surd$	1	1	$\times$	-	-
N69.9.246 $\mathrm{GM2}^+ \oplus \mathrm{T1}^- \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N69.9.247 $\mathrm{GM2}^+ \oplus \mathrm{T1}^- \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\times$	-	-
N69.9.248 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{T3}^-$	$\surd$	1	1	$\times$	-	-
N69.9.249 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\times$	-	-
N69.9.250 $\mathrm{GM2}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{T2}^+$	$\surd$	1	1	$\times$	-	-
N69.9.251 $\mathrm{GM2}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{T4}^+$	$\surd$	1	1	$\times$	-	-
N69.9.252 $\mathrm{GM2}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N69.9.253 $\mathrm{GM2}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N69.9.254 $\mathrm{GM2}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
N69.9.255 $\mathrm{GM2}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\times$	-	-
N69.9.256 $\mathrm{GM2}^+ \oplus \mathrm{T4}^+ \oplus \mathrm{T4}^+$	$\surd$	1	1	$\times$	-	-
N69.9.257 $\mathrm{GM2}^+ \oplus \mathrm{T4}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N69.9.258 $\mathrm{GM2}^+ \oplus \mathrm{T4}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
N69.9.259 $\mathrm{GM2}^+ \oplus \mathrm{T4}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\times$	-	-
N69.9.260 $\mathrm{GM2}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
N69.9.261 $\mathrm{GM2}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\times$	-	-
N69.9.262 $\mathrm{GM2}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{T2}^-$	$\surd$	1	1	$\times$	-	-
N69.9.263 $\mathrm{GM2}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{T4}^-$	$\surd$	1	1	$\surd$	$mm2$	B1
N69.9.264 $\mathrm{GM2}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N69.9.265 $\mathrm{GM2}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N69.9.266 $\mathrm{GM2}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N69.9.267 $\mathrm{GM2}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\times$	-	-
N69.9.268 $\mathrm{GM2}^+ \oplus \mathrm{T4}^+ \oplus \mathrm{T2}^-$	$\surd$	1	1	$\surd$	$mm2$	B1
N69.9.269 $\mathrm{GM2}^+ \oplus \mathrm{T4}^+ \oplus \mathrm{T4}^-$	$\surd$	1	1	$\times$	-	-
N69.9.270 $\mathrm{GM2}^+ \oplus \mathrm{T4}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N69.9.271 $\mathrm{GM2}^+ \oplus \mathrm{T4}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N69.9.272 $\mathrm{GM2}^+ \oplus \mathrm{T4}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N69.9.273 $\mathrm{GM2}^+ \oplus \mathrm{T4}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\times$	-	-
N69.9.274 $\mathrm{GM2}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{T2}^-$	$\surd$	1	1	$\times$	-	-
N69.9.275 $\mathrm{GM2}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{T4}^-$	$\surd$	1	1	$\times$	-	-
N69.9.276 $\mathrm{GM2}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\times$	-	-
N69.9.277 $\mathrm{GM2}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\times$	-	-
N69.9.278 $\mathrm{GM2}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N69.9.279 $\mathrm{GM2}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\surd$	222	B1
N69.9.280 $\mathrm{GM2}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{T3}^+$	$\surd$	1	1	$\times$	-	-
N69.9.281 $\mathrm{GM2}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$

Non-coplanar SSGs with parent space group $Fmmm$ (No. 69) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N69.9.282 $\mathrm{GM2}^{+}\oplus\mathrm{T2}^{+}\oplus\mathrm{Z2}^{+}$	$\surd$	1	1	$\times$	-	-
N69.9.283 $\mathrm{GM2}^{+}\oplus\mathrm{T4}^{+}\oplus\mathrm{T3}^{+}$	$\surd$	1	1	$\times$	-	-
N69.9.284 $\mathrm{GM2}^{+}\oplus\mathrm{T4}^{+}\oplus\mathrm{Y4}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N69.9.285 $\mathrm{GM2}^{+}\oplus\mathrm{T4}^{+}\oplus\mathrm{Z2}^{+}$	$\surd$	1	1	$\times$	-	-
N69.9.286 $\mathrm{GM2}^{+}\oplus\mathrm{Z3}^{+}\oplus\mathrm{T3}^{+}$	$\surd$	1	1	$\times$	-	-
N69.9.287 $\mathrm{GM2}^{+}\oplus\mathrm{Z3}^{+}\oplus\mathrm{Y4}^{+}$	$\surd$	1	1	$\times$	-	-
N69.9.288 $\mathrm{GM2}^{+}\oplus\mathrm{Z3}^{+}\oplus\mathrm{Z2}^{+}$	$\surd$	1	1	$\times$	-	-
N69.9.289 $\mathrm{GM2}^{+}\oplus\mathrm{T2}^{+}\oplus\mathrm{T3}^{-}$	$\surd$	1	1	$\times$	-	-
N69.9.290 $\mathrm{GM2}^{+}\oplus\mathrm{T2}^{+}\oplus\mathrm{Y4}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N69.9.291 $\mathrm{GM2}^{+}\oplus\mathrm{T2}^{+}\oplus\mathrm{Z2}^{-}$	$\surd$	1	1	$\times$	-	-
N69.9.292 $\mathrm{GM2}^{+}\oplus\mathrm{T4}^{+}\oplus\mathrm{T3}^{-}$	$\surd$	1	1	$\times$	-	-
N69.9.293 $\mathrm{GM2}^{+}\oplus\mathrm{T4}^{+}\oplus\mathrm{Y4}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N69.9.294 $\mathrm{GM2}^{+}\oplus\mathrm{T4}^{+}\oplus\mathrm{Z2}^{-}$	$\surd$	1	1	$\times$	-	-
N69.9.295 $\mathrm{GM2}^{+}\oplus\mathrm{Z3}^{+}\oplus\mathrm{T3}^{-}$	$\surd$	1	1	$\times$	-	-
N69.9.296 $\mathrm{GM2}^{+}\oplus\mathrm{Z3}^{+}\oplus\mathrm{Y4}^{-}$	$\surd$	1	1	$\times$	-	-
N69.9.297 $\mathrm{GM2}^{+}\oplus\mathrm{Z3}^{+}\oplus\mathrm{Z2}^{-}$	$\surd$	1	1	$\times$	-	-
N69.9.298 $\mathrm{GM2}^{+}\oplus\mathrm{T2}^{-}\oplus\mathrm{T2}^{-}$	$\surd$	1	1	$\times$	-	-
N69.9.299 $\mathrm{GM2}^{+}\oplus\mathrm{T2}^{-}\oplus\mathrm{T4}^{-}$	$\surd$	1	1	$\times$	-	-
N69.9.300 $\mathrm{GM2}^{+}\oplus\mathrm{T2}^{-}\oplus\mathrm{Y2}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N69.9.301 $\mathrm{GM2}^{+}\oplus\mathrm{T2}^{-}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N69.9.302 $\mathrm{GM2}^{+}\oplus\mathrm{T2}^{-}\oplus\mathrm{Z3}^{-}$	$\surd$	1	1	$\times$	-	-
N69.9.303 $\mathrm{GM2}^{+}\oplus\mathrm{T2}^{-}\oplus\mathrm{Z4}^{-}$	$\surd$	1	1	$\times$	-	-
N69.9.304 $\mathrm{GM2}^{+}\oplus\mathrm{T4}^{-}\oplus\mathrm{T4}^{-}$	$\surd$	1	1	$\times$	-	-
N69.9.305 $\mathrm{GM2}^{+}\oplus\mathrm{T4}^{-}\oplus\mathrm{Y3}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N69.9.306 $\mathrm{GM2}^{+}\oplus\mathrm{T4}^{-}\oplus\mathrm{Z3}^{-}$	$\surd$	1	1	$\times$	-	-
N69.9.307 $\mathrm{GM2}^{+}\oplus\mathrm{T4}^{-}\oplus\mathrm{Z4}^{-}$	$\surd$	1	1	$\times$	-	-
N69.9.308 $\mathrm{GM2}^{+}\oplus\mathrm{Z3}^{-}\oplus\mathrm{Z3}^{-}$	$\surd$	1	1	$\times$	-	-
N69.9.309 $\mathrm{GM2}^{+}\oplus\mathrm{Z3}^{-}\oplus\mathrm{Z4}^{-}$	$\surd$	1	1	$\times$	-	-
N69.9.310 $\mathrm{GM2}^{+}\oplus\mathrm{T2}^{-}\oplus\mathrm{T3}^{+}$	$\surd$	1	1	$\times$	-	-
N69.9.311 $\mathrm{GM2}^{+}\oplus\mathrm{T2}^{-}\oplus\mathrm{Y4}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N69.9.312 $\mathrm{GM2}^{+}\oplus\mathrm{T2}^{-}\oplus\mathrm{Z2}^{+}$	$\surd$	1	1	$\times$	-	-
N69.9.313 $\mathrm{GM2}^{+}\oplus\mathrm{T4}^{-}\oplus\mathrm{T3}^{+}$	$\surd$	1	1	$\times$	-	-
N69.9.314 $\mathrm{GM2}^{+}\oplus\mathrm{T4}^{-}\oplus\mathrm{Y4}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N69.9.315 $\mathrm{GM2}^{+}\oplus\mathrm{T4}^{-}\oplus\mathrm{Z2}^{+}$	$\surd$	1	1	$\times$	-	-
N69.9.316 $\mathrm{GM2}^{+}\oplus\mathrm{Z3}^{-}\oplus\mathrm{T3}^{+}$	$\surd$	1	1	$\times$	-	-
N69.9.317 $\mathrm{GM2}^{+}\oplus\mathrm{Z3}^{-}\oplus\mathrm{Y4}^{+}$	$\surd$	1	1	$\times$	-	-
N69.9.318 $\mathrm{GM2}^{+}\oplus\mathrm{Z3}^{-}\oplus\mathrm{Z2}^{+}$	$\surd$	1	1	$\times$	-	-
N69.9.319 $\mathrm{GM2}^{+}\oplus\mathrm{T2}^{-}\oplus\mathrm{T3}^{-}$	$\surd$	1	1	$\times$	-	-
N69.9.320 $\mathrm{GM2}^{+}\oplus\mathrm{T2}^{-}\oplus\mathrm{Y4}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N69.9.321 $\mathrm{GM2}^{+}\oplus\mathrm{T2}^{-}\oplus\mathrm{Z2}^{-}$	$\surd$	1	1	$\times$	-	-
N69.9.322 $\mathrm{GM2}^{+}\oplus\mathrm{T4}^{-}\oplus\mathrm{T3}^{-}$	$\surd$	1	1	$\times$	-	-
N69.9.323 $\mathrm{GM2}^{+}\oplus\mathrm{T4}^{-}\oplus\mathrm{Y4}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N69.9.324 $\mathrm{GM2}^{+}\oplus\mathrm{T4}^{-}\oplus\mathrm{Z2}^{-}$	$\surd$	1	1	$\times$	-	-
N69.9.325 $\mathrm{GM2}^{+}\oplus\mathrm{Z3}^{-}\oplus\mathrm{T3}^{-}$	$\surd$	1	1	$\times$	-	-
N69.9.326 $\mathrm{GM2}^{+}\oplus\mathrm{Z3}^{-}\oplus\mathrm{Y4}^{-}$	$\surd$	1	1	$\times$	-	-
N69.9.327 $\mathrm{GM2}^{+}\oplus\mathrm{Z3}^{-}\oplus\mathrm{Z2}^{-}$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $Fmmm$ (No. 69) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N69.9.328 $\mathrm{GM2}^{+}\oplus\mathrm{T3}^{+}\oplus\mathrm{T3}^{+}$	$\surd$	1	1	$\times$	-	-
N69.9.329 $\mathrm{GM2}^{+}\oplus\mathrm{T3}^{+}\oplus\mathrm{Y4}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N69.9.330 $\mathrm{GM2}^{+}\oplus\mathrm{T3}^{+}\oplus\mathrm{Z2}^{+}$	$\surd$	1	1	$\times$	-	-
N69.9.331 $\mathrm{GM2}^{+}\oplus\mathrm{Z2}^{+}\oplus\mathrm{Z2}^{+}$	$\surd$	1	1	$\times$	-	-
N69.9.332 $\mathrm{GM2}^{+}\oplus\mathrm{T3}^{+}\oplus\mathrm{T3}^{-}$	$\surd$	1	1	$\times$	-	-
N69.9.333 $\mathrm{GM2}^{+}\oplus\mathrm{T3}^{+}\oplus\mathrm{Y4}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N69.9.334 $\mathrm{GM2}^{+}\oplus\mathrm{T3}^{+}\oplus\mathrm{Z2}^{-}$	$\surd$	1	1	$\times$	-	-
N69.9.335 $\mathrm{GM2}^{+}\oplus\mathrm{Z2}^{+}\oplus\mathrm{T3}^{-}$	$\surd$	1	1	$\times$	-	-
N69.9.336 $\mathrm{GM2}^{+}\oplus\mathrm{Z2}^{+}\oplus\mathrm{Z2}^{-}$	$\surd$	1	1	$\times$	-	-
N69.9.337 $\mathrm{GM2}^{+}\oplus\mathrm{T3}^{-}\oplus\mathrm{T3}^{-}$	$\surd$	1	1	$\times$	-	-
N69.9.338 $\mathrm{GM2}^{+}\oplus\mathrm{T3}^{-}\oplus\mathrm{Y4}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N69.9.339 $\mathrm{GM2}^{+}\oplus\mathrm{T3}^{-}\oplus\mathrm{Z2}^{-}$	$\surd$	1	1	$\times$	-	-
N69.9.340 $\mathrm{GM2}^{+}\oplus\mathrm{Z2}^{-}\oplus\mathrm{Z2}^{-}$	$\surd$	1	1	$\times$	-	-
N69.9.341 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
N69.9.342 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
N69.9.343 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
N69.9.344 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{T1}^{+}$	$\surd$	0	0	$\surd$	-	-
N69.9.345 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{Z1}^{+}$	$\surd$	0	0	$\surd$	-	-
N69.9.346 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{T1}^{+}$	$\surd$	0	0	$\surd$	-	-
N69.9.347 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{Y1}^{+}$	$\surd$	0	0	$\surd$	-	-
N69.9.348 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{T1}^{-}$	$\surd$	0	0	$\surd$	-	-
N69.9.349 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{Z1}^{-}$	$\surd$	0	0	$\surd$	-	-
N69.9.350 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{T1}^{-}$	$\surd$	0	0	$\surd$	-	-
N69.9.351 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{Y1}^{-}$	$\surd$	0	0	$\surd$	-	-
N69.9.352 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{T2}^{+}$	$\surd$	0	0	$\surd$	-	-
N69.9.353 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{T4}^{+}$	$\surd$	0	0	$\surd$	-	-
N69.9.354 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{Z3}^{+}$	$\surd$	0	0	$\surd$	-	-
N69.9.355 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{T2}^{+}$	$\surd$	0	0	$\surd$	-	-
N69.9.356 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{T4}^{+}$	$\surd$	0	0	$\surd$	-	-
N69.9.357 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{Y2}^{+}$	$\surd$	0	0	$\surd$	-	-
N69.9.358 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{T2}^{-}$	$\surd$	0	0	$\surd$	-	-
N69.9.359 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{T4}^{-}$	$\surd$	0	0	$\surd$	-	-
N69.9.360 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{Z3}^{-}$	$\surd$	0	0	$\surd$	-	-
N69.9.361 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{T2}^{-}$	$\surd$	0	0	$\surd$	-	-
N69.9.362 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{T4}^{-}$	$\surd$	0	0	$\surd$	-	-
N69.9.363 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{Y2}^{-}$	$\surd$	0	0	$\surd$	-	-
N69.9.364 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{T3}^{+}$	$\surd$	0	0	$\surd$	-	-
N69.9.365 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{Z2}^{+}$	$\surd$	0	0	$\surd$	-	-
N69.9.366 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{T3}^{+}$	$\surd$	0	0	$\surd$	-	-
N69.9.367 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{Y4}^{+}$	$\surd$	0	0	$\surd$	-	-
N69.9.368 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{T3}^{-}$	$\surd$	0	0	$\surd$	-	-
N69.9.369 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{Z2}^{-}$	$\surd$	0	0	$\surd$	-	-
N69.9.370 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{T3}^{-}$	$\surd$	0	0	$\surd$	-	-
N69.9.371 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{Y4}^{-}$	$\surd$	0	0	$\surd$	-	-
N69.9.372 $\mathrm{GM2}^{-}\oplus\mathrm{T1}^{+}\oplus\mathrm{T1}^{+}$	$\surd$	1	0	$\times$	-	-
N69.9.373 $\mathrm{GM2}^{-}\oplus\mathrm{T1}^{+}\oplus\mathrm{Y1}^{+}$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $Fmmm$ (No. 69) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N69.9.374 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N69.9.375 $\mathrm{GM2}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N69.9.376 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{T1}^-$	$\surd$	1	1	$\times$	-	-
N69.9.377 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Y1}^-$	$\surd$	1	0	$\times$	-	-
N69.9.378 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N69.9.379 $\mathrm{GM2}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{T1}^-$	$\surd$	1	0	$\times$	-	-
N69.9.380 $\mathrm{GM2}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
N69.9.381 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{T2}^+$	$\surd$	1	0	$\times$	-	-
N69.9.382 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{T4}^+$	$\surd$	1	0	$\times$	-	-
N69.9.383 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N69.9.384 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N69.9.385 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N69.9.386 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N69.9.387 $\mathrm{GM2}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{T2}^+$	$\surd$	1	0	$\times$	-	-
N69.9.388 $\mathrm{GM2}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{T4}^+$	$\surd$	1	0	$\times$	-	-
N69.9.389 $\mathrm{GM2}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N69.9.390 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{T2}^-$	$\surd$	1	1	$\times$	-	-
N69.9.391 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{T4}^-$	$\surd$	1	1	$\times$	-	-
N69.9.392 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N69.9.393 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N69.9.394 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N69.9.395 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	0	$\times$	-	-
N69.9.396 $\mathrm{GM2}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{T2}^-$	$\surd$	1	0	$\times$	-	-
N69.9.397 $\mathrm{GM2}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{T4}^-$	$\surd$	1	0	$\times$	-	-
N69.9.398 $\mathrm{GM2}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N69.9.399 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{T3}^+$	$\surd$	1	0	$\times$	-	-
N69.9.400 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
N69.9.401 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N69.9.402 $\mathrm{GM2}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{T3}^+$	$\surd$	1	0	$\times$	-	-
N69.9.403 $\mathrm{GM2}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N69.9.404 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{T3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N69.9.405 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	0	$\times$	-	-
N69.9.406 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-
N69.9.407 $\mathrm{GM2}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{T3}^-$	$\surd$	1	0	$\times$	-	-
N69.9.408 $\mathrm{GM2}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N69.9.409 $\mathrm{GM2}^- \oplus \mathrm{T1}^- \oplus \mathrm{T1}^-$	$\surd$	1	0	$\times$	-	-
N69.9.410 $\mathrm{GM2}^- \oplus \mathrm{T1}^- \oplus \mathrm{Y1}^-$	$\surd$	1	0	$\times$	-	-
N69.9.411 $\mathrm{GM2}^- \oplus \mathrm{T1}^- \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N69.9.412 $\mathrm{GM2}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N69.9.413 $\mathrm{GM2}^- \oplus \mathrm{T1}^- \oplus \mathrm{T2}^+$	$\surd$	1	1	$\times$	-	-
N69.9.414 $\mathrm{GM2}^- \oplus \mathrm{T1}^- \oplus \mathrm{T4}^+$	$\surd$	1	1	$\times$	-	-
N69.9.415 $\mathrm{GM2}^- \oplus \mathrm{T1}^- \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N69.9.416 $\mathrm{GM2}^- \oplus \mathrm{T1}^- \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N69.9.417 $\mathrm{GM2}^- \oplus \mathrm{T1}^- \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N69.9.418 $\mathrm{GM2}^- \oplus \mathrm{T1}^- \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N69.9.419 $\mathrm{GM2}^- \oplus \mathrm{Z1}^- \oplus \mathrm{T2}^+$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $Fmmm$ (No. 69) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N69.9.420 $\mathrm{GM2}^- \oplus \mathrm{Z1}^- \oplus \mathrm{T4}^+$	$\surd$	1	0	$\times$	-	-
N69.9.421 $\mathrm{GM2}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
N69.9.422 $\mathrm{GM2}^- \oplus \mathrm{T1}^- \oplus \mathrm{T2}^-$	$\surd$	1	0	$\times$	-	-
N69.9.423 $\mathrm{GM2}^- \oplus \mathrm{T1}^- \oplus \mathrm{T4}^-$	$\surd$	1	0	$\times$	-	-
N69.9.424 $\mathrm{GM2}^- \oplus \mathrm{T1}^- \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N69.9.425 $\mathrm{GM2}^- \oplus \mathrm{T1}^- \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N69.9.426 $\mathrm{GM2}^- \oplus \mathrm{T1}^- \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N69.9.427 $\mathrm{GM2}^- \oplus \mathrm{T1}^- \oplus \mathrm{Z4}^-$	$\surd$	1	0	$\times$	-	-
N69.9.428 $\mathrm{GM2}^- \oplus \mathrm{Z1}^- \oplus \mathrm{T2}^-$	$\surd$	1	0	$\times$	-	-
N69.9.429 $\mathrm{GM2}^- \oplus \mathrm{Z1}^- \oplus \mathrm{T4}^-$	$\surd$	1	0	$\times$	-	-
N69.9.430 $\mathrm{GM2}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N69.9.431 $\mathrm{GM2}^- \oplus \mathrm{T1}^- \oplus \mathrm{T3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N69.9.432 $\mathrm{GM2}^- \oplus \mathrm{T1}^- \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
N69.9.433 $\mathrm{GM2}^- \oplus \mathrm{T1}^- \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N69.9.434 $\mathrm{GM2}^- \oplus \mathrm{Z1}^- \oplus \mathrm{T3}^+$	$\surd$	1	0	$\times$	-	-
N69.9.435 $\mathrm{GM2}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N69.9.436 $\mathrm{GM2}^- \oplus \mathrm{T1}^- \oplus \mathrm{T3}^-$	$\surd$	1	0	$\times$	-	-
N69.9.437 $\mathrm{GM2}^- \oplus \mathrm{T1}^- \oplus \mathrm{Y4}^-$	$\surd$	1	0	$\times$	-	-
N69.9.438 $\mathrm{GM2}^- \oplus \mathrm{T1}^- \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-
N69.9.439 $\mathrm{GM2}^- \oplus \mathrm{Z1}^- \oplus \mathrm{T3}^-$	$\surd$	1	0	$\times$	-	-
N69.9.440 $\mathrm{GM2}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-
N69.9.441 $\mathrm{GM2}^- \oplus \mathrm{T2}^+ \oplus \mathrm{T2}^+$	$\surd$	1	0	$\times$	-	-
N69.9.442 $\mathrm{GM2}^- \oplus \mathrm{T2}^+ \oplus \mathrm{T4}^+$	$\surd$	1	0	$\times$	-	-
N69.9.443 $\mathrm{GM2}^- \oplus \mathrm{T2}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N69.9.444 $\mathrm{GM2}^- \oplus \mathrm{T2}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N69.9.445 $\mathrm{GM2}^- \oplus \mathrm{T2}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N69.9.446 $\mathrm{GM2}^- \oplus \mathrm{T2}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N69.9.447 $\mathrm{GM2}^- \oplus \mathrm{T4}^+ \oplus \mathrm{T4}^+$	$\surd$	1	0	$\times$	-	-
N69.9.448 $\mathrm{GM2}^- \oplus \mathrm{T4}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N69.9.449 $\mathrm{GM2}^- \oplus \mathrm{T4}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N69.9.450 $\mathrm{GM2}^- \oplus \mathrm{T4}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N69.9.451 $\mathrm{GM2}^- \oplus \mathrm{Z3}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N69.9.452 $\mathrm{GM2}^- \oplus \mathrm{Z3}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N69.9.453 $\mathrm{GM2}^- \oplus \mathrm{T2}^+ \oplus \mathrm{T2}^-$	$\surd$	1	1	$\times$	-	-
N69.9.454 $\mathrm{GM2}^- \oplus \mathrm{T2}^+ \oplus \mathrm{T4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N69.9.455 $\mathrm{GM2}^- \oplus \mathrm{T2}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N69.9.456 $\mathrm{GM2}^- \oplus \mathrm{T2}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N69.9.457 $\mathrm{GM2}^- \oplus \mathrm{T2}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N69.9.458 $\mathrm{GM2}^- \oplus \mathrm{T2}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	0	$\times$	-	-
N69.9.459 $\mathrm{GM2}^- \oplus \mathrm{T4}^+ \oplus \mathrm{T2}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N69.9.460 $\mathrm{GM2}^- \oplus \mathrm{T4}^+ \oplus \mathrm{T4}^-$	$\surd$	1	1	$\times$	-	-
N69.9.461 $\mathrm{GM2}^- \oplus \mathrm{T4}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N69.9.462 $\mathrm{GM2}^- \oplus \mathrm{T4}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N69.9.463 $\mathrm{GM2}^- \oplus \mathrm{T4}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N69.9.464 $\mathrm{GM2}^- \oplus \mathrm{T4}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	0	$\times$	-	-
N69.9.465 $\mathrm{GM2}^- \oplus \mathrm{Z3}^+ \oplus \mathrm{T2}^-$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $Fmmm$ (No. 69) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N69.9.466 $\mathrm{GM2}^{-} \oplus \mathrm{Z3}^{+} \oplus \mathrm{T4}^{-}$	$\surd$	1	0	$\times$	-	-
N69.9.467 $\mathrm{GM2}^{-} \oplus \mathrm{Z3}^{+} \oplus \mathrm{Y2}^{-}$	$\surd$	1	0	$\times$	-	-
N69.9.468 $\mathrm{GM2}^{-} \oplus \mathrm{Z3}^{+} \oplus \mathrm{Y3}^{-}$	$\surd$	1	0	$\times$	-	-
N69.9.469 $\mathrm{GM2}^{-} \oplus \mathrm{Z3}^{+} \oplus \mathrm{Z3}^{-}$	$\surd$	1	1	$\times$	-	-
N69.9.470 $\mathrm{GM2}^{-} \oplus \mathrm{Z3}^{+} \oplus \mathrm{Z4}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N69.9.471 $\mathrm{GM2}^{-} \oplus \mathrm{T2}^{+} \oplus \mathrm{T3}^{+}$	$\surd$	1	0	$\times$	-	-
N69.9.472 $\mathrm{GM2}^{-} \oplus \mathrm{T2}^{+} \oplus \mathrm{Y4}^{+}$	$\surd$	1	0	$\times$	-	-
N69.9.473 $\mathrm{GM2}^{-} \oplus \mathrm{T2}^{+} \oplus \mathrm{Z2}^{+}$	$\surd$	1	0	$\times$	-	-
N69.9.474 $\mathrm{GM2}^{-} \oplus \mathrm{T4}^{+} \oplus \mathrm{T3}^{+}$	$\surd$	1	0	$\times$	-	-
N69.9.475 $\mathrm{GM2}^{-} \oplus \mathrm{T4}^{+} \oplus \mathrm{Y4}^{+}$	$\surd$	1	0	$\times$	-	-
N69.9.476 $\mathrm{GM2}^{-} \oplus \mathrm{T4}^{+} \oplus \mathrm{Z2}^{+}$	$\surd$	1	0	$\times$	-	-
N69.9.477 $\mathrm{GM2}^{-} \oplus \mathrm{Z3}^{+} \oplus \mathrm{T3}^{+}$	$\surd$	1	0	$\times$	-	-
N69.9.478 $\mathrm{GM2}^{-} \oplus \mathrm{Z3}^{+} \oplus \mathrm{Y4}^{+}$	$\surd$	1	0	$\times$	-	-
N69.9.479 $\mathrm{GM2}^{-} \oplus \mathrm{Z3}^{+} \oplus \mathrm{Z2}^{+}$	$\surd$	1	0	$\times$	-	-
N69.9.480 $\mathrm{GM2}^{-} \oplus \mathrm{T2}^{+} \oplus \mathrm{T3}^{-}$	$\surd$	1	1	$\times$	-	-
N69.9.481 $\mathrm{GM2}^{-} \oplus \mathrm{T2}^{+} \oplus \mathrm{Y4}^{-}$	$\surd$	1	0	$\times$	-	-
N69.9.482 $\mathrm{GM2}^{-} \oplus \mathrm{T2}^{+} \oplus \mathrm{Z2}^{-}$	$\surd$	1	0	$\times$	-	-
N69.9.483 $\mathrm{GM2}^{-} \oplus \mathrm{T4}^{+} \oplus \mathrm{T3}^{-}$	$\surd$	1	1	$\times$	-	-
N69.9.484 $\mathrm{GM2}^{-} \oplus \mathrm{T4}^{+} \oplus \mathrm{Y4}^{-}$	$\surd$	1	0	$\times$	-	-
N69.9.485 $\mathrm{GM2}^{-} \oplus \mathrm{T4}^{+} \oplus \mathrm{Z2}^{-}$	$\surd$	1	0	$\times$	-	-
N69.9.486 $\mathrm{GM2}^{-} \oplus \mathrm{Z3}^{+} \oplus \mathrm{T3}^{-}$	$\surd$	1	0	$\times$	-	-
N69.9.487 $\mathrm{GM2}^{-} \oplus \mathrm{Z3}^{+} \oplus \mathrm{Y4}^{-}$	$\surd$	1	0	$\times$	-	-
N69.9.488 $\mathrm{GM2}^{-} \oplus \mathrm{Z3}^{+} \oplus \mathrm{Z2}^{-}$	$\surd$	1	1	$\times$	-	-
N69.9.489 $\mathrm{GM2}^{-} \oplus \mathrm{T2}^{-} \oplus \mathrm{T2}^{-}$	$\surd$	1	0	$\times$	-	-
N69.9.490 $\mathrm{GM2}^{-} \oplus \mathrm{T2}^{-} \oplus \mathrm{T4}^{-}$	$\surd$	1	0	$\times$	-	-
N69.9.491 $\mathrm{GM2}^{-} \oplus \mathrm{T2}^{-} \oplus \mathrm{Y2}^{-}$	$\surd$	1	0	$\times$	-	-
N69.9.492 $\mathrm{GM2}^{-} \oplus \mathrm{T2}^{-} \oplus \mathrm{Y3}^{-}$	$\surd$	1	0	$\times$	-	-
N69.9.493 $\mathrm{GM2}^{-} \oplus \mathrm{T2}^{-} \oplus \mathrm{Z3}^{-}$	$\surd$	1	0	$\times$	-	-
N69.9.494 $\mathrm{GM2}^{-} \oplus \mathrm{T2}^{-} \oplus \mathrm{Z4}^{-}$	$\surd$	1	0	$\times$	-	-
N69.9.495 $\mathrm{GM2}^{-} \oplus \mathrm{T4}^{-} \oplus \mathrm{T4}^{-}$	$\surd$	1	0	$\times$	-	-
N69.9.496 $\mathrm{GM2}^{-} \oplus \mathrm{T4}^{-} \oplus \mathrm{Y3}^{-}$	$\surd$	1	0	$\times$	-	-
N69.9.497 $\mathrm{GM2}^{-} \oplus \mathrm{T4}^{-} \oplus \mathrm{Z3}^{-}$	$\surd$	1	0	$\times$	-	-
N69.9.498 $\mathrm{GM2}^{-} \oplus \mathrm{T4}^{-} \oplus \mathrm{Z4}^{-}$	$\surd$	1	0	$\times$	-	-
N69.9.499 $\mathrm{GM2}^{-} \oplus \mathrm{Z3}^{-} \oplus \mathrm{Z3}^{-}$	$\surd$	1	0	$\times$	-	-
N69.9.500 $\mathrm{GM2}^{-} \oplus \mathrm{Z3}^{-} \oplus \mathrm{Z4}^{-}$	$\surd$	1	0	$\times$	-	-
N69.9.501 $\mathrm{GM2}^{-} \oplus \mathrm{T2}^{-} \oplus \mathrm{T3}^{+}$	$\surd$	1	1	$\times$	-	-
N69.9.502 $\mathrm{GM2}^{-} \oplus \mathrm{T2}^{-} \oplus \mathrm{Y4}^{+}$	$\surd$	1	0	$\times$	-	-
N69.9.503 $\mathrm{GM2}^{-} \oplus \mathrm{T2}^{-} \oplus \mathrm{Z2}^{+}$	$\surd$	1	0	$\times$	-	-
N69.9.504 $\mathrm{GM2}^{-} \oplus \mathrm{T4}^{-} \oplus \mathrm{T3}^{+}$	$\surd$	1	1	$\times$	-	-
N69.9.505 $\mathrm{GM2}^{-} \oplus \mathrm{T4}^{-} \oplus \mathrm{Y4}^{+}$	$\surd$	1	0	$\times$	-	-
N69.9.506 $\mathrm{GM2}^{-} \oplus \mathrm{T4}^{-} \oplus \mathrm{Z2}^{+}$	$\surd$	1	0	$\times$	-	-
N69.9.507 $\mathrm{GM2}^{-} \oplus \mathrm{Z3}^{-} \oplus \mathrm{T3}^{+}$	$\surd$	1	0	$\times$	-	-
N69.9.508 $\mathrm{GM2}^{-} \oplus \mathrm{Z3}^{-} \oplus \mathrm{Y4}^{+}$	$\surd$	1	0	$\times$	-	-
N69.9.509 $\mathrm{GM2}^{-} \oplus \mathrm{Z3}^{-} \oplus \mathrm{Z2}^{+}$	$\surd$	1	1	$\times$	-	-
N69.9.510 $\mathrm{GM2}^{-} \oplus \mathrm{T2}^{-} \oplus \mathrm{T3}^{-}$	$\surd$	1	0	$\times$	-	-
N69.9.511 $\mathrm{GM2}^{-} \oplus \mathrm{T2}^{-} \oplus \mathrm{Y4}^{-}$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $Fmmm$ (No. 69) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N69.9.512 $\mathrm{GM2}^- \oplus \mathrm{T2}^- \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-
N69.9.513 $\mathrm{GM2}^- \oplus \mathrm{T4}^- \oplus \mathrm{T3}^-$	$\surd$	1	0	$\times$	-	-
N69.9.514 $\mathrm{GM2}^- \oplus \mathrm{T4}^- \oplus \mathrm{Y4}^-$	$\surd$	1	0	$\times$	-	-
N69.9.515 $\mathrm{GM2}^- \oplus \mathrm{T4}^- \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-
N69.9.516 $\mathrm{GM2}^- \oplus \mathrm{Z3}^- \oplus \mathrm{T3}^-$	$\surd$	1	0	$\times$	-	-
N69.9.517 $\mathrm{GM2}^- \oplus \mathrm{Z3}^- \oplus \mathrm{Y4}^-$	$\surd$	1	0	$\times$	-	-
N69.9.518 $\mathrm{GM2}^- \oplus \mathrm{Z3}^- \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-
N69.9.519 $\mathrm{GM2}^- \oplus \mathrm{T3}^+ \oplus \mathrm{T3}^+$	$\surd$	1	0	$\times$	-	-
N69.9.520 $\mathrm{GM2}^- \oplus \mathrm{T3}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
N69.9.521 $\mathrm{GM2}^- \oplus \mathrm{T3}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N69.9.522 $\mathrm{GM2}^- \oplus \mathrm{Z2}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N69.9.523 $\mathrm{GM2}^- \oplus \mathrm{T3}^+ \oplus \mathrm{T3}^-$	$\surd$	1	1	$\times$	-	-
N69.9.524 $\mathrm{GM2}^- \oplus \mathrm{T3}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	0	$\times$	-	-
N69.9.525 $\mathrm{GM2}^- \oplus \mathrm{T3}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-
N69.9.526 $\mathrm{GM2}^- \oplus \mathrm{Z2}^+ \oplus \mathrm{T3}^-$	$\surd$	1	0	$\times$	-	-
N69.9.527 $\mathrm{GM2}^- \oplus \mathrm{Z2}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\times$	-	-
N69.9.528 $\mathrm{GM2}^- \oplus \mathrm{T3}^- \oplus \mathrm{T3}^-$	$\surd$	1	0	$\times$	-	-
N69.9.529 $\mathrm{GM2}^- \oplus \mathrm{T3}^- \oplus \mathrm{Y4}^-$	$\surd$	1	0	$\times$	-	-
N69.9.530 $\mathrm{GM2}^- \oplus \mathrm{T3}^- \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-
N69.9.531 $\mathrm{GM2}^- \oplus \mathrm{Z2}^- \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-
N69.9.532 $\mathrm{T1}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{T1}^+$	$\surd$	0	0	$\surd$	-	-
N69.9.533 $\mathrm{T1}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Y1}^+$	$\surd$	1	0	$\times$	-	-
N69.9.534 $\mathrm{T1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Z1}^+$	$\times$	-	-	-	-	-
N69.9.535 $\mathrm{T1}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{T1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u}$
N69.9.536 $\mathrm{T1}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Y1}^-$	$\surd$	1	0	$\times$	-	-
N69.9.537 $\mathrm{T1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{T1}^-$	$\surd$	1	1	$\times$	-	-
N69.9.538 $\mathrm{T1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Z1}^-$	$\times$	-	-	-	-	-
N69.9.539 $\mathrm{T1}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{T2}^+$	$\surd$	0	0	$\surd$	-	-
N69.9.540 $\mathrm{T1}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N69.9.541 $\mathrm{T1}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N69.9.542 $\mathrm{T1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{T2}^+$	$\surd$	1	0	$\times$	-	-
N69.9.543 $\mathrm{T1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{T4}^+$	$\surd$	1	0	$\times$	-	-
N69.9.544 $\mathrm{T1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Z3}^+$	$\times$	-	-	-	-	-
N69.9.545 $\mathrm{T1}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{T2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N69.9.546 $\mathrm{T1}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N69.9.547 $\mathrm{T1}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N69.9.548 $\mathrm{T1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{T2}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N69.9.549 $\mathrm{T1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{T4}^-$	$\surd$	1	1	$\times$	-	-
N69.9.550 $\mathrm{T1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Z3}^-$	$\times$	-	-	-	-	-
N69.9.551 $\mathrm{T1}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{T3}^+$	$\surd$	0	0	$\surd$	-	-
N69.9.552 $\mathrm{T1}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
N69.9.553 $\mathrm{T1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{T3}^+$	$\surd$	1	0	$\times$	-	-
N69.9.554 $\mathrm{T1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Z2}^+$	$\times$	-	-	-	-	-
N69.9.555 $\mathrm{T1}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{T3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B3_u}$
N69.9.556 $\mathrm{T1}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	0	$\times$	-	-
N69.9.557 $\mathrm{T1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{T3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$

Non-coplanar SSGs with parent space group $Fmmm$ (No. 69) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N69.9.558 $\mathrm{T1}^+ \oplus \mathrm{Y1}^+ \oplus \mathrm{Z2}^-$	×	-	-	-	-	-
N69.9.559 $\mathrm{T1}^+ \oplus \mathrm{T1}^- \oplus \mathrm{T1}^-$	√	2	2	√	mmm	$\mathrm{A_u} \oplus \mathrm{A_u}$
N69.9.560 $\mathrm{T1}^+ \oplus \mathrm{T1}^- \oplus \mathrm{Y1}^-$	√	1	1	×	-	-
N69.9.561 $\mathrm{T1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y1}^-$	√	1	0	×	-	-
N69.9.562 $\mathrm{T1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Z1}^-$	×	-	-	-	-	-
N69.9.563 $\mathrm{T1}^+ \oplus \mathrm{T1}^- \oplus \mathrm{T2}^+$	√	2	2	√	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u}$
N69.9.564 $\mathrm{T1}^+ \oplus \mathrm{T1}^- \oplus \mathrm{Y2}^+$	√	1	1	×	-	-
N69.9.565 $\mathrm{T1}^+ \oplus \mathrm{T1}^- \oplus \mathrm{Y3}^+$	√	1	1	×	-	-
N69.9.566 $\mathrm{T1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{T2}^+$	√	1	0	×	-	-
N69.9.567 $\mathrm{T1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{T4}^+$	√	1	0	×	-	-
N69.9.568 $\mathrm{T1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y2}^+$	√	1	1	√	mmm	$\mathrm{B1_u}$
N69.9.569 $\mathrm{T1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y3}^+$	√	1	1	×	-	-
N69.9.570 $\mathrm{T1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Z3}^+$	×	-	-	-	-	-
N69.9.571 $\mathrm{T1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Z4}^+$	×	-	-	-	-	-
N69.9.572 $\mathrm{T1}^+ \oplus \mathrm{T1}^- \oplus \mathrm{T2}^-$	√	2	2	√	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u}$
N69.9.573 $\mathrm{T1}^+ \oplus \mathrm{T1}^- \oplus \mathrm{Y2}^-$	√	1	1	×	-	-
N69.9.574 $\mathrm{T1}^+ \oplus \mathrm{T1}^- \oplus \mathrm{Y3}^-$	√	1	1	×	-	-
N69.9.575 $\mathrm{T1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{T2}^-$	√	1	1	√	mmm	$\mathrm{B1_u}$
N69.9.576 $\mathrm{T1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{T4}^-$	√	1	1	×	-	-
N69.9.577 $\mathrm{T1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y2}^-$	√	1	0	×	-	-
N69.9.578 $\mathrm{T1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y3}^-$	√	1	0	×	-	-
N69.9.579 $\mathrm{T1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Z3}^-$	×	-	-	-	-	-
N69.9.580 $\mathrm{T1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Z4}^-$	×	-	-	-	-	-
N69.9.581 $\mathrm{T1}^+ \oplus \mathrm{T1}^- \oplus \mathrm{T3}^+$	√	2	2	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u}$
N69.9.582 $\mathrm{T1}^+ \oplus \mathrm{T1}^- \oplus \mathrm{Y4}^+$	√	1	1	×	-	-
N69.9.583 $\mathrm{T1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{T3}^+$	√	1	0	×	-	-
N69.9.584 $\mathrm{T1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y4}^+$	√	1	1	√	mmm	$\mathrm{B2_u}$
N69.9.585 $\mathrm{T1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Z2}^+$	×	-	-	-	-	-
N69.9.586 $\mathrm{T1}^+ \oplus \mathrm{T1}^- \oplus \mathrm{T3}^-$	√	2	2	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u}$
N69.9.587 $\mathrm{T1}^+ \oplus \mathrm{T1}^- \oplus \mathrm{Y4}^-$	√	1	1	×	-	-
N69.9.588 $\mathrm{T1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{T3}^-$	√	1	1	√	mmm	$\mathrm{B3_u}$
N69.9.589 $\mathrm{T1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Y4}^-$	√	1	0	×	-	-
N69.9.590 $\mathrm{T1}^+ \oplus \mathrm{Y1}^- \oplus \mathrm{Z2}^-$	×	-	-	-	-	-
N69.9.591 $\mathrm{T1}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{T2}^+$	√	0	0	√	-	-
N69.9.592 $\mathrm{T1}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{T4}^+$	√	0	0	√	-	-
N69.9.593 $\mathrm{T1}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{Y2}^+$	√	1	0	×	-	-
N69.9.594 $\mathrm{T1}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{Y3}^+$	√	1	0	×	-	-
N69.9.595 $\mathrm{T1}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{Z3}^+$	√	1	0	×	-	-
N69.9.596 $\mathrm{T1}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{Z4}^+$	√	1	0	×	-	-
N69.9.597 $\mathrm{T1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^+$	√	1	0	×	-	-
N69.9.598 $\mathrm{T1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^+$	√	1	0	×	-	-
N69.9.599 $\mathrm{T1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Z3}^+$	×	-	-	-	-	-
N69.9.600 $\mathrm{T1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Z4}^+$	×	-	-	-	-	-
N69.9.601 $\mathrm{T1}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^+$	√	1	0	×	-	-
N69.9.602 $\mathrm{T1}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Z3}^+$	×	-	-	-	-	-
N69.9.603 $\mathrm{T1}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{T2}^-$	√	2	2	√	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u}$

Non-coplanar SSGs with parent space group $Fmmm$ (No. 69) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N69.9.604 $\mathrm{T1}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{T4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_u}$
N69.9.605 $\mathrm{T1}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N69.9.606 $\mathrm{T1}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N69.9.607 $\mathrm{T1}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N69.9.608 $\mathrm{T1}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	0	$\times$	-	-
N69.9.609 $\mathrm{T1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{T2}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N69.9.610 $\mathrm{T1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{T4}^-$	$\surd$	1	1	$\times$	-	-
N69.9.611 $\mathrm{T1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\times$	-	-
N69.9.612 $\mathrm{T1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N69.9.613 $\mathrm{T1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Z3}^-$	$\times$	-	-	-	-	-
N69.9.614 $\mathrm{T1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Z4}^-$	$\times$	-	-	-	-	-
N69.9.615 $\mathrm{T1}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{T2}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N69.9.616 $\mathrm{T1}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{T4}^-$	$\surd$	1	1	$\times$	-	-
N69.9.617 $\mathrm{T1}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N69.9.618 $\mathrm{T1}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\times$	-	-
N69.9.619 $\mathrm{T1}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Z3}^-$	$\times$	-	-	-	-	-
N69.9.620 $\mathrm{T1}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Z4}^-$	$\times$	-	-	-	-	-
N69.9.621 $\mathrm{T1}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{T3}^+$	$\surd$	0	0	$\surd$	-	-
N69.9.622 $\mathrm{T1}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
N69.9.623 $\mathrm{T1}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N69.9.624 $\mathrm{T1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{T3}^+$	$\surd$	1	0	$\times$	-	-
N69.9.625 $\mathrm{T1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
N69.9.626 $\mathrm{T1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Z2}^+$	$\times$	-	-	-	-	-
N69.9.627 $\mathrm{T1}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{T3}^+$	$\surd$	1	0	$\times$	-	-
N69.9.628 $\mathrm{T1}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
N69.9.629 $\mathrm{T1}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Z2}^+$	$\times$	-	-	-	-	-
N69.9.630 $\mathrm{T1}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{T3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_u}$
N69.9.631 $\mathrm{T1}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	0	$\times$	-	-
N69.9.632 $\mathrm{T1}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-
N69.9.633 $\mathrm{T1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{T3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N69.9.634 $\mathrm{T1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\times$	-	-
N69.9.635 $\mathrm{T1}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Z2}^-$	$\times$	-	-	-	-	-
N69.9.636 $\mathrm{T1}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{T3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N69.9.637 $\mathrm{T1}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N69.9.638 $\mathrm{T1}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Z2}^-$	$\times$	-	-	-	-	-
N69.9.639 $\mathrm{T1}^+ \oplus \mathrm{T2}^- \oplus \mathrm{T2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N69.9.640 $\mathrm{T1}^+ \oplus \mathrm{T2}^- \oplus \mathrm{T4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N69.9.641 $\mathrm{T1}^+ \oplus \mathrm{T2}^- \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N69.9.642 $\mathrm{T1}^+ \oplus \mathrm{T2}^- \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N69.9.643 $\mathrm{T1}^+ \oplus \mathrm{T2}^- \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N69.9.644 $\mathrm{T1}^+ \oplus \mathrm{T2}^- \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\times$	-	-
N69.9.645 $\mathrm{T1}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N69.9.646 $\mathrm{T1}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N69.9.647 $\mathrm{T1}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Z3}^-$	$\times$	-	-	-	-	-
N69.9.648 $\mathrm{T1}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Z4}^-$	$\times$	-	-	-	-	-
N69.9.649 $\mathrm{T1}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $Fmmm$ (No. 69) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N69.9.650 $\mathrm{T1}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Z3}^-$	×	-	-	-	-	-
N69.9.651 $\mathrm{T1}^+ \oplus \mathrm{T2}^- \oplus \mathrm{T3}^+$	√	2	2	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N69.9.652 $\mathrm{T1}^+ \oplus \mathrm{T2}^- \oplus \mathrm{Y4}^+$	√	1	1	√	mmm	$\mathrm{B1_u}$
N69.9.653 $\mathrm{T1}^+ \oplus \mathrm{T2}^- \oplus \mathrm{Z2}^+$	√	1	1	×	-	-
N69.9.654 $\mathrm{T1}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{T3}^+$	√	1	0	×	-	-
N69.9.655 $\mathrm{T1}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y4}^+$	√	1	1	×	-	-
N69.9.656 $\mathrm{T1}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Z2}^+$	×	-	-	-	-	-
N69.9.657 $\mathrm{T1}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{T3}^+$	√	1	0	×	-	-
N69.9.658 $\mathrm{T1}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Y4}^+$	√	1	1	√	mmm	$\mathrm{B1_u}$
N69.9.659 $\mathrm{T1}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Z2}^+$	×	-	-	-	-	-
N69.9.660 $\mathrm{T1}^+ \oplus \mathrm{T2}^- \oplus \mathrm{T3}^-$	√	2	2	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u}$
N69.9.661 $\mathrm{T1}^+ \oplus \mathrm{T2}^- \oplus \mathrm{Y4}^-$	√	1	1	√	mmm	$\mathrm{B1_u}$
N69.9.662 $\mathrm{T1}^+ \oplus \mathrm{T2}^- \oplus \mathrm{Z2}^-$	√	1	1	×	-	-
N69.9.663 $\mathrm{T1}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{T3}^-$	√	1	1	√	mmm	$\mathrm{B3_u}$
N69.9.664 $\mathrm{T1}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y4}^-$	√	1	0	×	-	-
N69.9.665 $\mathrm{T1}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Z2}^-$	×	-	-	-	-	-
N69.9.666 $\mathrm{T1}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{T3}^-$	√	1	1	√	mmm	$\mathrm{B3_u}$
N69.9.667 $\mathrm{T1}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Y4}^-$	√	1	0	×	-	-
N69.9.668 $\mathrm{T1}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Z2}^-$	×	-	-	-	-	-
N69.9.669 $\mathrm{T1}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{T3}^+$	√	0	0	√	-	-
N69.9.670 $\mathrm{T1}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{Y4}^+$	√	1	0	×	-	-
N69.9.671 $\mathrm{T1}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{Y4}^+$	√	1	0	×	-	-
N69.9.672 $\mathrm{T1}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{Z2}^+$	×	-	-	-	-	-
N69.9.673 $\mathrm{T1}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{T3}^-$	√	2	2	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u}$
N69.9.674 $\mathrm{T1}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{Y4}^-$	√	1	0	×	-	-
N69.9.675 $\mathrm{T1}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{T3}^-$	√	1	1	√	mmm	$\mathrm{B3_u}$
N69.9.676 $\mathrm{T1}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{Y4}^-$	√	1	1	×	-	-
N69.9.677 $\mathrm{T1}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{Z2}^-$	×	-	-	-	-	-
N69.9.678 $\mathrm{T1}^+ \oplus \mathrm{T3}^- \oplus \mathrm{T3}^-$	√	2	2	√	mmm	$\mathrm{B3_u} \oplus \mathrm{B3_u}$
N69.9.679 $\mathrm{T1}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Y4}^-$	√	1	1	√	mmm	$\mathrm{B3_u}$
N69.9.680 $\mathrm{T1}^+ \oplus \mathrm{Y4}^- \oplus \mathrm{Y4}^-$	√	1	0	×	-	-
N69.9.681 $\mathrm{T1}^+ \oplus \mathrm{Y4}^- \oplus \mathrm{Z2}^-$	×	-	-	-	-	-
N69.9.682 $\mathrm{T1}^- \oplus \mathrm{T1}^- \oplus \mathrm{T1}^-$	√	0	0	√	-	-
N69.9.683 $\mathrm{T1}^- \oplus \mathrm{T1}^- \oplus \mathrm{Y1}^-$	√	1	0	×	-	-
N69.9.684 $\mathrm{T1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Z1}^-$	×	-	-	-	-	-
N69.9.685 $\mathrm{T1}^- \oplus \mathrm{T1}^- \oplus \mathrm{T2}^+$	√	2	2	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N69.9.686 $\mathrm{T1}^- \oplus \mathrm{T1}^- \oplus \mathrm{Y2}^+$	√	1	0	×	-	-
N69.9.687 $\mathrm{T1}^- \oplus \mathrm{T1}^- \oplus \mathrm{Y3}^+$	√	1	0	×	-	-
N69.9.688 $\mathrm{T1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{T2}^+$	√	1	1	√	mmm	$\mathrm{B1_u}$
N69.9.689 $\mathrm{T1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{T4}^+$	√	1	1	×	-	-
N69.9.690 $\mathrm{T1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Z3}^+$	×	-	-	-	-	-
N69.9.691 $\mathrm{T1}^- \oplus \mathrm{T1}^- \oplus \mathrm{T2}^-$	√	0	0	√	-	-
N69.9.692 $\mathrm{T1}^- \oplus \mathrm{T1}^- \oplus \mathrm{Y2}^-$	√	1	0	×	-	-
N69.9.693 $\mathrm{T1}^- \oplus \mathrm{T1}^- \oplus \mathrm{Y3}^-$	√	1	0	×	-	-
N69.9.694 $\mathrm{T1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{T2}^-$	√	1	0	×	-	-
N69.9.695 $\mathrm{T1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{T4}^-$	√	1	0	×	-	-

Non-coplanar SSGs with parent space group $Fmmm$ (No. 69) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N69.9.696 $\mathrm{T1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Z3}^-$	×	-	-	-	-	-
N69.9.697 $\mathrm{T1}^- \oplus \mathrm{T1}^- \oplus \mathrm{T3}^+$	√	2	2	√	mmm	$\mathrm{B3_u} \oplus \mathrm{B3_u}$
N69.9.698 $\mathrm{T1}^- \oplus \mathrm{T1}^- \oplus \mathrm{Y4}^+$	√	1	0	×	-	-
N69.9.699 $\mathrm{T1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{T3}^+$	√	1	1	√	mmm	$\mathrm{B3_u}$
N69.9.700 $\mathrm{T1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Z2}^+$	×	-	-	-	-	-
N69.9.701 $\mathrm{T1}^- \oplus \mathrm{T1}^- \oplus \mathrm{T3}^-$	√	0	0	√	-	-
N69.9.702 $\mathrm{T1}^- \oplus \mathrm{T1}^- \oplus \mathrm{Y4}^-$	√	1	0	×	-	-
N69.9.703 $\mathrm{T1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{T3}^-$	√	1	0	×	-	-
N69.9.704 $\mathrm{T1}^- \oplus \mathrm{Y1}^- \oplus \mathrm{Z2}^-$	×	-	-	-	-	-
N69.9.705 $\mathrm{T1}^- \oplus \mathrm{T2}^+ \oplus \mathrm{T2}^+$	√	2	2	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N69.9.706 $\mathrm{T1}^- \oplus \mathrm{T2}^+ \oplus \mathrm{T4}^+$	√	2	2	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N69.9.707 $\mathrm{T1}^- \oplus \mathrm{T2}^+ \oplus \mathrm{Y2}^+$	√	1	1	√	mmm	$\mathrm{B1_u}$
N69.9.708 $\mathrm{T1}^- \oplus \mathrm{T2}^+ \oplus \mathrm{Y3}^+$	√	1	1	√	mmm	$\mathrm{B1_u}$
N69.9.709 $\mathrm{T1}^- \oplus \mathrm{T2}^+ \oplus \mathrm{Z3}^+$	√	1	1	×	-	-
N69.9.710 $\mathrm{T1}^- \oplus \mathrm{T2}^+ \oplus \mathrm{Z4}^+$	√	1	1	×	-	-
N69.9.711 $\mathrm{T1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^+$	√	1	0	×	-	-
N69.9.712 $\mathrm{T1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^+$	√	1	0	×	-	-
N69.9.713 $\mathrm{T1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Z3}^+$	×	-	-	-	-	-
N69.9.714 $\mathrm{T1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Z4}^+$	×	-	-	-	-	-
N69.9.715 $\mathrm{T1}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^+$	√	1	0	×	-	-
N69.9.716 $\mathrm{T1}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Z3}^+$	×	-	-	-	-	-
N69.9.717 $\mathrm{T1}^- \oplus \mathrm{T2}^+ \oplus \mathrm{T2}^-$	√	2	2	√	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u}$
N69.9.718 $\mathrm{T1}^- \oplus \mathrm{T2}^+ \oplus \mathrm{T4}^-$	√	2	2	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u}$
N69.9.719 $\mathrm{T1}^- \oplus \mathrm{T2}^+ \oplus \mathrm{Y2}^-$	√	1	1	√	mmm	$\mathrm{B1_u}$
N69.9.720 $\mathrm{T1}^- \oplus \mathrm{T2}^+ \oplus \mathrm{Y3}^-$	√	1	1	√	mmm	$\mathrm{B1_u}$
N69.9.721 $\mathrm{T1}^- \oplus \mathrm{T2}^+ \oplus \mathrm{Z3}^-$	√	1	1	×	-	-
N69.9.722 $\mathrm{T1}^- \oplus \mathrm{T2}^+ \oplus \mathrm{Z4}^-$	√	1	1	×	-	-
N69.9.723 $\mathrm{T1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{T2}^-$	√	1	0	×	-	-
N69.9.724 $\mathrm{T1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{T4}^-$	√	1	0	×	-	-
N69.9.725 $\mathrm{T1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y2}^-$	√	1	1	×	-	-
N69.9.726 $\mathrm{T1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y3}^-$	√	1	1	√	mmm	$\mathrm{B2_u}$
N69.9.727 $\mathrm{T1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Z3}^-$	×	-	-	-	-	-
N69.9.728 $\mathrm{T1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Z4}^-$	×	-	-	-	-	-
N69.9.729 $\mathrm{T1}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{T2}^-$	√	1	0	×	-	-
N69.9.730 $\mathrm{T1}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{T4}^-$	√	1	0	×	-	-
N69.9.731 $\mathrm{T1}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Y2}^-$	√	1	1	√	mmm	$\mathrm{B2_u}$
N69.9.732 $\mathrm{T1}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^-$	√	1	1	×	-	-
N69.9.733 $\mathrm{T1}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Z3}^-$	×	-	-	-	-	-
N69.9.734 $\mathrm{T1}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Z4}^-$	×	-	-	-	-	-
N69.9.735 $\mathrm{T1}^- \oplus \mathrm{T2}^+ \oplus \mathrm{T3}^+$	√	2	2	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u}$
N69.9.736 $\mathrm{T1}^- \oplus \mathrm{T2}^+ \oplus \mathrm{Y4}^+$	√	1	1	√	mmm	$\mathrm{B1_u}$
N69.9.737 $\mathrm{T1}^- \oplus \mathrm{T2}^+ \oplus \mathrm{Z2}^+$	√	1	1	×	-	-
N69.9.738 $\mathrm{T1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{T3}^+$	√	1	1	√	mmm	$\mathrm{B3_u}$
N69.9.739 $\mathrm{T1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y4}^+$	√	1	0	×	-	-
N69.9.740 $\mathrm{T1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Z2}^+$	×	-	-	-	-	-
N69.9.741 $\mathrm{T1}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{T3}^+$	√	1	1	√	mmm	$\mathrm{B3_u}$

Non-coplanar SSGs with parent space group $Fmmm$ (No. 69) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N69.9.742 $\mathrm{T1}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
N69.9.743 $\mathrm{T1}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Z2}^+$	$\times$	-	-	-	-	-
N69.9.744 $\mathrm{T1}^- \oplus \mathrm{T2}^+ \oplus \mathrm{T3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N69.9.745 $\mathrm{T1}^- \oplus \mathrm{T2}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N69.9.746 $\mathrm{T1}^- \oplus \mathrm{T2}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\times$	-	-
N69.9.747 $\mathrm{T1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{T3}^-$	$\surd$	1	0	$\times$	-	-
N69.9.748 $\mathrm{T1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\times$	-	-
N69.9.749 $\mathrm{T1}^- \oplus \mathrm{Y2}^+ \oplus \mathrm{Z2}^-$	$\times$	-	-	-	-	-
N69.9.750 $\mathrm{T1}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{T3}^-$	$\surd$	1	0	$\times$	-	-
N69.9.751 $\mathrm{T1}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N69.9.752 $\mathrm{T1}^- \oplus \mathrm{Y3}^+ \oplus \mathrm{Z2}^-$	$\times$	-	-	-	-	-
N69.9.753 $\mathrm{T1}^- \oplus \mathrm{T2}^- \oplus \mathrm{T2}^-$	$\surd$	0	0	$\surd$	-	-
N69.9.754 $\mathrm{T1}^- \oplus \mathrm{T2}^- \oplus \mathrm{T4}^-$	$\surd$	0	0	$\surd$	-	-
N69.9.755 $\mathrm{T1}^- \oplus \mathrm{T2}^- \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N69.9.756 $\mathrm{T1}^- \oplus \mathrm{T2}^- \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N69.9.757 $\mathrm{T1}^- \oplus \mathrm{T2}^- \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N69.9.758 $\mathrm{T1}^- \oplus \mathrm{T2}^- \oplus \mathrm{Z4}^-$	$\surd$	1	0	$\times$	-	-
N69.9.759 $\mathrm{T1}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N69.9.760 $\mathrm{T1}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N69.9.761 $\mathrm{T1}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Z3}^-$	$\times$	-	-	-	-	-
N69.9.762 $\mathrm{T1}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Z4}^-$	$\times$	-	-	-	-	-
N69.9.763 $\mathrm{T1}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N69.9.764 $\mathrm{T1}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Z3}^-$	$\times$	-	-	-	-	-
N69.9.765 $\mathrm{T1}^- \oplus \mathrm{T2}^- \oplus \mathrm{T3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_u}$
N69.9.766 $\mathrm{T1}^- \oplus \mathrm{T2}^- \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
N69.9.767 $\mathrm{T1}^- \oplus \mathrm{T2}^- \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N69.9.768 $\mathrm{T1}^- \oplus \mathrm{Y2}^- \oplus \mathrm{T3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N69.9.769 $\mathrm{T1}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\times$	-	-
N69.9.770 $\mathrm{T1}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Z2}^+$	$\times$	-	-	-	-	-
N69.9.771 $\mathrm{T1}^- \oplus \mathrm{Y3}^- \oplus \mathrm{T3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N69.9.772 $\mathrm{T1}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N69.9.773 $\mathrm{T1}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Z2}^+$	$\times$	-	-	-	-	-
N69.9.774 $\mathrm{T1}^- \oplus \mathrm{T2}^- \oplus \mathrm{T3}^-$	$\surd$	0	0	$\surd$	-	-
N69.9.775 $\mathrm{T1}^- \oplus \mathrm{T2}^- \oplus \mathrm{Y4}^-$	$\surd$	1	0	$\times$	-	-
N69.9.776 $\mathrm{T1}^- \oplus \mathrm{T2}^- \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-
N69.9.777 $\mathrm{T1}^- \oplus \mathrm{Y2}^- \oplus \mathrm{T3}^-$	$\surd$	1	0	$\times$	-	-
N69.9.778 $\mathrm{T1}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Y4}^-$	$\surd$	1	0	$\times$	-	-
N69.9.779 $\mathrm{T1}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Z2}^-$	$\times$	-	-	-	-	-
N69.9.780 $\mathrm{T1}^- \oplus \mathrm{Y3}^- \oplus \mathrm{T3}^-$	$\surd$	1	0	$\times$	-	-
N69.9.781 $\mathrm{T1}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Y4}^-$	$\surd$	1	0	$\times$	-	-
N69.9.782 $\mathrm{T1}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Z2}^-$	$\times$	-	-	-	-	-
N69.9.783 $\mathrm{T1}^- \oplus \mathrm{T3}^+ \oplus \mathrm{T3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B3_u}$
N69.9.784 $\mathrm{T1}^- \oplus \mathrm{T3}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N69.9.785 $\mathrm{T1}^- \oplus \mathrm{Y4}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
N69.9.786 $\mathrm{T1}^- \oplus \mathrm{Y4}^+ \oplus \mathrm{Z2}^+$	$\times$	-	-	-	-	-
N69.9.787 $\mathrm{T1}^- \oplus \mathrm{T3}^+ \oplus \mathrm{T3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u}$

Non-coplanar SSGs with parent space group $Fmmm$ (No. 69) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N69.9.788 $\mathrm{T1}^- \oplus \mathrm{T3}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N69.9.789 $\mathrm{T1}^- \oplus \mathrm{Y4}^+ \oplus \mathrm{T3}^-$	$\surd$	1	0	$\times$	-	-
N69.9.790 $\mathrm{T1}^- \oplus \mathrm{Y4}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\times$	-	-
N69.9.791 $\mathrm{T1}^- \oplus \mathrm{Y4}^+ \oplus \mathrm{Z2}^-$	$\times$	-	-	-	-	-
N69.9.792 $\mathrm{T1}^- \oplus \mathrm{T3}^- \oplus \mathrm{T3}^-$	$\surd$	0	0	$\surd$	-	-
N69.9.793 $\mathrm{T1}^- \oplus \mathrm{T3}^- \oplus \mathrm{Y4}^-$	$\surd$	1	0	$\times$	-	-
N69.9.794 $\mathrm{T1}^- \oplus \mathrm{Y4}^- \oplus \mathrm{Y4}^-$	$\surd$	1	0	$\times$	-	-
N69.9.795 $\mathrm{T1}^- \oplus \mathrm{Y4}^- \oplus \mathrm{Z2}^-$	$\times$	-	-	-	-	-
N69.9.796 $\mathrm{T2}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{T2}^+$	$\surd$	0	0	$\surd$	-	-
N69.9.797 $\mathrm{T2}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{T4}^+$	$\surd$	0	0	$\surd$	-	-
N69.9.798 $\mathrm{T2}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N69.9.799 $\mathrm{T2}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N69.9.800 $\mathrm{T2}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N69.9.801 $\mathrm{T2}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N69.9.802 $\mathrm{T2}^+ \oplus \mathrm{T4}^+ \oplus \mathrm{Y2}^+$	$\surd$	1	0	$\times$	-	-
N69.9.803 $\mathrm{T2}^+ \oplus \mathrm{T4}^+ \oplus \mathrm{Y3}^+$	$\surd$	1	0	$\times$	-	-
N69.9.804 $\mathrm{T2}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Z3}^+$	$\times$	-	-	-	-	-
N69.9.805 $\mathrm{T2}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Z4}^+$	$\times$	-	-	-	-	-
N69.9.806 $\mathrm{T2}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{T2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u}$
N69.9.807 $\mathrm{T2}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{T4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B3_u}$
N69.9.808 $\mathrm{T2}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N69.9.809 $\mathrm{T2}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N69.9.810 $\mathrm{T2}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N69.9.811 $\mathrm{T2}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	0	$\times$	-	-
N69.9.812 $\mathrm{T2}^+ \oplus \mathrm{T4}^+ \oplus \mathrm{T2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u}$
N69.9.813 $\mathrm{T2}^+ \oplus \mathrm{T4}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N69.9.814 $\mathrm{T2}^+ \oplus \mathrm{T4}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N69.9.815 $\mathrm{T2}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{T2}^-$	$\surd$	1	1	$\times$	-	-
N69.9.816 $\mathrm{T2}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{T4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N69.9.817 $\mathrm{T2}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Z3}^-$	$\times$	-	-	-	-	-
N69.9.818 $\mathrm{T2}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{T2}^-$	$\surd$	1	1	$\times$	-	-
N69.9.819 $\mathrm{T2}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{T4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N69.9.820 $\mathrm{T2}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N69.9.821 $\mathrm{T2}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\times$	-	-
N69.9.822 $\mathrm{T2}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Z3}^-$	$\times$	-	-	-	-	-
N69.9.823 $\mathrm{T2}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Z4}^-$	$\times$	-	-	-	-	-
N69.9.824 $\mathrm{T2}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{T2}^-$	$\surd$	1	1	$\times$	-	-
N69.9.825 $\mathrm{T2}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{T4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N69.9.826 $\mathrm{T2}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Y2}^-$	$\times$	-	-	-	-	-
N69.9.827 $\mathrm{T2}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{T3}^+$	$\surd$	0	0	$\surd$	-	-
N69.9.828 $\mathrm{T2}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
N69.9.829 $\mathrm{T2}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N69.9.830 $\mathrm{T2}^+ \oplus \mathrm{T4}^+ \oplus \mathrm{T3}^+$	$\surd$	0	0	$\surd$	-	-
N69.9.831 $\mathrm{T2}^+ \oplus \mathrm{T4}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
N69.9.832 $\mathrm{T2}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{T3}^+$	$\surd$	1	0	$\times$	-	-
N69.9.833 $\mathrm{T2}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Z2}^+$	$\times$	-	-	-	-	-

Non-coplanar SSGs with parent space group $Fmmm$ (No. 69) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N69.9.834 $\mathrm{T2}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{T3}^+$	$\surd$	1	0	$\times$	-	-
N69.9.835 $\mathrm{T2}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
N69.9.836 $\mathrm{T2}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Z2}^+$	$\times$	-	-	-	-	-
N69.9.837 $\mathrm{T2}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{T3}^+$	$\surd$	1	0	$\times$	-	-
N69.9.838 $\mathrm{T2}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Y4}^+$	$\times$	-	-	-	-	-
N69.9.839 $\mathrm{T2}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{T3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_u} \oplus \mathrm{B2_u}$
N69.9.840 $\mathrm{T2}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	0	$\times$	-	-
N69.9.841 $\mathrm{T2}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-
N69.9.842 $\mathrm{T2}^+ \oplus \mathrm{T4}^+ \oplus \mathrm{T3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N69.9.843 $\mathrm{T2}^+ \oplus \mathrm{T4}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	0	$\times$	-	-
N69.9.844 $\mathrm{T2}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{T3}^-$	$\surd$	1	1	$\times$	-	-
N69.9.845 $\mathrm{T2}^+ \oplus \mathrm{Y2}^+ \oplus \mathrm{Z2}^-$	$\times$	-	-	-	-	-
N69.9.846 $\mathrm{T2}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{T3}^-$	$\surd$	1	1	$\times$	-	-
N69.9.847 $\mathrm{T2}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N69.9.848 $\mathrm{T2}^+ \oplus \mathrm{Y3}^+ \oplus \mathrm{Z2}^-$	$\times$	-	-	-	-	-
N69.9.849 $\mathrm{T2}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{T3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N69.9.850 $\mathrm{T2}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Y4}^-$	$\times$	-	-	-	-	-
N69.9.851 $\mathrm{T2}^+ \oplus \mathrm{T2}^- \oplus \mathrm{T2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u}$
N69.9.852 $\mathrm{T2}^+ \oplus \mathrm{T2}^- \oplus \mathrm{T4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u}$
N69.9.853 $\mathrm{T2}^+ \oplus \mathrm{T2}^- \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\times$	-	-
N69.9.854 $\mathrm{T2}^+ \oplus \mathrm{T2}^- \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\times$	-	-
N69.9.855 $\mathrm{T2}^+ \oplus \mathrm{T2}^- \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N69.9.856 $\mathrm{T2}^+ \oplus \mathrm{T2}^- \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\times$	-	-
N69.9.857 $\mathrm{T2}^+ \oplus \mathrm{T4}^- \oplus \mathrm{T4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B3_u}$
N69.9.858 $\mathrm{T2}^+ \oplus \mathrm{T4}^- \oplus \mathrm{Y2}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N69.9.859 $\mathrm{T2}^+ \oplus \mathrm{T4}^- \oplus \mathrm{Y3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N69.9.860 $\mathrm{T2}^+ \oplus \mathrm{T4}^- \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N69.9.861 $\mathrm{T2}^+ \oplus \mathrm{T4}^- \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N69.9.862 $\mathrm{T2}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N69.9.863 $\mathrm{T2}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N69.9.864 $\mathrm{T2}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Z3}^-$	$\times$	-	-	-	-	-
N69.9.865 $\mathrm{T2}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Z4}^-$	$\times$	-	-	-	-	-
N69.9.866 $\mathrm{T2}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N69.9.867 $\mathrm{T2}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Z3}^-$	$\times$	-	-	-	-	-
N69.9.868 $\mathrm{T2}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Z4}^-$	$\times$	-	-	-	-	-
N69.9.869 $\mathrm{T2}^+ \oplus \mathrm{Z3}^- \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N69.9.870 $\mathrm{T2}^+ \oplus \mathrm{Z3}^- \oplus \mathrm{Z4}^-$	$\surd$	1	0	$\times$	-	-
N69.9.871 $\mathrm{T2}^+ \oplus \mathrm{Z4}^- \oplus \mathrm{Z4}^-$	$\surd$	1	0	$\times$	-	-
N69.9.872 $\mathrm{T2}^+ \oplus \mathrm{T2}^- \oplus \mathrm{T3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B2_u}$
N69.9.873 $\mathrm{T2}^+ \oplus \mathrm{T2}^- \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\times$	-	-
N69.9.874 $\mathrm{T2}^+ \oplus \mathrm{T2}^- \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\times$	-	-
N69.9.875 $\mathrm{T2}^+ \oplus \mathrm{T4}^- \oplus \mathrm{T3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u}$
N69.9.876 $\mathrm{T2}^+ \oplus \mathrm{T4}^- \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N69.9.877 $\mathrm{T2}^+ \oplus \mathrm{T4}^- \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N69.9.878 $\mathrm{T2}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{T3}^+$	$\surd$	1	0	$\times$	-	-
N69.9.879 $\mathrm{T2}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $Fmmm$ (No. 69) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N69.9.880 $\mathrm{T2}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Z2}^+$	×	-	-	-	-	-
N69.9.881 $\mathrm{T2}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{T3}^+$	√	1	0	×	-	-
N69.9.882 $\mathrm{T2}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Y4}^+$	√	1	1	√	mmm	$\mathrm{B1_u}$
N69.9.883 $\mathrm{T2}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Z2}^+$	×	-	-	-	-	-
N69.9.884 $\mathrm{T2}^+ \oplus \mathrm{Z3}^- \oplus \mathrm{T3}^+$	√	1	0	×	-	-
N69.9.885 $\mathrm{T2}^+ \oplus \mathrm{Z3}^- \oplus \mathrm{Y4}^+$	×	-	-	-	-	-
N69.9.886 $\mathrm{T2}^+ \oplus \mathrm{Z3}^- \oplus \mathrm{Z2}^+$	√	1	1	√	mmm	$\mathrm{B2_u}$
N69.9.887 $\mathrm{T2}^+ \oplus \mathrm{Z4}^- \oplus \mathrm{T3}^+$	√	1	0	×	-	-
N69.9.888 $\mathrm{T2}^+ \oplus \mathrm{Z4}^- \oplus \mathrm{Y4}^+$	×	-	-	-	-	-
N69.9.889 $\mathrm{T2}^+ \oplus \mathrm{Z4}^- \oplus \mathrm{Z2}^+$	√	1	1	×	-	-
N69.9.890 $\mathrm{T2}^+ \oplus \mathrm{T2}^- \oplus \mathrm{T3}^-$	√	2	2	√	mmm	$\mathrm{A_u} \oplus \mathrm{B2_u}$
N69.9.891 $\mathrm{T2}^+ \oplus \mathrm{T2}^- \oplus \mathrm{Y4}^-$	√	1	1	×	-	-
N69.9.892 $\mathrm{T2}^+ \oplus \mathrm{T2}^- \oplus \mathrm{Z2}^-$	√	1	1	×	-	-
N69.9.893 $\mathrm{T2}^+ \oplus \mathrm{T4}^- \oplus \mathrm{T3}^-$	√	2	2	√	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_u}$
N69.9.894 $\mathrm{T2}^+ \oplus \mathrm{T4}^- \oplus \mathrm{Y4}^-$	√	1	1	√	mmm	$\mathrm{B3_u}$
N69.9.895 $\mathrm{T2}^+ \oplus \mathrm{T4}^- \oplus \mathrm{Z2}^-$	√	1	1	√	mmm	$\mathrm{B3_u}$
N69.9.896 $\mathrm{T2}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{T3}^-$	√	1	1	×	-	-
N69.9.897 $\mathrm{T2}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Y4}^-$	√	1	0	×	-	-
N69.9.898 $\mathrm{T2}^+ \oplus \mathrm{Y2}^- \oplus \mathrm{Z2}^-$	×	-	-	-	-	-
N69.9.899 $\mathrm{T2}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{T3}^-$	√	1	1	×	-	-
N69.9.900 $\mathrm{T2}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Y4}^-$	√	1	0	×	-	-
N69.9.901 $\mathrm{T2}^+ \oplus \mathrm{Y3}^- \oplus \mathrm{Z2}^-$	×	-	-	-	-	-
N69.9.902 $\mathrm{T2}^+ \oplus \mathrm{Z3}^- \oplus \mathrm{T3}^-$	√	1	1	√	mmm	$\mathrm{B2_u}$
N69.9.903 $\mathrm{T2}^+ \oplus \mathrm{Z3}^- \oplus \mathrm{Y4}^-$	×	-	-	-	-	-
N69.9.904 $\mathrm{T2}^+ \oplus \mathrm{Z3}^- \oplus \mathrm{Z2}^-$	√	1	0	×	-	-
N69.9.905 $\mathrm{T2}^+ \oplus \mathrm{Z4}^- \oplus \mathrm{T3}^-$	√	1	1	√	mmm	$\mathrm{B2_u}$
N69.9.906 $\mathrm{T2}^+ \oplus \mathrm{Z4}^- \oplus \mathrm{Y4}^-$	×	-	-	-	-	-
N69.9.907 $\mathrm{T2}^+ \oplus \mathrm{Z4}^- \oplus \mathrm{Z2}^-$	√	1	0	×	-	-
N69.9.908 $\mathrm{T2}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{T3}^+$	√	0	0	√	-	-
N69.9.909 $\mathrm{T2}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{Y4}^+$	√	1	0	×	-	-
N69.9.910 $\mathrm{T2}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{Z2}^+$	√	1	0	×	-	-
N69.9.911 $\mathrm{T2}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{Y4}^+$	√	1	0	×	-	-
N69.9.912 $\mathrm{T2}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{Z2}^+$	×	-	-	-	-	-
N69.9.913 $\mathrm{T2}^+ \oplus \mathrm{Z2}^+ \oplus \mathrm{Z2}^+$	√	1	0	×	-	-
N69.9.914 $\mathrm{T2}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{T3}^-$	√	2	2	√	mmm	$\mathrm{A_u} \oplus \mathrm{B2_u}$
N69.9.915 $\mathrm{T2}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{Y4}^-$	√	1	0	×	-	-
N69.9.916 $\mathrm{T2}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{Z2}^-$	√	1	0	×	-	-
N69.9.917 $\mathrm{T2}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{T3}^-$	√	1	1	×	-	-
N69.9.918 $\mathrm{T2}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{Y4}^-$	√	1	1	×	-	-
N69.9.919 $\mathrm{T2}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{Z2}^-$	×	-	-	-	-	-
N69.9.920 $\mathrm{T2}^+ \oplus \mathrm{Z2}^+ \oplus \mathrm{T3}^-$	√	1	1	√	mmm	$\mathrm{B2_u}$
N69.9.921 $\mathrm{T2}^+ \oplus \mathrm{Z2}^+ \oplus \mathrm{Y4}^-$	×	-	-	-	-	-
N69.9.922 $\mathrm{T2}^+ \oplus \mathrm{Z2}^+ \oplus \mathrm{Z2}^-$	√	1	1	×	-	-
N69.9.923 $\mathrm{T2}^+ \oplus \mathrm{T3}^- \oplus \mathrm{T3}^-$	√	2	2	√	mmm	$\mathrm{B2_u} \oplus \mathrm{B2_u}$
N69.9.924 $\mathrm{T2}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Y4}^-$	√	1	1	×	-	-
N69.9.925 $\mathrm{T2}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Z2}^-$	√	1	1	√	mmm	$\mathrm{B2_u}$

Non-coplanar SSGs with parent space group $Fmmm$ (No. 69) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N69.9.926 $\mathrm{T2}^+ \oplus \mathrm{Y4}^- \oplus \mathrm{Y4}^-$	$\surd$	1	0	$\times$	-	-
N69.9.927 $\mathrm{T2}^+ \oplus \mathrm{Y4}^- \oplus \mathrm{Z2}^-$	$\times$	-	-	-	-	-
N69.9.928 $\mathrm{T2}^+ \oplus \mathrm{Z2}^- \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-
N69.9.929 $\mathrm{T2}^- \oplus \mathrm{T2}^- \oplus \mathrm{T2}^-$	$\surd$	0	0	$\surd$	-	-
N69.9.930 $\mathrm{T2}^- \oplus \mathrm{T2}^- \oplus \mathrm{T4}^-$	$\surd$	0	0	$\surd$	-	-
N69.9.931 $\mathrm{T2}^- \oplus \mathrm{T2}^- \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N69.9.932 $\mathrm{T2}^- \oplus \mathrm{T2}^- \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N69.9.933 $\mathrm{T2}^- \oplus \mathrm{T2}^- \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N69.9.934 $\mathrm{T2}^- \oplus \mathrm{T2}^- \oplus \mathrm{Z4}^-$	$\surd$	1	0	$\times$	-	-
N69.9.935 $\mathrm{T2}^- \oplus \mathrm{T4}^- \oplus \mathrm{Y2}^-$	$\surd$	1	0	$\times$	-	-
N69.9.936 $\mathrm{T2}^- \oplus \mathrm{T4}^- \oplus \mathrm{Y3}^-$	$\surd$	1	0	$\times$	-	-
N69.9.937 $\mathrm{T2}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Z3}^-$	$\times$	-	-	-	-	-
N69.9.938 $\mathrm{T2}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Z4}^-$	$\times$	-	-	-	-	-
N69.9.939 $\mathrm{T2}^- \oplus \mathrm{T2}^- \oplus \mathrm{T3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_u} \oplus \mathrm{B2_u}$
N69.9.940 $\mathrm{T2}^- \oplus \mathrm{T2}^- \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
N69.9.941 $\mathrm{T2}^- \oplus \mathrm{T2}^- \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N69.9.942 $\mathrm{T2}^- \oplus \mathrm{T4}^- \oplus \mathrm{T3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N69.9.943 $\mathrm{T2}^- \oplus \mathrm{T4}^- \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
N69.9.944 $\mathrm{T2}^- \oplus \mathrm{Y2}^- \oplus \mathrm{T3}^+$	$\surd$	1	1	$\times$	-	-
N69.9.945 $\mathrm{T2}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Z2}^+$	$\times$	-	-	-	-	-
N69.9.946 $\mathrm{T2}^- \oplus \mathrm{Y3}^- \oplus \mathrm{T3}^+$	$\surd$	1	1	$\times$	-	-
N69.9.947 $\mathrm{T2}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N69.9.948 $\mathrm{T2}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Z2}^+$	$\times$	-	-	-	-	-
N69.9.949 $\mathrm{T2}^- \oplus \mathrm{Z3}^- \oplus \mathrm{T3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N69.9.950 $\mathrm{T2}^- \oplus \mathrm{Z3}^- \oplus \mathrm{Y4}^+$	$\times$	-	-	-	-	-
N69.9.951 $\mathrm{T2}^- \oplus \mathrm{T2}^- \oplus \mathrm{T3}^-$	$\surd$	0	0	$\surd$	-	-
N69.9.952 $\mathrm{T2}^- \oplus \mathrm{T2}^- \oplus \mathrm{Y4}^-$	$\surd$	1	0	$\times$	-	-
N69.9.953 $\mathrm{T2}^- \oplus \mathrm{T2}^- \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-
N69.9.954 $\mathrm{T2}^- \oplus \mathrm{T4}^- \oplus \mathrm{T3}^-$	$\surd$	0	0	$\surd$	-	-
N69.9.955 $\mathrm{T2}^- \oplus \mathrm{T4}^- \oplus \mathrm{Y4}^-$	$\surd$	1	0	$\times$	-	-
N69.9.956 $\mathrm{T2}^- \oplus \mathrm{Y2}^- \oplus \mathrm{T3}^-$	$\surd$	1	0	$\times$	-	-
N69.9.957 $\mathrm{T2}^- \oplus \mathrm{Y2}^- \oplus \mathrm{Z2}^-$	$\times$	-	-	-	-	-
N69.9.958 $\mathrm{T2}^- \oplus \mathrm{Y3}^- \oplus \mathrm{T3}^-$	$\surd$	1	0	$\times$	-	-
N69.9.959 $\mathrm{T2}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Y4}^-$	$\surd$	1	0	$\times$	-	-
N69.9.960 $\mathrm{T2}^- \oplus \mathrm{Y3}^- \oplus \mathrm{Z2}^-$	$\times$	-	-	-	-	-
N69.9.961 $\mathrm{T2}^- \oplus \mathrm{Z3}^- \oplus \mathrm{T3}^-$	$\surd$	1	0	$\times$	-	-
N69.9.962 $\mathrm{T2}^- \oplus \mathrm{Z3}^- \oplus \mathrm{Y4}^-$	$\times$	-	-	-	-	-
N69.9.963 $\mathrm{T2}^- \oplus \mathrm{T3}^+ \oplus \mathrm{T3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_u} \oplus \mathrm{B2_u}$
N69.9.964 $\mathrm{T2}^- \oplus \mathrm{T3}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	1	$\times$	-	-
N69.9.965 $\mathrm{T2}^- \oplus \mathrm{T3}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N69.9.966 $\mathrm{T2}^- \oplus \mathrm{Y4}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
N69.9.967 $\mathrm{T2}^- \oplus \mathrm{Y4}^+ \oplus \mathrm{Z2}^+$	$\times$	-	-	-	-	-
N69.9.968 $\mathrm{T2}^- \oplus \mathrm{Z2}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N69.9.969 $\mathrm{T2}^- \oplus \mathrm{T3}^+ \oplus \mathrm{T3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B2_u}$
N69.9.970 $\mathrm{T2}^- \oplus \mathrm{T3}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\times$	-	-
N69.9.971 $\mathrm{T2}^- \oplus \mathrm{T3}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$

Non-coplanar SSGs with parent space group $Fmmm$ (No. 69) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N69.9.972 $\mathrm{T2}^- \oplus \mathrm{Y4}^+ \oplus \mathrm{T3}^-$	$\surd$	1	0	$\times$	-	-
N69.9.973 $\mathrm{T2}^- \oplus \mathrm{Y4}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\times$	-	-
N69.9.974 $\mathrm{T2}^- \oplus \mathrm{Y4}^+ \oplus \mathrm{Z2}^-$	$\times$	-	-	-	-	-
N69.9.975 $\mathrm{T2}^- \oplus \mathrm{Z2}^+ \oplus \mathrm{T3}^-$	$\surd$	1	0	$\times$	-	-
N69.9.976 $\mathrm{T2}^- \oplus \mathrm{Z2}^+ \oplus \mathrm{Y4}^-$	$\times$	-	-	-	-	-
N69.9.977 $\mathrm{T2}^- \oplus \mathrm{Z2}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\times$	-	-
N69.9.978 $\mathrm{T2}^- \oplus \mathrm{T3}^- \oplus \mathrm{T3}^-$	$\surd$	0	0	$\surd$	-	-
N69.9.979 $\mathrm{T2}^- \oplus \mathrm{T3}^- \oplus \mathrm{Y4}^-$	$\surd$	1	0	$\times$	-	-
N69.9.980 $\mathrm{T2}^- \oplus \mathrm{T3}^- \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-
N69.9.981 $\mathrm{T2}^- \oplus \mathrm{Y4}^- \oplus \mathrm{Y4}^-$	$\surd$	1	0	$\times$	-	-
N69.9.982 $\mathrm{T2}^- \oplus \mathrm{Y4}^- \oplus \mathrm{Z2}^-$	$\times$	-	-	-	-	-
N69.9.983 $\mathrm{T2}^- \oplus \mathrm{Z2}^- \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-
N69.9.984 $\mathrm{T3}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{T3}^+$	$\surd$	0	0	$\surd$	-	-
N69.9.985 $\mathrm{T3}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{Y4}^+$	$\surd$	1	0	$\times$	-	-
N69.9.986 $\mathrm{T3}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{Z2}^+$	$\times$	-	-	-	-	-
N69.9.987 $\mathrm{T3}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{T3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u}$
N69.9.988 $\mathrm{T3}^+ \oplus \mathrm{T3}^+ \oplus \mathrm{Y4}^-$	$\surd$	1	0	$\times$	-	-
N69.9.989 $\mathrm{T3}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{T3}^-$	$\surd$	1	1	$\times$	-	-
N69.9.990 $\mathrm{T3}^+ \oplus \mathrm{Y4}^+ \oplus \mathrm{Z2}^-$	$\times$	-	-	-	-	-
N69.9.991 $\mathrm{T3}^+ \oplus \mathrm{T3}^- \oplus \mathrm{T3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u}$
N69.9.992 $\mathrm{T3}^+ \oplus \mathrm{T3}^- \oplus \mathrm{Y4}^-$	$\surd$	1	1	$\times$	-	-
N69.9.993 $\mathrm{T3}^+ \oplus \mathrm{Y4}^- \oplus \mathrm{Y4}^-$	$\surd$	1	0	$\times$	-	-
N69.9.994 $\mathrm{T3}^+ \oplus \mathrm{Y4}^- \oplus \mathrm{Z2}^-$	$\times$	-	-	-	-	-
N69.9.995 $\mathrm{T3}^- \oplus \mathrm{T3}^- \oplus \mathrm{T3}^-$	$\surd$	0	0	$\surd$	-	-
N69.9.996 $\mathrm{T3}^- \oplus \mathrm{T3}^- \oplus \mathrm{Y4}^-$	$\surd$	1	0	$\times$	-	-
N69.9.997 $\mathrm{T3}^- \oplus \mathrm{Y4}^- \oplus \mathrm{Z2}^-$	$\times$	-	-	-	-	-
N69.14.1 $\mathrm{GM1}^- \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N69.14.2 $\mathrm{GM1}^- \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N69.14.3 $\mathrm{GM1}^- \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N69.14.4 $\mathrm{GM1}^- \oplus \mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N69.14.5 $\mathrm{GM1}^- \oplus \mathrm{A2}$	$\surd$	1	1	$\times$	-	-
N69.14.6 $\mathrm{GM1}^- \oplus \mathrm{A3}$	$\surd$	1	1	$\times$	-	-
N69.14.7 $\mathrm{GM2}^+ \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	$mm2$	B2
N69.14.8 $\mathrm{GM2}^+ \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	222	B1
N69.14.9 $\mathrm{GM2}^+ \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	$mm2$	B2
N69.14.10 $\mathrm{GM2}^+ \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	222	B1
N69.14.11 $\mathrm{GM2}^+ \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	$mm2$	B2
N69.14.12 $\mathrm{GM2}^+ \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	$mm2$	B2
N69.14.13 $\mathrm{GM2}^+ \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	222	B1
N69.14.14 $\mathrm{GM2}^+ \oplus \mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N69.14.15 $\mathrm{GM2}^+ \oplus \mathrm{H1}$	$\surd$	1	1	$\times$	-	-
N69.14.16 $\mathrm{GM2}^+ \oplus \mathrm{A2}$	$\surd$	1	1	$\times$	-	-
N69.14.17 $\mathrm{GM2}^+ \oplus \mathrm{H2}$	$\surd$	1	1	$\times$	-	-
N69.14.18 $\mathrm{GM2}^+ \oplus \mathrm{A3}$	$\surd$	1	1	$\times$	-	-
N69.14.19 $\mathrm{GM2}^+ \oplus \mathrm{A4}$	$\surd$	1	1	$\times$	-	-
N69.14.20 $\mathrm{GM2}^+ \oplus \mathrm{H3}$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $Fmmm$ (No. 69) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N69.14.21 GM2$^-$ ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N69.14.22 GM2$^-$ ⊕ LD1	√	1	1	√	mmm	$\mathrm{B1_u}$
N69.14.23 GM2$^-$ ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
N69.14.24 GM2$^-$ ⊕ LD2	√	1	1	√	mmm	$\mathrm{B1_u}$
N69.14.25 GM2$^-$ ⊕ DT3	√	1	1	√	mmm	$\mathrm{B2_u}$
N69.14.26 GM2$^-$ ⊕ DT4	√	1	1	√	mmm	$\mathrm{B2_u}$
N69.14.27 GM2$^-$ ⊕ LD3	√	1	1	√	mmm	$\mathrm{B1_u}$
N69.14.28 GM2$^-$ ⊕ A1	√	1	1	×	-	-
N69.14.29 GM2$^-$ ⊕ H1	√	1	1	×	-	-
N69.14.30 GM2$^-$ ⊕ A2	√	1	1	×	-	-
N69.14.31 GM2$^-$ ⊕ H2	√	1	1	×	-	-
N69.14.32 GM2$^-$ ⊕ A3	√	1	1	×	-	-
N69.14.33 GM2$^-$ ⊕ A4	√	1	1	×	-	-
N69.14.34 GM2$^-$ ⊕ H3	√	1	1	×	-	-
N69.14.35 T1$^+$ ⊕ SM1	√	1	1	√	mmm	$\mathrm{B3_u}$
N69.14.36 T1$^+$ ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N69.14.37 T1$^+$ ⊕ SM2	√	1	1	√	mmm	$\mathrm{B3_u}$
N69.14.38 T1$^+$ ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
N69.14.39 T1$^+$ ⊕ SM3	√	1	1	√	mmm	$\mathrm{B3_u}$
N69.14.40 T1$^+$ ⊕ DT3	√	1	1	√	mmm	$\mathrm{B2_u}$
N69.14.41 T1$^+$ ⊕ DT4	√	1	1	√	mmm	$\mathrm{B2_u}$
N69.14.42 T1$^+$ ⊕ A1	√	1	1	×	-	-
N69.14.43 T1$^+$ ⊕ B1	√	1	1	√	mmm	$\mathrm{B2_u}$
N69.14.44 T1$^+$ ⊕ A2	√	1	1	×	-	-
N69.14.45 T1$^+$ ⊕ B2	√	1	1	√	mmm	$\mathrm{B2_u}$
N69.14.46 T1$^+$ ⊕ A3	√	1	1	×	-	-
N69.14.47 T1$^+$ ⊕ B3	√	1	1	√	mmm	$\mathrm{B2_u}$
N69.14.48 T1$^+$ ⊕ B4	√	1	1	√	mmm	$\mathrm{B2_u}$
N69.14.49 T1$^-$ ⊕ SM1	√	1	1	√	mmm	$\mathrm{B3_u}$
N69.14.50 T1$^-$ ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N69.14.51 T1$^-$ ⊕ SM2	√	1	1	√	mmm	$\mathrm{B3_u}$
N69.14.52 T1$^-$ ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
N69.14.53 T1$^-$ ⊕ SM3	√	1	1	√	mmm	$\mathrm{B3_u}$
N69.14.54 T1$^-$ ⊕ DT3	√	1	1	√	mmm	$\mathrm{B2_u}$
N69.14.55 T1$^-$ ⊕ DT4	√	1	1	√	mmm	$\mathrm{B2_u}$
N69.14.56 T1$^-$ ⊕ A1	√	1	1	×	-	-
N69.14.57 T1$^-$ ⊕ B1	√	1	1	√	mmm	$\mathrm{B2_u}$
N69.14.58 T1$^-$ ⊕ A2	√	1	1	×	-	-
N69.14.59 T1$^-$ ⊕ B2	√	1	1	√	mmm	$\mathrm{B2_u}$
N69.14.60 T1$^-$ ⊕ A3	√	1	1	×	-	-
N69.14.61 T1$^-$ ⊕ B3	√	1	1	√	mmm	$\mathrm{B2_u}$
N69.14.62 T1$^-$ ⊕ B4	√	1	1	√	mmm	$\mathrm{B2_u}$
N69.14.63 T2$^+$ ⊕ SM1	√	1	1	√	mmm	$\mathrm{B3_u}$
N69.14.64 T2$^+$ ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N69.14.65 T2$^+$ ⊕ LD1	√	1	1	√	mmm	$\mathrm{B1_u}$
N69.14.66 T2$^+$ ⊕ SM2	√	1	1	√	mmm	$\mathrm{B3_u}$

Non-coplanar SSGs with parent space group $Fmmm$ (No. 69) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N69.14.67 $\mathrm{T2}^{+} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N69.14.68 $\mathrm{T2}^{+} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N69.14.69 $\mathrm{T2}^{+} \oplus \mathrm{SM3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N69.14.70 $\mathrm{T2}^{+} \oplus \mathrm{SM4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N69.14.71 $\mathrm{T2}^{+} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N69.14.72 $\mathrm{T2}^{+} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N69.14.73 $\mathrm{T2}^{+} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N69.14.74 $\mathrm{T2}^{+} \oplus \mathrm{LD4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N69.14.75 $\mathrm{T2}^{+} \oplus \mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N69.14.76 $\mathrm{T2}^{+} \oplus \mathrm{B1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N69.14.77 $\mathrm{T2}^{+} \oplus \mathrm{H1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N69.14.78 $\mathrm{T2}^{+} \oplus \mathrm{A2}$	$\surd$	1	1	$\times$	-	-
N69.14.79 $\mathrm{T2}^{+} \oplus \mathrm{B2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N69.14.80 $\mathrm{T2}^{+} \oplus \mathrm{H2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N69.14.81 $\mathrm{T2}^{+} \oplus \mathrm{A3}$	$\surd$	1	1	$\times$	-	-
N69.14.82 $\mathrm{T2}^{+} \oplus \mathrm{A4}$	$\surd$	1	1	$\times$	-	-
N69.14.83 $\mathrm{T2}^{+} \oplus \mathrm{B3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N69.14.84 $\mathrm{T2}^{+} \oplus \mathrm{B4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N69.14.85 $\mathrm{T2}^{+} \oplus \mathrm{H3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N69.14.86 $\mathrm{T2}^{+} \oplus \mathrm{H4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N69.14.87 $\mathrm{T2}^{-} \oplus \mathrm{SM1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N69.14.88 $\mathrm{T2}^{-} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N69.14.89 $\mathrm{T2}^{-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N69.14.90 $\mathrm{T2}^{-} \oplus \mathrm{SM2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N69.14.91 $\mathrm{T2}^{-} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N69.14.92 $\mathrm{T2}^{-} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N69.14.93 $\mathrm{T2}^{-} \oplus \mathrm{SM3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N69.14.94 $\mathrm{T2}^{-} \oplus \mathrm{SM4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N69.14.95 $\mathrm{T2}^{-} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N69.14.96 $\mathrm{T2}^{-} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N69.14.97 $\mathrm{T2}^{-} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N69.14.98 $\mathrm{T2}^{-} \oplus \mathrm{LD4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N69.14.99 $\mathrm{T2}^{-} \oplus \mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N69.14.100 $\mathrm{T2}^{-} \oplus \mathrm{B1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N69.14.101 $\mathrm{T2}^{-} \oplus \mathrm{H1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N69.14.102 $\mathrm{T2}^{-} \oplus \mathrm{A2}$	$\surd$	1	1	$\times$	-	-
N69.14.103 $\mathrm{T2}^{-} \oplus \mathrm{B2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N69.14.104 $\mathrm{T2}^{-} \oplus \mathrm{H2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N69.14.105 $\mathrm{T2}^{-} \oplus \mathrm{A3}$	$\surd$	1	1	$\times$	-	-
N69.14.106 $\mathrm{T2}^{-} \oplus \mathrm{A4}$	$\surd$	1	1	$\times$	-	-
N69.14.107 $\mathrm{T2}^{-} \oplus \mathrm{B3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N69.14.108 $\mathrm{T2}^{-} \oplus \mathrm{B4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N69.14.109 $\mathrm{T2}^{-} \oplus \mathrm{H3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N69.14.110 $\mathrm{T2}^{-} \oplus \mathrm{H4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N69.14.111 $\mathrm{T3}^{+} \oplus \mathrm{SM1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N69.14.112 $\mathrm{T3}^{+} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$

Non-coplanar SSGs with parent space group $Fmmm$ (No. 69) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N69.14.113 $\mathrm{T3}^{+} \oplus \mathrm{SM2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N69.14.114 $\mathrm{T3}^{+} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N69.14.115 $\mathrm{T3}^{+} \oplus \mathrm{SM3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N69.14.116 $\mathrm{T3}^{+} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N69.14.117 $\mathrm{T3}^{+} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N69.14.118 $\mathrm{T3}^{+} \oplus \mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N69.14.119 $\mathrm{T3}^{+} \oplus \mathrm{B1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N69.14.120 $\mathrm{T3}^{+} \oplus \mathrm{A2}$	$\surd$	1	1	$\times$	-	-
N69.14.121 $\mathrm{T3}^{+} \oplus \mathrm{B2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N69.14.122 $\mathrm{T3}^{+} \oplus \mathrm{A3}$	$\surd$	1	1	$\times$	-	-
N69.14.123 $\mathrm{T3}^{+} \oplus \mathrm{B3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N69.14.124 $\mathrm{T3}^{+} \oplus \mathrm{B4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N69.14.125 $\mathrm{T3}^{-} \oplus \mathrm{SM1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N69.14.126 $\mathrm{T3}^{-} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N69.14.127 $\mathrm{T3}^{-} \oplus \mathrm{SM2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N69.14.128 $\mathrm{T3}^{-} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N69.14.129 $\mathrm{T3}^{-} \oplus \mathrm{SM3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N69.14.130 $\mathrm{T3}^{-} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N69.14.131 $\mathrm{T3}^{-} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N69.14.132 $\mathrm{T3}^{-} \oplus \mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N69.14.133 $\mathrm{T3}^{-} \oplus \mathrm{B1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N69.14.134 $\mathrm{T3}^{-} \oplus \mathrm{A2}$	$\surd$	1	1	$\times$	-	-
N69.14.135 $\mathrm{T3}^{-} \oplus \mathrm{B2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N69.14.136 $\mathrm{T3}^{-} \oplus \mathrm{A3}$	$\surd$	1	1	$\times$	-	-
N69.14.137 $\mathrm{T3}^{-} \oplus \mathrm{B3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N69.14.138 $\mathrm{T3}^{-} \oplus \mathrm{B4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$

TABLE S208: Collinear SSGs with parent space group $Fddd$ (No. 70).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L70.1.1 $\mathrm{GM1}^{+}$	1	mmm	$\mathrm{A_g}$
L70.2.1 $\mathrm{GM1}^{-}$	0	-	-
L70.2.2 $\mathrm{GM2}^{+}$	1	mmm	$\mathrm{B1_g}$
L70.2.3 $\mathrm{GM2}^{-}$	0	-	-

TABLE S209: Coplanar SSGs with parent space group $Fddd$ (No. 70).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P70.1.1 $\mathrm{GM1}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
P70.2.1 $\mathrm{GM1}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
P70.2.2 $\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
P70.2.3 $\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
P70.3.1 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-}$	$\surd$	0	0	$\surd$	-	-
P70.3.2 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
P70.3.3 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-

Coplanar SSGs with parent space group $Fddd$ (No. 70) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P70.3.4 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_g}$
P70.3.5 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B3_g}$
P70.3.6 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B1_g}$
P70.3.7 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B2_u}$
P70.3.8 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
P70.3.9 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
P70.6.1 T1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P70.6.2 T2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P70.8.1 DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P70.8.2 DT3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$

TABLE S210: Non-coplanar SSGs with parent space group $Fddd$ (No. 70).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N70.1.1 $\mathrm{GM1}^{+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{A_g}$
N70.2.1 $\mathrm{GM1}^{-}$	$\surd$	2	2	$\surd$	222	$\mathrm{A1}\oplus\mathrm{A1}$
N70.2.2 $\mathrm{GM2}^{+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{B1_g}$
N70.2.3 $\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1}\oplus\mathrm{A1}$
N70.3.1 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_u}\oplus\mathrm{A_u}$
N70.3.2 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1}\oplus\mathrm{A2}$
N70.3.3 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_u}\oplus\mathrm{B1_u}$
N70.3.4 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B1_g}\oplus\mathrm{B1_g}$
N70.3.5 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B1_g}\oplus\mathrm{B3_g}$
N70.3.6 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	222	$\mathrm{A1}\oplus\mathrm{B1}$
N70.3.7 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1}\oplus\mathrm{B1}$
N70.3.8 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B1_u}\oplus\mathrm{B1_u}$
N70.3.9 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B1_u}\oplus\mathrm{B3_u}$
N70.6.1 T1	$\surd$	1	1	$\surd$	$mm2$	A1
N70.6.2 T2	$\surd$	1	1	$\surd$	$mm2$	A1
N70.8.1 DT1	$\surd$	1	1	$\surd$	$mm2$	A1
N70.8.2 DT3	$\surd$	1	1	$\surd$	$mm2$	A1
N70.9.1 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}$	$\surd$	0	0	$\surd$	-	-
N70.9.2 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_u}\oplus\mathrm{B1_u}$
N70.9.3 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
N70.9.4 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	222	$\mathrm{B1}\oplus\mathrm{B1}$
N70.9.5 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2}\oplus\mathrm{B1}$
N70.9.6 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B1_g}\oplus\mathrm{B1_u}$
N70.9.7 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_u}\oplus\mathrm{B2_u}$
N70.9.8 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
N70.9.9 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
N70.9.10 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B1_g}$
N70.9.11 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B3_g}$
N70.9.12 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{+}\oplus\mathrm{GM4}^{+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B3_g}\oplus\mathrm{B2_g}$
N70.9.13 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2}\oplus\mathrm{A2}$
N70.9.14 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2}\oplus\mathrm{B2}$
N70.9.15 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{+}\oplus\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2}\oplus\mathrm{B2}$

Non-coplanar SSGs with parent space group $Fddd$ (No. 70) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N70.9.16 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	222	$\mathrm{B1} \oplus \mathrm{B3}$
N70.9.17 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$
N70.9.18 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g} \oplus \mathrm{B2_u}$
N70.9.19 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N70.9.20 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N70.9.21 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
N70.9.22 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N70.9.23 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N70.12.1 $\mathrm{GM1}^- \oplus \mathrm{T1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N70.12.2 $\mathrm{GM1}^- \oplus \mathrm{T2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N70.12.3 $\mathrm{GM2}^+ \oplus \mathrm{T1}$	$\surd$	1	1	$\surd$	$mm2$	B1
N70.12.4 $\mathrm{GM2}^+ \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	222	B1
N70.12.5 $\mathrm{GM2}^+ \oplus \mathrm{T2}$	$\surd$	1	1	$\surd$	$mm2$	B1
N70.12.6 $\mathrm{GM2}^+ \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	222	B1
N70.12.7 $\mathrm{GM2}^- \oplus \mathrm{T1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N70.12.8 $\mathrm{GM2}^- \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N70.12.9 $\mathrm{GM2}^- \oplus \mathrm{T2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N70.12.10 $\mathrm{GM2}^- \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N70.14.1 $\mathrm{GM1}^- \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N70.14.2 $\mathrm{GM1}^- \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N70.14.3 $\mathrm{GM2}^+ \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	$mm2$	B2
N70.14.4 $\mathrm{GM2}^+ \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	222	B1
N70.14.5 $\mathrm{GM2}^+ \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	$mm2$	B2
N70.14.6 $\mathrm{GM2}^+ \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	222	B1
N70.14.7 $\mathrm{GM2}^- \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N70.14.8 $\mathrm{GM2}^- \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N70.14.9 $\mathrm{GM2}^- \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N70.14.10 $\mathrm{GM2}^- \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$

TABLE S211: Collinear SSGs with parent space group $Immm$ (No. 71).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L71.1.1 $\mathrm{GM1}^+$	1	mmm	$\mathrm{A_g}$
L71.2.1 $\mathrm{GM1}^-$	0	-	-
L71.2.2 $\mathrm{GM2}^+$	1	mmm	$\mathrm{B1_g}$
L71.2.3 $\mathrm{GM2}^-$	0	-	-
L71.2.4 $\mathrm{X1}^+$	0	-	-
L71.2.5 $\mathrm{X1}^-$	0	-	-
L71.2.6 $\mathrm{X2}^+$	0	-	-
L71.2.7 $\mathrm{X2}^-$	0	-	-

TABLE S212: Coplanar SSGs with parent space group $Immm$ (No. 71).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P71.1.1 $\mathrm{GM1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$

Coplanar SSGs with parent space group $Immm$ (No. 71) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P71.2.1 $\mathrm{GM1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
P71.2.2 $\mathrm{GM2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
P71.2.3 $\mathrm{GM2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
P71.2.4 $\mathrm{X1}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P71.2.5 $\mathrm{X1}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P71.2.6 $\mathrm{X2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P71.2.7 $\mathrm{X2}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P71.3.1 $\mathrm{GM1}^- \oplus \mathrm{GM1}^-$	$\surd$	0	0	$\surd$	-	-
P71.3.2 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
P71.3.3 $\mathrm{GM1}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
P71.3.4 $\mathrm{GM1}^- \oplus \mathrm{X1}^+$	$\surd$	1	1	$\times$	-	-
P71.3.5 $\mathrm{GM1}^- \oplus \mathrm{X1}^-$	$\surd$	1	1	$\times$	-	-
P71.3.6 $\mathrm{GM1}^- \oplus \mathrm{X2}^+$	$\surd$	1	1	$\times$	-	-
P71.3.7 $\mathrm{GM1}^- \oplus \mathrm{X2}^-$	$\surd$	1	1	$\times$	-	-
P71.3.8 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
P71.3.9 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
P71.3.10 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
P71.3.11 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
P71.3.12 $\mathrm{GM2}^+ \oplus \mathrm{X1}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
P71.3.13 $\mathrm{GM2}^+ \oplus \mathrm{X1}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
P71.3.14 $\mathrm{GM2}^+ \oplus \mathrm{X2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
P71.3.15 $\mathrm{GM2}^+ \oplus \mathrm{X3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
P71.3.16 $\mathrm{GM2}^+ \oplus \mathrm{X2}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
P71.3.17 $\mathrm{GM2}^+ \oplus \mathrm{X3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
P71.3.18 $\mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
P71.3.19 $\mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
P71.3.20 $\mathrm{GM2}^- \oplus \mathrm{X1}^+$	$\surd$	1	1	$\times$	-	-
P71.3.21 $\mathrm{GM2}^- \oplus \mathrm{X1}^-$	$\surd$	1	1	$\times$	-	-
P71.3.22 $\mathrm{GM2}^- \oplus \mathrm{X2}^+$	$\surd$	1	1	$\times$	-	-
P71.3.23 $\mathrm{GM2}^- \oplus \mathrm{X3}^+$	$\surd$	1	1	$\times$	-	-
P71.3.24 $\mathrm{GM2}^- \oplus \mathrm{X2}^-$	$\surd$	1	1	$\times$	-	-
P71.3.25 $\mathrm{GM2}^- \oplus \mathrm{X3}^-$	$\surd$	1	1	$\times$	-	-
P71.3.26 $\mathrm{X1}^+ \oplus \mathrm{X1}^+$	$\surd$	1	0	$\times$	-	-
P71.3.27 $\mathrm{X1}^+ \oplus \mathrm{X1}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_u}$
P71.3.28 $\mathrm{X1}^+ \oplus \mathrm{X2}^+$	$\surd$	1	0	$\times$	-	-
P71.3.29 $\mathrm{X1}^+ \oplus \mathrm{X2}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P71.3.30 $\mathrm{X1}^- \oplus \mathrm{X1}^-$	$\surd$	1	0	$\times$	-	-
P71.3.31 $\mathrm{X1}^- \oplus \mathrm{X2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P71.3.32 $\mathrm{X1}^- \oplus \mathrm{X2}^-$	$\surd$	1	0	$\times$	-	-
P71.3.33 $\mathrm{X2}^+ \oplus \mathrm{X2}^+$	$\surd$	1	0	$\times$	-	-
P71.3.34 $\mathrm{X2}^+ \oplus \mathrm{X3}^+$	$\surd$	1	0	$\times$	-	-
P71.3.35 $\mathrm{X2}^+ \oplus \mathrm{X2}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_u}$
P71.3.36 $\mathrm{X2}^+ \oplus \mathrm{X3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P71.3.37 $\mathrm{X2}^- \oplus \mathrm{X2}^-$	$\surd$	1	0	$\times$	-	-
P71.3.38 $\mathrm{X2}^- \oplus \mathrm{X3}^-$	$\surd$	1	0	$\times$	-	-
P71.7.1 $\mathrm{R1}^+$	$\times$	-	-	-	-	-

Coplanar SSGs with parent space group $Immm$ (No. 71) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P71.7.2 $\mathrm{R1}^-$	$\times$	-	-	-	-	-
P71.7.3 W1	$\surd$	1	1	$\times$	-	-
P71.8.1 DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P71.8.2 DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P71.8.3 DT3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$

TABLE S213: Non-coplanar SSGs with parent space group $Immm$ (No. 71).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N71.1.1 $\mathrm{GM1}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{A_g}$
N71.2.1 $\mathrm{GM1}^-$	$\surd$	2	2	$\surd$	222	$\mathrm{A1}\oplus\mathrm{A1}$
N71.2.2 $\mathrm{GM2}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{B1_g}$
N71.2.3 $\mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1}\oplus\mathrm{A1}$
N71.2.4 $\mathrm{X1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_g}$
N71.2.5 $\mathrm{X1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_g}$
N71.2.6 $\mathrm{X2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_g}$
N71.2.7 $\mathrm{X2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_g}$
N71.3.1 $\mathrm{GM1}^-\oplus\mathrm{GM1}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_u}\oplus\mathrm{A_u}$
N71.3.2 $\mathrm{GM1}^-\oplus\mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1}\oplus\mathrm{A2}$
N71.3.3 $\mathrm{GM1}^-\oplus\mathrm{GM2}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_u}\oplus\mathrm{B1_u}$
N71.3.4 $\mathrm{GM1}^-\oplus\mathrm{X1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_u}$
N71.3.5 $\mathrm{GM1}^-\oplus\mathrm{X1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_u}$
N71.3.6 $\mathrm{GM1}^-\oplus\mathrm{X2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_u}$
N71.3.7 $\mathrm{GM1}^-\oplus\mathrm{X2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{A_u}$
N71.3.8 $\mathrm{GM2}^+\oplus\mathrm{GM2}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B1_g}\oplus\mathrm{B1_g}$
N71.3.9 $\mathrm{GM2}^+\oplus\mathrm{GM3}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B1_g}\oplus\mathrm{B3_g}$
N71.3.10 $\mathrm{GM2}^+\oplus\mathrm{GM2}^-$	$\surd$	2	2	$\surd$	222	$\mathrm{A1}\oplus\mathrm{B1}$
N71.3.11 $\mathrm{GM2}^+\oplus\mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1}\oplus\mathrm{B1}$
N71.3.12 $\mathrm{GM2}^+\oplus\mathrm{X1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B1_g}$
N71.3.13 $\mathrm{GM2}^+\oplus\mathrm{X1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B1_g}$
N71.3.14 $\mathrm{GM2}^+\oplus\mathrm{X2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B1_g}$
N71.3.15 $\mathrm{GM2}^+\oplus\mathrm{X3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B1_g}$
N71.3.16 $\mathrm{GM2}^+\oplus\mathrm{X2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B1_g}$
N71.3.17 $\mathrm{GM2}^+\oplus\mathrm{X3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B1_g}$
N71.3.18 $\mathrm{GM2}^-\oplus\mathrm{GM2}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B1_u}\oplus\mathrm{B1_u}$
N71.3.19 $\mathrm{GM2}^-\oplus\mathrm{GM3}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B1_u}\oplus\mathrm{B3_u}$
N71.3.20 $\mathrm{GM2}^-\oplus\mathrm{X1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B1_u}$
N71.3.21 $\mathrm{GM2}^-\oplus\mathrm{X1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B1_u}$
N71.3.22 $\mathrm{GM2}^-\oplus\mathrm{X2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B1_u}$
N71.3.23 $\mathrm{GM2}^-\oplus\mathrm{X3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B1_u}$
N71.3.24 $\mathrm{GM2}^-\oplus\mathrm{X2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B1_u}$
N71.3.25 $\mathrm{GM2}^-\oplus\mathrm{X3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B1_u}$
N71.3.26 $\mathrm{X1}^+\oplus\mathrm{X1}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N71.3.27 $\mathrm{X1}^+\oplus\mathrm{X1}^-$	$\surd$	1	1	$\surd$	222	A1
N71.3.28 $\mathrm{X1}^+\oplus\mathrm{X2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N71.3.29 $\mathrm{X1}^+\oplus\mathrm{X2}^-$	$\surd$	1	1	$\surd$	$mm2$	A1

Non-coplanar SSGs with parent space group $Immm$ (No. 71) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N71.3.30 $\mathrm{X1^-}\oplus\mathrm{X1^-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N71.3.31 $\mathrm{X1^-}\oplus\mathrm{X2^+}$	√	1	1	√	$mm2$	A1
N71.3.32 $\mathrm{X1^-}\oplus\mathrm{X2^-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N71.3.33 $\mathrm{X2^+}\oplus\mathrm{X2^+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N71.3.34 $\mathrm{X2^+}\oplus\mathrm{X3^+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N71.3.35 $\mathrm{X2^+}\oplus\mathrm{X2^-}$	√	1	1	√	222	A1
N71.3.36 $\mathrm{X2^+}\oplus\mathrm{X3^-}$	√	1	1	√	$mm2$	A1
N71.3.37 $\mathrm{X2^-}\oplus\mathrm{X2^-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N71.3.38 $\mathrm{X2^-}\oplus\mathrm{X3^-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N71.7.1 $\mathrm{R1^+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N71.7.2 $\mathrm{R1^-}$	√	1	1	√	mmm	$\mathrm{A_g}$
N71.7.3 W1	√	1	1	√	222	A1
N71.8.1 DT1	√	1	1	√	$mm2$	A1
N71.8.2 DT2	√	1	1	√	$mm2$	A1
N71.8.3 DT3	√	1	1	√	$mm2$	A1
N71.9.1 $\mathrm{GM1^-}\oplus\mathrm{GM1^-}\oplus\mathrm{GM1^-}$	√	0	0	√	-	-
N71.9.2 $\mathrm{GM1^-}\oplus\mathrm{GM1^-}\oplus\mathrm{GM2^+}$	√	3	3	√	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_u}\oplus\mathrm{B1_u}$
N71.9.3 $\mathrm{GM1^-}\oplus\mathrm{GM1^-}\oplus\mathrm{GM2^-}$	√	0	0	√	-	-
N71.9.4 $\mathrm{GM1^-}\oplus\mathrm{GM1^-}\oplus\mathrm{X1^+}$	√	0	0	√	-	-
N71.9.5 $\mathrm{GM1^-}\oplus\mathrm{GM1^-}\oplus\mathrm{X1^-}$	√	0	0	√	-	-
N71.9.6 $\mathrm{GM1^-}\oplus\mathrm{GM1^-}\oplus\mathrm{X2^+}$	√	0	0	√	-	-
N71.9.7 $\mathrm{GM1^-}\oplus\mathrm{GM1^-}\oplus\mathrm{X2^-}$	√	0	0	√	-	-
N71.9.8 $\mathrm{GM1^-}\oplus\mathrm{GM2^+}\oplus\mathrm{GM2^+}$	√	2	2	√	222	$\mathrm{B1}\oplus\mathrm{B1}$
N71.9.9 $\mathrm{GM1^-}\oplus\mathrm{GM2^+}\oplus\mathrm{GM3^+}$	√	2	2	√	$mm2$	$\mathrm{B2}\oplus\mathrm{B1}$
N71.9.10 $\mathrm{GM1^-}\oplus\mathrm{GM2^+}\oplus\mathrm{GM2^-}$	√	3	3	√	mmm	$\mathrm{A_u}\oplus\mathrm{B1_g}\oplus\mathrm{B1_u}$
N71.9.11 $\mathrm{GM1^-}\oplus\mathrm{GM2^+}\oplus\mathrm{GM3^-}$	√	3	3	√	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_u}\oplus\mathrm{B2_u}$
N71.9.12 $\mathrm{GM1^-}\oplus\mathrm{GM2^+}\oplus\mathrm{X1^+}$	√	2	2	√	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_u}$
N71.9.13 $\mathrm{GM1^-}\oplus\mathrm{GM2^+}\oplus\mathrm{X1^-}$	√	2	2	√	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_u}$
N71.9.14 $\mathrm{GM1^-}\oplus\mathrm{GM2^+}\oplus\mathrm{X2^+}$	√	2	2	√	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_u}$
N71.9.15 $\mathrm{GM1^-}\oplus\mathrm{GM2^+}\oplus\mathrm{X3^+}$	√	2	2	√	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_u}$
N71.9.16 $\mathrm{GM1^-}\oplus\mathrm{GM2^+}\oplus\mathrm{X2^-}$	√	2	2	√	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_u}$
N71.9.17 $\mathrm{GM1^-}\oplus\mathrm{GM2^+}\oplus\mathrm{X3^-}$	√	2	2	√	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_u}$
N71.9.18 $\mathrm{GM1^-}\oplus\mathrm{GM2^-}\oplus\mathrm{GM2^-}$	√	0	0	√	-	-
N71.9.19 $\mathrm{GM1^-}\oplus\mathrm{GM2^-}\oplus\mathrm{GM3^-}$	√	0	0	√	-	-
N71.9.20 $\mathrm{GM1^-}\oplus\mathrm{GM2^-}\oplus\mathrm{X1^+}$	√	0	0	√	-	-
N71.9.21 $\mathrm{GM1^-}\oplus\mathrm{GM2^-}\oplus\mathrm{X1^-}$	√	0	0	√	-	-
N71.9.22 $\mathrm{GM1^-}\oplus\mathrm{GM2^-}\oplus\mathrm{X2^+}$	√	0	0	√	-	-
N71.9.23 $\mathrm{GM1^-}\oplus\mathrm{GM2^-}\oplus\mathrm{X3^+}$	√	0	0	√	-	-
N71.9.24 $\mathrm{GM1^-}\oplus\mathrm{GM2^-}\oplus\mathrm{X2^-}$	√	0	0	√	-	-
N71.9.25 $\mathrm{GM1^-}\oplus\mathrm{GM2^-}\oplus\mathrm{X3^-}$	√	0	0	√	-	-
N71.9.26 $\mathrm{GM1^-}\oplus\mathrm{X1^+}\oplus\mathrm{X1^+}$	√	1	0	×	-	-
N71.9.27 $\mathrm{GM1^-}\oplus\mathrm{X1^+}\oplus\mathrm{X1^-}$	√	1	1	√	mmm	$\mathrm{A_u}$
N71.9.28 $\mathrm{GM1^-}\oplus\mathrm{X1^+}\oplus\mathrm{X2^+}$	√	1	0	×	-	-
N71.9.29 $\mathrm{GM1^-}\oplus\mathrm{X1^+}\oplus\mathrm{X2^-}$	√	1	1	√	mmm	$\mathrm{B1_u}$
N71.9.30 $\mathrm{GM1^-}\oplus\mathrm{X1^-}\oplus\mathrm{X1^-}$	√	1	0	×	-	-
N71.9.31 $\mathrm{GM1^-}\oplus\mathrm{X1^-}\oplus\mathrm{X2^+}$	√	1	1	√	mmm	$\mathrm{B1_u}$

Non-coplanar SSGs with parent space group $Immm$ (No. 71) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N71.9.32 $\mathrm{GM1}^- \oplus \mathrm{X1}^- \oplus \mathrm{X2}^-$	$\surd$	1	0	$\times$	-	-
N71.9.33 $\mathrm{GM1}^- \oplus \mathrm{X2}^+ \oplus \mathrm{X2}^+$	$\surd$	1	0	$\times$	-	-
N71.9.34 $\mathrm{GM1}^- \oplus \mathrm{X2}^+ \oplus \mathrm{X3}^+$	$\surd$	1	0	$\times$	-	-
N71.9.35 $\mathrm{GM1}^- \oplus \mathrm{X2}^+ \oplus \mathrm{X2}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_u}$
N71.9.36 $\mathrm{GM1}^- \oplus \mathrm{X2}^+ \oplus \mathrm{X3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N71.9.37 $\mathrm{GM1}^- \oplus \mathrm{X2}^- \oplus \mathrm{X2}^-$	$\surd$	1	0	$\times$	-	-
N71.9.38 $\mathrm{GM1}^- \oplus \mathrm{X2}^- \oplus \mathrm{X3}^-$	$\surd$	1	0	$\times$	-	-
N71.9.39 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N71.9.40 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B3_g}$
N71.9.41 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N71.9.42 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{A2}$
N71.9.43 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2} \oplus \mathrm{B2}$
N71.9.44 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{B2}$
N71.9.45 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	222	$\mathrm{B1} \oplus \mathrm{B3}$
N71.9.46 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{X1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N71.9.47 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{X1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N71.9.48 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{X1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N71.9.49 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{X1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N71.9.50 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{X2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N71.9.51 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{X3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N71.9.52 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{X2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N71.9.53 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{X4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N71.9.54 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{X2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N71.9.55 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{X3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N71.9.56 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{X2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N71.9.57 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{X4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N71.9.58 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$
N71.9.59 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g} \oplus \mathrm{B2_u}$
N71.9.60 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N71.9.61 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N71.9.62 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{X1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
N71.9.63 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{X1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N71.9.64 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{X1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
N71.9.65 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{X1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N71.9.66 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{X2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
N71.9.67 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{X3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
N71.9.68 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{X2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N71.9.69 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{X3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N71.9.70 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{X4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N71.9.71 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{X2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
N71.9.72 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{X3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
N71.9.73 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{X2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N71.9.74 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{X3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N71.9.75 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{X4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N71.9.76 $\mathrm{GM2}^+ \oplus \mathrm{X1}^+ \oplus \mathrm{X1}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N71.9.77 $\mathrm{GM2}^+ \oplus \mathrm{X1}^+ \oplus \mathrm{X1}^-$	$\surd$	1	1	$\surd$	$mm2$	A2

Non-coplanar SSGs with parent space group $Immm$ (No. 71) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N71.9.78 $\mathrm{GM2}^{+}\oplus\mathrm{X1}^{+}\oplus\mathrm{X2}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N71.9.79 $\mathrm{GM2}^{+}\oplus\mathrm{X1}^{+}\oplus\mathrm{X3}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N71.9.80 $\mathrm{GM2}^{+}\oplus\mathrm{X1}^{+}\oplus\mathrm{X2}^{-}$	$\surd$	1	1	$\surd$	222	B1
N71.9.81 $\mathrm{GM2}^{+}\oplus\mathrm{X1}^{+}\oplus\mathrm{X3}^{-}$	$\surd$	1	1	$\surd$	$mm2$	B1
N71.9.82 $\mathrm{GM2}^{+}\oplus\mathrm{X1}^{-}\oplus\mathrm{X1}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N71.9.83 $\mathrm{GM2}^{+}\oplus\mathrm{X1}^{-}\oplus\mathrm{X2}^{+}$	$\surd$	1	1	$\surd$	222	B1
N71.9.84 $\mathrm{GM2}^{+}\oplus\mathrm{X1}^{-}\oplus\mathrm{X3}^{+}$	$\surd$	1	1	$\surd$	$mm2$	B1
N71.9.85 $\mathrm{GM2}^{+}\oplus\mathrm{X1}^{-}\oplus\mathrm{X2}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N71.9.86 $\mathrm{GM2}^{+}\oplus\mathrm{X1}^{-}\oplus\mathrm{X3}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N71.9.87 $\mathrm{GM2}^{+}\oplus\mathrm{X2}^{+}\oplus\mathrm{X2}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N71.9.88 $\mathrm{GM2}^{+}\oplus\mathrm{X2}^{+}\oplus\mathrm{X3}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N71.9.89 $\mathrm{GM2}^{+}\oplus\mathrm{X3}^{+}\oplus\mathrm{X3}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N71.9.90 $\mathrm{GM2}^{+}\oplus\mathrm{X3}^{+}\oplus\mathrm{X4}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N71.9.91 $\mathrm{GM2}^{+}\oplus\mathrm{X2}^{+}\oplus\mathrm{X2}^{-}$	$\surd$	1	1	$\surd$	$mm2$	A2
N71.9.92 $\mathrm{GM2}^{+}\oplus\mathrm{X2}^{+}\oplus\mathrm{X3}^{-}$	$\surd$	1	1	$\surd$	$mm2$	B2
N71.9.93 $\mathrm{GM2}^{+}\oplus\mathrm{X3}^{+}\oplus\mathrm{X2}^{-}$	$\surd$	1	1	$\surd$	$mm2$	B2
N71.9.94 $\mathrm{GM2}^{+}\oplus\mathrm{X3}^{+}\oplus\mathrm{X3}^{-}$	$\surd$	1	1	$\surd$	$mm2$	A2
N71.9.95 $\mathrm{GM2}^{+}\oplus\mathrm{X3}^{+}\oplus\mathrm{X4}^{-}$	$\surd$	1	1	$\surd$	222	B1
N71.9.96 $\mathrm{GM2}^{+}\oplus\mathrm{X2}^{-}\oplus\mathrm{X2}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N71.9.97 $\mathrm{GM2}^{+}\oplus\mathrm{X2}^{-}\oplus\mathrm{X3}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N71.9.98 $\mathrm{GM2}^{+}\oplus\mathrm{X3}^{-}\oplus\mathrm{X3}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N71.9.99 $\mathrm{GM2}^{+}\oplus\mathrm{X3}^{-}\oplus\mathrm{X4}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N71.9.100 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
N71.9.101 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
N71.9.102 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
N71.9.103 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{X1}^{+}$	$\surd$	0	0	$\surd$	-	-
N71.9.104 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{X1}^{+}$	$\surd$	0	0	$\surd$	-	-
N71.9.105 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{X1}^{-}$	$\surd$	0	0	$\surd$	-	-
N71.9.106 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{X1}^{-}$	$\surd$	0	0	$\surd$	-	-
N71.9.107 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{X2}^{+}$	$\surd$	0	0	$\surd$	-	-
N71.9.108 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{X3}^{+}$	$\surd$	0	0	$\surd$	-	-
N71.9.109 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{X2}^{+}$	$\surd$	0	0	$\surd$	-	-
N71.9.110 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{X4}^{+}$	$\surd$	0	0	$\surd$	-	-
N71.9.111 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{X2}^{-}$	$\surd$	0	0	$\surd$	-	-
N71.9.112 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{X3}^{-}$	$\surd$	0	0	$\surd$	-	-
N71.9.113 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{X2}^{-}$	$\surd$	0	0	$\surd$	-	-
N71.9.114 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{X4}^{-}$	$\surd$	0	0	$\surd$	-	-
N71.9.115 $\mathrm{GM2}^{-}\oplus\mathrm{X1}^{+}\oplus\mathrm{X1}^{+}$	$\surd$	1	0	$\times$	-	-
N71.9.116 $\mathrm{GM2}^{-}\oplus\mathrm{X1}^{+}\oplus\mathrm{X1}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_u}$
N71.9.117 $\mathrm{GM2}^{-}\oplus\mathrm{X1}^{+}\oplus\mathrm{X2}^{+}$	$\surd$	1	0	$\times$	-	-
N71.9.118 $\mathrm{GM2}^{-}\oplus\mathrm{X1}^{+}\oplus\mathrm{X3}^{+}$	$\surd$	1	0	$\times$	-	-
N71.9.119 $\mathrm{GM2}^{-}\oplus\mathrm{X1}^{+}\oplus\mathrm{X2}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N71.9.120 $\mathrm{GM2}^{-}\oplus\mathrm{X1}^{+}\oplus\mathrm{X3}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N71.9.121 $\mathrm{GM2}^{-}\oplus\mathrm{X1}^{-}\oplus\mathrm{X1}^{-}$	$\surd$	1	0	$\times$	-	-
N71.9.122 $\mathrm{GM2}^{-}\oplus\mathrm{X1}^{-}\oplus\mathrm{X2}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N71.9.123 $\mathrm{GM2}^{-}\oplus\mathrm{X1}^{-}\oplus\mathrm{X3}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$

Non-coplanar SSGs with parent space group $Immm$ (No. 71) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N71.9.124 $\mathrm{GM2^-}\oplus\mathrm{X1^-}\oplus\mathrm{X2^-}$	$\surd$	1	0	$\times$	-	-
N71.9.125 $\mathrm{GM2^-}\oplus\mathrm{X1^-}\oplus\mathrm{X3^-}$	$\surd$	1	0	$\times$	-	-
N71.9.126 $\mathrm{GM2^-}\oplus\mathrm{X2^+}\oplus\mathrm{X2^+}$	$\surd$	1	0	$\times$	-	-
N71.9.127 $\mathrm{GM2^-}\oplus\mathrm{X2^+}\oplus\mathrm{X3^+}$	$\surd$	1	0	$\times$	-	-
N71.9.128 $\mathrm{GM2^-}\oplus\mathrm{X3^+}\oplus\mathrm{X3^+}$	$\surd$	1	0	$\times$	-	-
N71.9.129 $\mathrm{GM2^-}\oplus\mathrm{X3^+}\oplus\mathrm{X4^+}$	$\surd$	1	0	$\times$	-	-
N71.9.130 $\mathrm{GM2^-}\oplus\mathrm{X2^+}\oplus\mathrm{X2^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_u}$
N71.9.131 $\mathrm{GM2^-}\oplus\mathrm{X2^+}\oplus\mathrm{X3^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N71.9.132 $\mathrm{GM2^-}\oplus\mathrm{X3^+}\oplus\mathrm{X2^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N71.9.133 $\mathrm{GM2^-}\oplus\mathrm{X3^+}\oplus\mathrm{X3^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_u}$
N71.9.134 $\mathrm{GM2^-}\oplus\mathrm{X3^+}\oplus\mathrm{X4^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N71.9.135 $\mathrm{GM2^-}\oplus\mathrm{X2^-}\oplus\mathrm{X2^-}$	$\surd$	1	0	$\times$	-	-
N71.9.136 $\mathrm{GM2^-}\oplus\mathrm{X2^-}\oplus\mathrm{X3^-}$	$\surd$	1	0	$\times$	-	-
N71.9.137 $\mathrm{GM2^-}\oplus\mathrm{X3^-}\oplus\mathrm{X3^-}$	$\surd$	1	0	$\times$	-	-
N71.9.138 $\mathrm{GM2^-}\oplus\mathrm{X3^-}\oplus\mathrm{X4^-}$	$\surd$	1	0	$\times$	-	-
N71.9.139 $\mathrm{X1^+}\oplus\mathrm{X1^+}\oplus\mathrm{X1^+}$	$\surd$	0	0	$\surd$	-	-
N71.9.140 $\mathrm{X1^+}\oplus\mathrm{X1^+}\oplus\mathrm{X1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{A_u}$
N71.9.141 $\mathrm{X1^+}\oplus\mathrm{X1^+}\oplus\mathrm{X2^+}$	$\surd$	0	0	$\surd$	-	-
N71.9.142 $\mathrm{X1^+}\oplus\mathrm{X1^+}\oplus\mathrm{X2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B1_u}$
N71.9.143 $\mathrm{X1^+}\oplus\mathrm{X1^-}\oplus\mathrm{X1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{A_u}$
N71.9.144 $\mathrm{X1^+}\oplus\mathrm{X1^-}\oplus\mathrm{X2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B1_u}$
N71.9.145 $\mathrm{X1^+}\oplus\mathrm{X1^-}\oplus\mathrm{X2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B1_u}$
N71.9.146 $\mathrm{X1^+}\oplus\mathrm{X2^+}\oplus\mathrm{X2^+}$	$\surd$	0	0	$\surd$	-	-
N71.9.147 $\mathrm{X1^+}\oplus\mathrm{X2^+}\oplus\mathrm{X3^+}$	$\surd$	0	0	$\surd$	-	-
N71.9.148 $\mathrm{X1^+}\oplus\mathrm{X2^+}\oplus\mathrm{X2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B1_u}$
N71.9.149 $\mathrm{X1^+}\oplus\mathrm{X2^+}\oplus\mathrm{X3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u}\oplus\mathrm{B2_u}$
N71.9.150 $\mathrm{X1^+}\oplus\mathrm{X2^-}\oplus\mathrm{X2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B1_u}$
N71.9.151 $\mathrm{X1^+}\oplus\mathrm{X2^-}\oplus\mathrm{X3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B3_u}$
N71.9.152 $\mathrm{X1^-}\oplus\mathrm{X1^-}\oplus\mathrm{X1^-}$	$\surd$	0	0	$\surd$	-	-
N71.9.153 $\mathrm{X1^-}\oplus\mathrm{X1^-}\oplus\mathrm{X2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B1_u}$
N71.9.154 $\mathrm{X1^-}\oplus\mathrm{X1^-}\oplus\mathrm{X2^-}$	$\surd$	0	0	$\surd$	-	-
N71.9.155 $\mathrm{X1^-}\oplus\mathrm{X2^+}\oplus\mathrm{X2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B1_u}$
N71.9.156 $\mathrm{X1^-}\oplus\mathrm{X2^+}\oplus\mathrm{X3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B3_u}$
N71.9.157 $\mathrm{X1^-}\oplus\mathrm{X2^+}\oplus\mathrm{X2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B1_u}$
N71.9.158 $\mathrm{X1^-}\oplus\mathrm{X2^+}\oplus\mathrm{X3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B2_u}$
N71.9.159 $\mathrm{X1^-}\oplus\mathrm{X2^-}\oplus\mathrm{X2^-}$	$\surd$	0	0	$\surd$	-	-
N71.9.160 $\mathrm{X1^-}\oplus\mathrm{X2^-}\oplus\mathrm{X3^-}$	$\surd$	0	0	$\surd$	-	-
N71.9.161 $\mathrm{X2^+}\oplus\mathrm{X2^+}\oplus\mathrm{X2^+}$	$\surd$	0	0	$\surd$	-	-
N71.9.162 $\mathrm{X2^+}\oplus\mathrm{X2^+}\oplus\mathrm{X3^+}$	$\surd$	0	0	$\surd$	-	-
N71.9.163 $\mathrm{X2^+}\oplus\mathrm{X3^+}\oplus\mathrm{X4^+}$	$\surd$	0	0	$\surd$	-	-
N71.9.164 $\mathrm{X2^+}\oplus\mathrm{X2^+}\oplus\mathrm{X2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{A_u}$
N71.9.165 $\mathrm{X2^+}\oplus\mathrm{X2^+}\oplus\mathrm{X3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_u}\oplus\mathrm{B2_u}$
N71.9.166 $\mathrm{X2^+}\oplus\mathrm{X3^+}\oplus\mathrm{X2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B2_u}$
N71.9.167 $\mathrm{X2^+}\oplus\mathrm{X3^+}\oplus\mathrm{X4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B3_u}$
N71.9.168 $\mathrm{X2^+}\oplus\mathrm{X2^-}\oplus\mathrm{X2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{A_u}$
N71.9.169 $\mathrm{X2^+}\oplus\mathrm{X2^-}\oplus\mathrm{X3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B2_u}$

Non-coplanar SSGs with parent space group $Immm$ (No. 71) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N71.9.170 $\mathrm{X2^+} \oplus \mathrm{X3^-} \oplus \mathrm{X3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_u} \oplus \mathrm{B2_u}$
N71.9.171 $\mathrm{X2^+} \oplus \mathrm{X3^-} \oplus \mathrm{X4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_u}$
N71.9.172 $\mathrm{X2^-} \oplus \mathrm{X2^-} \oplus \mathrm{X2^-}$	$\surd$	0	0	$\surd$	-	-
N71.9.173 $\mathrm{X2^-} \oplus \mathrm{X2^-} \oplus \mathrm{X3^-}$	$\surd$	0	0	$\surd$	-	-
N71.9.174 $\mathrm{X2^-} \oplus \mathrm{X3^-} \oplus \mathrm{X4^-}$	$\surd$	0	0	$\surd$	-	-
N71.13.1 $\mathrm{GM1^-} \oplus \mathrm{R1^+}$	$\surd$	1	0	$\times$	-	-
N71.13.2 $\mathrm{GM1^-} \oplus \mathrm{R1^-}$	$\surd$	1	0	$\times$	-	-
N71.13.3 $\mathrm{GM1^-} \oplus \mathrm{W1}$	$\surd$	1	1	$\times$	-	-
N71.13.4 $\mathrm{GM2^+} \oplus \mathrm{R1^+}$	$\surd$	1	1	$\times$	-	-
N71.13.5 $\mathrm{GM2^+} \oplus \mathrm{T1^+}$	$\surd$	1	1	$\times$	-	-
N71.13.6 $\mathrm{GM2^+} \oplus \mathrm{R1^-}$	$\surd$	1	1	$\times$	-	-
N71.13.7 $\mathrm{GM2^+} \oplus \mathrm{T1^-}$	$\surd$	1	1	$\times$	-	-
N71.13.8 $\mathrm{GM2^+} \oplus \mathrm{W1}$	$\surd$	1	1	$\times$	-	-
N71.13.9 $\mathrm{GM2^-} \oplus \mathrm{R1^+}$	$\surd$	1	0	$\times$	-	-
N71.13.10 $\mathrm{GM2^-} \oplus \mathrm{T1^+}$	$\surd$	1	0	$\times$	-	-
N71.13.11 $\mathrm{GM2^-} \oplus \mathrm{R1^-}$	$\surd$	1	0	$\times$	-	-
N71.13.12 $\mathrm{GM2^-} \oplus \mathrm{T1^-}$	$\surd$	1	0	$\times$	-	-
N71.13.13 $\mathrm{GM2^-} \oplus \mathrm{W1}$	$\surd$	1	1	$\times$	-	-
N71.13.14 $\mathrm{X1^+} \oplus \mathrm{R1^+}$	$\times$	-	-	-	-	-
N71.13.15 $\mathrm{X1^+} \oplus \mathrm{R1^-}$	$\times$	-	-	-	-	-
N71.13.16 $\mathrm{X1^+} \oplus \mathrm{W1}$	$\surd$	1	1	$\times$	-	-
N71.13.17 $\mathrm{X1^-} \oplus \mathrm{R1^+}$	$\times$	-	-	-	-	-
N71.13.18 $\mathrm{X1^-} \oplus \mathrm{R1^-}$	$\times$	-	-	-	-	-
N71.13.19 $\mathrm{X1^-} \oplus \mathrm{W1}$	$\surd$	1	1	$\times$	-	-
N71.13.20 $\mathrm{X2^+} \oplus \mathrm{R1^+}$	$\times$	-	-	-	-	-
N71.13.21 $\mathrm{X2^+} \oplus \mathrm{T1^+}$	$\times$	-	-	-	-	-
N71.13.22 $\mathrm{X2^+} \oplus \mathrm{R1^-}$	$\times$	-	-	-	-	-
N71.13.23 $\mathrm{X2^+} \oplus \mathrm{T1^-}$	$\times$	-	-	-	-	-
N71.13.24 $\mathrm{X2^+} \oplus \mathrm{W1}$	$\surd$	1	1	$\times$	-	-
N71.13.25 $\mathrm{X2^-} \oplus \mathrm{R1^+}$	$\times$	-	-	-	-	-
N71.13.26 $\mathrm{X2^-} \oplus \mathrm{T1^+}$	$\times$	-	-	-	-	-
N71.13.27 $\mathrm{X2^-} \oplus \mathrm{R1^-}$	$\times$	-	-	-	-	-
N71.13.28 $\mathrm{X2^-} \oplus \mathrm{T1^-}$	$\times$	-	-	-	-	-
N71.13.29 $\mathrm{X2^-} \oplus \mathrm{W1}$	$\surd$	1	1	$\times$	-	-
N71.14.1 $\mathrm{GM1^-} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N71.14.2 $\mathrm{GM1^-} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N71.14.3 $\mathrm{GM1^-} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N71.14.4 $\mathrm{GM2^+} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	$mm2$	B2
N71.14.5 $\mathrm{GM2^+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	222	B1
N71.14.6 $\mathrm{GM2^+} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	$mm2$	B2
N71.14.7 $\mathrm{GM2^+} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	222	B1
N71.14.8 $\mathrm{GM2^+} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	$mm2$	B2
N71.14.9 $\mathrm{GM2^+} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	$mm2$	B2
N71.14.10 $\mathrm{GM2^+} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	222	B1
N71.14.11 $\mathrm{GM2^-} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N71.14.12 $\mathrm{GM2^-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$

Non-coplanar SSGs with parent space group $Immm$ (No. 71) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N71.14.13 GM2$^-$ ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
N71.14.14 GM2$^-$ ⊕ LD2	√	1	1	√	mmm	$\mathrm{B1_u}$
N71.14.15 GM2$^-$ ⊕ DT3	√	1	1	√	mmm	$\mathrm{B2_u}$
N71.14.16 GM2$^-$ ⊕ DT4	√	1	1	√	mmm	$\mathrm{B2_u}$
N71.14.17 GM2$^-$ ⊕ LD3	√	1	1	√	mmm	$\mathrm{B1_u}$
N71.14.18 X1$^+$ ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N71.14.19 X1$^+$ ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
N71.14.20 X1$^+$ ⊕ DT3	√	1	1	√	mmm	$\mathrm{B2_u}$
N71.14.21 X1$^-$ ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N71.14.22 X1$^-$ ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
N71.14.23 X1$^-$ ⊕ DT3	√	1	1	√	mmm	$\mathrm{B2_u}$
N71.14.24 X2$^+$ ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N71.14.25 X2$^+$ ⊕ LD1	√	1	1	√	mmm	$\mathrm{B1_u}$
N71.14.26 X2$^+$ ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
N71.14.27 X2$^+$ ⊕ LD2	√	1	1	√	mmm	$\mathrm{B1_u}$
N71.14.28 X2$^+$ ⊕ DT3	√	1	1	√	mmm	$\mathrm{B2_u}$
N71.14.29 X2$^+$ ⊕ DT4	√	1	1	√	mmm	$\mathrm{B2_u}$
N71.14.30 X2$^+$ ⊕ LD3	√	1	1	√	mmm	$\mathrm{B1_u}$
N71.14.31 X2$^-$ ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N71.14.32 X2$^-$ ⊕ LD1	√	1	1	√	mmm	$\mathrm{B1_u}$
N71.14.33 X2$^-$ ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
N71.14.34 X2$^-$ ⊕ LD2	√	1	1	√	mmm	$\mathrm{B1_u}$
N71.14.35 X2$^-$ ⊕ DT3	√	1	1	√	mmm	$\mathrm{B2_u}$
N71.14.36 X2$^-$ ⊕ DT4	√	1	1	√	mmm	$\mathrm{B2_u}$
N71.14.37 X2$^-$ ⊕ LD3	√	1	1	√	mmm	$\mathrm{B1_u}$

TABLE S214: Collinear SSGs with parent space group $Ibam$ (No. 72).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L72.1.1 GM1$^+$	1	mmm	$\mathrm{A_g}$
L72.2.1 GM1$^-$	0	-	-
L72.2.2 GM2$^+$	1	mmm	$\mathrm{B1_g}$
L72.2.3 GM2$^-$	0	-	-
L72.2.4 GM3$^+$	1	mmm	$\mathrm{B3_g}$
L72.2.5 GM3$^-$	0	-	-
L72.2.6 X1$^+$	0	-	-
L72.2.7 X1$^-$	0	-	-
L72.2.8 X2$^+$	0	-	-
L72.2.9 X2$^-$	0	-	-
L72.2.10 X3$^+$	0	-	-
L72.2.11 X3$^-$	0	-	-

TABLE S215: Coplanar SSGs with parent space group $Ibam$ (No. 72).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P72.1.1 GM1$^+$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$

Coplanar SSGs with parent space group $Ibam$ (No. 72) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P72.2.1 $\mathrm{GM1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
P72.2.2 $\mathrm{GM2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
P72.2.3 $\mathrm{GM2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
P72.2.4 $\mathrm{GM3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g}$
P72.2.5 $\mathrm{GM3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u}$
P72.2.6 $\mathrm{X1}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P72.2.7 $\mathrm{X1}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P72.2.8 $\mathrm{X2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P72.2.9 $\mathrm{X2}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P72.2.10 $\mathrm{X3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P72.2.11 $\mathrm{X3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P72.3.1 $\mathrm{GM1}^- \oplus \mathrm{GM1}^-$	$\surd$	0	0	$\surd$	-	-
P72.3.2 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
P72.3.3 $\mathrm{GM1}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
P72.3.4 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u}$
P72.3.5 $\mathrm{GM1}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
P72.3.6 $\mathrm{GM1}^- \oplus \mathrm{X1}^+$	$\surd$	1	1	$\times$	-	-
P72.3.7 $\mathrm{GM1}^- \oplus \mathrm{X1}^-$	$\surd$	1	1	$\times$	-	-
P72.3.8 $\mathrm{GM1}^- \oplus \mathrm{X2}^+$	$\surd$	1	1	$\times$	-	-
P72.3.9 $\mathrm{GM1}^- \oplus \mathrm{X2}^-$	$\surd$	1	1	$\times$	-	-
P72.3.10 $\mathrm{GM1}^- \oplus \mathrm{X3}^+$	$\surd$	1	1	$\times$	-	-
P72.3.11 $\mathrm{GM1}^- \oplus \mathrm{X3}^-$	$\surd$	1	1	$\times$	-	-
P72.3.12 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
P72.3.13 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
P72.3.14 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
P72.3.15 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
P72.3.16 $\mathrm{GM2}^+ \oplus \mathrm{X1}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
P72.3.17 $\mathrm{GM2}^+ \oplus \mathrm{X1}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
P72.3.18 $\mathrm{GM2}^+ \oplus \mathrm{X2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
P72.3.19 $\mathrm{GM2}^+ \oplus \mathrm{X2}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
P72.3.20 $\mathrm{GM2}^+ \oplus \mathrm{X3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
P72.3.21 $\mathrm{GM2}^+ \oplus \mathrm{X3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
P72.3.22 $\mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
P72.3.23 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
P72.3.24 $\mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
P72.3.25 $\mathrm{GM2}^- \oplus \mathrm{X1}^+$	$\surd$	1	1	$\times$	-	-
P72.3.26 $\mathrm{GM2}^- \oplus \mathrm{X1}^-$	$\surd$	1	1	$\times$	-	-
P72.3.27 $\mathrm{GM2}^- \oplus \mathrm{X2}^+$	$\surd$	1	1	$\times$	-	-
P72.3.28 $\mathrm{GM2}^- \oplus \mathrm{X2}^-$	$\surd$	1	1	$\times$	-	-
P72.3.29 $\mathrm{GM2}^- \oplus \mathrm{X3}^+$	$\surd$	1	1	$\times$	-	-
P72.3.30 $\mathrm{GM2}^- \oplus \mathrm{X3}^-$	$\surd$	1	1	$\times$	-	-
P72.3.31 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
P72.3.32 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g}$
P72.3.33 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
P72.3.34 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
P72.3.35 $\mathrm{GM3}^+ \oplus \mathrm{X1}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$

Coplanar SSGs with parent space group $Ibam$ (No. 72) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P72.3.36 $\mathrm{GM3^+} \oplus \mathrm{X1^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
P72.3.37 $\mathrm{GM3^+} \oplus \mathrm{X2^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
P72.3.38 $\mathrm{GM3^+} \oplus \mathrm{X2^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
P72.3.39 $\mathrm{GM3^+} \oplus \mathrm{X3^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
P72.3.40 $\mathrm{GM3^+} \oplus \mathrm{X4^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
P72.3.41 $\mathrm{GM3^+} \oplus \mathrm{X3^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
P72.3.42 $\mathrm{GM3^+} \oplus \mathrm{X4^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
P72.3.43 $\mathrm{GM3^-} \oplus \mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
P72.3.44 $\mathrm{GM3^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
P72.3.45 $\mathrm{GM3^-} \oplus \mathrm{X1^+}$	$\surd$	1	1	$\times$	-	-
P72.3.46 $\mathrm{GM3^-} \oplus \mathrm{X1^-}$	$\surd$	1	1	$\times$	-	-
P72.3.47 $\mathrm{GM3^-} \oplus \mathrm{X2^+}$	$\surd$	1	1	$\times$	-	-
P72.3.48 $\mathrm{GM3^-} \oplus \mathrm{X2^-}$	$\surd$	1	1	$\times$	-	-
P72.3.49 $\mathrm{GM3^-} \oplus \mathrm{X3^+}$	$\surd$	1	1	$\times$	-	-
P72.3.50 $\mathrm{GM3^-} \oplus \mathrm{X4^+}$	$\surd$	1	1	$\times$	-	-
P72.3.51 $\mathrm{GM3^-} \oplus \mathrm{X3^-}$	$\surd$	1	1	$\times$	-	-
P72.3.52 $\mathrm{GM3^-} \oplus \mathrm{X4^-}$	$\surd$	1	1	$\times$	-	-
P72.3.53 $\mathrm{X1^+} \oplus \mathrm{X1^+}$	$\surd$	1	0	$\times$	-	-
P72.3.54 $\mathrm{X1^+} \oplus \mathrm{X1^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_u}$
P72.3.55 $\mathrm{X1^+} \oplus \mathrm{X2^+}$	$\surd$	1	0	$\times$	-	-
P72.3.56 $\mathrm{X1^+} \oplus \mathrm{X2^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P72.3.57 $\mathrm{X1^+} \oplus \mathrm{X3^+}$	$\surd$	1	0	$\times$	-	-
P72.3.58 $\mathrm{X1^+} \oplus \mathrm{X3^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P72.3.59 $\mathrm{X1^-} \oplus \mathrm{X1^-}$	$\surd$	1	0	$\times$	-	-
P72.3.60 $\mathrm{X1^-} \oplus \mathrm{X2^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P72.3.61 $\mathrm{X1^-} \oplus \mathrm{X2^-}$	$\surd$	1	0	$\times$	-	-
P72.3.62 $\mathrm{X1^-} \oplus \mathrm{X3^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P72.3.63 $\mathrm{X1^-} \oplus \mathrm{X3^-}$	$\surd$	1	0	$\times$	-	-
P72.3.64 $\mathrm{X2^+} \oplus \mathrm{X2^+}$	$\surd$	1	0	$\times$	-	-
P72.3.65 $\mathrm{X2^+} \oplus \mathrm{X2^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_u}$
P72.3.66 $\mathrm{X2^+} \oplus \mathrm{X3^+}$	$\surd$	1	0	$\times$	-	-
P72.3.67 $\mathrm{X2^+} \oplus \mathrm{X3^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P72.3.68 $\mathrm{X2^-} \oplus \mathrm{X2^-}$	$\surd$	1	0	$\times$	-	-
P72.3.69 $\mathrm{X2^-} \oplus \mathrm{X3^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P72.3.70 $\mathrm{X2^-} \oplus \mathrm{X3^-}$	$\surd$	1	0	$\times$	-	-
P72.3.71 $\mathrm{X3^+} \oplus \mathrm{X3^+}$	$\surd$	1	0	$\times$	-	-
P72.3.72 $\mathrm{X3^+} \oplus \mathrm{X4^+}$	$\surd$	1	0	$\times$	-	-
P72.3.73 $\mathrm{X3^+} \oplus \mathrm{X3^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_u}$
P72.3.74 $\mathrm{X3^+} \oplus \mathrm{X4^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P72.3.75 $\mathrm{X3^-} \oplus \mathrm{X3^-}$	$\surd$	1	0	$\times$	-	-
P72.3.76 $\mathrm{X3^-} \oplus \mathrm{X4^-}$	$\surd$	1	0	$\times$	-	-
P72.7.1 $\mathrm{T1^+}$	$\times$	-	-	-	-	-
P72.7.2 $\mathrm{T1^-}$	$\times$	-	-	-	-	-
P72.8.1 DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P72.8.2 DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P72.8.3 DT3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$

Coplanar SSGs with parent space group $Ibam$ (No. 72) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P72.8.4 DT4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P72.8.5 LD1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P72.8.6 LD2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P72.8.7 LD3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$

TABLE S216: Non-coplanar SSGs with parent space group $Ibam$ (No. 72).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N72.1.1 $\mathrm{GM1^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g\oplus A_g\oplus A_g}$
N72.2.1 $\mathrm{GM1^-}$	$\surd$	2	2	$\surd$	222	$\mathrm{A1\oplus A1}$
N72.2.2 $\mathrm{GM2^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g\oplus A_g\oplus B1_g}$
N72.2.3 $\mathrm{GM2^-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1\oplus A1}$
N72.2.4 $\mathrm{GM3^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g\oplus A_g\oplus B3_g}$
N72.2.5 $\mathrm{GM3^-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1\oplus A1}$
N72.2.6 $\mathrm{X1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g\oplus A_g}$
N72.2.7 $\mathrm{X1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g\oplus A_g}$
N72.2.8 $\mathrm{X2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g\oplus A_g}$
N72.2.9 $\mathrm{X2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g\oplus A_g}$
N72.2.10 $\mathrm{X3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g\oplus A_g}$
N72.2.11 $\mathrm{X3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g\oplus A_g}$
N72.3.1 $\mathrm{GM1^-\oplus GM1^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g\oplus A_u\oplus A_u}$
N72.3.2 $\mathrm{GM1^-\oplus GM2^+}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1\oplus A2}$
N72.3.3 $\mathrm{GM1^-\oplus GM2^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g\oplus A_u\oplus B1_u}$
N72.3.4 $\mathrm{GM1^-\oplus GM3^+}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1\oplus A2}$
N72.3.5 $\mathrm{GM1^-\oplus GM3^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g\oplus A_u\oplus B3_u}$
N72.3.6 $\mathrm{GM1^-\oplus X1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g\oplus A_u}$
N72.3.7 $\mathrm{GM1^-\oplus X1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g\oplus A_u}$
N72.3.8 $\mathrm{GM1^-\oplus X2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g\oplus A_u}$
N72.3.9 $\mathrm{GM1^-\oplus X2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g\oplus A_u}$
N72.3.10 $\mathrm{GM1^-\oplus X3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g\oplus A_u}$
N72.3.11 $\mathrm{GM1^-\oplus X3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g\oplus A_u}$
N72.3.12 $\mathrm{GM2^+\oplus GM2^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g\oplus B1_g\oplus B1_g}$
N72.3.13 $\mathrm{GM2^+\oplus GM2^-}$	$\surd$	2	2	$\surd$	222	$\mathrm{A1\oplus B1}$
N72.3.14 $\mathrm{GM2^+\oplus GM3^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g\oplus B1_g\oplus B3_g}$
N72.3.15 $\mathrm{GM2^+\oplus GM3^-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1\oplus B1}$
N72.3.16 $\mathrm{GM2^+\oplus X1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g\oplus B1_g}$
N72.3.17 $\mathrm{GM2^+\oplus X1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g\oplus B1_g}$
N72.3.18 $\mathrm{GM2^+\oplus X2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g\oplus B1_g}$
N72.3.19 $\mathrm{GM2^+\oplus X2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g\oplus B1_g}$
N72.3.20 $\mathrm{GM2^+\oplus X3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g\oplus B1_g}$
N72.3.21 $\mathrm{GM2^+\oplus X3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g\oplus B1_g}$
N72.3.22 $\mathrm{GM2^-\oplus GM2^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g\oplus B1_u\oplus B1_u}$
N72.3.23 $\mathrm{GM2^-\oplus GM3^+}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1\oplus B2}$
N72.3.24 $\mathrm{GM2^-\oplus GM3^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g\oplus B1_u\oplus B3_u}$
N72.3.25 $\mathrm{GM2^-\oplus X1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g\oplus B1_u}$
N72.3.26 $\mathrm{GM2^-\oplus X1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g\oplus B1_u}$

Non-coplanar SSGs with parent space group $Ibam$ (No. 72) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N72.3.27 $\mathrm{GM2}^- \oplus \mathrm{X2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
N72.3.28 $\mathrm{GM2}^- \oplus \mathrm{X2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
N72.3.29 $\mathrm{GM2}^- \oplus \mathrm{X3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
N72.3.30 $\mathrm{GM2}^- \oplus \mathrm{X3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
N72.3.31 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N72.3.32 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N72.3.33 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	222	$\mathrm{A1} \oplus \mathrm{B3}$
N72.3.34 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{B2}$
N72.3.35 $\mathrm{GM3}^+ \oplus \mathrm{X1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g}$
N72.3.36 $\mathrm{GM3}^+ \oplus \mathrm{X1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g}$
N72.3.37 $\mathrm{GM3}^+ \oplus \mathrm{X2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g}$
N72.3.38 $\mathrm{GM3}^+ \oplus \mathrm{X2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g}$
N72.3.39 $\mathrm{GM3}^+ \oplus \mathrm{X3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g}$
N72.3.40 $\mathrm{GM3}^+ \oplus \mathrm{X4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g}$
N72.3.41 $\mathrm{GM3}^+ \oplus \mathrm{X3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g}$
N72.3.42 $\mathrm{GM3}^+ \oplus \mathrm{X4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g}$
N72.3.43 $\mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N72.3.44 $\mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N72.3.45 $\mathrm{GM3}^- \oplus \mathrm{X1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u}$
N72.3.46 $\mathrm{GM3}^- \oplus \mathrm{X1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u}$
N72.3.47 $\mathrm{GM3}^- \oplus \mathrm{X2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u}$
N72.3.48 $\mathrm{GM3}^- \oplus \mathrm{X2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u}$
N72.3.49 $\mathrm{GM3}^- \oplus \mathrm{X3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u}$
N72.3.50 $\mathrm{GM3}^- \oplus \mathrm{X4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u}$
N72.3.51 $\mathrm{GM3}^- \oplus \mathrm{X3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u}$
N72.3.52 $\mathrm{GM3}^- \oplus \mathrm{X4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u}$
N72.3.53 $\mathrm{X1}^+ \oplus \mathrm{X1}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N72.3.54 $\mathrm{X1}^+ \oplus \mathrm{X1}^-$	$\surd$	1	1	$\surd$	222	A1
N72.3.55 $\mathrm{X1}^+ \oplus \mathrm{X2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N72.3.56 $\mathrm{X1}^+ \oplus \mathrm{X2}^-$	$\surd$	1	1	$\surd$	$mm2$	A1
N72.3.57 $\mathrm{X1}^+ \oplus \mathrm{X3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N72.3.58 $\mathrm{X1}^+ \oplus \mathrm{X3}^-$	$\surd$	1	1	$\surd$	$mm2$	A1
N72.3.59 $\mathrm{X1}^- \oplus \mathrm{X1}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N72.3.60 $\mathrm{X1}^- \oplus \mathrm{X2}^+$	$\surd$	1	1	$\surd$	$mm2$	A1
N72.3.61 $\mathrm{X1}^- \oplus \mathrm{X2}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N72.3.62 $\mathrm{X1}^- \oplus \mathrm{X3}^+$	$\surd$	1	1	$\surd$	$mm2$	A1
N72.3.63 $\mathrm{X1}^- \oplus \mathrm{X3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N72.3.64 $\mathrm{X2}^+ \oplus \mathrm{X2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N72.3.65 $\mathrm{X2}^+ \oplus \mathrm{X2}^-$	$\surd$	1	1	$\surd$	222	A1
N72.3.66 $\mathrm{X2}^+ \oplus \mathrm{X3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N72.3.67 $\mathrm{X2}^+ \oplus \mathrm{X3}^-$	$\surd$	1	1	$\surd$	$mm2$	A1
N72.3.68 $\mathrm{X2}^- \oplus \mathrm{X2}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N72.3.69 $\mathrm{X2}^- \oplus \mathrm{X3}^+$	$\surd$	1	1	$\surd$	$mm2$	A1
N72.3.70 $\mathrm{X2}^- \oplus \mathrm{X3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N72.3.71 $\mathrm{X3}^+ \oplus \mathrm{X3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N72.3.72 $\mathrm{X3}^+ \oplus \mathrm{X4}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$

Non-coplanar SSGs with parent space group $Ibam$ (No. 72) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N72.3.73 $\mathrm{X3}^{+} \oplus \mathrm{X3}^{-}$	$\surd$	1	1	$\surd$	222	A1
N72.3.74 $\mathrm{X3}^{+} \oplus \mathrm{X4}^{-}$	$\surd$	1	1	$\surd$	$mm2$	A1
N72.3.75 $\mathrm{X3}^{-} \oplus \mathrm{X3}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N72.3.76 $\mathrm{X3}^{-} \oplus \mathrm{X4}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N72.7.1 $\mathrm{T1}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N72.7.2 $\mathrm{T1}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N72.8.1 DT1	$\surd$	1	1	$\surd$	$mm2$	A1
N72.8.2 DT2	$\surd$	1	1	$\surd$	$mm2$	A1
N72.8.3 DT3	$\surd$	1	1	$\surd$	$mm2$	A1
N72.8.4 DT4	$\surd$	1	1	$\surd$	$mm2$	A1
N72.8.5 LD1	$\surd$	1	1	$\surd$	$mm2$	A1
N72.8.6 LD2	$\surd$	1	1	$\surd$	$mm2$	A1
N72.8.7 LD3	$\surd$	1	1	$\surd$	$mm2$	A1
N72.9.1 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-}$	$\surd$	0	0	$\surd$	-	-
N72.9.2 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-} \oplus \mathrm{GM2}^{+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N72.9.3 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-} \oplus \mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
N72.9.4 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-} \oplus \mathrm{GM3}^{+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N72.9.5 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-} \oplus \mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
N72.9.6 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-} \oplus \mathrm{X1}^{+}$	$\surd$	0	0	$\surd$	-	-
N72.9.7 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-} \oplus \mathrm{X1}^{-}$	$\surd$	0	0	$\surd$	-	-
N72.9.8 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-} \oplus \mathrm{X2}^{+}$	$\surd$	0	0	$\surd$	-	-
N72.9.9 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-} \oplus \mathrm{X2}^{-}$	$\surd$	0	0	$\surd$	-	-
N72.9.10 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-} \oplus \mathrm{X3}^{+}$	$\surd$	0	0	$\surd$	-	-
N72.9.11 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-} \oplus \mathrm{X3}^{-}$	$\surd$	0	0	$\surd$	-	-
N72.9.12 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{+} \oplus \mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	222	$\mathrm{B1} \oplus \mathrm{B1}$
N72.9.13 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{+} \oplus \mathrm{GM2}^{-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N72.9.14 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{+} \oplus \mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2} \oplus \mathrm{B1}$
N72.9.15 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{+} \oplus \mathrm{GM3}^{-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_u}$
N72.9.16 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{+} \oplus \mathrm{X1}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N72.9.17 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{+} \oplus \mathrm{X1}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N72.9.18 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{+} \oplus \mathrm{X2}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N72.9.19 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{+} \oplus \mathrm{X2}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N72.9.20 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{+} \oplus \mathrm{X3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N72.9.21 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{+} \oplus \mathrm{X3}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N72.9.22 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{-} \oplus \mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
N72.9.23 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{-} \oplus \mathrm{GM3}^{+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N72.9.24 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{-} \oplus \mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
N72.9.25 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{-} \oplus \mathrm{X1}^{+}$	$\surd$	0	0	$\surd$	-	-
N72.9.26 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{-} \oplus \mathrm{X1}^{-}$	$\surd$	0	0	$\surd$	-	-
N72.9.27 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{-} \oplus \mathrm{X2}^{+}$	$\surd$	0	0	$\surd$	-	-
N72.9.28 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{-} \oplus \mathrm{X2}^{-}$	$\surd$	0	0	$\surd$	-	-
N72.9.29 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{-} \oplus \mathrm{X3}^{+}$	$\surd$	0	0	$\surd$	-	-
N72.9.30 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{-} \oplus \mathrm{X3}^{-}$	$\surd$	0	0	$\surd$	-	-
N72.9.31 $\mathrm{GM1}^{-} \oplus \mathrm{GM3}^{+} \oplus \mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	222	$\mathrm{B3} \oplus \mathrm{B3}$
N72.9.32 $\mathrm{GM1}^{-} \oplus \mathrm{GM3}^{+} \oplus \mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2} \oplus \mathrm{B1}$
N72.9.33 $\mathrm{GM1}^{-} \oplus \mathrm{GM3}^{+} \oplus \mathrm{GM3}^{-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$

Non-coplanar SSGs with parent space group $Ibam$ (No. 72) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N72.9.34 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{GM4^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B3_g}\oplus\mathrm{B3_u}$
N72.9.35 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{X1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_u}$
N72.9.36 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{X1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_u}$
N72.9.37 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{X2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_u}$
N72.9.38 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{X2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_u}$
N72.9.39 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{X3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_u}$
N72.9.40 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{X4^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_u}$
N72.9.41 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{X3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_u}$
N72.9.42 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{X4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_u}$
N72.9.43 $\mathrm{GM1^-}\oplus\mathrm{GM3^-}\oplus\mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
N72.9.44 $\mathrm{GM1^-}\oplus\mathrm{GM3^-}\oplus\mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N72.9.45 $\mathrm{GM1^-}\oplus\mathrm{GM3^-}\oplus\mathrm{X1^+}$	$\surd$	0	0	$\surd$	-	-
N72.9.46 $\mathrm{GM1^-}\oplus\mathrm{GM3^-}\oplus\mathrm{X1^-}$	$\surd$	0	0	$\surd$	-	-
N72.9.47 $\mathrm{GM1^-}\oplus\mathrm{GM3^-}\oplus\mathrm{X2^+}$	$\surd$	0	0	$\surd$	-	-
N72.9.48 $\mathrm{GM1^-}\oplus\mathrm{GM3^-}\oplus\mathrm{X2^-}$	$\surd$	0	0	$\surd$	-	-
N72.9.49 $\mathrm{GM1^-}\oplus\mathrm{GM3^-}\oplus\mathrm{X3^+}$	$\surd$	0	0	$\surd$	-	-
N72.9.50 $\mathrm{GM1^-}\oplus\mathrm{GM3^-}\oplus\mathrm{X4^+}$	$\surd$	0	0	$\surd$	-	-
N72.9.51 $\mathrm{GM1^-}\oplus\mathrm{GM3^-}\oplus\mathrm{X3^-}$	$\surd$	0	0	$\surd$	-	-
N72.9.52 $\mathrm{GM1^-}\oplus\mathrm{GM3^-}\oplus\mathrm{X4^-}$	$\surd$	0	0	$\surd$	-	-
N72.9.53 $\mathrm{GM1^-}\oplus\mathrm{X1^+}\oplus\mathrm{X1^+}$	$\surd$	1	0	$\times$	-	-
N72.9.54 $\mathrm{GM1^-}\oplus\mathrm{X1^+}\oplus\mathrm{X1^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_u}$
N72.9.55 $\mathrm{GM1^-}\oplus\mathrm{X1^+}\oplus\mathrm{X2^+}$	$\surd$	1	0	$\times$	-	-
N72.9.56 $\mathrm{GM1^-}\oplus\mathrm{X1^+}\oplus\mathrm{X2^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N72.9.57 $\mathrm{GM1^-}\oplus\mathrm{X1^+}\oplus\mathrm{X3^+}$	$\surd$	1	0	$\times$	-	-
N72.9.58 $\mathrm{GM1^-}\oplus\mathrm{X1^+}\oplus\mathrm{X3^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N72.9.59 $\mathrm{GM1^-}\oplus\mathrm{X1^-}\oplus\mathrm{X1^-}$	$\surd$	1	0	$\times$	-	-
N72.9.60 $\mathrm{GM1^-}\oplus\mathrm{X1^-}\oplus\mathrm{X2^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N72.9.61 $\mathrm{GM1^-}\oplus\mathrm{X1^-}\oplus\mathrm{X2^-}$	$\surd$	1	0	$\times$	-	-
N72.9.62 $\mathrm{GM1^-}\oplus\mathrm{X1^-}\oplus\mathrm{X3^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N72.9.63 $\mathrm{GM1^-}\oplus\mathrm{X1^-}\oplus\mathrm{X3^-}$	$\surd$	1	0	$\times$	-	-
N72.9.64 $\mathrm{GM1^-}\oplus\mathrm{X2^+}\oplus\mathrm{X2^+}$	$\surd$	1	0	$\times$	-	-
N72.9.65 $\mathrm{GM1^-}\oplus\mathrm{X2^+}\oplus\mathrm{X2^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_u}$
N72.9.66 $\mathrm{GM1^-}\oplus\mathrm{X2^+}\oplus\mathrm{X3^+}$	$\surd$	1	0	$\times$	-	-
N72.9.67 $\mathrm{GM1^-}\oplus\mathrm{X2^+}\oplus\mathrm{X3^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N72.9.68 $\mathrm{GM1^-}\oplus\mathrm{X2^-}\oplus\mathrm{X2^-}$	$\surd$	1	0	$\times$	-	-
N72.9.69 $\mathrm{GM1^-}\oplus\mathrm{X2^-}\oplus\mathrm{X3^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N72.9.70 $\mathrm{GM1^-}\oplus\mathrm{X2^-}\oplus\mathrm{X3^-}$	$\surd$	1	0	$\times$	-	-
N72.9.71 $\mathrm{GM1^-}\oplus\mathrm{X3^+}\oplus\mathrm{X3^+}$	$\surd$	1	0	$\times$	-	-
N72.9.72 $\mathrm{GM1^-}\oplus\mathrm{X3^+}\oplus\mathrm{X4^+}$	$\surd$	1	0	$\times$	-	-
N72.9.73 $\mathrm{GM1^-}\oplus\mathrm{X3^+}\oplus\mathrm{X3^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_u}$
N72.9.74 $\mathrm{GM1^-}\oplus\mathrm{X3^+}\oplus\mathrm{X4^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N72.9.75 $\mathrm{GM1^-}\oplus\mathrm{X3^-}\oplus\mathrm{X3^-}$	$\surd$	1	0	$\times$	-	-
N72.9.76 $\mathrm{GM1^-}\oplus\mathrm{X3^-}\oplus\mathrm{X4^-}$	$\surd$	1	0	$\times$	-	-
N72.9.77 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{GM2^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B1_g}$
N72.9.78 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{GM2^-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2}\oplus\mathrm{A2}$
N72.9.79 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{GM3^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B3_g}$

Non-coplanar SSGs with parent space group $Ibam$ (No. 72) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N72.9.80 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2} \oplus \mathrm{B2}$
N72.9.81 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{X1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N72.9.82 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{X1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N72.9.83 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{X2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N72.9.84 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{X2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N72.9.85 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{X3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N72.9.86 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{X3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N72.9.87 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$
N72.9.88 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{B2}$
N72.9.89 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g} \oplus \mathrm{B2_u}$
N72.9.90 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{X1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
N72.9.91 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{X1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
N72.9.92 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{X2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
N72.9.93 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{X2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
N72.9.94 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{X3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
N72.9.95 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{X3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
N72.9.96 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N72.9.97 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N72.9.98 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{B2}$
N72.9.99 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	222	$\mathrm{B1} \oplus \mathrm{B3}$
N72.9.100 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{X1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N72.9.101 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{X1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N72.9.102 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{X2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N72.9.103 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{X2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N72.9.104 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{X3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N72.9.105 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{X4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N72.9.106 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{X3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N72.9.107 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{X4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N72.9.108 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N72.9.109 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N72.9.110 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{X1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N72.9.111 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{X1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N72.9.112 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{X2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N72.9.113 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{X2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N72.9.114 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{X3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N72.9.115 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{X4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N72.9.116 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{X3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N72.9.117 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{X4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N72.9.118 $\mathrm{GM2}^+ \oplus \mathrm{X1}^+ \oplus \mathrm{X1}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N72.9.119 $\mathrm{GM2}^+ \oplus \mathrm{X1}^+ \oplus \mathrm{X1}^-$	$\surd$	1	1	$\surd$	$mm2$	$\mathrm{A2}$
N72.9.120 $\mathrm{GM2}^+ \oplus \mathrm{X1}^+ \oplus \mathrm{X2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N72.9.121 $\mathrm{GM2}^+ \oplus \mathrm{X1}^+ \oplus \mathrm{X2}^-$	$\surd$	1	1	$\surd$	222	$\mathrm{B1}$
N72.9.122 $\mathrm{GM2}^+ \oplus \mathrm{X1}^+ \oplus \mathrm{X3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N72.9.123 $\mathrm{GM2}^+ \oplus \mathrm{X1}^+ \oplus \mathrm{X3}^-$	$\surd$	1	1	$\surd$	$mm2$	$\mathrm{B1}$
N72.9.124 $\mathrm{GM2}^+ \oplus \mathrm{X1}^- \oplus \mathrm{X1}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N72.9.125 $\mathrm{GM2}^+ \oplus \mathrm{X1}^- \oplus \mathrm{X2}^+$	$\surd$	1	1	$\surd$	222	$\mathrm{B1}$

Non-coplanar SSGs with parent space group $Ibam$ (No. 72) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N72.9.126 $\mathrm{GM2}^{+}\oplus\mathrm{X1}^{-}\oplus\mathrm{X2}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N72.9.127 $\mathrm{GM2}^{+}\oplus\mathrm{X1}^{-}\oplus\mathrm{X3}^{+}$	$\surd$	1	1	$\surd$	$mm2$	B1
N72.9.128 $\mathrm{GM2}^{+}\oplus\mathrm{X1}^{-}\oplus\mathrm{X3}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N72.9.129 $\mathrm{GM2}^{+}\oplus\mathrm{X2}^{+}\oplus\mathrm{X2}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N72.9.130 $\mathrm{GM2}^{+}\oplus\mathrm{X2}^{+}\oplus\mathrm{X2}^{-}$	$\surd$	1	1	$\surd$	$mm2$	A2
N72.9.131 $\mathrm{GM2}^{+}\oplus\mathrm{X2}^{+}\oplus\mathrm{X3}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N72.9.132 $\mathrm{GM2}^{+}\oplus\mathrm{X2}^{+}\oplus\mathrm{X3}^{-}$	$\surd$	1	1	$\surd$	$mm2$	B2
N72.9.133 $\mathrm{GM2}^{+}\oplus\mathrm{X2}^{-}\oplus\mathrm{X2}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N72.9.134 $\mathrm{GM2}^{+}\oplus\mathrm{X2}^{-}\oplus\mathrm{X3}^{+}$	$\surd$	1	1	$\surd$	$mm2$	B2
N72.9.135 $\mathrm{GM2}^{+}\oplus\mathrm{X2}^{-}\oplus\mathrm{X3}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N72.9.136 $\mathrm{GM2}^{+}\oplus\mathrm{X3}^{+}\oplus\mathrm{X3}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N72.9.137 $\mathrm{GM2}^{+}\oplus\mathrm{X3}^{+}\oplus\mathrm{X4}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N72.9.138 $\mathrm{GM2}^{+}\oplus\mathrm{X3}^{+}\oplus\mathrm{X3}^{-}$	$\surd$	1	1	$\surd$	$mm2$	A2
N72.9.139 $\mathrm{GM2}^{+}\oplus\mathrm{X3}^{+}\oplus\mathrm{X4}^{-}$	$\surd$	1	1	$\surd$	222	B1
N72.9.140 $\mathrm{GM2}^{+}\oplus\mathrm{X3}^{-}\oplus\mathrm{X3}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N72.9.141 $\mathrm{GM2}^{+}\oplus\mathrm{X3}^{-}\oplus\mathrm{X4}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N72.9.142 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
N72.9.143 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B2_u}\oplus\mathrm{B2_u}$
N72.9.144 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
N72.9.145 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{X1}^{+}$	$\surd$	0	0	$\surd$	-	-
N72.9.146 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{X1}^{-}$	$\surd$	0	0	$\surd$	-	-
N72.9.147 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{X2}^{+}$	$\surd$	0	0	$\surd$	-	-
N72.9.148 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{X2}^{-}$	$\surd$	0	0	$\surd$	-	-
N72.9.149 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{X3}^{+}$	$\surd$	0	0	$\surd$	-	-
N72.9.150 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{X3}^{-}$	$\surd$	0	0	$\surd$	-	-
N72.9.151 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2}\oplus\mathrm{B2}$
N72.9.152 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{+}\oplus\mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	222	$\mathrm{B3}\oplus\mathrm{B2}$
N72.9.153 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B3_g}\oplus\mathrm{B2_u}$
N72.9.154 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{+}\oplus\mathrm{GM4}^{-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B3_g}\oplus\mathrm{B2_u}$
N72.9.155 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{+}\oplus\mathrm{X1}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B2_u}$
N72.9.156 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{+}\oplus\mathrm{X1}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B2_u}$
N72.9.157 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{+}\oplus\mathrm{X2}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B2_u}$
N72.9.158 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{+}\oplus\mathrm{X2}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B2_u}$
N72.9.159 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{+}\oplus\mathrm{X3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B2_u}$
N72.9.160 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{+}\oplus\mathrm{X4}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B2_u}$
N72.9.161 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{+}\oplus\mathrm{X3}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B2_u}$
N72.9.162 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{+}\oplus\mathrm{X4}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B2_u}$
N72.9.163 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
N72.9.164 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
N72.9.165 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{X1}^{+}$	$\surd$	0	0	$\surd$	-	-
N72.9.166 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{X1}^{-}$	$\surd$	0	0	$\surd$	-	-
N72.9.167 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{X2}^{+}$	$\surd$	0	0	$\surd$	-	-
N72.9.168 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{X2}^{-}$	$\surd$	0	0	$\surd$	-	-
N72.9.169 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{X3}^{+}$	$\surd$	0	0	$\surd$	-	-
N72.9.170 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{X4}^{+}$	$\surd$	0	0	$\surd$	-	-
N72.9.171 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{X3}^{-}$	$\surd$	0	0	$\surd$	-	-

Non-coplanar SSGs with parent space group $Ibam$ (No. 72) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N72.9.172 $\mathrm{GM2^-}\oplus\mathrm{GM3^-}\oplus\mathrm{X4^-}$	$\surd$	0	0	$\surd$	-	-
N72.9.173 $\mathrm{GM2^-}\oplus\mathrm{X1^+}\oplus\mathrm{X1^+}$	$\surd$	1	0	$\times$	-	-
N72.9.174 $\mathrm{GM2^-}\oplus\mathrm{X1^+}\oplus\mathrm{X1^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_u}$
N72.9.175 $\mathrm{GM2^-}\oplus\mathrm{X1^+}\oplus\mathrm{X2^+}$	$\surd$	1	0	$\times$	-	-
N72.9.176 $\mathrm{GM2^-}\oplus\mathrm{X1^+}\oplus\mathrm{X2^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N72.9.177 $\mathrm{GM2^-}\oplus\mathrm{X1^+}\oplus\mathrm{X3^+}$	$\surd$	1	0	$\times$	-	-
N72.9.178 $\mathrm{GM2^-}\oplus\mathrm{X1^+}\oplus\mathrm{X3^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N72.9.179 $\mathrm{GM2^-}\oplus\mathrm{X1^-}\oplus\mathrm{X1^-}$	$\surd$	1	0	$\times$	-	-
N72.9.180 $\mathrm{GM2^-}\oplus\mathrm{X1^-}\oplus\mathrm{X2^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N72.9.181 $\mathrm{GM2^-}\oplus\mathrm{X1^-}\oplus\mathrm{X2^-}$	$\surd$	1	0	$\times$	-	-
N72.9.182 $\mathrm{GM2^-}\oplus\mathrm{X1^-}\oplus\mathrm{X3^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N72.9.183 $\mathrm{GM2^-}\oplus\mathrm{X1^-}\oplus\mathrm{X3^-}$	$\surd$	1	0	$\times$	-	-
N72.9.184 $\mathrm{GM2^-}\oplus\mathrm{X2^+}\oplus\mathrm{X2^+}$	$\surd$	1	0	$\times$	-	-
N72.9.185 $\mathrm{GM2^-}\oplus\mathrm{X2^+}\oplus\mathrm{X2^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_u}$
N72.9.186 $\mathrm{GM2^-}\oplus\mathrm{X2^+}\oplus\mathrm{X3^+}$	$\surd$	1	0	$\times$	-	-
N72.9.187 $\mathrm{GM2^-}\oplus\mathrm{X2^+}\oplus\mathrm{X3^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N72.9.188 $\mathrm{GM2^-}\oplus\mathrm{X2^-}\oplus\mathrm{X2^-}$	$\surd$	1	0	$\times$	-	-
N72.9.189 $\mathrm{GM2^-}\oplus\mathrm{X2^-}\oplus\mathrm{X3^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N72.9.190 $\mathrm{GM2^-}\oplus\mathrm{X2^-}\oplus\mathrm{X3^-}$	$\surd$	1	0	$\times$	-	-
N72.9.191 $\mathrm{GM2^-}\oplus\mathrm{X3^+}\oplus\mathrm{X3^+}$	$\surd$	1	0	$\times$	-	-
N72.9.192 $\mathrm{GM2^-}\oplus\mathrm{X3^+}\oplus\mathrm{X4^+}$	$\surd$	1	0	$\times$	-	-
N72.9.193 $\mathrm{GM2^-}\oplus\mathrm{X3^+}\oplus\mathrm{X3^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_u}$
N72.9.194 $\mathrm{GM2^-}\oplus\mathrm{X3^+}\oplus\mathrm{X4^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N72.9.195 $\mathrm{GM2^-}\oplus\mathrm{X3^-}\oplus\mathrm{X3^-}$	$\surd$	1	0	$\times$	-	-
N72.9.196 $\mathrm{GM2^-}\oplus\mathrm{X3^-}\oplus\mathrm{X4^-}$	$\surd$	1	0	$\times$	-	-
N72.9.197 $\mathrm{GM3^+}\oplus\mathrm{GM3^+}\oplus\mathrm{GM3^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_g}\oplus\mathrm{B3_g}$
N72.9.198 $\mathrm{GM3^+}\oplus\mathrm{GM3^+}\oplus\mathrm{GM4^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_g}\oplus\mathrm{B2_g}$
N72.9.199 $\mathrm{GM3^+}\oplus\mathrm{GM3^+}\oplus\mathrm{GM3^-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2}\oplus\mathrm{A2}$
N72.9.200 $\mathrm{GM3^+}\oplus\mathrm{GM3^+}\oplus\mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2}\oplus\mathrm{B2}$
N72.9.201 $\mathrm{GM3^+}\oplus\mathrm{GM4^+}\oplus\mathrm{GM3^-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2}\oplus\mathrm{B2}$
N72.9.202 $\mathrm{GM3^+}\oplus\mathrm{GM3^+}\oplus\mathrm{X1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_g}$
N72.9.203 $\mathrm{GM3^+}\oplus\mathrm{GM4^+}\oplus\mathrm{X1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B2_g}$
N72.9.204 $\mathrm{GM3^+}\oplus\mathrm{GM3^+}\oplus\mathrm{X1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_g}$
N72.9.205 $\mathrm{GM3^+}\oplus\mathrm{GM4^+}\oplus\mathrm{X1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B2_g}$
N72.9.206 $\mathrm{GM3^+}\oplus\mathrm{GM3^+}\oplus\mathrm{X2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_g}$
N72.9.207 $\mathrm{GM3^+}\oplus\mathrm{GM4^+}\oplus\mathrm{X2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B2_g}$
N72.9.208 $\mathrm{GM3^+}\oplus\mathrm{GM3^+}\oplus\mathrm{X2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_g}$
N72.9.209 $\mathrm{GM3^+}\oplus\mathrm{GM4^+}\oplus\mathrm{X2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B2_g}$
N72.9.210 $\mathrm{GM3^+}\oplus\mathrm{GM3^+}\oplus\mathrm{X3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_g}$
N72.9.211 $\mathrm{GM3^+}\oplus\mathrm{GM3^+}\oplus\mathrm{X4^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_g}$
N72.9.212 $\mathrm{GM3^+}\oplus\mathrm{GM4^+}\oplus\mathrm{X3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B2_g}$
N72.9.213 $\mathrm{GM3^+}\oplus\mathrm{GM3^+}\oplus\mathrm{X3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_g}$
N72.9.214 $\mathrm{GM3^+}\oplus\mathrm{GM3^+}\oplus\mathrm{X4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_g}$
N72.9.215 $\mathrm{GM3^+}\oplus\mathrm{GM4^+}\oplus\mathrm{X3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B2_g}$
N72.9.216 $\mathrm{GM3^+}\oplus\mathrm{GM3^-}\oplus\mathrm{GM3^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{A_u}\oplus\mathrm{B3_g}$
N72.9.217 $\mathrm{GM3^+}\oplus\mathrm{GM3^-}\oplus\mathrm{GM4^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B1_u}\oplus\mathrm{B3_g}$

Non-coplanar SSGs with parent space group $Ibam$ (No. 72) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N72.9.218 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{GM4^-}$	√	3	3	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B3_g}$
N72.9.219 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{X1^+}$	√	2	2	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N72.9.220 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{X1^+}$	√	2	2	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N72.9.221 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{X1^-}$	√	2	2	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N72.9.222 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{X1^-}$	√	2	2	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N72.9.223 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{X2^+}$	√	2	2	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N72.9.224 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{X2^+}$	√	2	2	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N72.9.225 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{X2^-}$	√	2	2	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N72.9.226 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{X2^-}$	√	2	2	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N72.9.227 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{X3^+}$	√	2	2	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N72.9.228 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{X4^+}$	√	2	2	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N72.9.229 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{X3^+}$	√	2	2	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N72.9.230 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{X4^+}$	√	2	2	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N72.9.231 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{X3^-}$	√	2	2	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N72.9.232 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{X4^-}$	√	2	2	√	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
N72.9.233 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{X3^-}$	√	2	2	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N72.9.234 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{X4^-}$	√	2	2	√	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
N72.9.235 $\mathrm{GM3^+} \oplus \mathrm{X1^+} \oplus \mathrm{X1^+}$	√	1	1	√	mmm	$\mathrm{B3_g}$
N72.9.236 $\mathrm{GM3^+} \oplus \mathrm{X1^+} \oplus \mathrm{X1^-}$	√	1	1	√	$mm2$	A2
N72.9.237 $\mathrm{GM3^+} \oplus \mathrm{X1^+} \oplus \mathrm{X2^+}$	√	1	1	√	mmm	$\mathrm{B3_g}$
N72.9.238 $\mathrm{GM3^+} \oplus \mathrm{X1^+} \oplus \mathrm{X2^-}$	√	1	1	√	$mm2$	B2
N72.9.239 $\mathrm{GM3^+} \oplus \mathrm{X1^+} \oplus \mathrm{X3^+}$	√	1	1	√	mmm	$\mathrm{B3_g}$
N72.9.240 $\mathrm{GM3^+} \oplus \mathrm{X1^+} \oplus \mathrm{X4^+}$	√	1	1	√	mmm	$\mathrm{B3_g}$
N72.9.241 $\mathrm{GM3^+} \oplus \mathrm{X1^+} \oplus \mathrm{X3^-}$	√	1	1	√	222	B3
N72.9.242 $\mathrm{GM3^+} \oplus \mathrm{X1^+} \oplus \mathrm{X4^-}$	√	1	1	√	$mm2$	B2
N72.9.243 $\mathrm{GM3^+} \oplus \mathrm{X1^-} \oplus \mathrm{X1^-}$	√	1	1	√	mmm	$\mathrm{B3_g}$
N72.9.244 $\mathrm{GM3^+} \oplus \mathrm{X1^-} \oplus \mathrm{X2^+}$	√	1	1	√	$mm2$	B2
N72.9.245 $\mathrm{GM3^+} \oplus \mathrm{X1^-} \oplus \mathrm{X2^-}$	√	1	1	√	mmm	$\mathrm{B3_g}$
N72.9.246 $\mathrm{GM3^+} \oplus \mathrm{X1^-} \oplus \mathrm{X3^+}$	√	1	1	√	222	B3
N72.9.247 $\mathrm{GM3^+} \oplus \mathrm{X1^-} \oplus \mathrm{X4^+}$	√	1	1	√	$mm2$	B2
N72.9.248 $\mathrm{GM3^+} \oplus \mathrm{X1^-} \oplus \mathrm{X3^-}$	√	1	1	√	mmm	$\mathrm{B3_g}$
N72.9.249 $\mathrm{GM3^+} \oplus \mathrm{X1^-} \oplus \mathrm{X4^-}$	√	1	1	√	mmm	$\mathrm{B3_g}$
N72.9.250 $\mathrm{GM3^+} \oplus \mathrm{X2^+} \oplus \mathrm{X2^+}$	√	1	1	√	mmm	$\mathrm{B3_g}$
N72.9.251 $\mathrm{GM3^+} \oplus \mathrm{X2^+} \oplus \mathrm{X2^-}$	√	1	1	√	$mm2$	A2
N72.9.252 $\mathrm{GM3^+} \oplus \mathrm{X2^+} \oplus \mathrm{X3^+}$	√	1	1	√	mmm	$\mathrm{B3_g}$
N72.9.253 $\mathrm{GM3^+} \oplus \mathrm{X2^+} \oplus \mathrm{X4^+}$	√	1	1	√	mmm	$\mathrm{B3_g}$
N72.9.254 $\mathrm{GM3^+} \oplus \mathrm{X2^+} \oplus \mathrm{X3^-}$	√	1	1	√	$mm2$	B2
N72.9.255 $\mathrm{GM3^+} \oplus \mathrm{X2^+} \oplus \mathrm{X4^-}$	√	1	1	√	222	B3
N72.9.256 $\mathrm{GM3^+} \oplus \mathrm{X2^-} \oplus \mathrm{X2^-}$	√	1	1	√	mmm	$\mathrm{B3_g}$
N72.9.257 $\mathrm{GM3^+} \oplus \mathrm{X2^-} \oplus \mathrm{X3^+}$	√	1	1	√	$mm2$	B2
N72.9.258 $\mathrm{GM3^+} \oplus \mathrm{X2^-} \oplus \mathrm{X4^+}$	√	1	1	√	222	B3
N72.9.259 $\mathrm{GM3^+} \oplus \mathrm{X2^-} \oplus \mathrm{X3^-}$	√	1	1	√	mmm	$\mathrm{B3_g}$
N72.9.260 $\mathrm{GM3^+} \oplus \mathrm{X2^-} \oplus \mathrm{X4^-}$	√	1	1	√	mmm	$\mathrm{B3_g}$
N72.9.261 $\mathrm{GM3^+} \oplus \mathrm{X3^+} \oplus \mathrm{X3^+}$	√	1	1	√	mmm	$\mathrm{B3_g}$
N72.9.262 $\mathrm{GM3^+} \oplus \mathrm{X3^+} \oplus \mathrm{X4^+}$	√	1	1	√	mmm	$\mathrm{B3_g}$
N72.9.263 $\mathrm{GM3^+} \oplus \mathrm{X4^+} \oplus \mathrm{X4^+}$	√	1	1	√	mmm	$\mathrm{B3_g}$

Non-coplanar SSGs with parent space group $Ibam$ (No. 72) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N72.9.264 $\mathrm{GM3}^{+}\oplus\mathrm{X3}^{+}\oplus\mathrm{X3}^{-}$	$\surd$	1	1	$\surd$	$mm2$	A2
N72.9.265 $\mathrm{GM3}^{+}\oplus\mathrm{X3}^{+}\oplus\mathrm{X4}^{-}$	$\surd$	1	1	$\surd$	$mm2$	B2
N72.9.266 $\mathrm{GM3}^{+}\oplus\mathrm{X4}^{+}\oplus\mathrm{X3}^{-}$	$\surd$	1	1	$\surd$	$mm2$	B2
N72.9.267 $\mathrm{GM3}^{+}\oplus\mathrm{X4}^{+}\oplus\mathrm{X4}^{-}$	$\surd$	1	1	$\surd$	$mm2$	A2
N72.9.268 $\mathrm{GM3}^{+}\oplus\mathrm{X3}^{-}\oplus\mathrm{X3}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N72.9.269 $\mathrm{GM3}^{+}\oplus\mathrm{X3}^{-}\oplus\mathrm{X4}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N72.9.270 $\mathrm{GM3}^{+}\oplus\mathrm{X4}^{-}\oplus\mathrm{X4}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N72.9.271 $\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
N72.9.272 $\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
N72.9.273 $\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{X1}^{+}$	$\surd$	0	0	$\surd$	-	-
N72.9.274 $\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{-}\oplus\mathrm{X1}^{+}$	$\surd$	0	0	$\surd$	-	-
N72.9.275 $\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{X1}^{-}$	$\surd$	0	0	$\surd$	-	-
N72.9.276 $\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{-}\oplus\mathrm{X1}^{-}$	$\surd$	0	0	$\surd$	-	-
N72.9.277 $\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{X2}^{+}$	$\surd$	0	0	$\surd$	-	-
N72.9.278 $\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{-}\oplus\mathrm{X2}^{+}$	$\surd$	0	0	$\surd$	-	-
N72.9.279 $\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{X2}^{-}$	$\surd$	0	0	$\surd$	-	-
N72.9.280 $\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{-}\oplus\mathrm{X2}^{-}$	$\surd$	0	0	$\surd$	-	-
N72.9.281 $\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{X3}^{+}$	$\surd$	0	0	$\surd$	-	-
N72.9.282 $\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{X4}^{+}$	$\surd$	0	0	$\surd$	-	-
N72.9.283 $\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{-}\oplus\mathrm{X3}^{+}$	$\surd$	0	0	$\surd$	-	-
N72.9.284 $\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{X3}^{-}$	$\surd$	0	0	$\surd$	-	-
N72.9.285 $\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{X4}^{-}$	$\surd$	0	0	$\surd$	-	-
N72.9.286 $\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{-}\oplus\mathrm{X3}^{-}$	$\surd$	0	0	$\surd$	-	-
N72.9.287 $\mathrm{GM3}^{-}\oplus\mathrm{X1}^{+}\oplus\mathrm{X1}^{+}$	$\surd$	1	0	$\times$	-	-
N72.9.288 $\mathrm{GM3}^{-}\oplus\mathrm{X1}^{+}\oplus\mathrm{X1}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_u}$
N72.9.289 $\mathrm{GM3}^{-}\oplus\mathrm{X1}^{+}\oplus\mathrm{X2}^{+}$	$\surd$	1	0	$\times$	-	-
N72.9.290 $\mathrm{GM3}^{-}\oplus\mathrm{X1}^{+}\oplus\mathrm{X2}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N72.9.291 $\mathrm{GM3}^{-}\oplus\mathrm{X1}^{+}\oplus\mathrm{X3}^{+}$	$\surd$	1	0	$\times$	-	-
N72.9.292 $\mathrm{GM3}^{-}\oplus\mathrm{X1}^{+}\oplus\mathrm{X4}^{+}$	$\surd$	1	0	$\times$	-	-
N72.9.293 $\mathrm{GM3}^{-}\oplus\mathrm{X1}^{+}\oplus\mathrm{X3}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N72.9.294 $\mathrm{GM3}^{-}\oplus\mathrm{X1}^{+}\oplus\mathrm{X4}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N72.9.295 $\mathrm{GM3}^{-}\oplus\mathrm{X1}^{-}\oplus\mathrm{X1}^{-}$	$\surd$	1	0	$\times$	-	-
N72.9.296 $\mathrm{GM3}^{-}\oplus\mathrm{X1}^{-}\oplus\mathrm{X2}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N72.9.297 $\mathrm{GM3}^{-}\oplus\mathrm{X1}^{-}\oplus\mathrm{X2}^{-}$	$\surd$	1	0	$\times$	-	-
N72.9.298 $\mathrm{GM3}^{-}\oplus\mathrm{X1}^{-}\oplus\mathrm{X3}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N72.9.299 $\mathrm{GM3}^{-}\oplus\mathrm{X1}^{-}\oplus\mathrm{X4}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N72.9.300 $\mathrm{GM3}^{-}\oplus\mathrm{X1}^{-}\oplus\mathrm{X3}^{-}$	$\surd$	1	0	$\times$	-	-
N72.9.301 $\mathrm{GM3}^{-}\oplus\mathrm{X1}^{-}\oplus\mathrm{X4}^{-}$	$\surd$	1	0	$\times$	-	-
N72.9.302 $\mathrm{GM3}^{-}\oplus\mathrm{X2}^{+}\oplus\mathrm{X2}^{+}$	$\surd$	1	0	$\times$	-	-
N72.9.303 $\mathrm{GM3}^{-}\oplus\mathrm{X2}^{+}\oplus\mathrm{X2}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_u}$
N72.9.304 $\mathrm{GM3}^{-}\oplus\mathrm{X2}^{+}\oplus\mathrm{X3}^{+}$	$\surd$	1	0	$\times$	-	-
N72.9.305 $\mathrm{GM3}^{-}\oplus\mathrm{X2}^{+}\oplus\mathrm{X4}^{+}$	$\surd$	1	0	$\times$	-	-
N72.9.306 $\mathrm{GM3}^{-}\oplus\mathrm{X2}^{+}\oplus\mathrm{X3}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N72.9.307 $\mathrm{GM3}^{-}\oplus\mathrm{X2}^{+}\oplus\mathrm{X4}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N72.9.308 $\mathrm{GM3}^{-}\oplus\mathrm{X2}^{-}\oplus\mathrm{X2}^{-}$	$\surd$	1	0	$\times$	-	-
N72.9.309 $\mathrm{GM3}^{-}\oplus\mathrm{X2}^{-}\oplus\mathrm{X3}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$

Non-coplanar SSGs with parent space group $Ibam$ (No. 72) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N72.9.310 $\mathrm{GM3^-}\oplus\mathrm{X2^-}\oplus\mathrm{X4^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N72.9.311 $\mathrm{GM3^-}\oplus\mathrm{X2^-}\oplus\mathrm{X3^-}$	$\surd$	1	0	$\times$	-	-
N72.9.312 $\mathrm{GM3^-}\oplus\mathrm{X2^-}\oplus\mathrm{X4^-}$	$\surd$	1	0	$\times$	-	-
N72.9.313 $\mathrm{GM3^-}\oplus\mathrm{X3^+}\oplus\mathrm{X3^+}$	$\surd$	1	0	$\times$	-	-
N72.9.314 $\mathrm{GM3^-}\oplus\mathrm{X3^+}\oplus\mathrm{X4^+}$	$\surd$	1	0	$\times$	-	-
N72.9.315 $\mathrm{GM3^-}\oplus\mathrm{X4^+}\oplus\mathrm{X4^+}$	$\surd$	1	0	$\times$	-	-
N72.9.316 $\mathrm{GM3^-}\oplus\mathrm{X3^+}\oplus\mathrm{X3^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_u}$
N72.9.317 $\mathrm{GM3^-}\oplus\mathrm{X3^+}\oplus\mathrm{X4^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N72.9.318 $\mathrm{GM3^-}\oplus\mathrm{X4^+}\oplus\mathrm{X3^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N72.9.319 $\mathrm{GM3^-}\oplus\mathrm{X4^+}\oplus\mathrm{X4^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_u}$
N72.9.320 $\mathrm{GM3^-}\oplus\mathrm{X3^-}\oplus\mathrm{X3^-}$	$\surd$	1	0	$\times$	-	-
N72.9.321 $\mathrm{GM3^-}\oplus\mathrm{X3^-}\oplus\mathrm{X4^-}$	$\surd$	1	0	$\times$	-	-
N72.9.322 $\mathrm{GM3^-}\oplus\mathrm{X4^-}\oplus\mathrm{X4^-}$	$\surd$	1	0	$\times$	-	-
N72.9.323 $\mathrm{X1^+}\oplus\mathrm{X1^+}\oplus\mathrm{X1^+}$	$\surd$	0	0	$\surd$	-	-
N72.9.324 $\mathrm{X1^+}\oplus\mathrm{X1^+}\oplus\mathrm{X1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{A_u}$
N72.9.325 $\mathrm{X1^+}\oplus\mathrm{X1^+}\oplus\mathrm{X2^+}$	$\surd$	0	0	$\surd$	-	-
N72.9.326 $\mathrm{X1^+}\oplus\mathrm{X1^+}\oplus\mathrm{X2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B1_u}$
N72.9.327 $\mathrm{X1^+}\oplus\mathrm{X1^+}\oplus\mathrm{X3^+}$	$\surd$	0	0	$\surd$	-	-
N72.9.328 $\mathrm{X1^+}\oplus\mathrm{X1^+}\oplus\mathrm{X3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u}\oplus\mathrm{B3_u}$
N72.9.329 $\mathrm{X1^+}\oplus\mathrm{X1^-}\oplus\mathrm{X1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{A_u}$
N72.9.330 $\mathrm{X1^+}\oplus\mathrm{X1^-}\oplus\mathrm{X2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B1_u}$
N72.9.331 $\mathrm{X1^+}\oplus\mathrm{X1^-}\oplus\mathrm{X2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B1_u}$
N72.9.332 $\mathrm{X1^+}\oplus\mathrm{X1^-}\oplus\mathrm{X3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B3_u}$
N72.9.333 $\mathrm{X1^+}\oplus\mathrm{X1^-}\oplus\mathrm{X3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B3_u}$
N72.9.334 $\mathrm{X1^+}\oplus\mathrm{X2^+}\oplus\mathrm{X2^+}$	$\surd$	0	0	$\surd$	-	-
N72.9.335 $\mathrm{X1^+}\oplus\mathrm{X2^+}\oplus\mathrm{X2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B1_u}$
N72.9.336 $\mathrm{X1^+}\oplus\mathrm{X2^+}\oplus\mathrm{X3^+}$	$\surd$	0	0	$\surd$	-	-
N72.9.337 $\mathrm{X1^+}\oplus\mathrm{X2^+}\oplus\mathrm{X3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u}\oplus\mathrm{B2_u}$
N72.9.338 $\mathrm{X1^+}\oplus\mathrm{X2^-}\oplus\mathrm{X2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B1_u}$
N72.9.339 $\mathrm{X1^+}\oplus\mathrm{X2^-}\oplus\mathrm{X3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B2_u}$
N72.9.340 $\mathrm{X1^+}\oplus\mathrm{X2^-}\oplus\mathrm{X3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B3_u}$
N72.9.341 $\mathrm{X1^+}\oplus\mathrm{X3^+}\oplus\mathrm{X3^+}$	$\surd$	0	0	$\surd$	-	-
N72.9.342 $\mathrm{X1^+}\oplus\mathrm{X3^+}\oplus\mathrm{X4^+}$	$\surd$	0	0	$\surd$	-	-
N72.9.343 $\mathrm{X1^+}\oplus\mathrm{X3^+}\oplus\mathrm{X3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B3_u}$
N72.9.344 $\mathrm{X1^+}\oplus\mathrm{X3^+}\oplus\mathrm{X4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B2_u}$
N72.9.345 $\mathrm{X1^+}\oplus\mathrm{X3^-}\oplus\mathrm{X3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u}\oplus\mathrm{B3_u}$
N72.9.346 $\mathrm{X1^+}\oplus\mathrm{X3^-}\oplus\mathrm{X4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u}\oplus\mathrm{B2_u}$
N72.9.347 $\mathrm{X1^-}\oplus\mathrm{X1^-}\oplus\mathrm{X1^-}$	$\surd$	0	0	$\surd$	-	-
N72.9.348 $\mathrm{X1^-}\oplus\mathrm{X1^-}\oplus\mathrm{X2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B1_u}$
N72.9.349 $\mathrm{X1^-}\oplus\mathrm{X1^-}\oplus\mathrm{X2^-}$	$\surd$	0	0	$\surd$	-	-
N72.9.350 $\mathrm{X1^-}\oplus\mathrm{X1^-}\oplus\mathrm{X3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u}\oplus\mathrm{B3_u}$
N72.9.351 $\mathrm{X1^-}\oplus\mathrm{X1^-}\oplus\mathrm{X3^-}$	$\surd$	0	0	$\surd$	-	-
N72.9.352 $\mathrm{X1^-}\oplus\mathrm{X2^+}\oplus\mathrm{X2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B1_u}$
N72.9.353 $\mathrm{X1^-}\oplus\mathrm{X2^+}\oplus\mathrm{X2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B1_u}$
N72.9.354 $\mathrm{X1^-}\oplus\mathrm{X2^+}\oplus\mathrm{X3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B3_u}$
N72.9.355 $\mathrm{X1^-}\oplus\mathrm{X2^+}\oplus\mathrm{X3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B2_u}$

Non-coplanar SSGs with parent space group $Ibam$ (No. 72) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N72.9.356 $\mathrm{X1^-}\oplus\mathrm{X2^-}\oplus\mathrm{X2^-}$	$\surd$	0	0	$\surd$	-	-
N72.9.357 $\mathrm{X1^-}\oplus\mathrm{X2^-}\oplus\mathrm{X3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u}\oplus\mathrm{B2_u}$
N72.9.358 $\mathrm{X1^-}\oplus\mathrm{X2^-}\oplus\mathrm{X3^-}$	$\surd$	0	0	$\surd$	-	-
N72.9.359 $\mathrm{X1^-}\oplus\mathrm{X3^+}\oplus\mathrm{X3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u}\oplus\mathrm{B3_u}$
N72.9.360 $\mathrm{X1^-}\oplus\mathrm{X3^+}\oplus\mathrm{X4^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u}\oplus\mathrm{B2_u}$
N72.9.361 $\mathrm{X1^-}\oplus\mathrm{X3^+}\oplus\mathrm{X3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B3_u}$
N72.9.362 $\mathrm{X1^-}\oplus\mathrm{X3^+}\oplus\mathrm{X4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B3_u}$
N72.9.363 $\mathrm{X1^-}\oplus\mathrm{X3^-}\oplus\mathrm{X3^-}$	$\surd$	0	0	$\surd$	-	-
N72.9.364 $\mathrm{X1^-}\oplus\mathrm{X3^-}\oplus\mathrm{X4^-}$	$\surd$	0	0	$\surd$	-	-
N72.9.365 $\mathrm{X2^+}\oplus\mathrm{X2^+}\oplus\mathrm{X2^+}$	$\surd$	0	0	$\surd$	-	-
N72.9.366 $\mathrm{X2^+}\oplus\mathrm{X2^+}\oplus\mathrm{X2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{A_u}$
N72.9.367 $\mathrm{X2^+}\oplus\mathrm{X2^+}\oplus\mathrm{X3^+}$	$\surd$	0	0	$\surd$	-	-
N72.9.368 $\mathrm{X2^+}\oplus\mathrm{X2^+}\oplus\mathrm{X3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_u}\oplus\mathrm{B2_u}$
N72.9.369 $\mathrm{X2^+}\oplus\mathrm{X2^-}\oplus\mathrm{X2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{A_u}$
N72.9.370 $\mathrm{X2^+}\oplus\mathrm{X2^-}\oplus\mathrm{X3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B2_u}$
N72.9.371 $\mathrm{X2^+}\oplus\mathrm{X2^-}\oplus\mathrm{X3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B2_u}$
N72.9.372 $\mathrm{X2^+}\oplus\mathrm{X3^+}\oplus\mathrm{X3^+}$	$\surd$	0	0	$\surd$	-	-
N72.9.373 $\mathrm{X2^+}\oplus\mathrm{X3^+}\oplus\mathrm{X4^+}$	$\surd$	0	0	$\surd$	-	-
N72.9.374 $\mathrm{X2^+}\oplus\mathrm{X3^+}\oplus\mathrm{X3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B2_u}$
N72.9.375 $\mathrm{X2^+}\oplus\mathrm{X3^+}\oplus\mathrm{X4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B3_u}$
N72.9.376 $\mathrm{X2^+}\oplus\mathrm{X3^-}\oplus\mathrm{X3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_u}\oplus\mathrm{B2_u}$
N72.9.377 $\mathrm{X2^+}\oplus\mathrm{X3^-}\oplus\mathrm{X4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u}\oplus\mathrm{B2_u}$
N72.9.378 $\mathrm{X2^-}\oplus\mathrm{X2^-}\oplus\mathrm{X2^-}$	$\surd$	0	0	$\surd$	-	-
N72.9.379 $\mathrm{X2^-}\oplus\mathrm{X2^-}\oplus\mathrm{X3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_u}\oplus\mathrm{B2_u}$
N72.9.380 $\mathrm{X2^-}\oplus\mathrm{X2^-}\oplus\mathrm{X3^-}$	$\surd$	0	0	$\surd$	-	-
N72.9.381 $\mathrm{X2^-}\oplus\mathrm{X3^+}\oplus\mathrm{X3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_u}\oplus\mathrm{B2_u}$
N72.9.382 $\mathrm{X2^-}\oplus\mathrm{X3^+}\oplus\mathrm{X4^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u}\oplus\mathrm{B2_u}$
N72.9.383 $\mathrm{X2^-}\oplus\mathrm{X3^+}\oplus\mathrm{X3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B2_u}$
N72.9.384 $\mathrm{X2^-}\oplus\mathrm{X3^+}\oplus\mathrm{X4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B2_u}$
N72.9.385 $\mathrm{X2^-}\oplus\mathrm{X3^-}\oplus\mathrm{X3^-}$	$\surd$	0	0	$\surd$	-	-
N72.9.386 $\mathrm{X2^-}\oplus\mathrm{X3^-}\oplus\mathrm{X4^-}$	$\surd$	0	0	$\surd$	-	-
N72.9.387 $\mathrm{X3^+}\oplus\mathrm{X3^+}\oplus\mathrm{X3^+}$	$\surd$	0	0	$\surd$	-	-
N72.9.388 $\mathrm{X3^+}\oplus\mathrm{X3^+}\oplus\mathrm{X4^+}$	$\surd$	0	0	$\surd$	-	-
N72.9.389 $\mathrm{X3^+}\oplus\mathrm{X3^+}\oplus\mathrm{X3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{A_u}$
N72.9.390 $\mathrm{X3^+}\oplus\mathrm{X3^+}\oplus\mathrm{X4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B1_u}$
N72.9.391 $\mathrm{X3^+}\oplus\mathrm{X4^+}\oplus\mathrm{X3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B1_u}$
N72.9.392 $\mathrm{X3^+}\oplus\mathrm{X3^-}\oplus\mathrm{X3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{A_u}$
N72.9.393 $\mathrm{X3^+}\oplus\mathrm{X3^-}\oplus\mathrm{X4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B1_u}$
N72.9.394 $\mathrm{X3^+}\oplus\mathrm{X4^-}\oplus\mathrm{X4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B1_u}$
N72.9.395 $\mathrm{X3^-}\oplus\mathrm{X3^-}\oplus\mathrm{X3^-}$	$\surd$	0	0	$\surd$	-	-
N72.9.396 $\mathrm{X3^-}\oplus\mathrm{X3^-}\oplus\mathrm{X4^-}$	$\surd$	0	0	$\surd$	-	-
N72.13.1 $\mathrm{GM1^-}\oplus\mathrm{T1^+}$	$\surd$	1	0	$\times$	-	-
N72.13.2 $\mathrm{GM1^-}\oplus\mathrm{T1^-}$	$\surd$	1	0	$\times$	-	-
N72.13.3 $\mathrm{GM2^+}\oplus\mathrm{T1^+}$	$\surd$	1	1	$\times$	-	-
N72.13.4 $\mathrm{GM2^+}\oplus\mathrm{T1^-}$	$\surd$	1	1	$\times$	-	-
N72.13.5 $\mathrm{GM2^-}\oplus\mathrm{T1^+}$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $Ibam$ (No. 72) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N72.13.6 $\mathrm{GM2}^{-} \oplus \mathrm{T1}^{-}$	$\surd$	1	0	$\times$	-	-
N72.13.7 $\mathrm{GM3}^{+} \oplus \mathrm{T1}^{+}$	$\surd$	1	1	$\times$	-	-
N72.13.8 $\mathrm{GM3}^{+} \oplus \mathrm{T1}^{-}$	$\surd$	1	1	$\times$	-	-
N72.13.9 $\mathrm{GM3}^{-} \oplus \mathrm{T1}^{+}$	$\surd$	1	0	$\times$	-	-
N72.13.10 $\mathrm{GM3}^{-} \oplus \mathrm{T1}^{-}$	$\surd$	1	0	$\times$	-	-
N72.13.11 $\mathrm{X1}^{+} \oplus \mathrm{T1}^{+}$	$\times$	-	-	-	-	-
N72.13.12 $\mathrm{X1}^{+} \oplus \mathrm{T1}^{-}$	$\times$	-	-	-	-	-
N72.13.13 $\mathrm{X1}^{-} \oplus \mathrm{T1}^{+}$	$\times$	-	-	-	-	-
N72.13.14 $\mathrm{X1}^{-} \oplus \mathrm{T1}^{-}$	$\times$	-	-	-	-	-
N72.13.15 $\mathrm{X2}^{+} \oplus \mathrm{T1}^{+}$	$\times$	-	-	-	-	-
N72.13.16 $\mathrm{X2}^{+} \oplus \mathrm{T1}^{-}$	$\times$	-	-	-	-	-
N72.13.17 $\mathrm{X2}^{-} \oplus \mathrm{T1}^{+}$	$\times$	-	-	-	-	-
N72.13.18 $\mathrm{X2}^{-} \oplus \mathrm{T1}^{-}$	$\times$	-	-	-	-	-
N72.13.19 $\mathrm{X3}^{+} \oplus \mathrm{T1}^{+}$	$\times$	-	-	-	-	-
N72.13.20 $\mathrm{X3}^{+} \oplus \mathrm{T1}^{-}$	$\times$	-	-	-	-	-
N72.13.21 $\mathrm{X3}^{-} \oplus \mathrm{T1}^{+}$	$\times$	-	-	-	-	-
N72.13.22 $\mathrm{X3}^{-} \oplus \mathrm{T1}^{-}$	$\times$	-	-	-	-	-
N72.14.1 $\mathrm{GM1}^{-} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N72.14.2 $\mathrm{GM1}^{-} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N72.14.3 $\mathrm{GM1}^{-} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N72.14.4 $\mathrm{GM1}^{-} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N72.14.5 $\mathrm{GM1}^{-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N72.14.6 $\mathrm{GM1}^{-} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N72.14.7 $\mathrm{GM1}^{-} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N72.14.8 $\mathrm{GM2}^{+} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	$mm2$	B2
N72.14.9 $\mathrm{GM2}^{+} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	$mm2$	B2
N72.14.10 $\mathrm{GM2}^{+} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	$mm2$	B2
N72.14.11 $\mathrm{GM2}^{+} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	$mm2$	B2
N72.14.12 $\mathrm{GM2}^{+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	222	B1
N72.14.13 $\mathrm{GM2}^{+} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	222	B1
N72.14.14 $\mathrm{GM2}^{+} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	222	B1
N72.14.15 $\mathrm{GM2}^{-} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N72.14.16 $\mathrm{GM2}^{-} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N72.14.17 $\mathrm{GM2}^{-} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N72.14.18 $\mathrm{GM2}^{-} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N72.14.19 $\mathrm{GM2}^{-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N72.14.20 $\mathrm{GM2}^{-} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N72.14.21 $\mathrm{GM2}^{-} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N72.14.22 $\mathrm{GM3}^{+} \oplus \mathrm{SM1}$	$\surd$	1	1	$\surd$	222	B3
N72.14.23 $\mathrm{GM3}^{+} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	$mm2$	B2
N72.14.24 $\mathrm{GM3}^{+} \oplus \mathrm{SM2}$	$\surd$	1	1	$\surd$	222	B3
N72.14.25 $\mathrm{GM3}^{+} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	$mm2$	B2
N72.14.26 $\mathrm{GM3}^{+} \oplus \mathrm{SM3}$	$\surd$	1	1	$\surd$	222	B3
N72.14.27 $\mathrm{GM3}^{+} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	$mm2$	B2
N72.14.28 $\mathrm{GM3}^{+} \oplus \mathrm{SM4}$	$\surd$	1	1	$\surd$	222	B3
N72.14.29 $\mathrm{GM3}^{+} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	$mm2$	B2

Non-coplanar SSGs with parent space group $Ibam$ (No. 72) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N72.14.30 $\mathrm{GM3}^{+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$mm2$	$\mathrm{B2}$
N72.14.31 $\mathrm{GM3}^{+} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	$mm2$	$\mathrm{B2}$
N72.14.32 $\mathrm{GM3}^{+} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	$mm2$	$\mathrm{B2}$
N72.14.33 $\mathrm{GM3}^{+} \oplus \mathrm{LD4}$	$\surd$	1	1	$\surd$	$mm2$	$\mathrm{B2}$
N72.14.34 $\mathrm{GM3}^{-} \oplus \mathrm{SM1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N72.14.35 $\mathrm{GM3}^{-} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N72.14.36 $\mathrm{GM3}^{-} \oplus \mathrm{SM2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N72.14.37 $\mathrm{GM3}^{-} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N72.14.38 $\mathrm{GM3}^{-} \oplus \mathrm{SM3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N72.14.39 $\mathrm{GM3}^{-} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N72.14.40 $\mathrm{GM3}^{-} \oplus \mathrm{SM4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N72.14.41 $\mathrm{GM3}^{-} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N72.14.42 $\mathrm{GM3}^{-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N72.14.43 $\mathrm{GM3}^{-} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N72.14.44 $\mathrm{GM3}^{-} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N72.14.45 $\mathrm{GM3}^{-} \oplus \mathrm{LD4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N72.14.46 $\mathrm{X1}^{+} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N72.14.47 $\mathrm{X1}^{+} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N72.14.48 $\mathrm{X1}^{+} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N72.14.49 $\mathrm{X1}^{+} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N72.14.50 $\mathrm{X1}^{+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N72.14.51 $\mathrm{X1}^{+} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N72.14.52 $\mathrm{X1}^{+} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N72.14.53 $\mathrm{X1}^{-} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N72.14.54 $\mathrm{X1}^{-} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N72.14.55 $\mathrm{X1}^{-} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N72.14.56 $\mathrm{X1}^{-} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N72.14.57 $\mathrm{X1}^{-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N72.14.58 $\mathrm{X1}^{-} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N72.14.59 $\mathrm{X1}^{-} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N72.14.60 $\mathrm{X2}^{+} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N72.14.61 $\mathrm{X2}^{+} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N72.14.62 $\mathrm{X2}^{+} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N72.14.63 $\mathrm{X2}^{+} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N72.14.64 $\mathrm{X2}^{+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N72.14.65 $\mathrm{X2}^{+} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N72.14.66 $\mathrm{X2}^{+} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N72.14.67 $\mathrm{X2}^{-} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N72.14.68 $\mathrm{X2}^{-} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N72.14.69 $\mathrm{X2}^{-} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N72.14.70 $\mathrm{X2}^{-} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N72.14.71 $\mathrm{X2}^{-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N72.14.72 $\mathrm{X2}^{-} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N72.14.73 $\mathrm{X2}^{-} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N72.14.74 $\mathrm{X3}^{+} \oplus \mathrm{SM1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N72.14.75 $\mathrm{X3}^{+} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$

Non-coplanar SSGs with parent space group $Ibam$ (No. 72) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N72.14.76 $\mathrm{X3}^{+} \oplus \mathrm{SM2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N72.14.77 $\mathrm{X3}^{+} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N72.14.78 $\mathrm{X3}^{+} \oplus \mathrm{SM3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N72.14.79 $\mathrm{X3}^{+} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N72.14.80 $\mathrm{X3}^{+} \oplus \mathrm{SM4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N72.14.81 $\mathrm{X3}^{+} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N72.14.82 $\mathrm{X3}^{+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N72.14.83 $\mathrm{X3}^{+} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N72.14.84 $\mathrm{X3}^{+} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N72.14.85 $\mathrm{X3}^{+} \oplus \mathrm{LD4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N72.14.86 $\mathrm{X3}^{-} \oplus \mathrm{SM1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N72.14.87 $\mathrm{X3}^{-} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N72.14.88 $\mathrm{X3}^{-} \oplus \mathrm{SM2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N72.14.89 $\mathrm{X3}^{-} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N72.14.90 $\mathrm{X3}^{-} \oplus \mathrm{SM3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N72.14.91 $\mathrm{X3}^{-} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N72.14.92 $\mathrm{X3}^{-} \oplus \mathrm{SM4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N72.14.93 $\mathrm{X3}^{-} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N72.14.94 $\mathrm{X3}^{-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N72.14.95 $\mathrm{X3}^{-} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N72.14.96 $\mathrm{X3}^{-} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N72.14.97 $\mathrm{X3}^{-} \oplus \mathrm{LD4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$

TABLE S217: Collinear SSGs with parent space group $Ibca$ (No. 73).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L73.1.1 $\mathrm{GM1}^{+}$	1	mmm	$\mathrm{A_g}$
L73.2.1 $\mathrm{GM1}^{-}$	0	-	-
L73.2.2 $\mathrm{GM2}^{+}$	1	mmm	$\mathrm{B1_g}$
L73.2.3 $\mathrm{GM2}^{-}$	0	-	-
L73.2.4 $\mathrm{X1}^{+}$	0	-	-
L73.2.5 $\mathrm{X4}^{+}$	0	-	-

TABLE S218: Coplanar SSGs with parent space group $Ibca$ (No. 73).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P73.1.1 $\mathrm{GM1}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
P73.2.1 $\mathrm{GM1}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
P73.2.2 $\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
P73.2.3 $\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
P73.2.4 $\mathrm{X1}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P73.2.5 $\mathrm{X4}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P73.3.1 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-}$	$\surd$	0	0	$\surd$	-	-
P73.3.2 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
P73.3.3 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-

Coplanar SSGs with parent space group $Ibca$ (No. 73) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P73.3.4 $\mathrm{GM1^-} \oplus \mathrm{X1^+}$	$\surd$	1	1	$\times$	-	-
P73.3.5 $\mathrm{GM1^-} \oplus \mathrm{X4^+}$	$\surd$	1	1	$\times$	-	-
P73.3.6 $\mathrm{GM2^+} \oplus \mathrm{GM2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
P73.3.7 $\mathrm{GM2^+} \oplus \mathrm{GM3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
P73.3.8 $\mathrm{GM2^+} \oplus \mathrm{GM2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
P73.3.9 $\mathrm{GM2^+} \oplus \mathrm{GM3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
P73.3.10 $\mathrm{GM2^+} \oplus \mathrm{X1^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
P73.3.11 $\mathrm{GM2^+} \oplus \mathrm{X1^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
P73.3.12 $\mathrm{GM2^+} \oplus \mathrm{X3^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
P73.3.13 $\mathrm{GM2^+} \oplus \mathrm{X4^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
P73.3.14 $\mathrm{GM2^-} \oplus \mathrm{GM2^-}$	$\surd$	0	0	$\surd$	-	-
P73.3.15 $\mathrm{GM2^-} \oplus \mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
P73.3.16 $\mathrm{GM2^-} \oplus \mathrm{X1^+}$	$\surd$	1	1	$\times$	-	-
P73.3.17 $\mathrm{GM2^-} \oplus \mathrm{X1^-}$	$\surd$	1	1	$\times$	-	-
P73.3.18 $\mathrm{GM2^-} \oplus \mathrm{X3^+}$	$\surd$	1	1	$\times$	-	-
P73.3.19 $\mathrm{GM2^-} \oplus \mathrm{X4^+}$	$\surd$	1	1	$\times$	-	-
P73.3.20 $\mathrm{X1^+} \oplus \mathrm{X1^+}$	$\surd$	1	0	$\times$	-	-
P73.3.21 $\mathrm{X1^+} \oplus \mathrm{X1^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_u}$
P73.3.22 $\mathrm{X1^+} \oplus \mathrm{X2^+}$	$\surd$	1	0	$\times$	-	-
P73.3.23 $\mathrm{X1^+} \oplus \mathrm{X2^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P73.3.24 $\mathrm{X1^+} \oplus \mathrm{X3^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P73.3.25 $\mathrm{X1^+} \oplus \mathrm{X4^+}$	$\surd$	1	0	$\times$	-	-
P73.3.26 $\mathrm{X1^+} \oplus \mathrm{X4^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P73.3.27 $\mathrm{X4^+} \oplus \mathrm{X4^+}$	$\surd$	1	0	$\times$	-	-
P73.3.28 $\mathrm{X4^+} \oplus \mathrm{X4^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_u}$
P73.8.1 DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P73.8.2 DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P73.8.3 DT3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$

TABLE S219: Non-coplanar SSGs with parent space group $Ibca$ (No. 73).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N73.1.1 $\mathrm{GM1^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{A_g}$
N73.2.1 $\mathrm{GM1^-}$	$\surd$	2	2	$\surd$	222	$\mathrm{A1} \oplus \mathrm{A1}$
N73.2.2 $\mathrm{GM2^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B1_g}$
N73.2.3 $\mathrm{GM2^-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{A1}$
N73.2.4 $\mathrm{X1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
N73.2.5 $\mathrm{X4^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
N73.3.1 $\mathrm{GM1^-} \oplus \mathrm{GM1^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{A_u}$
N73.3.2 $\mathrm{GM1^-} \oplus \mathrm{GM2^+}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{A2}$
N73.3.3 $\mathrm{GM1^-} \oplus \mathrm{GM2^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N73.3.4 $\mathrm{GM1^-} \oplus \mathrm{X1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
N73.3.5 $\mathrm{GM1^-} \oplus \mathrm{X4^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
N73.3.6 $\mathrm{GM2^+} \oplus \mathrm{GM2^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N73.3.7 $\mathrm{GM2^+} \oplus \mathrm{GM3^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g} \oplus \mathrm{B3_g}$
N73.3.8 $\mathrm{GM2^+} \oplus \mathrm{GM2^-}$	$\surd$	2	2	$\surd$	222	$\mathrm{A1} \oplus \mathrm{B1}$

Non-coplanar SSGs with parent space group $Ibca$ (No. 73) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N73.3.9 $\mathrm{GM2^+} \oplus \mathrm{GM3^-}$	√	2	2	√	$mm2$	$\mathrm{A1} \oplus \mathrm{B1}$
N73.3.10 $\mathrm{GM2^+} \oplus \mathrm{X1^+}$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
N73.3.11 $\mathrm{GM2^+} \oplus \mathrm{X1^-}$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
N73.3.12 $\mathrm{GM2^+} \oplus \mathrm{X3^+}$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
N73.3.13 $\mathrm{GM2^+} \oplus \mathrm{X4^+}$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
N73.3.14 $\mathrm{GM2^-} \oplus \mathrm{GM2^-}$	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N73.3.15 $\mathrm{GM2^-} \oplus \mathrm{GM3^-}$	√	3	3	√	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u} \oplus \mathrm{B3_u}$
N73.3.16 $\mathrm{GM2^-} \oplus \mathrm{X1^+}$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
N73.3.17 $\mathrm{GM2^-} \oplus \mathrm{X1^-}$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
N73.3.18 $\mathrm{GM2^-} \oplus \mathrm{X3^+}$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
N73.3.19 $\mathrm{GM2^-} \oplus \mathrm{X4^+}$	√	2	2	√	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
N73.3.20 $\mathrm{X1^+} \oplus \mathrm{X1^+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N73.3.21 $\mathrm{X1^+} \oplus \mathrm{X1^-}$	√	1	1	√	222	A1
N73.3.22 $\mathrm{X1^+} \oplus \mathrm{X2^+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N73.3.23 $\mathrm{X1^+} \oplus \mathrm{X2^-}$	√	1	1	√	$mm2$	A1
N73.3.24 $\mathrm{X1^+} \oplus \mathrm{X3^-}$	√	1	1	√	$mm2$	A1
N73.3.25 $\mathrm{X1^+} \oplus \mathrm{X4^+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N73.3.26 $\mathrm{X1^+} \oplus \mathrm{X4^-}$	√	1	1	√	$mm2$	A1
N73.3.27 $\mathrm{X4^+} \oplus \mathrm{X4^+}$	√	1	1	√	mmm	$\mathrm{A_g}$
N73.3.28 $\mathrm{X4^+} \oplus \mathrm{X4^-}$	√	1	1	√	222	A1
N73.8.1 DT1	√	1	1	√	$mm2$	A1
N73.8.2 DT2	√	1	1	√	$mm2$	A1
N73.8.3 DT3	√	1	1	√	$mm2$	A1
N73.9.1 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM1^-}$	√	0	0	√	-	-
N73.9.2 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM2^+}$	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N73.9.3 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM2^-}$	√	0	0	√	-	-
N73.9.4 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{X1^+}$	√	0	0	√	-	-
N73.9.5 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{X4^+}$	√	0	0	√	-	-
N73.9.6 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{GM2^+}$	√	2	2	√	222	$\mathrm{B1} \oplus \mathrm{B1}$
N73.9.7 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{GM3^+}$	√	2	2	√	$mm2$	$\mathrm{B2} \oplus \mathrm{B1}$
N73.9.8 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{GM2^-}$	√	3	3	√	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N73.9.9 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{GM3^-}$	√	3	3	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_u}$
N73.9.10 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{X1^+}$	√	2	2	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N73.9.11 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{X1^-}$	√	2	2	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N73.9.12 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{X3^+}$	√	2	2	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N73.9.13 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{X4^+}$	√	2	2	√	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N73.9.14 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{GM2^-}$	√	0	0	√	-	-
N73.9.15 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{GM3^-}$	√	0	0	√	-	-
N73.9.16 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{X1^+}$	√	0	0	√	-	-
N73.9.17 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{X1^-}$	√	0	0	√	-	-
N73.9.18 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{X3^+}$	√	0	0	√	-	-
N73.9.19 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{X4^+}$	√	0	0	√	-	-
N73.9.20 $\mathrm{GM1^-} \oplus \mathrm{X1^+} \oplus \mathrm{X1^+}$	√	1	0	×	-	-
N73.9.21 $\mathrm{GM1^-} \oplus \mathrm{X1^+} \oplus \mathrm{X1^-}$	√	1	1	√	mmm	$\mathrm{A_u}$
N73.9.22 $\mathrm{GM1^-} \oplus \mathrm{X1^+} \oplus \mathrm{X2^+}$	√	1	0	×	-	-
N73.9.23 $\mathrm{GM1^-} \oplus \mathrm{X1^+} \oplus \mathrm{X2^-}$	√	1	1	√	mmm	$\mathrm{B1_u}$

Non-coplanar SSGs with parent space group $Ibca$ (No. 73) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N73.9.24 $\mathrm{GM1^-}\oplus\mathrm{X1^+}\oplus\mathrm{X3^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N73.9.25 $\mathrm{GM1^-}\oplus\mathrm{X1^+}\oplus\mathrm{X4^+}$	$\surd$	1	0	$\times$	-	-
N73.9.26 $\mathrm{GM1^-}\oplus\mathrm{X1^+}\oplus\mathrm{X4^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N73.9.27 $\mathrm{GM1^-}\oplus\mathrm{X4^+}\oplus\mathrm{X4^+}$	$\surd$	1	0	$\times$	-	-
N73.9.28 $\mathrm{GM1^-}\oplus\mathrm{X4^+}\oplus\mathrm{X4^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_u}$
N73.9.29 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{GM2^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B1_g}$
N73.9.30 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{GM3^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B3_g}$
N73.9.31 $\mathrm{GM2^+}\oplus\mathrm{GM3^+}\oplus\mathrm{GM4^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B3_g}\oplus\mathrm{B2_g}$
N73.9.32 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{GM2^-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2}\oplus\mathrm{A2}$
N73.9.33 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{GM3^-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2}\oplus\mathrm{B2}$
N73.9.34 $\mathrm{GM2^+}\oplus\mathrm{GM3^+}\oplus\mathrm{GM2^-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2}\oplus\mathrm{B2}$
N73.9.35 $\mathrm{GM2^+}\oplus\mathrm{GM3^+}\oplus\mathrm{GM4^-}$	$\surd$	2	2	$\surd$	222	$\mathrm{B1}\oplus\mathrm{B3}$
N73.9.36 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{X1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_g}$
N73.9.37 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{X1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_g}$
N73.9.38 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{X3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_g}$
N73.9.39 $\mathrm{GM2^+}\oplus\mathrm{GM3^+}\oplus\mathrm{X1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B3_g}$
N73.9.40 $\mathrm{GM2^+}\oplus\mathrm{GM3^+}\oplus\mathrm{X2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B3_g}$
N73.9.41 $\mathrm{GM2^+}\oplus\mathrm{GM3^+}\oplus\mathrm{X2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B3_g}$
N73.9.42 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{X4^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B1_g}$
N73.9.43 $\mathrm{GM2^+}\oplus\mathrm{GM3^+}\oplus\mathrm{X4^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B3_g}$
N73.9.44 $\mathrm{GM2^+}\oplus\mathrm{GM2^-}\oplus\mathrm{GM2^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{A_u}\oplus\mathrm{B1_g}$
N73.9.45 $\mathrm{GM2^+}\oplus\mathrm{GM2^-}\oplus\mathrm{GM3^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B1_g}\oplus\mathrm{B2_u}$
N73.9.46 $\mathrm{GM2^+}\oplus\mathrm{GM3^-}\oplus\mathrm{GM3^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B2_u}\oplus\mathrm{B2_u}$
N73.9.47 $\mathrm{GM2^+}\oplus\mathrm{GM3^-}\oplus\mathrm{GM4^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B3_u}\oplus\mathrm{B2_u}$
N73.9.48 $\mathrm{GM2^+}\oplus\mathrm{GM2^-}\oplus\mathrm{X1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B1_g}$
N73.9.49 $\mathrm{GM2^+}\oplus\mathrm{GM2^-}\oplus\mathrm{X1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B1_g}$
N73.9.50 $\mathrm{GM2^+}\oplus\mathrm{GM2^-}\oplus\mathrm{X3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B1_g}$
N73.9.51 $\mathrm{GM2^+}\oplus\mathrm{GM3^-}\oplus\mathrm{X1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B2_u}$
N73.9.52 $\mathrm{GM2^+}\oplus\mathrm{GM3^-}\oplus\mathrm{X1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B2_u}$
N73.9.53 $\mathrm{GM2^+}\oplus\mathrm{GM3^-}\oplus\mathrm{X2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B2_u}$
N73.9.54 $\mathrm{GM2^+}\oplus\mathrm{GM3^-}\oplus\mathrm{X2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B2_u}$
N73.9.55 $\mathrm{GM2^+}\oplus\mathrm{GM3^-}\oplus\mathrm{X3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B2_u}$
N73.9.56 $\mathrm{GM2^+}\oplus\mathrm{GM3^-}\oplus\mathrm{X3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B2_u}$
N73.9.57 $\mathrm{GM2^+}\oplus\mathrm{GM2^-}\oplus\mathrm{X4^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B1_g}$
N73.9.58 $\mathrm{GM2^+}\oplus\mathrm{GM3^-}\oplus\mathrm{X4^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B2_u}$
N73.9.59 $\mathrm{GM2^+}\oplus\mathrm{GM3^-}\oplus\mathrm{X4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g}\oplus\mathrm{B2_u}$
N73.9.60 $\mathrm{GM2^+}\oplus\mathrm{X1^+}\oplus\mathrm{X1^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N73.9.61 $\mathrm{GM2^+}\oplus\mathrm{X1^+}\oplus\mathrm{X1^-}$	$\surd$	1	1	$\surd$	$mm2$	A2
N73.9.62 $\mathrm{GM2^+}\oplus\mathrm{X1^+}\oplus\mathrm{X2^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N73.9.63 $\mathrm{GM2^+}\oplus\mathrm{X1^+}\oplus\mathrm{X2^-}$	$\surd$	1	1	$\surd$	222	B1
N73.9.64 $\mathrm{GM2^+}\oplus\mathrm{X1^+}\oplus\mathrm{X3^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N73.9.65 $\mathrm{GM2^+}\oplus\mathrm{X1^+}\oplus\mathrm{X3^-}$	$\surd$	1	1	$\surd$	$mm2$	B1
N73.9.66 $\mathrm{GM2^+}\oplus\mathrm{X1^-}\oplus\mathrm{X1^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N73.9.67 $\mathrm{GM2^+}\oplus\mathrm{X1^-}\oplus\mathrm{X2^+}$	$\surd$	1	1	$\surd$	222	B1
N73.9.68 $\mathrm{GM2^+}\oplus\mathrm{X1^-}\oplus\mathrm{X3^+}$	$\surd$	1	1	$\surd$	$mm2$	B1
N73.9.69 $\mathrm{GM2^+}\oplus\mathrm{X1^-}\oplus\mathrm{X3^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$

Non-coplanar SSGs with parent space group $Ibca$ (No. 73) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N73.9.70 $\mathrm{GM2^+}\oplus\mathrm{X3^+}\oplus\mathrm{X3^+}$	√	1	1	√	mmm	$\mathrm{B1_g}$
N73.9.71 $\mathrm{GM2^+}\oplus\mathrm{X3^+}\oplus\mathrm{X3^-}$	√	1	1	√	$mm2$	A2
N73.9.72 $\mathrm{GM2^+}\oplus\mathrm{X1^+}\oplus\mathrm{X4^+}$	√	1	1	√	mmm	$\mathrm{B1_g}$
N73.9.73 $\mathrm{GM2^+}\oplus\mathrm{X1^+}\oplus\mathrm{X4^-}$	√	1	1	√	$mm2$	B2
N73.9.74 $\mathrm{GM2^+}\oplus\mathrm{X1^-}\oplus\mathrm{X4^+}$	√	1	1	√	$mm2$	B2
N73.9.75 $\mathrm{GM2^+}\oplus\mathrm{X1^-}\oplus\mathrm{X4^-}$	√	1	1	√	mmm	$\mathrm{B1_g}$
N73.9.76 $\mathrm{GM2^+}\oplus\mathrm{X3^+}\oplus\mathrm{X4^+}$	√	1	1	√	mmm	$\mathrm{B1_g}$
N73.9.77 $\mathrm{GM2^+}\oplus\mathrm{X3^+}\oplus\mathrm{X4^-}$	√	1	1	√	222	B1
N73.9.78 $\mathrm{GM2^+}\oplus\mathrm{X4^+}\oplus\mathrm{X4^+}$	√	1	1	√	mmm	$\mathrm{B1_g}$
N73.9.79 $\mathrm{GM2^+}\oplus\mathrm{X4^+}\oplus\mathrm{X4^-}$	√	1	1	√	$mm2$	A2
N73.9.80 $\mathrm{GM2^-}\oplus\mathrm{GM2^-}\oplus\mathrm{GM2^-}$	√	0	0	√	-	-
N73.9.81 $\mathrm{GM2^-}\oplus\mathrm{GM2^-}\oplus\mathrm{GM3^-}$	√	0	0	√	-	-
N73.9.82 $\mathrm{GM2^-}\oplus\mathrm{GM3^-}\oplus\mathrm{GM4^-}$	√	0	0	√	-	-
N73.9.83 $\mathrm{GM2^-}\oplus\mathrm{GM2^-}\oplus\mathrm{X1^+}$	√	0	0	√	-	-
N73.9.84 $\mathrm{GM2^-}\oplus\mathrm{GM2^-}\oplus\mathrm{X1^-}$	√	0	0	√	-	-
N73.9.85 $\mathrm{GM2^-}\oplus\mathrm{GM2^-}\oplus\mathrm{X3^+}$	√	0	0	√	-	-
N73.9.86 $\mathrm{GM2^-}\oplus\mathrm{GM3^-}\oplus\mathrm{X1^+}$	√	0	0	√	-	-
N73.9.87 $\mathrm{GM2^-}\oplus\mathrm{GM3^-}\oplus\mathrm{X2^+}$	√	0	0	√	-	-
N73.9.88 $\mathrm{GM2^-}\oplus\mathrm{GM3^-}\oplus\mathrm{X2^-}$	√	0	0	√	-	-
N73.9.89 $\mathrm{GM2^-}\oplus\mathrm{GM2^-}\oplus\mathrm{X4^+}$	√	0	0	√	-	-
N73.9.90 $\mathrm{GM2^-}\oplus\mathrm{GM3^-}\oplus\mathrm{X4^+}$	√	0	0	√	-	-
N73.9.91 $\mathrm{GM2^-}\oplus\mathrm{X1^+}\oplus\mathrm{X1^+}$	√	1	0	×	-	-
N73.9.92 $\mathrm{GM2^-}\oplus\mathrm{X1^+}\oplus\mathrm{X1^-}$	√	1	1	√	mmm	$\mathrm{A_u}$
N73.9.93 $\mathrm{GM2^-}\oplus\mathrm{X1^+}\oplus\mathrm{X2^+}$	√	1	0	×	-	-
N73.9.94 $\mathrm{GM2^-}\oplus\mathrm{X1^+}\oplus\mathrm{X2^-}$	√	1	1	√	mmm	$\mathrm{B1_u}$
N73.9.95 $\mathrm{GM2^-}\oplus\mathrm{X1^+}\oplus\mathrm{X3^+}$	√	1	0	×	-	-
N73.9.96 $\mathrm{GM2^-}\oplus\mathrm{X1^+}\oplus\mathrm{X3^-}$	√	1	1	√	mmm	$\mathrm{B3_u}$
N73.9.97 $\mathrm{GM2^-}\oplus\mathrm{X1^-}\oplus\mathrm{X1^-}$	√	1	0	×	-	-
N73.9.98 $\mathrm{GM2^-}\oplus\mathrm{X1^-}\oplus\mathrm{X2^+}$	√	1	1	√	mmm	$\mathrm{B1_u}$
N73.9.99 $\mathrm{GM2^-}\oplus\mathrm{X1^-}\oplus\mathrm{X3^+}$	√	1	1	√	mmm	$\mathrm{B3_u}$
N73.9.100 $\mathrm{GM2^-}\oplus\mathrm{X1^-}\oplus\mathrm{X3^-}$	√	1	0	×	-	-
N73.9.101 $\mathrm{GM2^-}\oplus\mathrm{X3^+}\oplus\mathrm{X3^+}$	√	1	0	×	-	-
N73.9.102 $\mathrm{GM2^-}\oplus\mathrm{X3^+}\oplus\mathrm{X3^-}$	√	1	1	√	mmm	$\mathrm{A_u}$
N73.9.103 $\mathrm{GM2^-}\oplus\mathrm{X1^+}\oplus\mathrm{X4^+}$	√	1	0	×	-	-
N73.9.104 $\mathrm{GM2^-}\oplus\mathrm{X1^+}\oplus\mathrm{X4^-}$	√	1	1	√	mmm	$\mathrm{B2_u}$
N73.9.105 $\mathrm{GM2^-}\oplus\mathrm{X1^-}\oplus\mathrm{X4^+}$	√	1	1	√	mmm	$\mathrm{B2_u}$
N73.9.106 $\mathrm{GM2^-}\oplus\mathrm{X1^-}\oplus\mathrm{X4^-}$	√	1	0	×	-	-
N73.9.107 $\mathrm{GM2^-}\oplus\mathrm{X3^+}\oplus\mathrm{X4^+}$	√	1	0	×	-	-
N73.9.108 $\mathrm{GM2^-}\oplus\mathrm{X3^+}\oplus\mathrm{X4^-}$	√	1	1	√	mmm	$\mathrm{B1_u}$
N73.9.109 $\mathrm{GM2^-}\oplus\mathrm{X4^+}\oplus\mathrm{X4^+}$	√	1	0	×	-	-
N73.9.110 $\mathrm{GM2^-}\oplus\mathrm{X4^+}\oplus\mathrm{X4^-}$	√	1	1	√	mmm	$\mathrm{A_u}$
N73.9.111 $\mathrm{X1^+}\oplus\mathrm{X1^+}\oplus\mathrm{X1^+}$	√	0	0	√	-	-
N73.9.112 $\mathrm{X1^+}\oplus\mathrm{X1^+}\oplus\mathrm{X1^-}$	√	2	2	√	mmm	$\mathrm{A_u}\oplus\mathrm{A_u}$
N73.9.113 $\mathrm{X1^+}\oplus\mathrm{X1^+}\oplus\mathrm{X2^+}$	√	0	0	√	-	-
N73.9.114 $\mathrm{X1^+}\oplus\mathrm{X1^+}\oplus\mathrm{X2^-}$	√	2	2	√	mmm	$\mathrm{B1_u}\oplus\mathrm{B1_u}$
N73.9.115 $\mathrm{X1^+}\oplus\mathrm{X1^+}\oplus\mathrm{X3^+}$	√	0	0	√	-	-

Non-coplanar SSGs with parent space group $Ibca$ (No. 73) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N73.9.116 $\mathrm{X1^+} \oplus \mathrm{X1^+} \oplus \mathrm{X3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B3_u}$
N73.9.117 $\mathrm{X1^+} \oplus \mathrm{X1^-} \oplus \mathrm{X2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u}$
N73.9.118 $\mathrm{X1^+} \oplus \mathrm{X1^-} \oplus \mathrm{X2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u}$
N73.9.119 $\mathrm{X1^+} \oplus \mathrm{X2^+} \oplus \mathrm{X3^+}$	$\surd$	0	0	$\surd$	-	-
N73.9.120 $\mathrm{X1^+} \oplus \mathrm{X2^+} \oplus \mathrm{X3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_u}$
N73.9.121 $\mathrm{X1^+} \oplus \mathrm{X1^+} \oplus \mathrm{X4^+}$	$\surd$	0	0	$\surd$	-	-
N73.9.122 $\mathrm{X1^+} \oplus \mathrm{X1^+} \oplus \mathrm{X4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_u} \oplus \mathrm{B2_u}$
N73.9.123 $\mathrm{X1^+} \oplus \mathrm{X1^-} \oplus \mathrm{X4^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B2_u}$
N73.9.124 $\mathrm{X1^+} \oplus \mathrm{X2^+} \oplus \mathrm{X4^+}$	$\surd$	0	0	$\surd$	-	-
N73.9.125 $\mathrm{X1^+} \oplus \mathrm{X2^+} \oplus \mathrm{X4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_u}$
N73.9.126 $\mathrm{X1^+} \oplus \mathrm{X2^-} \oplus \mathrm{X4^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u}$
N73.9.127 $\mathrm{X1^+} \oplus \mathrm{X3^-} \oplus \mathrm{X4^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u}$
N73.9.128 $\mathrm{X1^+} \oplus \mathrm{X4^+} \oplus \mathrm{X4^+}$	$\surd$	0	0	$\surd$	-	-
N73.9.129 $\mathrm{X1^+} \oplus \mathrm{X4^+} \oplus \mathrm{X4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B2_u}$
N73.9.130 $\mathrm{X1^+} \oplus \mathrm{X4^-} \oplus \mathrm{X4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_u} \oplus \mathrm{B2_u}$
N73.9.131 $\mathrm{X4^+} \oplus \mathrm{X4^+} \oplus \mathrm{X4^+}$	$\surd$	0	0	$\surd$	-	-
N73.9.132 $\mathrm{X4^+} \oplus \mathrm{X4^+} \oplus \mathrm{X4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u}$
N73.14.1 $\mathrm{GM1^-} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N73.14.2 $\mathrm{GM1^-} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N73.14.3 $\mathrm{GM1^-} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N73.14.4 $\mathrm{GM2^+} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	$mm2$	B2
N73.14.5 $\mathrm{GM2^+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	222	B1
N73.14.6 $\mathrm{GM2^+} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	$mm2$	B2
N73.14.7 $\mathrm{GM2^+} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	222	B1
N73.14.8 $\mathrm{GM2^+} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	$mm2$	B2
N73.14.9 $\mathrm{GM2^+} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	$mm2$	B2
N73.14.10 $\mathrm{GM2^+} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	222	B1
N73.14.11 $\mathrm{GM2^-} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N73.14.12 $\mathrm{GM2^-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N73.14.13 $\mathrm{GM2^-} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N73.14.14 $\mathrm{GM2^-} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N73.14.15 $\mathrm{GM2^-} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N73.14.16 $\mathrm{GM2^-} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N73.14.17 $\mathrm{GM2^-} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N73.14.18 $\mathrm{X1^+} \oplus \mathrm{SM1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N73.14.19 $\mathrm{X1^+} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N73.14.20 $\mathrm{X1^+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N73.14.21 $\mathrm{X1^+} \oplus \mathrm{SM2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N73.14.22 $\mathrm{X1^+} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N73.14.23 $\mathrm{X1^+} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N73.14.24 $\mathrm{X1^+} \oplus \mathrm{SM3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N73.14.25 $\mathrm{X1^+} \oplus \mathrm{SM4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N73.14.26 $\mathrm{X1^+} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N73.14.27 $\mathrm{X1^+} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N73.14.28 $\mathrm{X1^+} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N73.14.29 $\mathrm{X1^+} \oplus \mathrm{LD4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$

Non-coplanar SSGs with parent space group $Ibca$ (No. 73) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N73.14.30 $\mathrm{X4}^{+} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N73.14.31 $\mathrm{X4}^{+} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N73.14.32 $\mathrm{X4}^{+} \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N73.14.33 $\mathrm{X4}^{+} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$

TABLE S220: Collinear SSGs with parent space group $Imma$ (No. 74).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L74.1.1 $\mathrm{GM1}^{+}$	1	mmm	$\mathrm{A_g}$
L74.2.1 $\mathrm{GM1}^{-}$	0	-	-
L74.2.2 $\mathrm{GM2}^{+}$	1	mmm	$\mathrm{B1_g}$
L74.2.3 $\mathrm{GM2}^{-}$	0	-	-
L74.2.4 $\mathrm{GM3}^{+}$	1	mmm	$\mathrm{B3_g}$
L74.2.5 $\mathrm{GM3}^{-}$	0	-	-
L74.2.6 $\mathrm{X1}^{+}$	0	-	-
L74.2.7 $\mathrm{X1}^{-}$	0	-	-
L74.2.8 $\mathrm{X3}^{+}$	0	-	-
L74.2.9 $\mathrm{X4}^{+}$	0	-	-

TABLE S221: Coplanar SSGs with parent space group $Imma$ (No. 74).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P74.1.1 $\mathrm{GM1}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
P74.2.1 $\mathrm{GM1}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
P74.2.2 $\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
P74.2.3 $\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_u}$
P74.2.4 $\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_g}$
P74.2.5 $\mathrm{GM3}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B3_u}$
P74.2.6 $\mathrm{X1}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P74.2.7 $\mathrm{X1}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P74.2.8 $\mathrm{X3}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P74.2.9 $\mathrm{X4}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
P74.3.1 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-}$	$\surd$	0	0	$\surd$	-	-
P74.3.2 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
P74.3.3 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
P74.3.4 $\mathrm{GM1}^{-} \oplus \mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u}$
P74.3.5 $\mathrm{GM1}^{-} \oplus \mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
P74.3.6 $\mathrm{GM1}^{-} \oplus \mathrm{X1}^{+}$	$\surd$	1	1	$\times$	-	-
P74.3.7 $\mathrm{GM1}^{-} \oplus \mathrm{X1}^{-}$	$\surd$	1	1	$\times$	-	-
P74.3.8 $\mathrm{GM1}^{-} \oplus \mathrm{X3}^{+}$	$\surd$	1	1	$\times$	-	-
P74.3.9 $\mathrm{GM1}^{-} \oplus \mathrm{X4}^{+}$	$\surd$	1	1	$\times$	-	-
P74.3.10 $\mathrm{GM2}^{+} \oplus \mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
P74.3.11 $\mathrm{GM2}^{+} \oplus \mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
P74.3.12 $\mathrm{GM2}^{+} \oplus \mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
P74.3.13 $\mathrm{GM2}^{+} \oplus \mathrm{GM3}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$

Coplanar SSGs with parent space group $Imma$ (No. 74) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P74.3.14 $\mathrm{GM2^+} \oplus \mathrm{X1^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
P74.3.15 $\mathrm{GM2^+} \oplus \mathrm{X1^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
P74.3.16 $\mathrm{GM2^+} \oplus \mathrm{X3^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
P74.3.17 $\mathrm{GM2^+} \oplus \mathrm{X4^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
P74.3.18 $\mathrm{GM2^-} \oplus \mathrm{GM2^-}$	$\surd$	0	0	$\surd$	-	-
P74.3.19 $\mathrm{GM2^-} \oplus \mathrm{GM3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u}$
P74.3.20 $\mathrm{GM2^-} \oplus \mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
P74.3.21 $\mathrm{GM2^-} \oplus \mathrm{X1^+}$	$\surd$	1	1	$\times$	-	-
P74.3.22 $\mathrm{GM2^-} \oplus \mathrm{X1^-}$	$\surd$	1	1	$\times$	-	-
P74.3.23 $\mathrm{GM2^-} \oplus \mathrm{X3^+}$	$\surd$	1	1	$\times$	-	-
P74.3.24 $\mathrm{GM2^-} \oplus \mathrm{X4^+}$	$\surd$	1	1	$\times$	-	-
P74.3.25 $\mathrm{GM3^+} \oplus \mathrm{GM3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_g}$
P74.3.26 $\mathrm{GM3^+} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_g}$
P74.3.27 $\mathrm{GM3^+} \oplus \mathrm{GM3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g}$
P74.3.28 $\mathrm{GM3^+} \oplus \mathrm{GM4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g}$
P74.3.29 $\mathrm{GM3^+} \oplus \mathrm{X1^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
P74.3.30 $\mathrm{GM3^+} \oplus \mathrm{X2^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
P74.3.31 $\mathrm{GM3^+} \oplus \mathrm{X1^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
P74.3.32 $\mathrm{GM3^+} \oplus \mathrm{X2^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
P74.3.33 $\mathrm{GM3^+} \oplus \mathrm{X3^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
P74.3.34 $\mathrm{GM3^+} \oplus \mathrm{X3^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
P74.3.35 $\mathrm{GM3^+} \oplus \mathrm{X4^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
P74.3.36 $\mathrm{GM3^+} \oplus \mathrm{X4^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
P74.3.37 $\mathrm{GM3^-} \oplus \mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
P74.3.38 $\mathrm{GM3^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
P74.3.39 $\mathrm{GM3^-} \oplus \mathrm{X1^+}$	$\surd$	1	1	$\times$	-	-
P74.3.40 $\mathrm{GM3^-} \oplus \mathrm{X2^-}$	$\surd$	1	1	$\times$	-	-
P74.3.41 $\mathrm{GM3^-} \oplus \mathrm{X1^-}$	$\surd$	1	1	$\times$	-	-
P74.3.42 $\mathrm{GM3^-} \oplus \mathrm{X2^+}$	$\surd$	1	1	$\times$	-	-
P74.3.43 $\mathrm{GM3^-} \oplus \mathrm{X3^+}$	$\surd$	1	1	$\times$	-	-
P74.3.44 $\mathrm{GM3^-} \oplus \mathrm{X3^-}$	$\surd$	1	1	$\times$	-	-
P74.3.45 $\mathrm{GM3^-} \oplus \mathrm{X4^+}$	$\surd$	1	1	$\times$	-	-
P74.3.46 $\mathrm{GM3^-} \oplus \mathrm{X4^-}$	$\surd$	1	1	$\times$	-	-
P74.3.47 $\mathrm{X1^+} \oplus \mathrm{X1^+}$	$\surd$	1	0	$\times$	-	-
P74.3.48 $\mathrm{X1^+} \oplus \mathrm{X2^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P74.3.49 $\mathrm{X1^+} \oplus \mathrm{X1^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_u}$
P74.3.50 $\mathrm{X1^+} \oplus \mathrm{X2^+}$	$\surd$	1	0	$\times$	-	-
P74.3.51 $\mathrm{X1^+} \oplus \mathrm{X3^+}$	$\surd$	1	0	$\times$	-	-
P74.3.52 $\mathrm{X1^+} \oplus \mathrm{X3^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P74.3.53 $\mathrm{X1^+} \oplus \mathrm{X4^+}$	$\surd$	1	0	$\times$	-	-
P74.3.54 $\mathrm{X1^+} \oplus \mathrm{X4^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P74.3.55 $\mathrm{X1^-} \oplus \mathrm{X1^-}$	$\surd$	1	0	$\times$	-	-
P74.3.56 $\mathrm{X1^-} \oplus \mathrm{X2^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P74.3.57 $\mathrm{X1^-} \oplus \mathrm{X3^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
P74.3.58 $\mathrm{X1^-} \oplus \mathrm{X3^-}$	$\surd$	1	0	$\times$	-	-
P74.3.59 $\mathrm{X1^-} \oplus \mathrm{X4^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$

Coplanar SSGs with parent space group $Imma$ (No. 74) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P74.3.60 $\mathrm{X1}^- \oplus \mathrm{X4}^-$	$\surd$	1	0	$\times$	-	-
P74.3.61 $\mathrm{X3}^+ \oplus \mathrm{X3}^+$	$\surd$	1	0	$\times$	-	-
P74.3.62 $\mathrm{X3}^+ \oplus \mathrm{X3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_u}$
P74.3.63 $\mathrm{X3}^+ \oplus \mathrm{X4}^+$	$\surd$	1	0	$\times$	-	-
P74.3.64 $\mathrm{X3}^+ \oplus \mathrm{X4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P74.3.65 $\mathrm{X4}^+ \oplus \mathrm{X4}^+$	$\surd$	1	0	$\times$	-	-
P74.3.66 $\mathrm{X4}^+ \oplus \mathrm{X4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_u}$
P74.7.1 $\mathrm{R1}^+$	$\times$	-	-	-	-	-
P74.7.2 $\mathrm{R1}^-$	$\times$	-	-	-	-	-
P74.8.1 DT1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P74.8.2 DT2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P74.8.3 DT3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P74.8.4 DT4	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
P74.8.5 LD1	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P74.8.6 LD2	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
P74.8.7 LD3	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$

TABLE S222: Non-coplanar SSGs with parent space group $Imma$ (No. 74).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N74.1.1 $\mathrm{GM1}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{A_g}$
N74.2.1 $\mathrm{GM1}^-$	$\surd$	2	2	$\surd$	222	$\mathrm{A1} \oplus \mathrm{A1}$
N74.2.2 $\mathrm{GM2}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B1_g}$
N74.2.3 $\mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{A1}$
N74.2.4 $\mathrm{GM3}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B3_g}$
N74.2.5 $\mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{A1}$
N74.2.6 $\mathrm{X1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
N74.2.7 $\mathrm{X1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
N74.2.8 $\mathrm{X3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
N74.2.9 $\mathrm{X4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_g}$
N74.3.1 $\mathrm{GM1}^- \oplus \mathrm{GM1}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{A_u}$
N74.3.2 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{A2}$
N74.3.3 $\mathrm{GM1}^- \oplus \mathrm{GM2}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B1_u}$
N74.3.4 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{A2}$
N74.3.5 $\mathrm{GM1}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B3_u}$
N74.3.6 $\mathrm{GM1}^- \oplus \mathrm{X1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
N74.3.7 $\mathrm{GM1}^- \oplus \mathrm{X1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
N74.3.8 $\mathrm{GM1}^- \oplus \mathrm{X3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
N74.3.9 $\mathrm{GM1}^- \oplus \mathrm{X4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{A_u}$
N74.3.10 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N74.3.11 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	2	2	$\surd$	222	$\mathrm{A1} \oplus \mathrm{B1}$
N74.3.12 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g} \oplus \mathrm{B3_g}$
N74.3.13 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1} \oplus \mathrm{B1}$
N74.3.14 $\mathrm{GM2}^+ \oplus \mathrm{X1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
N74.3.15 $\mathrm{GM2}^+ \oplus \mathrm{X1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$
N74.3.16 $\mathrm{GM2}^+ \oplus \mathrm{X3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g} \oplus \mathrm{B1_g}$

Non-coplanar SSGs with parent space group $Imma$ (No. 74) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N74.3.17 $\mathrm{GM2}^{+}\oplus\mathrm{X4}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B1_g}$
N74.3.18 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B1_u}\oplus\mathrm{B1_u}$
N74.3.19 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1}\oplus\mathrm{B2}$
N74.3.20 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B1_u}\oplus\mathrm{B3_u}$
N74.3.21 $\mathrm{GM2}^{-}\oplus\mathrm{X1}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B1_u}$
N74.3.22 $\mathrm{GM2}^{-}\oplus\mathrm{X1}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B1_u}$
N74.3.23 $\mathrm{GM2}^{-}\oplus\mathrm{X3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B1_u}$
N74.3.24 $\mathrm{GM2}^{-}\oplus\mathrm{X4}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B1_u}$
N74.3.25 $\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}\oplus\mathrm{B3_g}$
N74.3.26 $\mathrm{GM3}^{+}\oplus\mathrm{GM4}^{+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}\oplus\mathrm{B2_g}$
N74.3.27 $\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{-}$	$\surd$	2	2	$\surd$	222	$\mathrm{A1}\oplus\mathrm{B3}$
N74.3.28 $\mathrm{GM3}^{+}\oplus\mathrm{GM4}^{-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A1}\oplus\mathrm{B2}$
N74.3.29 $\mathrm{GM3}^{+}\oplus\mathrm{X1}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}$
N74.3.30 $\mathrm{GM3}^{+}\oplus\mathrm{X2}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}$
N74.3.31 $\mathrm{GM3}^{+}\oplus\mathrm{X1}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}$
N74.3.32 $\mathrm{GM3}^{+}\oplus\mathrm{X2}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}$
N74.3.33 $\mathrm{GM3}^{+}\oplus\mathrm{X3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}$
N74.3.34 $\mathrm{GM3}^{+}\oplus\mathrm{X3}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}$
N74.3.35 $\mathrm{GM3}^{+}\oplus\mathrm{X4}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}$
N74.3.36 $\mathrm{GM3}^{+}\oplus\mathrm{X4}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_g}$
N74.3.37 $\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}\oplus\mathrm{B3_u}$
N74.3.38 $\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}\oplus\mathrm{B2_u}$
N74.3.39 $\mathrm{GM3}^{-}\oplus\mathrm{X1}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}$
N74.3.40 $\mathrm{GM3}^{-}\oplus\mathrm{X2}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}$
N74.3.41 $\mathrm{GM3}^{-}\oplus\mathrm{X1}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}$
N74.3.42 $\mathrm{GM3}^{-}\oplus\mathrm{X2}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}$
N74.3.43 $\mathrm{GM3}^{-}\oplus\mathrm{X3}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}$
N74.3.44 $\mathrm{GM3}^{-}\oplus\mathrm{X3}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}$
N74.3.45 $\mathrm{GM3}^{-}\oplus\mathrm{X4}^{+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}$
N74.3.46 $\mathrm{GM3}^{-}\oplus\mathrm{X4}^{-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_g}\oplus\mathrm{B3_u}$
N74.3.47 $\mathrm{X1}^{+}\oplus\mathrm{X1}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N74.3.48 $\mathrm{X1}^{+}\oplus\mathrm{X2}^{-}$	$\surd$	1	1	$\surd$	$mm2$	A1
N74.3.49 $\mathrm{X1}^{+}\oplus\mathrm{X1}^{-}$	$\surd$	1	1	$\surd$	222	A1
N74.3.50 $\mathrm{X1}^{+}\oplus\mathrm{X2}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N74.3.51 $\mathrm{X1}^{+}\oplus\mathrm{X3}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N74.3.52 $\mathrm{X1}^{+}\oplus\mathrm{X3}^{-}$	$\surd$	1	1	$\surd$	$mm2$	A1
N74.3.53 $\mathrm{X1}^{+}\oplus\mathrm{X4}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N74.3.54 $\mathrm{X1}^{+}\oplus\mathrm{X4}^{-}$	$\surd$	1	1	$\surd$	$mm2$	A1
N74.3.55 $\mathrm{X1}^{-}\oplus\mathrm{X1}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N74.3.56 $\mathrm{X1}^{-}\oplus\mathrm{X2}^{+}$	$\surd$	1	1	$\surd$	$mm2$	A1
N74.3.57 $\mathrm{X1}^{-}\oplus\mathrm{X3}^{+}$	$\surd$	1	1	$\surd$	$mm2$	A1
N74.3.58 $\mathrm{X1}^{-}\oplus\mathrm{X3}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N74.3.59 $\mathrm{X1}^{-}\oplus\mathrm{X4}^{+}$	$\surd$	1	1	$\surd$	$mm2$	A1
N74.3.60 $\mathrm{X1}^{-}\oplus\mathrm{X4}^{-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N74.3.61 $\mathrm{X3}^{+}\oplus\mathrm{X3}^{+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N74.3.62 $\mathrm{X3}^{+}\oplus\mathrm{X3}^{-}$	$\surd$	1	1	$\surd$	222	A1

Non-coplanar SSGs with parent space group $Imma$ (No. 74) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N74.3.63 $\mathrm{X3^+} \oplus \mathrm{X4^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N74.3.64 $\mathrm{X3^+} \oplus \mathrm{X4^-}$	$\surd$	1	1	$\surd$	$mm2$	A1
N74.3.65 $\mathrm{X4^+} \oplus \mathrm{X4^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N74.3.66 $\mathrm{X4^+} \oplus \mathrm{X4^-}$	$\surd$	1	1	$\surd$	222	A1
N74.7.1 $\mathrm{R1^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N74.7.2 $\mathrm{R1^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_g}$
N74.8.1 DT1	$\surd$	1	1	$\surd$	$mm2$	A1
N74.8.2 DT2	$\surd$	1	1	$\surd$	$mm2$	A1
N74.8.3 DT3	$\surd$	1	1	$\surd$	$mm2$	A1
N74.8.4 DT4	$\surd$	1	1	$\surd$	$mm2$	A1
N74.8.5 LD1	$\surd$	1	1	$\surd$	$mm2$	A1
N74.8.6 LD2	$\surd$	1	1	$\surd$	$mm2$	A1
N74.8.7 LD3	$\surd$	1	1	$\surd$	$mm2$	A1
N74.9.1 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM1^-}$	$\surd$	0	0	$\surd$	-	-
N74.9.2 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM2^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N74.9.3 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM2^-}$	$\surd$	0	0	$\surd$	-	-
N74.9.4 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM3^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u} \oplus \mathrm{B3_u}$
N74.9.5 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
N74.9.6 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{X1^+}$	$\surd$	0	0	$\surd$	-	-
N74.9.7 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{X1^-}$	$\surd$	0	0	$\surd$	-	-
N74.9.8 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{X3^+}$	$\surd$	0	0	$\surd$	-	-
N74.9.9 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{X4^+}$	$\surd$	0	0	$\surd$	-	-
N74.9.10 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{GM2^+}$	$\surd$	2	2	$\surd$	222	$\mathrm{B1} \oplus \mathrm{B1}$
N74.9.11 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{GM2^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N74.9.12 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{GM3^+}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2} \oplus \mathrm{B1}$
N74.9.13 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{GM3^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_u}$
N74.9.14 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{X1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N74.9.15 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{X1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N74.9.16 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{X3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N74.9.17 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{X4^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N74.9.18 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{GM2^-}$	$\surd$	0	0	$\surd$	-	-
N74.9.19 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{GM3^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N74.9.20 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
N74.9.21 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{X1^+}$	$\surd$	0	0	$\surd$	-	-
N74.9.22 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{X1^-}$	$\surd$	0	0	$\surd$	-	-
N74.9.23 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{X3^+}$	$\surd$	0	0	$\surd$	-	-
N74.9.24 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{X4^+}$	$\surd$	0	0	$\surd$	-	-
N74.9.25 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{GM3^+}$	$\surd$	2	2	$\surd$	222	$\mathrm{B3} \oplus \mathrm{B3}$
N74.9.26 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2} \oplus \mathrm{B1}$
N74.9.27 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{GM3^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N74.9.28 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_g} \oplus \mathrm{B3_u}$
N74.9.29 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{X1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u}$
N74.9.30 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{X2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u}$
N74.9.31 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{X1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u}$
N74.9.32 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{X2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u}$
N74.9.33 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{X3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u}$

Non-coplanar SSGs with parent space group $Imma$ (No. 74) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N74.9.34 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{X3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u}$
N74.9.35 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{X4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u}$
N74.9.36 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{X4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B3_u}$
N74.9.37 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N74.9.38 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N74.9.39 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{X1}^+$	$\surd$	0	0	$\surd$	-	-
N74.9.40 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{X2}^-$	$\surd$	0	0	$\surd$	-	-
N74.9.41 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{X1}^-$	$\surd$	0	0	$\surd$	-	-
N74.9.42 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{X2}^+$	$\surd$	0	0	$\surd$	-	-
N74.9.43 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{X3}^+$	$\surd$	0	0	$\surd$	-	-
N74.9.44 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{X3}^-$	$\surd$	0	0	$\surd$	-	-
N74.9.45 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{X4}^+$	$\surd$	0	0	$\surd$	-	-
N74.9.46 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{X4}^-$	$\surd$	0	0	$\surd$	-	-
N74.9.47 $\mathrm{GM1}^- \oplus \mathrm{X1}^+ \oplus \mathrm{X1}^+$	$\surd$	1	0	$\times$	-	-
N74.9.48 $\mathrm{GM1}^- \oplus \mathrm{X1}^+ \oplus \mathrm{X2}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N74.9.49 $\mathrm{GM1}^- \oplus \mathrm{X1}^+ \oplus \mathrm{X1}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_u}$
N74.9.50 $\mathrm{GM1}^- \oplus \mathrm{X1}^+ \oplus \mathrm{X2}^+$	$\surd$	1	0	$\times$	-	-
N74.9.51 $\mathrm{GM1}^- \oplus \mathrm{X1}^+ \oplus \mathrm{X3}^+$	$\surd$	1	0	$\times$	-	-
N74.9.52 $\mathrm{GM1}^- \oplus \mathrm{X1}^+ \oplus \mathrm{X3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N74.9.53 $\mathrm{GM1}^- \oplus \mathrm{X1}^+ \oplus \mathrm{X4}^+$	$\surd$	1	0	$\times$	-	-
N74.9.54 $\mathrm{GM1}^- \oplus \mathrm{X1}^+ \oplus \mathrm{X4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N74.9.55 $\mathrm{GM1}^- \oplus \mathrm{X1}^- \oplus \mathrm{X1}^-$	$\surd$	1	0	$\times$	-	-
N74.9.56 $\mathrm{GM1}^- \oplus \mathrm{X1}^- \oplus \mathrm{X2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N74.9.57 $\mathrm{GM1}^- \oplus \mathrm{X1}^- \oplus \mathrm{X3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N74.9.58 $\mathrm{GM1}^- \oplus \mathrm{X1}^- \oplus \mathrm{X3}^-$	$\surd$	1	0	$\times$	-	-
N74.9.59 $\mathrm{GM1}^- \oplus \mathrm{X1}^- \oplus \mathrm{X4}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N74.9.60 $\mathrm{GM1}^- \oplus \mathrm{X1}^- \oplus \mathrm{X4}^-$	$\surd$	1	0	$\times$	-	-
N74.9.61 $\mathrm{GM1}^- \oplus \mathrm{X3}^+ \oplus \mathrm{X3}^+$	$\surd$	1	0	$\times$	-	-
N74.9.62 $\mathrm{GM1}^- \oplus \mathrm{X3}^+ \oplus \mathrm{X3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_u}$
N74.9.63 $\mathrm{GM1}^- \oplus \mathrm{X3}^+ \oplus \mathrm{X4}^+$	$\surd$	1	0	$\times$	-	-
N74.9.64 $\mathrm{GM1}^- \oplus \mathrm{X3}^+ \oplus \mathrm{X4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N74.9.65 $\mathrm{GM1}^- \oplus \mathrm{X4}^+ \oplus \mathrm{X4}^+$	$\surd$	1	0	$\times$	-	-
N74.9.66 $\mathrm{GM1}^- \oplus \mathrm{X4}^+ \oplus \mathrm{X4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_u}$
N74.9.67 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N74.9.68 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{A2}$
N74.9.69 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B3_g}$
N74.9.70 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2} \oplus \mathrm{B2}$
N74.9.71 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{X1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N74.9.72 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{X1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N74.9.73 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{X3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N74.9.74 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{X4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N74.9.75 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B1_g}$
N74.9.76 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{B2}$
N74.9.77 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g} \oplus \mathrm{B2_u}$
N74.9.78 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{X1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
N74.9.79 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{X1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$

Non-coplanar SSGs with parent space group $Imma$ (No. 74) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N74.9.80 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{X3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
N74.9.81 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{X4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_g}$
N74.9.82 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B3_g}$
N74.9.83 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g} \oplus \mathrm{B2_g}$
N74.9.84 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2} \oplus \mathrm{B2}$
N74.9.85 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	222	$\mathrm{B1} \oplus \mathrm{B3}$
N74.9.86 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{X1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N74.9.87 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{X2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N74.9.88 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{X1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N74.9.89 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{X2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N74.9.90 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{X3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N74.9.91 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{X3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N74.9.92 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{X4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N74.9.93 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{X4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_g}$
N74.9.94 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N74.9.95 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B3_u} \oplus \mathrm{B2_u}$
N74.9.96 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{X1}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N74.9.97 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{X2}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N74.9.98 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{X1}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N74.9.99 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{X2}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N74.9.100 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{X3}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N74.9.101 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{X3}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N74.9.102 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{X4}^+$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N74.9.103 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{X4}^-$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N74.9.104 $\mathrm{GM2}^+ \oplus \mathrm{X1}^+ \oplus \mathrm{X1}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N74.9.105 $\mathrm{GM2}^+ \oplus \mathrm{X1}^+ \oplus \mathrm{X2}^-$	$\surd$	1	1	$\surd$	222	B1
N74.9.106 $\mathrm{GM2}^+ \oplus \mathrm{X1}^+ \oplus \mathrm{X1}^-$	$\surd$	1	1	$\surd$	$mm2$	A2
N74.9.107 $\mathrm{GM2}^+ \oplus \mathrm{X1}^+ \oplus \mathrm{X2}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N74.9.108 $\mathrm{GM2}^+ \oplus \mathrm{X1}^+ \oplus \mathrm{X3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N74.9.109 $\mathrm{GM2}^+ \oplus \mathrm{X1}^+ \oplus \mathrm{X3}^-$	$\surd$	1	1	$\surd$	$mm2$	B1
N74.9.110 $\mathrm{GM2}^+ \oplus \mathrm{X1}^+ \oplus \mathrm{X4}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N74.9.111 $\mathrm{GM2}^+ \oplus \mathrm{X1}^+ \oplus \mathrm{X4}^-$	$\surd$	1	1	$\surd$	$mm2$	B2
N74.9.112 $\mathrm{GM2}^+ \oplus \mathrm{X1}^- \oplus \mathrm{X1}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N74.9.113 $\mathrm{GM2}^+ \oplus \mathrm{X1}^- \oplus \mathrm{X2}^+$	$\surd$	1	1	$\surd$	222	B1
N74.9.114 $\mathrm{GM2}^+ \oplus \mathrm{X1}^- \oplus \mathrm{X3}^+$	$\surd$	1	1	$\surd$	$mm2$	B1
N74.9.115 $\mathrm{GM2}^+ \oplus \mathrm{X1}^- \oplus \mathrm{X3}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N74.9.116 $\mathrm{GM2}^+ \oplus \mathrm{X1}^- \oplus \mathrm{X4}^+$	$\surd$	1	1	$\surd$	$mm2$	B2
N74.9.117 $\mathrm{GM2}^+ \oplus \mathrm{X1}^- \oplus \mathrm{X4}^-$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N74.9.118 $\mathrm{GM2}^+ \oplus \mathrm{X3}^+ \oplus \mathrm{X3}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N74.9.119 $\mathrm{GM2}^+ \oplus \mathrm{X3}^+ \oplus \mathrm{X3}^-$	$\surd$	1	1	$\surd$	$mm2$	A2
N74.9.120 $\mathrm{GM2}^+ \oplus \mathrm{X3}^+ \oplus \mathrm{X4}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N74.9.121 $\mathrm{GM2}^+ \oplus \mathrm{X3}^+ \oplus \mathrm{X4}^-$	$\surd$	1	1	$\surd$	222	B1
N74.9.122 $\mathrm{GM2}^+ \oplus \mathrm{X4}^+ \oplus \mathrm{X4}^+$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_g}$
N74.9.123 $\mathrm{GM2}^+ \oplus \mathrm{X4}^+ \oplus \mathrm{X4}^-$	$\surd$	1	1	$\surd$	$mm2$	A2
N74.9.124 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
N74.9.125 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$

Non-coplanar SSGs with parent space group $Imma$ (No. 74) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N74.9.126 $\mathrm{GM2^-}\oplus\mathrm{GM2^-}\oplus\mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
N74.9.127 $\mathrm{GM2^-}\oplus\mathrm{GM2^-}\oplus\mathrm{X1^+}$	$\surd$	0	0	$\surd$	-	-
N74.9.128 $\mathrm{GM2^-}\oplus\mathrm{GM2^-}\oplus\mathrm{X1^-}$	$\surd$	0	0	$\surd$	-	-
N74.9.129 $\mathrm{GM2^-}\oplus\mathrm{GM2^-}\oplus\mathrm{X3^+}$	$\surd$	0	0	$\surd$	-	-
N74.9.130 $\mathrm{GM2^-}\oplus\mathrm{GM2^-}\oplus\mathrm{X4^+}$	$\surd$	0	0	$\surd$	-	-
N74.9.131 $\mathrm{GM2^-}\oplus\mathrm{GM3^+}\oplus\mathrm{GM3^+}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2}\oplus\mathrm{B2}$
N74.9.132 $\mathrm{GM2^-}\oplus\mathrm{GM3^+}\oplus\mathrm{GM4^+}$	$\surd$	2	2	$\surd$	222	$\mathrm{B3}\oplus\mathrm{B2}$
N74.9.133 $\mathrm{GM2^-}\oplus\mathrm{GM3^+}\oplus\mathrm{GM3^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B3_g}\oplus\mathrm{B2_u}$
N74.9.134 $\mathrm{GM2^-}\oplus\mathrm{GM3^+}\oplus\mathrm{GM4^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B3_g}\oplus\mathrm{B2_u}$
N74.9.135 $\mathrm{GM2^-}\oplus\mathrm{GM3^+}\oplus\mathrm{X1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B2_u}$
N74.9.136 $\mathrm{GM2^-}\oplus\mathrm{GM3^+}\oplus\mathrm{X2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B2_u}$
N74.9.137 $\mathrm{GM2^-}\oplus\mathrm{GM3^+}\oplus\mathrm{X1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B2_u}$
N74.9.138 $\mathrm{GM2^-}\oplus\mathrm{GM3^+}\oplus\mathrm{X2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B2_u}$
N74.9.139 $\mathrm{GM2^-}\oplus\mathrm{GM3^+}\oplus\mathrm{X3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B2_u}$
N74.9.140 $\mathrm{GM2^-}\oplus\mathrm{GM3^+}\oplus\mathrm{X3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B2_u}$
N74.9.141 $\mathrm{GM2^-}\oplus\mathrm{GM3^+}\oplus\mathrm{X4^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B2_u}$
N74.9.142 $\mathrm{GM2^-}\oplus\mathrm{GM3^+}\oplus\mathrm{X4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B2_u}$
N74.9.143 $\mathrm{GM2^-}\oplus\mathrm{GM3^-}\oplus\mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
N74.9.144 $\mathrm{GM2^-}\oplus\mathrm{GM3^-}\oplus\mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N74.9.145 $\mathrm{GM2^-}\oplus\mathrm{GM3^-}\oplus\mathrm{X1^+}$	$\surd$	0	0	$\surd$	-	-
N74.9.146 $\mathrm{GM2^-}\oplus\mathrm{GM3^-}\oplus\mathrm{X2^-}$	$\surd$	0	0	$\surd$	-	-
N74.9.147 $\mathrm{GM2^-}\oplus\mathrm{GM3^-}\oplus\mathrm{X1^-}$	$\surd$	0	0	$\surd$	-	-
N74.9.148 $\mathrm{GM2^-}\oplus\mathrm{GM3^-}\oplus\mathrm{X2^+}$	$\surd$	0	0	$\surd$	-	-
N74.9.149 $\mathrm{GM2^-}\oplus\mathrm{GM3^-}\oplus\mathrm{X3^+}$	$\surd$	0	0	$\surd$	-	-
N74.9.150 $\mathrm{GM2^-}\oplus\mathrm{GM3^-}\oplus\mathrm{X3^-}$	$\surd$	0	0	$\surd$	-	-
N74.9.151 $\mathrm{GM2^-}\oplus\mathrm{GM3^-}\oplus\mathrm{X4^+}$	$\surd$	0	0	$\surd$	-	-
N74.9.152 $\mathrm{GM2^-}\oplus\mathrm{GM3^-}\oplus\mathrm{X4^-}$	$\surd$	0	0	$\surd$	-	-
N74.9.153 $\mathrm{GM2^-}\oplus\mathrm{X1^+}\oplus\mathrm{X1^+}$	$\surd$	1	0	$\times$	-	-
N74.9.154 $\mathrm{GM2^-}\oplus\mathrm{X1^+}\oplus\mathrm{X2^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N74.9.155 $\mathrm{GM2^-}\oplus\mathrm{X1^+}\oplus\mathrm{X1^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_u}$
N74.9.156 $\mathrm{GM2^-}\oplus\mathrm{X1^+}\oplus\mathrm{X2^+}$	$\surd$	1	0	$\times$	-	-
N74.9.157 $\mathrm{GM2^-}\oplus\mathrm{X1^+}\oplus\mathrm{X3^+}$	$\surd$	1	0	$\times$	-	-
N74.9.158 $\mathrm{GM2^-}\oplus\mathrm{X1^+}\oplus\mathrm{X3^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N74.9.159 $\mathrm{GM2^-}\oplus\mathrm{X1^+}\oplus\mathrm{X4^+}$	$\surd$	1	0	$\times$	-	-
N74.9.160 $\mathrm{GM2^-}\oplus\mathrm{X1^+}\oplus\mathrm{X4^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N74.9.161 $\mathrm{GM2^-}\oplus\mathrm{X1^-}\oplus\mathrm{X1^-}$	$\surd$	1	0	$\times$	-	-
N74.9.162 $\mathrm{GM2^-}\oplus\mathrm{X1^-}\oplus\mathrm{X2^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N74.9.163 $\mathrm{GM2^-}\oplus\mathrm{X1^-}\oplus\mathrm{X3^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N74.9.164 $\mathrm{GM2^-}\oplus\mathrm{X1^-}\oplus\mathrm{X3^-}$	$\surd$	1	0	$\times$	-	-
N74.9.165 $\mathrm{GM2^-}\oplus\mathrm{X1^-}\oplus\mathrm{X4^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N74.9.166 $\mathrm{GM2^-}\oplus\mathrm{X1^-}\oplus\mathrm{X4^-}$	$\surd$	1	0	$\times$	-	-
N74.9.167 $\mathrm{GM2^-}\oplus\mathrm{X3^+}\oplus\mathrm{X3^+}$	$\surd$	1	0	$\times$	-	-
N74.9.168 $\mathrm{GM2^-}\oplus\mathrm{X3^+}\oplus\mathrm{X3^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_u}$
N74.9.169 $\mathrm{GM2^-}\oplus\mathrm{X3^+}\oplus\mathrm{X4^+}$	$\surd$	1	0	$\times$	-	-
N74.9.170 $\mathrm{GM2^-}\oplus\mathrm{X3^+}\oplus\mathrm{X4^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N74.9.171 $\mathrm{GM2^-}\oplus\mathrm{X4^+}\oplus\mathrm{X4^+}$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $Imma$ (No. 74) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N74.9.172 $\mathrm{GM2^-}\oplus\mathrm{X4^+}\oplus\mathrm{X4^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_u}$
N74.9.173 $\mathrm{GM3^+}\oplus\mathrm{GM3^+}\oplus\mathrm{GM3^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_g}\oplus\mathrm{B3_g}$
N74.9.174 $\mathrm{GM3^+}\oplus\mathrm{GM3^+}\oplus\mathrm{GM4^+}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_g}\oplus\mathrm{B2_g}$
N74.9.175 $\mathrm{GM3^+}\oplus\mathrm{GM3^+}\oplus\mathrm{GM3^-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2}\oplus\mathrm{A2}$
N74.9.176 $\mathrm{GM3^+}\oplus\mathrm{GM3^+}\oplus\mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{B2}\oplus\mathrm{B2}$
N74.9.177 $\mathrm{GM3^+}\oplus\mathrm{GM4^+}\oplus\mathrm{GM3^-}$	$\surd$	2	2	$\surd$	$mm2$	$\mathrm{A2}\oplus\mathrm{B2}$
N74.9.178 $\mathrm{GM3^+}\oplus\mathrm{GM3^+}\oplus\mathrm{X1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_g}$
N74.9.179 $\mathrm{GM3^+}\oplus\mathrm{GM3^+}\oplus\mathrm{X2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_g}$
N74.9.180 $\mathrm{GM3^+}\oplus\mathrm{GM4^+}\oplus\mathrm{X1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B2_g}$
N74.9.181 $\mathrm{GM3^+}\oplus\mathrm{GM3^+}\oplus\mathrm{X1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_g}$
N74.9.182 $\mathrm{GM3^+}\oplus\mathrm{GM3^+}\oplus\mathrm{X2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_g}$
N74.9.183 $\mathrm{GM3^+}\oplus\mathrm{GM4^+}\oplus\mathrm{X1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B2_g}$
N74.9.184 $\mathrm{GM3^+}\oplus\mathrm{GM3^+}\oplus\mathrm{X3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_g}$
N74.9.185 $\mathrm{GM3^+}\oplus\mathrm{GM3^+}\oplus\mathrm{X3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_g}$
N74.9.186 $\mathrm{GM3^+}\oplus\mathrm{GM4^+}\oplus\mathrm{X3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B2_g}$
N74.9.187 $\mathrm{GM3^+}\oplus\mathrm{GM3^+}\oplus\mathrm{X4^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_g}$
N74.9.188 $\mathrm{GM3^+}\oplus\mathrm{GM3^+}\oplus\mathrm{X4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B3_g}$
N74.9.189 $\mathrm{GM3^+}\oplus\mathrm{GM4^+}\oplus\mathrm{X4^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_g}\oplus\mathrm{B2_g}$
N74.9.190 $\mathrm{GM3^+}\oplus\mathrm{GM3^-}\oplus\mathrm{GM3^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{A_u}\oplus\mathrm{B3_g}$
N74.9.191 $\mathrm{GM3^+}\oplus\mathrm{GM3^-}\oplus\mathrm{GM4^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B1_u}\oplus\mathrm{B3_g}$
N74.9.192 $\mathrm{GM3^+}\oplus\mathrm{GM4^-}\oplus\mathrm{GM4^-}$	$\surd$	3	3	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B1_u}\oplus\mathrm{B3_g}$
N74.9.193 $\mathrm{GM3^+}\oplus\mathrm{GM3^-}\oplus\mathrm{X1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B3_g}$
N74.9.194 $\mathrm{GM3^+}\oplus\mathrm{GM3^-}\oplus\mathrm{X2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B3_g}$
N74.9.195 $\mathrm{GM3^+}\oplus\mathrm{GM4^-}\oplus\mathrm{X1^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B3_g}$
N74.9.196 $\mathrm{GM3^+}\oplus\mathrm{GM4^-}\oplus\mathrm{X2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B3_g}$
N74.9.197 $\mathrm{GM3^+}\oplus\mathrm{GM3^-}\oplus\mathrm{X1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B3_g}$
N74.9.198 $\mathrm{GM3^+}\oplus\mathrm{GM3^-}\oplus\mathrm{X2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B3_g}$
N74.9.199 $\mathrm{GM3^+}\oplus\mathrm{GM4^-}\oplus\mathrm{X1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B3_g}$
N74.9.200 $\mathrm{GM3^+}\oplus\mathrm{GM4^-}\oplus\mathrm{X2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B3_g}$
N74.9.201 $\mathrm{GM3^+}\oplus\mathrm{GM3^-}\oplus\mathrm{X3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B3_g}$
N74.9.202 $\mathrm{GM3^+}\oplus\mathrm{GM3^-}\oplus\mathrm{X3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B3_g}$
N74.9.203 $\mathrm{GM3^+}\oplus\mathrm{GM4^-}\oplus\mathrm{X3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B3_g}$
N74.9.204 $\mathrm{GM3^+}\oplus\mathrm{GM4^-}\oplus\mathrm{X3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B3_g}$
N74.9.205 $\mathrm{GM3^+}\oplus\mathrm{GM3^-}\oplus\mathrm{X4^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B3_g}$
N74.9.206 $\mathrm{GM3^+}\oplus\mathrm{GM3^-}\oplus\mathrm{X4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B3_g}$
N74.9.207 $\mathrm{GM3^+}\oplus\mathrm{GM4^-}\oplus\mathrm{X4^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B3_g}$
N74.9.208 $\mathrm{GM3^+}\oplus\mathrm{GM4^-}\oplus\mathrm{X4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B3_g}$
N74.9.209 $\mathrm{GM3^+}\oplus\mathrm{X1^+}\oplus\mathrm{X1^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N74.9.210 $\mathrm{GM3^+}\oplus\mathrm{X1^+}\oplus\mathrm{X2^-}$	$\surd$	1	1	$\surd$	$mm2$	$\mathrm{B2}$
N74.9.211 $\mathrm{GM3^+}\oplus\mathrm{X2^-}\oplus\mathrm{X2^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N74.9.212 $\mathrm{GM3^+}\oplus\mathrm{X1^+}\oplus\mathrm{X1^-}$	$\surd$	1	1	$\surd$	$mm2$	$\mathrm{A2}$
N74.9.213 $\mathrm{GM3^+}\oplus\mathrm{X1^+}\oplus\mathrm{X2^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N74.9.214 $\mathrm{GM3^+}\oplus\mathrm{X2^-}\oplus\mathrm{X1^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N74.9.215 $\mathrm{GM3^+}\oplus\mathrm{X2^-}\oplus\mathrm{X2^+}$	$\surd$	1	1	$\surd$	$mm2$	$\mathrm{A2}$
N74.9.216 $\mathrm{GM3^+}\oplus\mathrm{X1^+}\oplus\mathrm{X3^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N74.9.217 $\mathrm{GM3^+}\oplus\mathrm{X1^+}\oplus\mathrm{X3^-}$	$\surd$	1	1	$\surd$	222	$\mathrm{B3}$

Non-coplanar SSGs with parent space group $Imma$ (No. 74) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N74.9.218 $\mathrm{GM3^+} \oplus \mathrm{X2^-} \oplus \mathrm{X3^+}$	$\surd$	1	1	$\surd$	$mm2$	$\mathrm{B2}$
N74.9.219 $\mathrm{GM3^+} \oplus \mathrm{X2^-} \oplus \mathrm{X3^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N74.9.220 $\mathrm{GM3^+} \oplus \mathrm{X1^+} \oplus \mathrm{X4^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N74.9.221 $\mathrm{GM3^+} \oplus \mathrm{X1^+} \oplus \mathrm{X4^-}$	$\surd$	1	1	$\surd$	$mm2$	$\mathrm{B2}$
N74.9.222 $\mathrm{GM3^+} \oplus \mathrm{X2^-} \oplus \mathrm{X4^+}$	$\surd$	1	1	$\surd$	222	$\mathrm{B3}$
N74.9.223 $\mathrm{GM3^+} \oplus \mathrm{X2^-} \oplus \mathrm{X4^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N74.9.224 $\mathrm{GM3^+} \oplus \mathrm{X1^-} \oplus \mathrm{X1^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N74.9.225 $\mathrm{GM3^+} \oplus \mathrm{X1^-} \oplus \mathrm{X2^+}$	$\surd$	1	1	$\surd$	$mm2$	$\mathrm{B2}$
N74.9.226 $\mathrm{GM3^+} \oplus \mathrm{X2^+} \oplus \mathrm{X2^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N74.9.227 $\mathrm{GM3^+} \oplus \mathrm{X1^-} \oplus \mathrm{X3^+}$	$\surd$	1	1	$\surd$	222	$\mathrm{B3}$
N74.9.228 $\mathrm{GM3^+} \oplus \mathrm{X1^-} \oplus \mathrm{X3^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N74.9.229 $\mathrm{GM3^+} \oplus \mathrm{X2^+} \oplus \mathrm{X3^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N74.9.230 $\mathrm{GM3^+} \oplus \mathrm{X2^+} \oplus \mathrm{X3^-}$	$\surd$	1	1	$\surd$	$mm2$	$\mathrm{B2}$
N74.9.231 $\mathrm{GM3^+} \oplus \mathrm{X1^-} \oplus \mathrm{X4^+}$	$\surd$	1	1	$\surd$	$mm2$	$\mathrm{B2}$
N74.9.232 $\mathrm{GM3^+} \oplus \mathrm{X1^-} \oplus \mathrm{X4^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N74.9.233 $\mathrm{GM3^+} \oplus \mathrm{X2^+} \oplus \mathrm{X4^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N74.9.234 $\mathrm{GM3^+} \oplus \mathrm{X2^+} \oplus \mathrm{X4^-}$	$\surd$	1	1	$\surd$	222	$\mathrm{B3}$
N74.9.235 $\mathrm{GM3^+} \oplus \mathrm{X3^+} \oplus \mathrm{X3^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N74.9.236 $\mathrm{GM3^+} \oplus \mathrm{X3^+} \oplus \mathrm{X3^-}$	$\surd$	1	1	$\surd$	$mm2$	$\mathrm{A2}$
N74.9.237 $\mathrm{GM3^+} \oplus \mathrm{X3^-} \oplus \mathrm{X3^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N74.9.238 $\mathrm{GM3^+} \oplus \mathrm{X3^+} \oplus \mathrm{X4^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N74.9.239 $\mathrm{GM3^+} \oplus \mathrm{X3^+} \oplus \mathrm{X4^-}$	$\surd$	1	1	$\surd$	$mm2$	$\mathrm{B2}$
N74.9.240 $\mathrm{GM3^+} \oplus \mathrm{X3^-} \oplus \mathrm{X4^+}$	$\surd$	1	1	$\surd$	$mm2$	$\mathrm{B2}$
N74.9.241 $\mathrm{GM3^+} \oplus \mathrm{X3^-} \oplus \mathrm{X4^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N74.9.242 $\mathrm{GM3^+} \oplus \mathrm{X4^+} \oplus \mathrm{X4^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N74.9.243 $\mathrm{GM3^+} \oplus \mathrm{X4^+} \oplus \mathrm{X4^-}$	$\surd$	1	1	$\surd$	$mm2$	$\mathrm{A2}$
N74.9.244 $\mathrm{GM3^+} \oplus \mathrm{X4^-} \oplus \mathrm{X4^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_g}$
N74.9.245 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
N74.9.246 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N74.9.247 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{X1^+}$	$\surd$	0	0	$\surd$	-	-
N74.9.248 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{X2^-}$	$\surd$	0	0	$\surd$	-	-
N74.9.249 $\mathrm{GM3^-} \oplus \mathrm{GM4^-} \oplus \mathrm{X1^+}$	$\surd$	0	0	$\surd$	-	-
N74.9.250 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{X1^-}$	$\surd$	0	0	$\surd$	-	-
N74.9.251 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{X2^+}$	$\surd$	0	0	$\surd$	-	-
N74.9.252 $\mathrm{GM3^-} \oplus \mathrm{GM4^-} \oplus \mathrm{X1^-}$	$\surd$	0	0	$\surd$	-	-
N74.9.253 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{X3^+}$	$\surd$	0	0	$\surd$	-	-
N74.9.254 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{X3^-}$	$\surd$	0	0	$\surd$	-	-
N74.9.255 $\mathrm{GM3^-} \oplus \mathrm{GM4^-} \oplus \mathrm{X3^+}$	$\surd$	0	0	$\surd$	-	-
N74.9.256 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{X4^+}$	$\surd$	0	0	$\surd$	-	-
N74.9.257 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{X4^-}$	$\surd$	0	0	$\surd$	-	-
N74.9.258 $\mathrm{GM3^-} \oplus \mathrm{GM4^-} \oplus \mathrm{X4^+}$	$\surd$	0	0	$\surd$	-	-
N74.9.259 $\mathrm{GM3^-} \oplus \mathrm{X1^+} \oplus \mathrm{X1^+}$	$\surd$	1	0	$\times$	-	-
N74.9.260 $\mathrm{GM3^-} \oplus \mathrm{X1^+} \oplus \mathrm{X2^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N74.9.261 $\mathrm{GM3^-} \oplus \mathrm{X2^-} \oplus \mathrm{X2^-}$	$\surd$	1	0	$\times$	-	-
N74.9.262 $\mathrm{GM3^-} \oplus \mathrm{X1^+} \oplus \mathrm{X1^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_u}$
N74.9.263 $\mathrm{GM3^-} \oplus \mathrm{X1^+} \oplus \mathrm{X2^+}$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $Imma$ (No. 74) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N74.9.264 $\mathrm{GM3^-}\oplus\mathrm{X2^-}\oplus\mathrm{X1^-}$	$\surd$	1	0	$\times$	-	-
N74.9.265 $\mathrm{GM3^-}\oplus\mathrm{X2^-}\oplus\mathrm{X2^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_u}$
N74.9.266 $\mathrm{GM3^-}\oplus\mathrm{X1^+}\oplus\mathrm{X3^+}$	$\surd$	1	0	$\times$	-	-
N74.9.267 $\mathrm{GM3^-}\oplus\mathrm{X1^+}\oplus\mathrm{X3^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N74.9.268 $\mathrm{GM3^-}\oplus\mathrm{X2^-}\oplus\mathrm{X3^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N74.9.269 $\mathrm{GM3^-}\oplus\mathrm{X2^-}\oplus\mathrm{X3^-}$	$\surd$	1	0	$\times$	-	-
N74.9.270 $\mathrm{GM3^-}\oplus\mathrm{X1^+}\oplus\mathrm{X4^+}$	$\surd$	1	0	$\times$	-	-
N74.9.271 $\mathrm{GM3^-}\oplus\mathrm{X1^+}\oplus\mathrm{X4^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N74.9.272 $\mathrm{GM3^-}\oplus\mathrm{X2^-}\oplus\mathrm{X4^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N74.9.273 $\mathrm{GM3^-}\oplus\mathrm{X2^-}\oplus\mathrm{X4^-}$	$\surd$	1	0	$\times$	-	-
N74.9.274 $\mathrm{GM3^-}\oplus\mathrm{X1^-}\oplus\mathrm{X1^-}$	$\surd$	1	0	$\times$	-	-
N74.9.275 $\mathrm{GM3^-}\oplus\mathrm{X1^-}\oplus\mathrm{X2^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N74.9.276 $\mathrm{GM3^-}\oplus\mathrm{X2^+}\oplus\mathrm{X2^+}$	$\surd$	1	0	$\times$	-	-
N74.9.277 $\mathrm{GM3^-}\oplus\mathrm{X1^-}\oplus\mathrm{X3^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N74.9.278 $\mathrm{GM3^-}\oplus\mathrm{X1^-}\oplus\mathrm{X3^-}$	$\surd$	1	0	$\times$	-	-
N74.9.279 $\mathrm{GM3^-}\oplus\mathrm{X2^+}\oplus\mathrm{X3^+}$	$\surd$	1	0	$\times$	-	-
N74.9.280 $\mathrm{GM3^-}\oplus\mathrm{X2^+}\oplus\mathrm{X3^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N74.9.281 $\mathrm{GM3^-}\oplus\mathrm{X1^-}\oplus\mathrm{X4^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N74.9.282 $\mathrm{GM3^-}\oplus\mathrm{X1^-}\oplus\mathrm{X4^-}$	$\surd$	1	0	$\times$	-	-
N74.9.283 $\mathrm{GM3^-}\oplus\mathrm{X2^+}\oplus\mathrm{X4^+}$	$\surd$	1	0	$\times$	-	-
N74.9.284 $\mathrm{GM3^-}\oplus\mathrm{X2^+}\oplus\mathrm{X4^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B3_u}$
N74.9.285 $\mathrm{GM3^-}\oplus\mathrm{X3^+}\oplus\mathrm{X3^+}$	$\surd$	1	0	$\times$	-	-
N74.9.286 $\mathrm{GM3^-}\oplus\mathrm{X3^+}\oplus\mathrm{X3^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_u}$
N74.9.287 $\mathrm{GM3^-}\oplus\mathrm{X3^-}\oplus\mathrm{X3^-}$	$\surd$	1	0	$\times$	-	-
N74.9.288 $\mathrm{GM3^-}\oplus\mathrm{X3^+}\oplus\mathrm{X4^+}$	$\surd$	1	0	$\times$	-	-
N74.9.289 $\mathrm{GM3^-}\oplus\mathrm{X3^+}\oplus\mathrm{X4^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N74.9.290 $\mathrm{GM3^-}\oplus\mathrm{X3^-}\oplus\mathrm{X4^+}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N74.9.291 $\mathrm{GM3^-}\oplus\mathrm{X3^-}\oplus\mathrm{X4^-}$	$\surd$	1	0	$\times$	-	-
N74.9.292 $\mathrm{GM3^-}\oplus\mathrm{X4^+}\oplus\mathrm{X4^+}$	$\surd$	1	0	$\times$	-	-
N74.9.293 $\mathrm{GM3^-}\oplus\mathrm{X4^+}\oplus\mathrm{X4^-}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{A_u}$
N74.9.294 $\mathrm{GM3^-}\oplus\mathrm{X4^-}\oplus\mathrm{X4^-}$	$\surd$	1	0	$\times$	-	-
N74.9.295 $\mathrm{X1^+}\oplus\mathrm{X1^+}\oplus\mathrm{X1^+}$	$\surd$	0	0	$\surd$	-	-
N74.9.296 $\mathrm{X1^+}\oplus\mathrm{X1^+}\oplus\mathrm{X2^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B1_u}$
N74.9.297 $\mathrm{X1^+}\oplus\mathrm{X1^+}\oplus\mathrm{X1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{A_u}$
N74.9.298 $\mathrm{X1^+}\oplus\mathrm{X1^+}\oplus\mathrm{X2^+}$	$\surd$	0	0	$\surd$	-	-
N74.9.299 $\mathrm{X1^+}\oplus\mathrm{X2^-}\oplus\mathrm{X1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B1_u}$
N74.9.300 $\mathrm{X1^+}\oplus\mathrm{X1^+}\oplus\mathrm{X3^+}$	$\surd$	0	0	$\surd$	-	-
N74.9.301 $\mathrm{X1^+}\oplus\mathrm{X1^+}\oplus\mathrm{X3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u}\oplus\mathrm{B3_u}$
N74.9.302 $\mathrm{X1^+}\oplus\mathrm{X2^-}\oplus\mathrm{X3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B2_u}$
N74.9.303 $\mathrm{X1^+}\oplus\mathrm{X1^+}\oplus\mathrm{X4^+}$	$\surd$	0	0	$\surd$	-	-
N74.9.304 $\mathrm{X1^+}\oplus\mathrm{X1^+}\oplus\mathrm{X4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_u}\oplus\mathrm{B2_u}$
N74.9.305 $\mathrm{X1^+}\oplus\mathrm{X2^-}\oplus\mathrm{X4^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u}\oplus\mathrm{B3_u}$
N74.9.306 $\mathrm{X1^+}\oplus\mathrm{X1^-}\oplus\mathrm{X1^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{A_u}$
N74.9.307 $\mathrm{X1^+}\oplus\mathrm{X1^-}\oplus\mathrm{X2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B1_u}$
N74.9.308 $\mathrm{X1^+}\oplus\mathrm{X2^+}\oplus\mathrm{X2^+}$	$\surd$	0	0	$\surd$	-	-
N74.9.309 $\mathrm{X1^+}\oplus\mathrm{X1^-}\oplus\mathrm{X3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u}\oplus\mathrm{B3_u}$

Non-coplanar SSGs with parent space group $Imma$ (No. 74) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N74.9.310 $\mathrm{X1^+} \oplus \mathrm{X1^-} \oplus \mathrm{X3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u}$
N74.9.311 $\mathrm{X1^+} \oplus \mathrm{X2^+} \oplus \mathrm{X3^+}$	$\surd$	0	0	$\surd$	-	-
N74.9.312 $\mathrm{X1^+} \oplus \mathrm{X2^+} \oplus \mathrm{X3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_u}$
N74.9.313 $\mathrm{X1^+} \oplus \mathrm{X1^-} \oplus \mathrm{X4^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B2_u}$
N74.9.314 $\mathrm{X1^+} \oplus \mathrm{X1^-} \oplus \mathrm{X4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B2_u}$
N74.9.315 $\mathrm{X1^+} \oplus \mathrm{X2^+} \oplus \mathrm{X4^+}$	$\surd$	0	0	$\surd$	-	-
N74.9.316 $\mathrm{X1^+} \oplus \mathrm{X2^+} \oplus \mathrm{X4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_u}$
N74.9.317 $\mathrm{X1^+} \oplus \mathrm{X3^+} \oplus \mathrm{X3^+}$	$\surd$	0	0	$\surd$	-	-
N74.9.318 $\mathrm{X1^+} \oplus \mathrm{X3^+} \oplus \mathrm{X3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u}$
N74.9.319 $\mathrm{X1^+} \oplus \mathrm{X3^-} \oplus \mathrm{X3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B3_u}$
N74.9.320 $\mathrm{X1^+} \oplus \mathrm{X3^+} \oplus \mathrm{X4^+}$	$\surd$	0	0	$\surd$	-	-
N74.9.321 $\mathrm{X1^+} \oplus \mathrm{X3^+} \oplus \mathrm{X4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N74.9.322 $\mathrm{X1^+} \oplus \mathrm{X3^-} \oplus \mathrm{X4^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u}$
N74.9.323 $\mathrm{X1^+} \oplus \mathrm{X3^-} \oplus \mathrm{X4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_u}$
N74.9.324 $\mathrm{X1^+} \oplus \mathrm{X4^+} \oplus \mathrm{X4^+}$	$\surd$	0	0	$\surd$	-	-
N74.9.325 $\mathrm{X1^+} \oplus \mathrm{X4^+} \oplus \mathrm{X4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B2_u}$
N74.9.326 $\mathrm{X1^+} \oplus \mathrm{X4^-} \oplus \mathrm{X4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_u} \oplus \mathrm{B2_u}$
N74.9.327 $\mathrm{X1^-} \oplus \mathrm{X1^-} \oplus \mathrm{X1^-}$	$\surd$	0	0	$\surd$	-	-
N74.9.328 $\mathrm{X1^-} \oplus \mathrm{X1^-} \oplus \mathrm{X2^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N74.9.329 $\mathrm{X1^-} \oplus \mathrm{X1^-} \oplus \mathrm{X3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B3_u}$
N74.9.330 $\mathrm{X1^-} \oplus \mathrm{X1^-} \oplus \mathrm{X3^-}$	$\surd$	0	0	$\surd$	-	-
N74.9.331 $\mathrm{X1^-} \oplus \mathrm{X2^+} \oplus \mathrm{X3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u}$
N74.9.332 $\mathrm{X1^-} \oplus \mathrm{X1^-} \oplus \mathrm{X4^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_u} \oplus \mathrm{B2_u}$
N74.9.333 $\mathrm{X1^-} \oplus \mathrm{X1^-} \oplus \mathrm{X4^-}$	$\surd$	0	0	$\surd$	-	-
N74.9.334 $\mathrm{X1^-} \oplus \mathrm{X2^+} \oplus \mathrm{X4^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N74.9.335 $\mathrm{X1^-} \oplus \mathrm{X3^+} \oplus \mathrm{X3^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B3_u}$
N74.9.336 $\mathrm{X1^-} \oplus \mathrm{X3^+} \oplus \mathrm{X3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B3_u}$
N74.9.337 $\mathrm{X1^-} \oplus \mathrm{X3^-} \oplus \mathrm{X3^-}$	$\surd$	0	0	$\surd$	-	-
N74.9.338 $\mathrm{X1^-} \oplus \mathrm{X3^+} \oplus \mathrm{X4^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B3_u} \oplus \mathrm{B2_u}$
N74.9.339 $\mathrm{X1^-} \oplus \mathrm{X3^+} \oplus \mathrm{X4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B3_u}$
N74.9.340 $\mathrm{X1^-} \oplus \mathrm{X3^-} \oplus \mathrm{X4^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N74.9.341 $\mathrm{X1^-} \oplus \mathrm{X3^-} \oplus \mathrm{X4^-}$	$\surd$	0	0	$\surd$	-	-
N74.9.342 $\mathrm{X1^-} \oplus \mathrm{X4^+} \oplus \mathrm{X4^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B2_u} \oplus \mathrm{B2_u}$
N74.9.343 $\mathrm{X1^-} \oplus \mathrm{X4^+} \oplus \mathrm{X4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B2_u}$
N74.9.344 $\mathrm{X1^-} \oplus \mathrm{X4^-} \oplus \mathrm{X4^-}$	$\surd$	0	0	$\surd$	-	-
N74.9.345 $\mathrm{X3^+} \oplus \mathrm{X3^+} \oplus \mathrm{X3^+}$	$\surd$	0	0	$\surd$	-	-
N74.9.346 $\mathrm{X3^+} \oplus \mathrm{X3^+} \oplus \mathrm{X3^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u}$
N74.9.347 $\mathrm{X3^+} \oplus \mathrm{X3^+} \oplus \mathrm{X4^+}$	$\surd$	0	0	$\surd$	-	-
N74.9.348 $\mathrm{X3^+} \oplus \mathrm{X3^+} \oplus \mathrm{X4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N74.9.349 $\mathrm{X3^+} \oplus \mathrm{X3^-} \oplus \mathrm{X4^+}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u}$
N74.9.350 $\mathrm{X3^+} \oplus \mathrm{X4^+} \oplus \mathrm{X4^+}$	$\surd$	0	0	$\surd$	-	-
N74.9.351 $\mathrm{X3^+} \oplus \mathrm{X4^+} \oplus \mathrm{X4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{B1_u}$
N74.9.352 $\mathrm{X3^+} \oplus \mathrm{X4^-} \oplus \mathrm{X4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N74.9.353 $\mathrm{X4^+} \oplus \mathrm{X4^+} \oplus \mathrm{X4^+}$	$\surd$	0	0	$\surd$	-	-
N74.9.354 $\mathrm{X4^+} \oplus \mathrm{X4^+} \oplus \mathrm{X4^-}$	$\surd$	2	2	$\surd$	mmm	$\mathrm{A_u} \oplus \mathrm{A_u}$
N74.13.1 $\mathrm{GM1^-} \oplus \mathrm{R1^+}$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $Imma$ (No. 74) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N74.13.2 $\mathrm{GM1}^- \oplus \mathrm{R1}^-$	$\surd$	1	0	$\times$	-	-
N74.13.3 $\mathrm{GM2}^+ \oplus \mathrm{R1}^+$	$\surd$	1	1	$\times$	-	-
N74.13.4 $\mathrm{GM2}^+ \oplus \mathrm{R1}^-$	$\surd$	1	1	$\times$	-	-
N74.13.5 $\mathrm{GM2}^- \oplus \mathrm{R1}^+$	$\surd$	1	0	$\times$	-	-
N74.13.6 $\mathrm{GM2}^- \oplus \mathrm{R1}^-$	$\surd$	1	0	$\times$	-	-
N74.13.7 $\mathrm{GM3}^+ \oplus \mathrm{S1}^+$	$\surd$	1	1	$\times$	-	-
N74.13.8 $\mathrm{GM3}^+ \oplus \mathrm{R1}^+$	$\surd$	1	1	$\times$	-	-
N74.13.9 $\mathrm{GM3}^+ \oplus \mathrm{S1}^-$	$\surd$	1	1	$\times$	-	-
N74.13.10 $\mathrm{GM3}^+ \oplus \mathrm{R1}^-$	$\surd$	1	1	$\times$	-	-
N74.13.11 $\mathrm{GM3}^- \oplus \mathrm{S1}^+$	$\surd$	1	0	$\times$	-	-
N74.13.12 $\mathrm{GM3}^- \oplus \mathrm{R1}^+$	$\surd$	1	0	$\times$	-	-
N74.13.13 $\mathrm{GM3}^- \oplus \mathrm{S1}^-$	$\surd$	1	0	$\times$	-	-
N74.13.14 $\mathrm{GM3}^- \oplus \mathrm{R1}^-$	$\surd$	1	0	$\times$	-	-
N74.13.15 $\mathrm{X1}^+ \oplus \mathrm{S1}^+$	$\times$	-	-	-	-	-
N74.13.16 $\mathrm{X1}^+ \oplus \mathrm{R1}^+$	$\times$	-	-	-	-	-
N74.13.17 $\mathrm{X1}^+ \oplus \mathrm{S1}^-$	$\times$	-	-	-	-	-
N74.13.18 $\mathrm{X1}^+ \oplus \mathrm{R1}^-$	$\times$	-	-	-	-	-
N74.13.19 $\mathrm{X1}^- \oplus \mathrm{S1}^+$	$\times$	-	-	-	-	-
N74.13.20 $\mathrm{X1}^- \oplus \mathrm{R1}^+$	$\times$	-	-	-	-	-
N74.13.21 $\mathrm{X1}^- \oplus \mathrm{S1}^-$	$\times$	-	-	-	-	-
N74.13.22 $\mathrm{X1}^- \oplus \mathrm{R1}^-$	$\times$	-	-	-	-	-
N74.13.23 $\mathrm{X3}^+ \oplus \mathrm{S1}^+$	$\times$	-	-	-	-	-
N74.13.24 $\mathrm{X3}^+ \oplus \mathrm{R1}^+$	$\times$	-	-	-	-	-
N74.13.25 $\mathrm{X3}^+ \oplus \mathrm{S1}^-$	$\times$	-	-	-	-	-
N74.13.26 $\mathrm{X3}^+ \oplus \mathrm{R1}^-$	$\times$	-	-	-	-	-
N74.13.27 $\mathrm{X4}^+ \oplus \mathrm{S1}^+$	$\times$	-	-	-	-	-
N74.13.28 $\mathrm{X4}^+ \oplus \mathrm{R1}^+$	$\times$	-	-	-	-	-
N74.13.29 $\mathrm{X4}^+ \oplus \mathrm{S1}^-$	$\times$	-	-	-	-	-
N74.13.30 $\mathrm{X4}^+ \oplus \mathrm{R1}^-$	$\times$	-	-	-	-	-
N74.14.1 $\mathrm{GM1}^- \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N74.14.2 $\mathrm{GM1}^- \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N74.14.3 $\mathrm{GM1}^- \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N74.14.4 $\mathrm{GM1}^- \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N74.14.5 $\mathrm{GM1}^- \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N74.14.6 $\mathrm{GM1}^- \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N74.14.7 $\mathrm{GM1}^- \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B1_u}$
N74.14.8 $\mathrm{GM2}^+ \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	$mm2$	B2
N74.14.9 $\mathrm{GM2}^+ \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	$mm2$	B2
N74.14.10 $\mathrm{GM2}^+ \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	$mm2$	B2
N74.14.11 $\mathrm{GM2}^+ \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	$mm2$	B2
N74.14.12 $\mathrm{GM2}^+ \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	222	B1
N74.14.13 $\mathrm{GM2}^+ \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	222	B1
N74.14.14 $\mathrm{GM2}^+ \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	222	B1
N74.14.15 $\mathrm{GM2}^- \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N74.14.16 $\mathrm{GM2}^- \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$
N74.14.17 $\mathrm{GM2}^- \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	mmm	$\mathrm{B2_u}$

Non-coplanar SSGs with parent space group $Imma$ (No. 74) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N74.14.18 GM2$^-$ ⊕ DT4	√	1	1	√	mmm	$\mathrm{B2_u}$
N74.14.19 GM2$^-$ ⊕ LD1	√	1	1	√	mmm	$\mathrm{B1_u}$
N74.14.20 GM2$^-$ ⊕ LD2	√	1	1	√	mmm	$\mathrm{B1_u}$
N74.14.21 GM2$^-$ ⊕ LD3	√	1	1	√	mmm	$\mathrm{B1_u}$
N74.14.22 GM3$^+$ ⊕ SM1	√	1	1	√	222	B3
N74.14.23 GM3$^+$ ⊕ DT1	√	1	1	√	$mm2$	B2
N74.14.24 GM3$^+$ ⊕ SM2	√	1	1	√	222	B3
N74.14.25 GM3$^+$ ⊕ DT2	√	1	1	√	$mm2$	B2
N74.14.26 GM3$^+$ ⊕ SM3	√	1	1	√	222	B3
N74.14.27 GM3$^+$ ⊕ DT3	√	1	1	√	$mm2$	B2
N74.14.28 GM3$^+$ ⊕ SM4	√	1	1	√	222	B3
N74.14.29 GM3$^+$ ⊕ DT4	√	1	1	√	$mm2$	B2
N74.14.30 GM3$^+$ ⊕ LD1	√	1	1	√	$mm2$	B2
N74.14.31 GM3$^+$ ⊕ LD2	√	1	1	√	$mm2$	B2
N74.14.32 GM3$^+$ ⊕ LD3	√	1	1	√	$mm2$	B2
N74.14.33 GM3$^+$ ⊕ LD4	√	1	1	√	$mm2$	B2
N74.14.34 GM3$^-$ ⊕ SM1	√	1	1	√	mmm	$\mathrm{B3_u}$
N74.14.35 GM3$^-$ ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N74.14.36 GM3$^-$ ⊕ SM2	√	1	1	√	mmm	$\mathrm{B3_u}$
N74.14.37 GM3$^-$ ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
N74.14.38 GM3$^-$ ⊕ SM3	√	1	1	√	mmm	$\mathrm{B3_u}$
N74.14.39 GM3$^-$ ⊕ DT3	√	1	1	√	mmm	$\mathrm{B2_u}$
N74.14.40 GM3$^-$ ⊕ SM4	√	1	1	√	mmm	$\mathrm{B3_u}$
N74.14.41 GM3$^-$ ⊕ DT4	√	1	1	√	mmm	$\mathrm{B2_u}$
N74.14.42 GM3$^-$ ⊕ LD1	√	1	1	√	mmm	$\mathrm{B1_u}$
N74.14.43 GM3$^-$ ⊕ LD2	√	1	1	√	mmm	$\mathrm{B1_u}$
N74.14.44 GM3$^-$ ⊕ LD3	√	1	1	√	mmm	$\mathrm{B1_u}$
N74.14.45 GM3$^-$ ⊕ LD4	√	1	1	√	mmm	$\mathrm{B1_u}$
N74.14.46 X1$^+$ ⊕ SM1	√	1	1	√	mmm	$\mathrm{B3_u}$
N74.14.47 X1$^+$ ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N74.14.48 X1$^+$ ⊕ SM2	√	1	1	√	mmm	$\mathrm{B3_u}$
N74.14.49 X1$^+$ ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
N74.14.50 X1$^+$ ⊕ SM3	√	1	1	√	mmm	$\mathrm{B3_u}$
N74.14.51 X1$^+$ ⊕ DT3	√	1	1	√	mmm	$\mathrm{B2_u}$
N74.14.52 X1$^+$ ⊕ SM4	√	1	1	√	mmm	$\mathrm{B3_u}$
N74.14.53 X1$^+$ ⊕ DT4	√	1	1	√	mmm	$\mathrm{B2_u}$
N74.14.54 X1$^+$ ⊕ LD1	√	1	1	√	mmm	$\mathrm{B1_u}$
N74.14.55 X1$^+$ ⊕ LD2	√	1	1	√	mmm	$\mathrm{B1_u}$
N74.14.56 X1$^+$ ⊕ LD3	√	1	1	√	mmm	$\mathrm{B1_u}$
N74.14.57 X1$^+$ ⊕ LD4	√	1	1	√	mmm	$\mathrm{B1_u}$
N74.14.58 X1$^-$ ⊕ SM1	√	1	1	√	mmm	$\mathrm{B3_u}$
N74.14.59 X1$^-$ ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N74.14.60 X1$^-$ ⊕ SM2	√	1	1	√	mmm	$\mathrm{B3_u}$
N74.14.61 X1$^-$ ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
N74.14.62 X1$^-$ ⊕ SM3	√	1	1	√	mmm	$\mathrm{B3_u}$
N74.14.63 X1$^-$ ⊕ DT3	√	1	1	√	mmm	$\mathrm{B2_u}$

Non-coplanar SSGs with parent space group $Imma$ (No. 74) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N74.14.64 X1$^-$ ⊕ SM4	√	1	1	√	mmm	$\mathrm{B3_u}$
N74.14.65 X1$^-$ ⊕ DT4	√	1	1	√	mmm	$\mathrm{B2_u}$
N74.14.66 X1$^-$ ⊕ LD1	√	1	1	√	mmm	$\mathrm{B1_u}$
N74.14.67 X1$^-$ ⊕ LD2	√	1	1	√	mmm	$\mathrm{B1_u}$
N74.14.68 X1$^-$ ⊕ LD3	√	1	1	√	mmm	$\mathrm{B1_u}$
N74.14.69 X1$^-$ ⊕ LD4	√	1	1	√	mmm	$\mathrm{B1_u}$
N74.14.70 X3$^+$ ⊕ SM1	√	1	1	√	mmm	$\mathrm{B3_u}$
N74.14.71 X3$^+$ ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N74.14.72 X3$^+$ ⊕ SM2	√	1	1	√	mmm	$\mathrm{B3_u}$
N74.14.73 X3$^+$ ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
N74.14.74 X3$^+$ ⊕ SM3	√	1	1	√	mmm	$\mathrm{B3_u}$
N74.14.75 X3$^+$ ⊕ DT3	√	1	1	√	mmm	$\mathrm{B2_u}$
N74.14.76 X3$^+$ ⊕ SM4	√	1	1	√	mmm	$\mathrm{B3_u}$
N74.14.77 X3$^+$ ⊕ DT4	√	1	1	√	mmm	$\mathrm{B2_u}$
N74.14.78 X3$^+$ ⊕ LD1	√	1	1	√	mmm	$\mathrm{B1_u}$
N74.14.79 X3$^+$ ⊕ LD2	√	1	1	√	mmm	$\mathrm{B1_u}$
N74.14.80 X3$^+$ ⊕ LD3	√	1	1	√	mmm	$\mathrm{B1_u}$
N74.14.81 X3$^+$ ⊕ LD4	√	1	1	√	mmm	$\mathrm{B1_u}$
N74.14.82 X4$^+$ ⊕ SM1	√	1	1	√	mmm	$\mathrm{B3_u}$
N74.14.83 X4$^+$ ⊕ DT1	√	1	1	√	mmm	$\mathrm{B2_u}$
N74.14.84 X4$^+$ ⊕ SM2	√	1	1	√	mmm	$\mathrm{B3_u}$
N74.14.85 X4$^+$ ⊕ DT2	√	1	1	√	mmm	$\mathrm{B2_u}$
N74.14.86 X4$^+$ ⊕ SM3	√	1	1	√	mmm	$\mathrm{B3_u}$
N74.14.87 X4$^+$ ⊕ DT3	√	1	1	√	mmm	$\mathrm{B2_u}$
N74.14.88 X4$^+$ ⊕ SM4	√	1	1	√	mmm	$\mathrm{B3_u}$
N74.14.89 X4$^+$ ⊕ DT4	√	1	1	√	mmm	$\mathrm{B2_u}$
N74.14.90 X4$^+$ ⊕ LD1	√	1	1	√	mmm	$\mathrm{B1_u}$
N74.14.91 X4$^+$ ⊕ LD2	√	1	1	√	mmm	$\mathrm{B1_u}$
N74.14.92 X4$^+$ ⊕ LD3	√	1	1	√	mmm	$\mathrm{B1_u}$
N74.14.93 X4$^+$ ⊕ LD4	√	1	1	√	mmm	$\mathrm{B1_u}$

TABLE S223: Collinear SSGs with parent space group $P4$ (No. 75).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L75.1.1 GM1	1	$4/m$	$\mathrm{A_g}$
L75.2.1 GM2	1	$4/m$	$\mathrm{B_g}$
L75.2.2 A1	0	-	-
L75.2.3 M1	0	-	-
L75.2.4 Z1	0	-	-
L75.2.5 Z2	0	-	-

TABLE S224: Coplanar SSGs with parent space group $P4$ (No. 75).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P75.1.1 GM1	√	3	3	√	$4/m$	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{A_u}$

Coplanar SSGs with parent space group $P4$ (No. 75) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P75.2.1 GM2	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_g} \oplus \mathrm{B_g} \oplus \mathrm{B_u}$
P75.2.2 A1	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_g}$
P75.2.3 M1	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_g}$
P75.2.4 Z1	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_g}$
P75.2.5 Z2	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_g}$
P75.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_u} \oplus \mathrm{B_g} \oplus \mathrm{B_g}$
P75.3.2 GM2 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
P75.3.3 GM2 $\oplus$ M1	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{B_g}$
P75.3.4 GM2 $\oplus$ Z1	$\surd$	1	1	$\times$	-	-
P75.3.5 GM2 $\oplus$ Z2	$\surd$	1	1	$\times$	-	-
P75.3.6 A1 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
P75.3.7 A1 $\oplus$ A2	$\surd$	1	1	$\times$	-	-
P75.3.8 A1 $\oplus$ M1	$\times$	-	-	-	-	-
P75.3.9 A1 $\oplus$ M2	$\times$	-	-	-	-	-
P75.3.10 A1 $\oplus$ Z1	$\times$	-	-	-	-	-
P75.3.11 A1 $\oplus$ Z2	$\times$	-	-	-	-	-
P75.3.12 M1 $\oplus$ M1	$\surd$	1	1	$\times$	-	-
P75.3.13 M1 $\oplus$ M2	$\surd$	1	1	$\times$	-	-
P75.3.14 M1 $\oplus$ Z1	$\times$	-	-	-	-	-
P75.3.15 M1 $\oplus$ Z2	$\times$	-	-	-	-	-
P75.3.16 Z1 $\oplus$ Z1	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
P75.3.17 Z1 $\oplus$ Z2	$\surd$	1	1	$\times$	-	-
P75.3.18 Z2 $\oplus$ Z2	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
P75.4.1 GM3GM4	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_u} \oplus {}^2\mathrm{E_g} \oplus {}^1\mathrm{E_g}$
P75.4.2 Z3Z4	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
P75.4.3 M3M4	$\surd$	1	1	$\times$	-	-
P75.4.4 A3A4	$\surd$	1	1	$\times$	-	-
P75.5.1 LD1LE1	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
P75.5.2 LD2LE2	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
P75.5.3 LD3LE3	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
P75.5.4 V1VA1	$\surd$	1	1	$\times$	-	-
P75.5.5 V3VA3	$\surd$	1	1	$\times$	-	-
P75.7.1 X1	$\times$	-	-	-	-	-
P75.7.2 R1	$\times$	-	-	-	-	-

TABLE S225: Non-coplanar SSGs with parent space group $P4$ (No. 75).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N75.1.1 GM1	$\surd$	3	3	$\surd$	4	$\mathrm{A} \oplus \mathrm{A} \oplus \mathrm{A}$
N75.2.1 GM2	$\surd$	3	3	$\surd$	$\bar{4}$	$\mathrm{A} \oplus \mathrm{A} \oplus \mathrm{B}$
N75.2.2 A1	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{A_u}$
N75.2.3 M1	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{A_u}$
N75.2.4 Z1	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{A_u}$
N75.2.5 Z2	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{A_u}$
N75.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	4	$\mathrm{A} \oplus \mathrm{B} \oplus \mathrm{B}$
N75.3.2 GM2 $\oplus$ A1	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_g} \oplus \mathrm{B_g} \oplus \mathrm{B_u}$

Non-coplanar SSGs with parent space group $P4$ (No. 75) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N75.3.3 GM2 ⊕ M1	√	3	3	√	$4/m$	$\mathrm{A_g} \oplus \mathrm{B_g} \oplus \mathrm{B_u}$
N75.3.4 GM2 ⊕ Z1	√	3	3	√	$4/m$	$\mathrm{A_g} \oplus \mathrm{B_g} \oplus \mathrm{B_u}$
N75.3.5 GM2 ⊕ Z2	√	3	3	√	$4/m$	$\mathrm{A_g} \oplus \mathrm{B_g} \oplus \mathrm{B_u}$
N75.3.6 A1 ⊕ A1	√	1	1	√	4	A
N75.3.7 A1 ⊕ A2	√	1	1	√	$\bar{4}$	A
N75.3.8 A1 ⊕ M1	√	1	1	√	$4/m$	$\mathrm{A_g}$
N75.3.9 A1 ⊕ M2	√	1	1	√	$4/m$	$\mathrm{A_g}$
N75.3.10 A1 ⊕ Z1	√	1	1	√	$4/m$	$\mathrm{A_g}$
N75.3.11 A1 ⊕ Z2	√	1	1	√	$4/m$	$\mathrm{A_g}$
N75.3.12 M1 ⊕ M1	√	1	1	√	4	A
N75.3.13 M1 ⊕ M2	√	1	1	√	$\bar{4}$	A
N75.3.14 M1 ⊕ Z1	√	1	1	√	$4/m$	$\mathrm{A_g}$
N75.3.15 M1 ⊕ Z2	√	1	1	√	$4/m$	$\mathrm{A_g}$
N75.3.16 Z1 ⊕ Z1	√	1	1	√	4	A
N75.3.17 Z1 ⊕ Z2	√	1	1	√	$\bar{4}$	A
N75.3.18 Z2 ⊕ Z2	√	1	1	√	4	A
N75.4.1 GM3GM4	√	3	3	√	4	$\mathrm{A} \oplus {}^2\mathrm{E} \oplus {}^1\mathrm{E}$
N75.4.2 Z3Z4	√	1	1	√	4	A
N75.4.3 M3M4	√	1	1	√	4	A
N75.4.4 A3A4	√	1	1	√	4	A
N75.5.1 LD1LE1	√	1	1	√	4	A
N75.5.2 LD2LE2	√	1	1	√	4	A
N75.5.3 LD3LE3	√	1	1	√	4	A
N75.5.4 V1VA1	√	1	1	√	4	A
N75.5.5 V3VA3	√	1	1	√	4	A
N75.7.1 X1	√	1	1	√	$4/m$	$\mathrm{A_g}$
N75.7.2 R1	√	1	1	√	$4/m$	$\mathrm{A_g}$
N75.9.1 GM2 ⊕ GM2 ⊕ GM2	√	3	3	√	$\bar{4}$	$\mathrm{B} \oplus \mathrm{B} \oplus \mathrm{B}$
N75.9.2 GM2 ⊕ GM2 ⊕ A1	√	3	3	√	$4/m$	$\mathrm{A_u} \oplus \mathrm{B_g} \oplus \mathrm{B_g}$
N75.9.3 GM2 ⊕ GM2 ⊕ M1	√	3	3	√	$4/m$	$\mathrm{A_u} \oplus \mathrm{B_g} \oplus \mathrm{B_g}$
N75.9.4 GM2 ⊕ GM2 ⊕ Z1	√	3	3	√	$4/m$	$\mathrm{A_u} \oplus \mathrm{B_g} \oplus \mathrm{B_g}$
N75.9.5 GM2 ⊕ GM2 ⊕ Z2	√	3	3	√	$4/m$	$\mathrm{A_u} \oplus \mathrm{B_g} \oplus \mathrm{B_g}$
N75.9.6 GM2 ⊕ A1 ⊕ A1	√	1	1	√	$\bar{4}$	B
N75.9.7 GM2 ⊕ A1 ⊕ A2	√	1	1	×	-	-
N75.9.8 GM2 ⊕ A1 ⊕ M1	√	1	1	√	$4/m$	$\mathrm{B_g}$
N75.9.9 GM2 ⊕ A1 ⊕ M2	√	1	1	√	$4/m$	$\mathrm{B_g}$
N75.9.10 GM2 ⊕ A1 ⊕ Z1	√	1	1	×	-	-
N75.9.11 GM2 ⊕ A1 ⊕ Z2	√	1	1	×	-	-
N75.9.12 GM2 ⊕ M1 ⊕ M1	√	1	1	√	$\bar{4}$	B
N75.9.13 GM2 ⊕ M1 ⊕ M2	√	1	1	√	4	B
N75.9.14 GM2 ⊕ M1 ⊕ Z1	√	1	1	√	$4/m$	$\mathrm{B_g}$
N75.9.15 GM2 ⊕ M1 ⊕ Z2	√	1	1	√	$4/m$	$\mathrm{B_g}$
N75.9.16 GM2 ⊕ Z1 ⊕ Z1	√	1	1	√	$\bar{4}$	B
N75.9.17 GM2 ⊕ Z1 ⊕ Z2	√	1	1	×	-	-
N75.9.18 GM2 ⊕ Z2 ⊕ Z2	√	1	1	√	$\bar{4}$	B
N75.9.19 A1 ⊕ A1 ⊕ A1	√	3	3	√	$4/m$	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{A_u}$

Non-coplanar SSGs with parent space group $P4$ (No. 75) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N75.9.20 A1 ⊕ A1 ⊕ A2	√	3	3	√	$4/m$	$\mathrm{A_u} \oplus \mathrm{B_u} \oplus \mathrm{B_u}$
N75.9.21 A1 ⊕ A1 ⊕ M1	√	1	1	√	$4/m$	$\mathrm{A_u}$
N75.9.22 A1 ⊕ A1 ⊕ M2	√	1	1	√	$4/m$	$\mathrm{A_u}$
N75.9.23 A1 ⊕ A2 ⊕ M1	√	1	1	×	-	-
N75.9.24 A1 ⊕ A1 ⊕ Z1	√	1	1	×	-	-
N75.9.25 A1 ⊕ A2 ⊕ Z1	√	1	1	×	-	-
N75.9.26 A1 ⊕ A1 ⊕ Z2	√	1	1	×	-	-
N75.9.27 A1 ⊕ A2 ⊕ Z2	√	1	1	×	-	-
N75.9.28 A1 ⊕ M1 ⊕ M1	√	1	1	√	$4/m$	$\mathrm{A_u}$
N75.9.29 A1 ⊕ M1 ⊕ M2	√	1	1	√	$4/m$	$\mathrm{B_u}$
N75.9.30 A1 ⊕ M2 ⊕ M2	√	1	1	√	$4/m$	$\mathrm{A_u}$
N75.9.31 A1 ⊕ M1 ⊕ Z1	×	-	-	-	-	-
N75.9.32 A1 ⊕ M2 ⊕ Z1	×	-	-	-	-	-
N75.9.33 A1 ⊕ M1 ⊕ Z2	×	-	-	-	-	-
N75.9.34 A1 ⊕ M2 ⊕ Z2	×	-	-	-	-	-
N75.9.35 A1 ⊕ Z1 ⊕ Z1	√	1	1	√	$4/m$	$\mathrm{A_u}$
N75.9.36 A1 ⊕ Z1 ⊕ Z2	√	1	1	√	$4/m$	$\mathrm{B_u}$
N75.9.37 A1 ⊕ Z2 ⊕ Z2	√	1	1	√	$4/m$	$\mathrm{A_u}$
N75.9.38 M1 ⊕ M1 ⊕ M1	√	3	3	√	$4/m$	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{A_u}$
N75.9.39 M1 ⊕ M1 ⊕ M2	√	3	3	√	$4/m$	$\mathrm{A_u} \oplus \mathrm{B_u} \oplus \mathrm{B_u}$
N75.9.40 M1 ⊕ M1 ⊕ Z1	√	1	1	×	-	-
N75.9.41 M1 ⊕ M2 ⊕ Z1	√	1	1	×	-	-
N75.9.42 M1 ⊕ M1 ⊕ Z2	√	1	1	×	-	-
N75.9.43 M1 ⊕ M2 ⊕ Z2	√	1	1	×	-	-
N75.9.44 M1 ⊕ Z1 ⊕ Z1	√	1	1	√	$4/m$	$\mathrm{A_u}$
N75.9.45 M1 ⊕ Z1 ⊕ Z2	√	1	1	×	-	-
N75.9.46 M1 ⊕ Z2 ⊕ Z2	√	1	1	√	$4/m$	$\mathrm{A_u}$
N75.9.47 Z1 ⊕ Z1 ⊕ Z1	√	3	3	√	$4/m$	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{A_u}$
N75.9.48 Z1 ⊕ Z1 ⊕ Z2	√	3	3	√	$4/m$	$\mathrm{A_u} \oplus \mathrm{B_u} \oplus \mathrm{B_u}$
N75.9.49 Z1 ⊕ Z2 ⊕ Z2	√	3	3	√	$4/m$	$\mathrm{A_u} \oplus \mathrm{B_u} \oplus \mathrm{B_u}$
N75.9.50 Z2 ⊕ Z2 ⊕ Z2	√	3	3	√	$4/m$	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{A_u}$
N75.10.1 GM2 ⊕ GM3GM4	√	3	3	√	$\bar{4}$	$\mathrm{B} \oplus {}^2\mathrm{E} \oplus {}^1\mathrm{E}$
N75.10.2 GM2 ⊕ Z3Z4	√	1	1	√	$\bar{4}$	B
N75.10.3 GM2 ⊕ M3M4	√	1	1	√	$\bar{4}$	B
N75.10.4 GM2 ⊕ A3A4	√	1	1	√	$\bar{4}$	B
N75.10.5 A1 ⊕ GM3GM4	√	3	3	√	$4/m$	$\mathrm{A_u} \oplus {}^2\mathrm{E_g} \oplus {}^1\mathrm{E_g}$
N75.10.6 A1 ⊕ Z3Z4	√	1	1	√	$4/m$	$\mathrm{A_u}$
N75.10.7 A1 ⊕ M3M4	√	1	1	√	$4/m$	$\mathrm{A_u}$
N75.10.8 A1 ⊕ A3A4	√	3	3	√	$4/m$	$\mathrm{A_u} \oplus {}^2\mathrm{E_u} \oplus {}^1\mathrm{E_u}$
N75.10.9 M1 ⊕ GM3GM4	√	3	3	√	$4/m$	$\mathrm{A_u} \oplus {}^2\mathrm{E_g} \oplus {}^1\mathrm{E_g}$
N75.10.10 M1 ⊕ Z3Z4	√	1	1	√	$4/m$	$\mathrm{A_u}$
N75.10.11 M1 ⊕ M3M4	√	3	3	√	$4/m$	$\mathrm{A_u} \oplus {}^2\mathrm{E_u} \oplus {}^1\mathrm{E_u}$
N75.10.12 M1 ⊕ A3A4	√	1	1	√	$4/m$	$\mathrm{A_u}$
N75.10.13 Z1 ⊕ GM3GM4	√	3	3	√	$4/m$	$\mathrm{A_u} \oplus {}^2\mathrm{E_g} \oplus {}^1\mathrm{E_g}$
N75.10.14 Z1 ⊕ Z3Z4	√	3	3	√	$4/m$	$\mathrm{A_u} \oplus {}^2\mathrm{E_u} \oplus {}^1\mathrm{E_u}$
N75.10.15 Z1 ⊕ M3M4	√	1	1	×	-	-

Non-coplanar SSGs with parent space group $P4$ (No. 75) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N75.10.16 Z1 ⊕ A3A4	√	1	1	×	-	-
N75.10.17 Z2 ⊕ GM3GM4	√	3	3	√	$4/m$	$\mathrm{A_u} \oplus {}^2\mathrm{E_g} \oplus {}^1\mathrm{E_g}$
N75.10.18 Z2 ⊕ Z3Z4	√	3	3	√	$4/m$	$\mathrm{A_u} \oplus {}^2\mathrm{E_u} \oplus {}^1\mathrm{E_u}$
N75.10.19 Z2 ⊕ M3M4	√	1	1	×	-	-
N75.10.20 Z2 ⊕ A3A4	√	1	1	×	-	-
N75.11.1 GM2 ⊕ LD1LE1	√	1	1	√	$\bar{4}$	B
N75.11.2 GM2 ⊕ LD2LE2	√	1	1	√	$\bar{4}$	B
N75.11.3 GM2 ⊕ LD3LE3	√	1	1	√	$\bar{4}$	B
N75.11.4 GM2 ⊕ V1VA1	√	1	1	√	$\bar{4}$	B
N75.11.5 GM2 ⊕ V3VA3	√	1	1	√	$\bar{4}$	B
N75.11.6 A1 ⊕ LD1LE1	√	1	1	√	$4/m$	$\mathrm{A_u}$
N75.11.7 A1 ⊕ LD2LE2	√	1	1	√	$4/m$	$\mathrm{A_u}$
N75.11.8 A1 ⊕ LD3LE3	√	1	1	√	$4/m$	$\mathrm{A_u}$
N75.11.9 A1 ⊕ V1VA1	√	1	1	√	$4/m$	$\mathrm{A_u}$
N75.11.10 A1 ⊕ V2VA2	√	1	1	√	$4/m$	$\mathrm{A_u}$
N75.11.11 A1 ⊕ V3VA3	√	1	1	√	$4/m$	$\mathrm{A_u}$
N75.11.12 M1 ⊕ LD1LE1	√	1	1	√	$4/m$	$\mathrm{A_u}$
N75.11.13 M1 ⊕ LD2LE2	√	1	1	√	$4/m$	$\mathrm{A_u}$
N75.11.14 M1 ⊕ LD3LE3	√	1	1	√	$4/m$	$\mathrm{A_u}$
N75.11.15 M1 ⊕ V1VA1	√	1	1	√	$4/m$	$\mathrm{A_u}$
N75.11.16 M1 ⊕ V2VA2	√	1	1	√	$4/m$	$\mathrm{A_u}$
N75.11.17 M1 ⊕ V3VA3	√	1	1	√	$4/m$	$\mathrm{A_u}$
N75.11.18 Z1 ⊕ LD1LE1	√	1	1	√	$4/m$	$\mathrm{A_u}$
N75.11.19 Z1 ⊕ LD2LE2	√	1	1	√	$4/m$	$\mathrm{A_u}$
N75.11.20 Z1 ⊕ LD3LE3	√	1	1	√	$4/m$	$\mathrm{A_u}$
N75.11.21 Z1 ⊕ V1VA1	√	1	1	×	-	-
N75.11.22 Z1 ⊕ V3VA3	√	1	1	×	-	-
N75.11.23 Z2 ⊕ LD1LE1	√	1	1	√	$4/m$	$\mathrm{A_u}$
N75.11.24 Z2 ⊕ LD2LE2	√	1	1	√	$4/m$	$\mathrm{A_u}$
N75.11.25 Z2 ⊕ LD3LE3	√	1	1	√	$4/m$	$\mathrm{A_u}$
N75.11.26 Z2 ⊕ V1VA1	√	1	1	×	-	-
N75.11.27 Z2 ⊕ V3VA3	√	1	1	×	-	-
N75.13.1 GM2 ⊕ X1	√	1	1	√	$4/m$	$\mathrm{B_g}$
N75.13.2 GM2 ⊕ R1	√	1	1	×	-	-
N75.13.3 A1 ⊕ X1	×	-	-	-	-	-
N75.13.4 A1 ⊕ X2	×	-	-	-	-	-
N75.13.5 A1 ⊕ R1	×	-	-	-	-	-
N75.13.6 A1 ⊕ R2	×	-	-	-	-	-
N75.13.7 M1 ⊕ X1	×	-	-	-	-	-
N75.13.8 M1 ⊕ X2	×	-	-	-	-	-
N75.13.9 M1 ⊕ R1	×	-	-	-	-	-
N75.13.10 M1 ⊕ R2	×	-	-	-	-	-
N75.13.11 Z1 ⊕ X1	×	-	-	-	-	-
N75.13.12 Z1 ⊕ R1	×	-	-	-	-	-
N75.13.13 Z2 ⊕ X1	×	-	-	-	-	-
N75.13.14 Z2 ⊕ R1	×	-	-	-	-	-

Collinear SSGs with parent space group $P4_1$ (No. 76)(continued)

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation

TABLE S226: Collinear SSGs with parent space group $P4_1$ (No. 76).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L76.1.1 GM1	1	$4/m$	$\mathrm{A_g}$
L76.2.1 GM2	1	$4/m$	$\mathrm{B_g}$
L76.2.2 M1	0	-	-

TABLE S227: Coplanar SSGs with parent space group $P4_1$ (No. 76).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P76.1.1 GM1	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{A_u}$
P76.2.1 GM2	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_g}\oplus\mathrm{B_g}\oplus\mathrm{B_u}$
P76.2.2 M1	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_g}$
P76.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_u}\oplus\mathrm{B_g}\oplus\mathrm{B_g}$
P76.3.2 GM2 $\oplus$ M1	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{B_g}$
P76.3.3 M1 $\oplus$ M1	$\surd$	1	1	$\times$	-	-
P76.3.4 M1 $\oplus$ M2	$\surd$	1	1	$\times$	-	-
P76.4.1 GM3GM4	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_u}\oplus{}^2\mathrm{E_g}\oplus{}^1\mathrm{E_g}$
P76.4.2 Z1Z3	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
P76.4.3 Z2Z4	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
P76.4.4 M3M4	$\surd$	1	1	$\times$	-	-
P76.4.5 A1A3	$\surd$	1	1	$\times$	-	-
P76.5.1 LD1LE1	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
P76.5.2 V1VA1	$\surd$	1	1	$\times$	-	-
P76.7.1 X1	$\times$	-	-	-	-	-

TABLE S228: Non-coplanar SSGs with parent space group $P4_1$ (No. 76).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N76.1.1 GM1	$\surd$	3	3	$\surd$	4	$\mathrm{A}\oplus\mathrm{A}\oplus\mathrm{A}$
N76.2.1 GM2	$\surd$	3	3	$\surd$	$\bar{4}$	$\mathrm{A}\oplus\mathrm{A}\oplus\mathrm{B}$
N76.2.2 M1	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{A_u}$
N76.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	4	$\mathrm{A}\oplus\mathrm{B}\oplus\mathrm{B}$
N76.3.2 GM2 $\oplus$ M1	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_g}\oplus\mathrm{B_g}\oplus\mathrm{B_u}$
N76.3.3 M1 $\oplus$ M1	$\surd$	1	1	$\surd$	4	A
N76.3.4 M1 $\oplus$ M2	$\surd$	1	1	$\surd$	$\bar{4}$	A
N76.4.1 GM3GM4	$\surd$	3	3	$\surd$	4	$\mathrm{A}\oplus{}^2\mathrm{E}\oplus{}^1\mathrm{E}$
N76.4.2 Z1Z3	$\surd$	1	1	$\surd$	4	A
N76.4.3 Z2Z4	$\surd$	1	1	$\surd$	4	A
N76.4.4 M3M4	$\surd$	1	1	$\surd$	4	A
N76.4.5 A1A3	$\surd$	1	1	$\surd$	4	A
N76.5.1 LD1LE1	$\surd$	1	1	$\surd$	4	A
N76.5.2 V1VA1	$\surd$	1	1	$\surd$	4	A
N76.7.1 X1	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_g}$

Non-coplanar SSGs with parent space group $P4_1$ (No. 76) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N76.9.1 GM2 ⊕ GM2 ⊕ GM2	√	3	3	√	$\bar{4}$	$\mathrm{B}\oplus\mathrm{B}\oplus\mathrm{B}$
N76.9.2 GM2 ⊕ GM2 ⊕ M1	√	3	3	√	$4/m$	$\mathrm{A_u}\oplus\mathrm{B_g}\oplus\mathrm{B_g}$
N76.9.3 GM2 ⊕ M1 ⊕ M1	√	1	1	√	$\bar{4}$	B
N76.9.4 GM2 ⊕ M1 ⊕ M2	√	1	1	√	4	B
N76.9.5 M1 ⊕ M1 ⊕ M1	√	3	3	√	$4/m$	$\mathrm{A_u}\oplus\mathrm{A_u}\oplus\mathrm{A_u}$
N76.9.6 M1 ⊕ M1 ⊕ M2	√	3	3	√	$4/m$	$\mathrm{A_u}\oplus\mathrm{B_u}\oplus\mathrm{B_u}$
N76.10.1 GM2 ⊕ GM3GM4	√	3	3	√	$\bar{4}$	$\mathrm{B}\oplus{}^2\mathrm{E}\oplus{}^1\mathrm{E}$
N76.10.2 GM2 ⊕ Z1Z3	√	1	1	√	$\bar{4}$	B
N76.10.3 GM2 ⊕ Z2Z4	√	1	1	√	$\bar{4}$	B
N76.10.4 GM2 ⊕ M3M4	√	1	1	√	$\bar{4}$	B
N76.10.5 GM2 ⊕ A1A3	√	1	1	√	$\bar{4}$	B
N76.10.6 M1 ⊕ GM3GM4	√	3	3	√	$4/m$	$\mathrm{A_u}\oplus{}^2\mathrm{E_g}\oplus{}^1\mathrm{E_g}$
N76.10.7 M1 ⊕ Z1Z3	√	1	1	√	$4/m$	$\mathrm{A_u}$
N76.10.8 M1 ⊕ Z2Z4	√	1	1	√	$4/m$	$\mathrm{A_u}$
N76.10.9 M1 ⊕ M3M4	√	3	3	√	$4/m$	$\mathrm{A_u}\oplus{}^2\mathrm{E_u}\oplus{}^1\mathrm{E_u}$
N76.10.10 M1 ⊕ A1A3	√	1	1	√	$4/m$	$\mathrm{A_u}$
N76.10.11 M1 ⊕ A2A4	√	1	1	√	$4/m$	$\mathrm{A_u}$
N76.11.1 GM2 ⊕ LD1LE1	√	1	1	√	$\bar{4}$	B
N76.11.2 GM2 ⊕ V1VA1	√	1	1	√	$\bar{4}$	B
N76.11.3 M1 ⊕ LD1LE1	√	1	1	√	$4/m$	$\mathrm{A_u}$
N76.11.4 M1 ⊕ V1VA1	√	1	1	√	$4/m$	$\mathrm{A_u}$
N76.13.1 GM2 ⊕ X1	√	1	1	√	$4/m$	$\mathrm{B_g}$
N76.13.2 M1 ⊕ X1	×	-	-	-	-	-
N76.13.3 M1 ⊕ X2	×	-	-	-	-	-

TABLE S229: Collinear SSGs with parent space group $P4_2$ (No. 77).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L77.1.1 GM1	1	$4/m$	$\mathrm{A_g}$
L77.2.1 GM2	1	$4/m$	$\mathrm{B_g}$
L77.2.2 A3	0	-	-
L77.2.3 M1	0	-	-
L77.2.4 Z3	0	-	-
L77.2.5 Z4	0	-	-

TABLE S230: Coplanar SSGs with parent space group $P4_2$ (No. 77).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P77.1.1 GM1	√	3	3	√	$4/m$	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{A_u}$
P77.2.1 GM2	√	3	3	√	$4/m$	$\mathrm{A_g}\oplus\mathrm{B_g}\oplus\mathrm{B_u}$
P77.2.2 A3	√	1	1	√	$4/m$	$\mathrm{A_g}$
P77.2.3 M1	√	1	1	√	$4/m$	$\mathrm{A_g}$
P77.2.4 Z3	√	1	1	√	$4/m$	$\mathrm{A_g}$
P77.2.5 Z4	√	1	1	√	$4/m$	$\mathrm{A_g}$

Coplanar SSGs with parent space group $P4_2$ (No. 77) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P77.3.1 GM2 ⊕ GM2	√	3	3	√	$4/m$	$\mathrm{A_u} \oplus \mathrm{B_g} \oplus \mathrm{B_g}$
P77.3.2 GM2 ⊕ A3	√	1	1	×	-	-
P77.3.3 GM2 ⊕ M1	√	1	1	√	$4/m$	$\mathrm{B_g}$
P77.3.4 GM2 ⊕ Z3	√	1	1	×	-	-
P77.3.5 GM2 ⊕ Z4	√	1	1	×	-	-
P77.3.6 A3 ⊕ A3	√	1	1	×	-	-
P77.3.7 A3 ⊕ A4	√	1	1	×	-	-
P77.3.8 A3 ⊕ M1	×	-	-	-	-	-
P77.3.9 A3 ⊕ M2	×	-	-	-	-	-
P77.3.10 A3 ⊕ Z3	×	-	-	-	-	-
P77.3.11 A3 ⊕ Z4	×	-	-	-	-	-
P77.3.12 M1 ⊕ M1	√	1	1	×	-	-
P77.3.13 M1 ⊕ M2	√	1	1	×	-	-
P77.3.14 M1 ⊕ Z3	×	-	-	-	-	-
P77.3.15 M1 ⊕ Z4	×	-	-	-	-	-
P77.3.16 Z3 ⊕ Z3	√	1	1	√	$4/m$	$\mathrm{A_u}$
P77.3.17 Z3 ⊕ Z4	√	1	1	×	-	-
P77.3.18 Z4 ⊕ Z4	√	1	1	√	$4/m$	$\mathrm{A_u}$
P77.4.1 GM3GM4	√	3	3	√	$4/m$	$\mathrm{A_u} \oplus {}^2\mathrm{E_g} \oplus {}^1\mathrm{E_g}$
P77.4.2 Z1Z2	√	1	1	√	$4/m$	$\mathrm{A_u}$
P77.4.3 M3M4	√	1	1	×	-	-
P77.4.4 A1A2	√	1	1	×	-	-
P77.5.1 LD1LE1	√	1	1	√	$4/m$	$\mathrm{A_u}$
P77.5.2 LD3LE3	√	1	1	√	$4/m$	$\mathrm{A_u}$
P77.5.3 V1VA1	√	1	1	×	-	-
P77.5.4 V3VA3	√	1	1	×	-	-
P77.7.1 X1	×	-	-	-	-	-
P77.7.2 R1	×	-	-	-	-	-

TABLE S231: Non-coplanar SSGs with parent space group $P4_2$ (No. 77).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N77.1.1 GM1	√	3	3	√	4	$\mathrm{A} \oplus \mathrm{A} \oplus \mathrm{A}$
N77.2.1 GM2	√	3	3	√	$\bar{4}$	$\mathrm{A} \oplus \mathrm{A} \oplus \mathrm{B}$
N77.2.2 A3	√	3	3	√	$4/m$	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{A_u}$
N77.2.3 M1	√	3	3	√	$4/m$	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{A_u}$
N77.2.4 Z3	√	3	3	√	$4/m$	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{A_u}$
N77.2.5 Z4	√	3	3	√	$4/m$	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{A_u}$
N77.3.1 GM2 ⊕ GM2	√	3	3	√	4	$\mathrm{A} \oplus \mathrm{B} \oplus \mathrm{B}$
N77.3.2 GM2 ⊕ A3	√	3	3	√	$4/m$	$\mathrm{A_g} \oplus \mathrm{B_g} \oplus \mathrm{B_u}$
N77.3.3 GM2 ⊕ M1	√	3	3	√	$4/m$	$\mathrm{A_g} \oplus \mathrm{B_g} \oplus \mathrm{B_u}$
N77.3.4 GM2 ⊕ Z3	√	3	3	√	$4/m$	$\mathrm{A_g} \oplus \mathrm{B_g} \oplus \mathrm{B_u}$
N77.3.5 GM2 ⊕ Z4	√	3	3	√	$4/m$	$\mathrm{A_g} \oplus \mathrm{B_g} \oplus \mathrm{B_u}$
N77.3.6 A3 ⊕ A3	√	1	1	√	4	A
N77.3.7 A3 ⊕ A4	√	1	1	√	$\bar{4}$	A
N77.3.8 A3 ⊕ M1	√	1	1	√	$4/m$	$\mathrm{A_g}$

Non-coplanar SSGs with parent space group $P4_2$ (No. 77) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N77.3.9 A3 $\oplus$ M2	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_g}$
N77.3.10 A3 $\oplus$ Z3	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_g}$
N77.3.11 A3 $\oplus$ Z4	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_g}$
N77.3.12 M1 $\oplus$ M1	$\surd$	1	1	$\surd$	4	A
N77.3.13 M1 $\oplus$ M2	$\surd$	1	1	$\surd$	$\bar{4}$	A
N77.3.14 M1 $\oplus$ Z3	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_g}$
N77.3.15 M1 $\oplus$ Z4	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_g}$
N77.3.16 Z3 $\oplus$ Z3	$\surd$	1	1	$\surd$	4	A
N77.3.17 Z3 $\oplus$ Z4	$\surd$	1	1	$\surd$	$\bar{4}$	A
N77.3.18 Z4 $\oplus$ Z4	$\surd$	1	1	$\surd$	4	A
N77.4.1 GM3GM4	$\surd$	3	3	$\surd$	4	$\mathrm{A} \oplus {}^2\mathrm{E} \oplus {}^1\mathrm{E}$
N77.4.2 Z1Z2	$\surd$	1	1	$\surd$	4	A
N77.4.3 M3M4	$\surd$	1	1	$\surd$	4	A
N77.4.4 A1A2	$\surd$	1	1	$\surd$	4	A
N77.5.1 LD1LE1	$\surd$	1	1	$\surd$	4	A
N77.5.2 LD3LE3	$\surd$	1	1	$\surd$	4	A
N77.5.3 V1VA1	$\surd$	1	1	$\surd$	4	A
N77.5.4 V3VA3	$\surd$	1	1	$\surd$	4	A
N77.7.1 X1	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_g}$
N77.7.2 R1	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_g}$
N77.9.1 GM2 $\oplus$ GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$\bar{4}$	B $\oplus$ B $\oplus$ B
N77.9.2 GM2 $\oplus$ GM2 $\oplus$ A3	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_u} \oplus \mathrm{B_g} \oplus \mathrm{B_g}$
N77.9.3 GM2 $\oplus$ GM2 $\oplus$ M1	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_u} \oplus \mathrm{B_g} \oplus \mathrm{B_g}$
N77.9.4 GM2 $\oplus$ GM2 $\oplus$ Z3	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_u} \oplus \mathrm{B_g} \oplus \mathrm{B_g}$
N77.9.5 GM2 $\oplus$ GM2 $\oplus$ Z4	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_u} \oplus \mathrm{B_g} \oplus \mathrm{B_g}$
N77.9.6 GM2 $\oplus$ A3 $\oplus$ A3	$\surd$	1	1	$\surd$	$\bar{4}$	B
N77.9.7 GM2 $\oplus$ A3 $\oplus$ A4	$\surd$	1	1	$\times$	-	-
N77.9.8 GM2 $\oplus$ A3 $\oplus$ M1	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{B_g}$
N77.9.9 GM2 $\oplus$ A3 $\oplus$ M2	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{B_g}$
N77.9.10 GM2 $\oplus$ A3 $\oplus$ Z3	$\surd$	1	1	$\times$	-	-
N77.9.11 GM2 $\oplus$ A3 $\oplus$ Z4	$\surd$	1	1	$\times$	-	-
N77.9.12 GM2 $\oplus$ M1 $\oplus$ M1	$\surd$	1	1	$\surd$	$\bar{4}$	B
N77.9.13 GM2 $\oplus$ M1 $\oplus$ M2	$\surd$	1	1	$\surd$	4	B
N77.9.14 GM2 $\oplus$ M1 $\oplus$ Z3	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{B_g}$
N77.9.15 GM2 $\oplus$ M1 $\oplus$ Z4	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{B_g}$
N77.9.16 GM2 $\oplus$ Z3 $\oplus$ Z3	$\surd$	1	1	$\surd$	$\bar{4}$	B
N77.9.17 GM2 $\oplus$ Z3 $\oplus$ Z4	$\surd$	1	1	$\times$	-	-
N77.9.18 GM2 $\oplus$ Z4 $\oplus$ Z4	$\surd$	1	1	$\surd$	$\bar{4}$	B
N77.9.19 A3 $\oplus$ A3 $\oplus$ A3	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{A_u}$
N77.9.20 A3 $\oplus$ A3 $\oplus$ A4	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_u} \oplus \mathrm{B_u} \oplus \mathrm{B_u}$
N77.9.21 A3 $\oplus$ A3 $\oplus$ M1	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
N77.9.22 A3 $\oplus$ A3 $\oplus$ M2	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
N77.9.23 A3 $\oplus$ A4 $\oplus$ M1	$\surd$	1	1	$\times$	-	-
N77.9.24 A3 $\oplus$ A3 $\oplus$ Z3	$\surd$	1	1	$\times$	-	-
N77.9.25 A3 $\oplus$ A4 $\oplus$ Z3	$\surd$	1	1	$\times$	-	-
N77.9.26 A3 $\oplus$ A3 $\oplus$ Z4	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $P4_2$ (No. 77) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N77.9.27 A3 ⊕ A4 ⊕ Z4	√	1	1	×	-	-
N77.9.28 A3 ⊕ M1 ⊕ M1	√	1	1	√	$4/m$	$\mathrm{A_u}$
N77.9.29 A3 ⊕ M1 ⊕ M2	√	1	1	√	$4/m$	$\mathrm{B_u}$
N77.9.30 A3 ⊕ M2 ⊕ M2	√	1	1	√	$4/m$	$\mathrm{A_u}$
N77.9.31 A3 ⊕ M1 ⊕ Z3	×	-	-	-	-	-
N77.9.32 A3 ⊕ M2 ⊕ Z3	×	-	-	-	-	-
N77.9.33 A3 ⊕ M1 ⊕ Z4	×	-	-	-	-	-
N77.9.34 A3 ⊕ M2 ⊕ Z4	×	-	-	-	-	-
N77.9.35 A3 ⊕ Z3 ⊕ Z3	√	1	1	√	$4/m$	$\mathrm{A_u}$
N77.9.36 A3 ⊕ Z3 ⊕ Z4	√	1	1	√	$4/m$	$\mathrm{B_u}$
N77.9.37 A3 ⊕ Z4 ⊕ Z4	√	1	1	√	$4/m$	$\mathrm{A_u}$
N77.9.38 M1 ⊕ M1 ⊕ M1	√	3	3	√	$4/m$	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{A_u}$
N77.9.39 M1 ⊕ M1 ⊕ M2	√	3	3	√	$4/m$	$\mathrm{A_u} \oplus \mathrm{B_u} \oplus \mathrm{B_u}$
N77.9.40 M1 ⊕ M1 ⊕ Z3	√	1	1	×	-	-
N77.9.41 M1 ⊕ M2 ⊕ Z3	√	1	1	×	-	-
N77.9.42 M1 ⊕ M1 ⊕ Z4	√	1	1	×	-	-
N77.9.43 M1 ⊕ M2 ⊕ Z4	√	1	1	×	-	-
N77.9.44 M1 ⊕ Z3 ⊕ Z3	√	1	1	√	$4/m$	$\mathrm{A_u}$
N77.9.45 M1 ⊕ Z3 ⊕ Z4	√	1	1	×	-	-
N77.9.46 M1 ⊕ Z4 ⊕ Z4	√	1	1	√	$4/m$	$\mathrm{A_u}$
N77.9.47 Z3 ⊕ Z3 ⊕ Z3	√	3	3	√	$4/m$	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{A_u}$
N77.9.48 Z3 ⊕ Z3 ⊕ Z4	√	3	3	√	$4/m$	$\mathrm{A_u} \oplus \mathrm{B_u} \oplus \mathrm{B_u}$
N77.9.49 Z3 ⊕ Z4 ⊕ Z4	√	3	3	√	$4/m$	$\mathrm{A_u} \oplus \mathrm{B_u} \oplus \mathrm{B_u}$
N77.9.50 Z4 ⊕ Z4 ⊕ Z4	√	3	3	√	$4/m$	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{A_u}$
N77.10.1 GM2 ⊕ GM3GM4	√	3	3	√	$\bar{4}$	$\mathrm{B} \oplus {}^2\mathrm{E} \oplus {}^1\mathrm{E}$
N77.10.2 GM2 ⊕ Z1Z2	√	1	1	√	$\bar{4}$	B
N77.10.3 GM2 ⊕ M3M4	√	1	1	√	$\bar{4}$	B
N77.10.4 GM2 ⊕ A1A2	√	1	1	√	$\bar{4}$	B
N77.10.5 A3 ⊕ GM3GM4	√	3	3	√	$4/m$	$\mathrm{A_u} \oplus {}^2\mathrm{E_g} \oplus {}^1\mathrm{E_g}$
N77.10.6 A3 ⊕ Z1Z2	√	1	1	√	$4/m$	$\mathrm{A_u}$
N77.10.7 A3 ⊕ M3M4	√	1	1	√	$4/m$	$\mathrm{A_u}$
N77.10.8 A3 ⊕ A1A2	√	3	3	√	$4/m$	$\mathrm{A_u} \oplus {}^2\mathrm{E_u} \oplus {}^1\mathrm{E_u}$
N77.10.9 M1 ⊕ GM3GM4	√	3	3	√	$4/m$	$\mathrm{A_u} \oplus {}^2\mathrm{E_g} \oplus {}^1\mathrm{E_g}$
N77.10.10 M1 ⊕ Z1Z2	√	1	1	√	$4/m$	$\mathrm{A_u}$
N77.10.11 M1 ⊕ M3M4	√	3	3	√	$4/m$	$\mathrm{A_u} \oplus {}^2\mathrm{E_u} \oplus {}^1\mathrm{E_u}$
N77.10.12 M1 ⊕ A1A2	√	1	1	√	$4/m$	$\mathrm{A_u}$
N77.10.13 Z3 ⊕ GM3GM4	√	3	3	√	$4/m$	$\mathrm{A_u} \oplus {}^2\mathrm{E_g} \oplus {}^1\mathrm{E_g}$
N77.10.14 Z3 ⊕ Z1Z2	√	3	3	√	$4/m$	$\mathrm{A_u} \oplus {}^2\mathrm{E_u} \oplus {}^1\mathrm{E_u}$
N77.10.15 Z3 ⊕ M3M4	√	1	1	×	-	-
N77.10.16 Z3 ⊕ A1A2	√	1	1	×	-	-
N77.10.17 Z4 ⊕ GM3GM4	√	3	3	√	$4/m$	$\mathrm{A_u} \oplus {}^2\mathrm{E_g} \oplus {}^1\mathrm{E_g}$
N77.10.18 Z4 ⊕ Z1Z2	√	3	3	√	$4/m$	$\mathrm{A_u} \oplus {}^2\mathrm{E_u} \oplus {}^1\mathrm{E_u}$
N77.10.19 Z4 ⊕ M3M4	√	1	1	×	-	-
N77.10.20 Z4 ⊕ A1A2	√	1	1	×	-	-
N77.11.1 GM2 ⊕ LD1LE1	√	1	1	√	$\bar{4}$	B
N77.11.2 GM2 ⊕ LD3LE3	√	1	1	√	$\bar{4}$	B

Non-coplanar SSGs with parent space group $P4_2$ (No. 77) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N77.11.3 GM2 $\oplus$ V1VA1	$\surd$	1	1	$\surd$	$\bar{4}$	B
N77.11.4 GM2 $\oplus$ V3VA3	$\surd$	1	1	$\surd$	$\bar{4}$	B
N77.11.5 A3 $\oplus$ LD1LE1	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
N77.11.6 A3 $\oplus$ LD3LE3	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
N77.11.7 A3 $\oplus$ V1VA1	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
N77.11.8 A3 $\oplus$ V3VA3	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
N77.11.9 M1 $\oplus$ LD1LE1	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
N77.11.10 M1 $\oplus$ LD3LE3	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
N77.11.11 M1 $\oplus$ V1VA1	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
N77.11.12 M1 $\oplus$ V3VA3	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
N77.11.13 Z3 $\oplus$ LD1LE1	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
N77.11.14 Z3 $\oplus$ LD3LE3	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
N77.11.15 Z3 $\oplus$ V1VA1	$\surd$	1	1	$\times$	-	-
N77.11.16 Z3 $\oplus$ V3VA3	$\surd$	1	1	$\times$	-	-
N77.11.17 Z4 $\oplus$ LD1LE1	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
N77.11.18 Z4 $\oplus$ LD3LE3	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
N77.11.19 Z4 $\oplus$ V1VA1	$\surd$	1	1	$\times$	-	-
N77.11.20 Z4 $\oplus$ V3VA3	$\surd$	1	1	$\times$	-	-
N77.13.1 GM2 $\oplus$ X1	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{B_g}$
N77.13.2 GM2 $\oplus$ R1	$\surd$	1	1	$\times$	-	-
N77.13.3 A3 $\oplus$ X1	$\times$	-	-	-	-	-
N77.13.4 A3 $\oplus$ X2	$\times$	-	-	-	-	-
N77.13.5 A3 $\oplus$ R1	$\times$	-	-	-	-	-
N77.13.6 A3 $\oplus$ R2	$\times$	-	-	-	-	-
N77.13.7 M1 $\oplus$ X1	$\times$	-	-	-	-	-
N77.13.8 M1 $\oplus$ X2	$\times$	-	-	-	-	-
N77.13.9 M1 $\oplus$ R1	$\times$	-	-	-	-	-
N77.13.10 M1 $\oplus$ R2	$\times$	-	-	-	-	-
N77.13.11 Z3 $\oplus$ X1	$\times$	-	-	-	-	-
N77.13.12 Z3 $\oplus$ R1	$\times$	-	-	-	-	-
N77.13.13 Z4 $\oplus$ X1	$\times$	-	-	-	-	-
N77.13.14 Z4 $\oplus$ R1	$\times$	-	-	-	-	-

TABLE S232: Collinear SSGs with parent space group $P4_3$ (No. 78).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L78.1.1 GM1	1	$4/m$	$\mathrm{A_g}$
L78.2.1 GM2	1	$4/m$	$\mathrm{B_g}$
L78.2.2 M1	0	-	-

TABLE S233: Coplanar SSGs with parent space group $P4_3$ (No. 78).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P78.1.1 GM1	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{A_u}$
P78.2.1 GM2	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_g} \oplus \mathrm{B_g} \oplus \mathrm{B_u}$
P78.2.2 M1	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_g}$

Coplanar SSGs with parent space group $P4_3$ (No. 78) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P78.3.1 GM2 ⊕ GM2	√	3	3	√	$4/m$	$\mathrm{A_u} \oplus \mathrm{B_g} \oplus \mathrm{B_g}$
P78.3.2 GM2 ⊕ M1	√	1	1	√	$4/m$	$\mathrm{B_g}$
P78.3.3 M1 ⊕ M1	√	1	1	×	-	-
P78.3.4 M1 ⊕ M2	√	1	1	×	-	-
P78.4.1 GM3GM4	√	3	3	√	$4/m$	$\mathrm{A_u} \oplus {}^2\mathrm{E_g} \oplus {}^1\mathrm{E_g}$
P78.4.2 Z1Z3	√	1	1	√	$4/m$	$\mathrm{A_u}$
P78.4.3 Z2Z4	√	1	1	√	$4/m$	$\mathrm{A_u}$
P78.4.4 M3M4	√	1	1	×	-	-
P78.4.5 A1A3	√	1	1	×	-	-
P78.5.1 LD1LE1	√	1	1	√	$4/m$	$\mathrm{A_u}$
P78.5.2 V1VA1	√	1	1	×	-	-
P78.7.1 X1	×	-	-	-	-	-

TABLE S234: Non-coplanar SSGs with parent space group $P4_3$ (No. 78).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N78.1.1 GM1	√	3	3	√	4	$\mathrm{A} \oplus \mathrm{A} \oplus \mathrm{A}$
N78.2.1 GM2	√	3	3	√	$\bar{4}$	$\mathrm{A} \oplus \mathrm{A} \oplus \mathrm{B}$
N78.2.2 M1	√	3	3	√	$4/m$	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{A_u}$
N78.3.1 GM2 ⊕ GM2	√	3	3	√	4	$\mathrm{A} \oplus \mathrm{B} \oplus \mathrm{B}$
N78.3.2 GM2 ⊕ M1	√	3	3	√	$4/m$	$\mathrm{A_g} \oplus \mathrm{B_g} \oplus \mathrm{B_u}$
N78.3.3 M1 ⊕ M1	√	1	1	√	4	A
N78.3.4 M1 ⊕ M2	√	1	1	√	$\bar{4}$	A
N78.4.1 GM3GM4	√	3	3	√	4	$\mathrm{A} \oplus {}^2\mathrm{E} \oplus {}^1\mathrm{E}$
N78.4.2 Z1Z3	√	1	1	√	4	A
N78.4.3 Z2Z4	√	1	1	√	4	A
N78.4.4 M3M4	√	1	1	√	4	A
N78.4.5 A1A3	√	1	1	√	4	A
N78.5.1 LD1LE1	√	1	1	√	4	A
N78.5.2 V1VA1	√	1	1	√	4	A
N78.7.1 X1	√	1	1	√	$4/m$	$\mathrm{A_g}$
N78.9.1 GM2 ⊕ GM2 ⊕ GM2	√	3	3	√	$\bar{4}$	$\mathrm{B} \oplus \mathrm{B} \oplus \mathrm{B}$
N78.9.2 GM2 ⊕ GM2 ⊕ M1	√	3	3	√	$4/m$	$\mathrm{A_u} \oplus \mathrm{B_g} \oplus \mathrm{B_g}$
N78.9.3 GM2 ⊕ M1 ⊕ M1	√	1	1	√	$\bar{4}$	B
N78.9.4 GM2 ⊕ M1 ⊕ M2	√	1	1	√	4	B
N78.9.5 M1 ⊕ M1 ⊕ M1	√	3	3	√	$4/m$	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{A_u}$
N78.9.6 M1 ⊕ M1 ⊕ M2	√	3	3	√	$4/m$	$\mathrm{A_u} \oplus \mathrm{B_u} \oplus \mathrm{B_u}$
N78.10.1 GM2 ⊕ GM3GM4	√	3	3	√	$\bar{4}$	$\mathrm{B} \oplus {}^2\mathrm{E} \oplus {}^1\mathrm{E}$
N78.10.2 GM2 ⊕ Z1Z3	√	1	1	√	$\bar{4}$	B
N78.10.3 GM2 ⊕ Z2Z4	√	1	1	√	$\bar{4}$	B
N78.10.4 GM2 ⊕ M3M4	√	1	1	√	$\bar{4}$	B
N78.10.5 GM2 ⊕ A1A3	√	1	1	√	$\bar{4}$	B
N78.10.6 M1 ⊕ GM3GM4	√	3	3	√	$4/m$	$\mathrm{A_u} \oplus {}^2\mathrm{E_g} \oplus {}^1\mathrm{E_g}$
N78.10.7 M1 ⊕ Z1Z3	√	1	1	√	$4/m$	$\mathrm{A_u}$
N78.10.8 M1 ⊕ Z2Z4	√	1	1	√	$4/m$	$\mathrm{A_u}$
N78.10.9 M1 ⊕ M3M4	√	3	3	√	$4/m$	$\mathrm{A_u} \oplus {}^2\mathrm{E_u} \oplus {}^1\mathrm{E_u}$

Non-coplanar SSGs with parent space group $P4_3$ (No. 78) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N78.10.10 M1 $\oplus$ A1A3	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
N78.10.11 M1 $\oplus$ A2A4	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
N78.11.1 GM2 $\oplus$ LD1LE1	$\surd$	1	1	$\surd$	$\bar{4}$	B
N78.11.2 GM2 $\oplus$ V1VA1	$\surd$	1	1	$\surd$	$\bar{4}$	B
N78.11.3 M1 $\oplus$ LD1LE1	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
N78.11.4 M1 $\oplus$ V1VA1	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
N78.13.1 GM2 $\oplus$ X1	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{B_g}$
N78.13.2 M1 $\oplus$ X1	$\times$	-	-	-	-	-
N78.13.3 M1 $\oplus$ X2	$\times$	-	-	-	-	-

TABLE S235: Collinear SSGs with parent space group $I4$ (No. 79).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L79.1.1 GM1	1	$4/m$	$\mathrm{A_g}$
L79.2.1 GM2	1	$4/m$	$\mathrm{B_g}$
L79.2.2 M1	0	-	-
L79.2.3 M2	0	-	-

TABLE S236: Coplanar SSGs with parent space group $I4$ (No. 79).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P79.1.1 GM1	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{A_u}$
P79.2.1 GM2	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_g} \oplus \mathrm{B_g} \oplus \mathrm{B_u}$
P79.2.2 M1	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_g}$
P79.2.3 M2	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_g}$
P79.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_u} \oplus \mathrm{B_g} \oplus \mathrm{B_g}$
P79.3.2 GM2 $\oplus$ M1	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{B_g}$
P79.3.3 GM2 $\oplus$ M2	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{B_g}$
P79.3.4 M1 $\oplus$ M1	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
P79.3.5 M1 $\oplus$ M2	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{B_u}$
P79.3.6 M2 $\oplus$ M2	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
P79.4.1 GM3GM4	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_u} \oplus {}^2\mathrm{E_g} \oplus {}^1\mathrm{E_g}$
P79.4.2 M3M4	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
P79.5.1 LD1LE1	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
P79.5.2 LD2LE2	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
P79.5.3 LD3LE3	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
P79.7.1 X1	$\times$	-	-	-	-	-
P79.7.2 X2	$\times$	-	-	-	-	-
P79.7.3 P1	$\surd$	1	1	$\times$	-	-

TABLE S237: Non-coplanar SSGs with parent space group $I4$ (No. 79).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N79.1.1 GM1	$\surd$	3	3	$\surd$	4	$\mathrm{A} \oplus \mathrm{A} \oplus \mathrm{A}$

Non-coplanar SSGs with parent space group $I4$ (No. 79) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N79.2.1 GM2	√	3	3	√	$\bar{4}$	$\mathrm{A}\oplus\mathrm{A}\oplus\mathrm{B}$
N79.2.2 M1	√	3	3	√	$4/m$	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{A_u}$
N79.2.3 M2	√	3	3	√	$4/m$	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{A_u}$
N79.3.1 GM2 ⊕ GM2	√	3	3	√	4	$\mathrm{A}\oplus\mathrm{B}\oplus\mathrm{B}$
N79.3.2 GM2 ⊕ M1	√	3	3	√	$4/m$	$\mathrm{A_g}\oplus\mathrm{B_g}\oplus\mathrm{B_u}$
N79.3.3 GM2 ⊕ M2	√	3	3	√	$4/m$	$\mathrm{A_g}\oplus\mathrm{B_g}\oplus\mathrm{B_u}$
N79.3.4 M1 ⊕ M1	√	1	1	√	4	A
N79.3.5 M1 ⊕ M2	√	1	1	√	$\bar{4}$	A
N79.3.6 M2 ⊕ M2	√	1	1	√	4	A
N79.4.1 GM3GM4	√	3	3	√	4	$\mathrm{A}\oplus{}^2\mathrm{E}\oplus{}^1\mathrm{E}$
N79.4.2 M3M4	√	1	1	√	4	A
N79.5.1 LD1LE1	√	1	1	√	4	A
N79.5.2 LD2LE2	√	1	1	√	4	A
N79.5.3 LD3LE3	√	1	1	√	4	A
N79.7.1 X1	√	1	1	√	$4/m$	$\mathrm{A_g}$
N79.7.2 X2	√	1	1	√	$4/m$	$\mathrm{A_g}$
N79.7.3 P1	√	1	1	√	$\bar{4}$	A
N79.9.1 GM2 ⊕ GM2 ⊕ GM2	√	3	3	√	$\bar{4}$	$\mathrm{B}\oplus\mathrm{B}\oplus\mathrm{B}$
N79.9.2 GM2 ⊕ GM2 ⊕ M1	√	3	3	√	$4/m$	$\mathrm{A_u}\oplus\mathrm{B_g}\oplus\mathrm{B_g}$
N79.9.3 GM2 ⊕ GM2 ⊕ M2	√	3	3	√	$4/m$	$\mathrm{A_u}\oplus\mathrm{B_g}\oplus\mathrm{B_g}$
N79.9.4 GM2 ⊕ M1 ⊕ M1	√	1	1	√	$\bar{4}$	B
N79.9.5 GM2 ⊕ M1 ⊕ M2	√	1	1	√	4	B
N79.9.6 GM2 ⊕ M2 ⊕ M2	√	1	1	√	$\bar{4}$	B
N79.9.7 M1 ⊕ M1 ⊕ M1	√	3	3	√	$4/m$	$\mathrm{A_u}\oplus\mathrm{A_u}\oplus\mathrm{A_u}$
N79.9.8 M1 ⊕ M1 ⊕ M2	√	3	3	√	$4/m$	$\mathrm{A_u}\oplus\mathrm{B_u}\oplus\mathrm{B_u}$
N79.9.9 M1 ⊕ M2 ⊕ M2	√	3	3	√	$4/m$	$\mathrm{A_u}\oplus\mathrm{B_u}\oplus\mathrm{B_u}$
N79.9.10 M2 ⊕ M2 ⊕ M2	√	3	3	√	$4/m$	$\mathrm{A_u}\oplus\mathrm{A_u}\oplus\mathrm{A_u}$
N79.10.1 GM2 ⊕ GM3GM4	√	3	3	√	$\bar{4}$	$\mathrm{B}\oplus{}^2\mathrm{E}\oplus{}^1\mathrm{E}$
N79.10.2 GM2 ⊕ M3M4	√	1	1	√	$\bar{4}$	B
N79.10.3 M1 ⊕ GM3GM4	√	3	3	√	$4/m$	$\mathrm{A_u}\oplus{}^2\mathrm{E_g}\oplus{}^1\mathrm{E_g}$
N79.10.4 M1 ⊕ M3M4	√	3	3	√	$4/m$	$\mathrm{A_u}\oplus{}^2\mathrm{E_u}\oplus{}^1\mathrm{E_u}$
N79.10.5 M2 ⊕ GM3GM4	√	3	3	√	$4/m$	$\mathrm{A_u}\oplus{}^2\mathrm{E_g}\oplus{}^1\mathrm{E_g}$
N79.10.6 M2 ⊕ M3M4	√	3	3	√	$4/m$	$\mathrm{A_u}\oplus{}^2\mathrm{E_u}\oplus{}^1\mathrm{E_u}$
N79.11.1 GM2 ⊕ LD1LE1	√	1	1	√	$\bar{4}$	B
N79.11.2 GM2 ⊕ LD2LE2	√	1	1	√	$\bar{4}$	B
N79.11.3 GM2 ⊕ LD3LE3	√	1	1	√	$\bar{4}$	B
N79.11.4 M1 ⊕ LD1LE1	√	1	1	√	$4/m$	$\mathrm{A_u}$
N79.11.5 M1 ⊕ LD2LE2	√	1	1	√	$4/m$	$\mathrm{A_u}$
N79.11.6 M1 ⊕ LD3LE3	√	1	1	√	$4/m$	$\mathrm{A_u}$
N79.11.7 M2 ⊕ LD1LE1	√	1	1	√	$4/m$	$\mathrm{A_u}$
N79.11.8 M2 ⊕ LD2LE2	√	1	1	√	$4/m$	$\mathrm{A_u}$
N79.11.9 M2 ⊕ LD3LE3	√	1	1	√	$4/m$	$\mathrm{A_u}$
N79.13.1 GM2 ⊕ X1	√	1	1	√	$4/m$	$\mathrm{B_g}$
N79.13.2 GM2 ⊕ X2	√	1	1	√	$4/m$	$\mathrm{B_g}$
N79.13.3 GM2 ⊕ P1	√	1	1	×	-	-
N79.13.4 M1 ⊕ X1	×	-	-	-	-	-

Non-coplanar SSGs with parent space group $I4$ (No. 79) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N79.13.5 M1 $\oplus$ X2	$\times$	-	-	-	-	-
N79.13.6 M1 $\oplus$ P1	$\surd$	1	1	$\times$	-	-
N79.13.7 M2 $\oplus$ X1	$\times$	-	-	-	-	-
N79.13.8 M2 $\oplus$ X2	$\times$	-	-	-	-	-
N79.13.9 M2 $\oplus$ P1	$\surd$	1	1	$\times$	-	-

TABLE S238: Collinear SSGs with parent space group $I4_1$ (No. 80).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L80.1.1 GM1	1	$4/m$	$\mathrm{A_g}$
L80.2.1 GM2	1	$4/m$	$\mathrm{B_g}$
L80.2.2 M3	0	-	-
L80.2.3 M4	0	-	-

TABLE S239: Coplanar SSGs with parent space group $I4_1$ (No. 80).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P80.1.1 GM1	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{A_u}$
P80.2.1 GM2	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_g} \oplus \mathrm{B_g} \oplus \mathrm{B_u}$
P80.2.2 M3	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_g}$
P80.2.3 M4	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_g}$
P80.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_u} \oplus \mathrm{B_g} \oplus \mathrm{B_g}$
P80.3.2 GM2 $\oplus$ M3	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{B_g}$
P80.3.3 GM2 $\oplus$ M4	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{B_g}$
P80.3.4 M3 $\oplus$ M3	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
P80.3.5 M3 $\oplus$ M4	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{B_u}$
P80.3.6 M4 $\oplus$ M4	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
P80.4.1 GM3GM4	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_u} \oplus {}^2\mathrm{E_g} \oplus {}^1\mathrm{E_g}$
P80.4.2 M1M2	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
P80.5.1 LD1LE1	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
P80.5.2 LD3LE3	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
P80.7.1 X1	$\times$	-	-	-	-	-
P80.7.2 X2	$\times$	-	-	-	-	-

TABLE S240: Non-coplanar SSGs with parent space group $I4_1$ (No. 80).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N80.1.1 GM1	$\surd$	3	3	$\surd$	4	$\mathrm{A} \oplus \mathrm{A} \oplus \mathrm{A}$
N80.2.1 GM2	$\surd$	3	3	$\surd$	$\bar{4}$	$\mathrm{A} \oplus \mathrm{A} \oplus \mathrm{B}$
N80.2.2 M3	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{A_u}$
N80.2.3 M4	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{A_u}$
N80.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	4	$\mathrm{A} \oplus \mathrm{B} \oplus \mathrm{B}$
N80.3.2 GM2 $\oplus$ M3	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_g} \oplus \mathrm{B_g} \oplus \mathrm{B_u}$
N80.3.3 GM2 $\oplus$ M4	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_g} \oplus \mathrm{B_g} \oplus \mathrm{B_u}$
N80.3.4 M3 $\oplus$ M3	$\surd$	1	1	$\surd$	4	A

Non-coplanar SSGs with parent space group $I4_1$ (No. 80) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N80.3.5 M3 ⊕ M4	√	1	1	√	$\bar{4}$	A
N80.3.6 M4 ⊕ M4	√	1	1	√	4	A
N80.4.1 GM3GM4	√	3	3	√	4	$\mathrm{A} \oplus {}^2\mathrm{E} \oplus {}^1\mathrm{E}$
N80.4.2 M1M2	√	1	1	√	4	A
N80.5.1 LD1LE1	√	1	1	√	4	A
N80.5.2 LD3LE3	√	1	1	√	4	A
N80.7.1 X1	√	1	1	√	$4/m$	$\mathrm{A_g}$
N80.7.2 X2	√	1	1	√	$4/m$	$\mathrm{A_g}$
N80.9.1 GM2 ⊕ GM2 ⊕ GM2	√	3	3	√	$\bar{4}$	$\mathrm{B} \oplus \mathrm{B} \oplus \mathrm{B}$
N80.9.2 GM2 ⊕ GM2 ⊕ M3	√	3	3	√	$4/m$	$\mathrm{A_u} \oplus \mathrm{B_g} \oplus \mathrm{B_g}$
N80.9.3 GM2 ⊕ GM2 ⊕ M4	√	3	3	√	$4/m$	$\mathrm{A_u} \oplus \mathrm{B_g} \oplus \mathrm{B_g}$
N80.9.4 GM2 ⊕ M3 ⊕ M3	√	1	1	√	$\bar{4}$	B
N80.9.5 GM2 ⊕ M3 ⊕ M4	√	1	1	√	4	B
N80.9.6 GM2 ⊕ M4 ⊕ M4	√	1	1	√	$\bar{4}$	B
N80.9.7 M3 ⊕ M3 ⊕ M3	√	3	3	√	$4/m$	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{A_u}$
N80.9.8 M3 ⊕ M3 ⊕ M4	√	3	3	√	$4/m$	$\mathrm{A_u} \oplus \mathrm{B_u} \oplus \mathrm{B_u}$
N80.9.9 M3 ⊕ M4 ⊕ M4	√	3	3	√	$4/m$	$\mathrm{A_u} \oplus \mathrm{B_u} \oplus \mathrm{B_u}$
N80.9.10 M4 ⊕ M4 ⊕ M4	√	3	3	√	$4/m$	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{A_u}$
N80.10.1 GM2 ⊕ GM3GM4	√	3	3	√	$\bar{4}$	$\mathrm{B} \oplus {}^2\mathrm{E} \oplus {}^1\mathrm{E}$
N80.10.2 GM2 ⊕ M1M2	√	1	1	√	$\bar{4}$	B
N80.10.3 M3 ⊕ GM3GM4	√	3	3	√	$4/m$	$\mathrm{A_u} \oplus {}^2\mathrm{E_g} \oplus {}^1\mathrm{E_g}$
N80.10.4 M3 ⊕ M1M2	√	3	3	√	$4/m$	$\mathrm{A_u} \oplus {}^2\mathrm{E_u} \oplus {}^1\mathrm{E_u}$
N80.10.5 M4 ⊕ GM3GM4	√	3	3	√	$4/m$	$\mathrm{A_u} \oplus {}^2\mathrm{E_g} \oplus {}^1\mathrm{E_g}$
N80.10.6 M4 ⊕ M1M2	√	3	3	√	$4/m$	$\mathrm{A_u} \oplus {}^2\mathrm{E_u} \oplus {}^1\mathrm{E_u}$
N80.11.1 GM2 ⊕ LD1LE1	√	1	1	√	$\bar{4}$	B
N80.11.2 GM2 ⊕ LD3LE3	√	1	1	√	$\bar{4}$	B
N80.11.3 M3 ⊕ LD1LE1	√	1	1	√	$4/m$	$\mathrm{A_u}$
N80.11.4 M3 ⊕ LD3LE3	√	1	1	√	$4/m$	$\mathrm{A_u}$
N80.11.5 M4 ⊕ LD1LE1	√	1	1	√	$4/m$	$\mathrm{A_u}$
N80.11.6 M4 ⊕ LD3LE3	√	1	1	√	$4/m$	$\mathrm{A_u}$
N80.13.1 GM2 ⊕ X1	√	1	1	√	$4/m$	$\mathrm{B_g}$
N80.13.2 GM2 ⊕ X2	√	1	1	√	$4/m$	$\mathrm{B_g}$
N80.13.3 M3 ⊕ X1	×	-	-	-	-	-
N80.13.4 M3 ⊕ X2	×	-	-	-	-	-
N80.13.5 M4 ⊕ X1	×	-	-	-	-	-
N80.13.6 M4 ⊕ X2	×	-	-	-	-	-

TABLE S241: Collinear SSGs with parent space group $P\bar{4}$ (No. 81).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L81.1.1 GM1	1	$4/m$	$\mathrm{A_g}$
L81.2.1 GM2	1	$4/m$	$\mathrm{B_g}$
L81.2.2 A1	0	-	-
L81.2.3 M1	0	-	-
L81.2.4 Z1	0	-	-

TABLE S242: Coplanar SSGs with parent space group $P\bar{4}$ (No. 81).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P81.1.1 GM1	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B_u}$
P81.2.1 GM2	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B_g}$
P81.2.2 A1	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_g}$
P81.2.3 M1	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_g}$
P81.2.4 Z1	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_g}$
P81.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{B_g} \oplus \mathrm{B_g} \oplus \mathrm{B_u}$
P81.3.2 GM2 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
P81.3.3 GM2 $\oplus$ M1	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{B_g}$
P81.3.4 GM2 $\oplus$ Z1	$\surd$	1	1	$\times$	-	-
P81.3.5 A1 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
P81.3.6 A1 $\oplus$ A2	$\surd$	1	1	$\times$	-	-
P81.3.7 A1 $\oplus$ M1	$\times$	-	-	-	-	-
P81.3.8 A1 $\oplus$ Z1	$\times$	-	-	-	-	-
P81.3.9 M1 $\oplus$ M1	$\surd$	1	1	$\times$	-	-
P81.3.10 M1 $\oplus$ M2	$\surd$	1	1	$\times$	-	-
P81.3.11 M1 $\oplus$ Z1	$\times$	-	-	-	-	-
P81.3.12 Z1 $\oplus$ Z1	$\surd$	1	1	$\times$	-	-
P81.3.13 Z1 $\oplus$ Z2	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
P81.4.1 GM3GM4	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{B_u} \oplus {}^2\mathrm{E_g} \oplus {}^1\mathrm{E_g}$
P81.4.2 Z3Z4	$\surd$	1	1	$\times$	-	-
P81.4.3 M3M4	$\surd$	1	1	$\times$	-	-
P81.4.4 A3A4	$\surd$	1	1	$\times$	-	-
P81.7.1 X1	$\times$	-	-	-	-	-
P81.7.2 R1	$\times$	-	-	-	-	-
P81.8.1 LD1	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
P81.8.2 V1	$\surd$	1	1	$\times$	-	-

TABLE S243: Non-coplanar SSGs with parent space group $P\bar{4}$ (No. 81).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N81.1.1 GM1	$\surd$	3	3	$\surd$	$\bar{4}$	$\mathrm{A} \oplus \mathrm{A} \oplus \mathrm{A}$
N81.2.1 GM2	$\surd$	3	3	$\surd$	4	$\mathrm{A} \oplus \mathrm{A} \oplus \mathrm{B}$
N81.2.2 A1	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B_u}$
N81.2.3 M1	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B_u}$
N81.2.4 Z1	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B_u}$
N81.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$\bar{4}$	$\mathrm{A} \oplus \mathrm{B} \oplus \mathrm{B}$
N81.3.2 GM2 $\oplus$ A1	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B_g}$
N81.3.3 GM2 $\oplus$ M1	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B_g}$
N81.3.4 GM2 $\oplus$ Z1	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B_g}$
N81.3.5 A1 $\oplus$ A1	$\surd$	1	1	$\surd$	$\bar{4}$	A
N81.3.6 A1 $\oplus$ A2	$\surd$	1	1	$\surd$	4	A
N81.3.7 A1 $\oplus$ M1	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_g}$
N81.3.8 A1 $\oplus$ Z1	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_g}$
N81.3.9 M1 $\oplus$ M1	$\surd$	1	1	$\surd$	$\bar{4}$	A
N81.3.10 M1 $\oplus$ M2	$\surd$	1	1	$\surd$	4	A
N81.3.11 M1 $\oplus$ Z1	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_g}$

Non-coplanar SSGs with parent space group $P\bar{4}$ (No. 81) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N81.3.12 Z1 ⊕ Z1	√	1	1	√	$\bar{4}$	A
N81.3.13 Z1 ⊕ Z2	√	1	1	√	4	A
N81.4.1 GM3GM4	√	3	3	√	$\bar{4}$	$\mathrm{A} \oplus {}^2\mathrm{E} \oplus {}^1\mathrm{E}$
N81.4.2 Z3Z4	√	1	1	√	$\bar{4}$	A
N81.4.3 M3M4	√	1	1	√	$\bar{4}$	A
N81.4.4 A3A4	√	1	1	√	$\bar{4}$	A
N81.7.1 X1	√	1	1	√	$4/m$	$\mathrm{A_g}$
N81.7.2 R1	√	1	1	√	$4/m$	$\mathrm{A_g}$
N81.8.1 LD1	√	1	1	√	4	A
N81.8.2 V1	√	1	1	√	4	A
N81.9.1 GM2 ⊕ GM2 ⊕ GM2	√	3	3	√	4	B ⊕ B ⊕ B
N81.9.2 GM2 ⊕ GM2 ⊕ A1	√	3	3	√	$4/m$	$\mathrm{B_g} \oplus \mathrm{B_g} \oplus \mathrm{B_u}$
N81.9.3 GM2 ⊕ GM2 ⊕ M1	√	3	3	√	$4/m$	$\mathrm{B_g} \oplus \mathrm{B_g} \oplus \mathrm{B_u}$
N81.9.4 GM2 ⊕ GM2 ⊕ Z1	√	3	3	√	$4/m$	$\mathrm{B_g} \oplus \mathrm{B_g} \oplus \mathrm{B_u}$
N81.9.5 GM2 ⊕ A1 ⊕ A1	√	1	1	×	-	-
N81.9.6 GM2 ⊕ A1 ⊕ A2	√	1	1	√	$\bar{4}$	B
N81.9.7 GM2 ⊕ A1 ⊕ M1	√	1	1	√	$4/m$	$\mathrm{B_g}$
N81.9.8 GM2 ⊕ A1 ⊕ Z1	√	1	1	×	-	-
N81.9.9 GM2 ⊕ M1 ⊕ M1	√	1	1	√	4	B
N81.9.10 GM2 ⊕ M1 ⊕ M2	√	1	1	√	$\bar{4}$	B
N81.9.11 GM2 ⊕ M1 ⊕ Z1	√	1	1	√	$4/m$	$\mathrm{B_g}$
N81.9.12 GM2 ⊕ Z1 ⊕ Z1	√	1	1	×	-	-
N81.9.13 GM2 ⊕ Z1 ⊕ Z2	√	1	1	√	$\bar{4}$	B
N81.9.14 A1 ⊕ A1 ⊕ A1	√	3	3	√	$4/m$	$\mathrm{B_u} \oplus \mathrm{B_u} \oplus \mathrm{B_u}$
N81.9.15 A1 ⊕ A1 ⊕ A2	√	3	3	√	$4/m$	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B_u}$
N81.9.16 A1 ⊕ A1 ⊕ M1	√	1	1	×	-	-
N81.9.17 A1 ⊕ A2 ⊕ M1	√	1	1	√	$4/m$	$\mathrm{A_u}$
N81.9.18 A1 ⊕ A1 ⊕ Z1	√	1	1	×	-	-
N81.9.19 A1 ⊕ A2 ⊕ Z1	√	1	1	×	-	-
N81.9.20 A1 ⊕ M1 ⊕ M1	√	1	1	√	$4/m$	$\mathrm{B_u}$
N81.9.21 A1 ⊕ M1 ⊕ M2	√	1	1	√	$4/m$	$\mathrm{A_u}$
N81.9.22 A1 ⊕ M1 ⊕ Z1	×	-	-	-	-	-
N81.9.23 A1 ⊕ M1 ⊕ Z2	×	-	-	-	-	-
N81.9.24 A1 ⊕ Z1 ⊕ Z1	√	1	1	√	$4/m$	$\mathrm{B_u}$
N81.9.25 A1 ⊕ Z1 ⊕ Z2	√	1	1	√	$4/m$	$\mathrm{A_u}$
N81.9.26 M1 ⊕ M1 ⊕ M1	√	3	3	√	$4/m$	$\mathrm{B_u} \oplus \mathrm{B_u} \oplus \mathrm{B_u}$
N81.9.27 M1 ⊕ M1 ⊕ M2	√	3	3	√	$4/m$	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B_u}$
N81.9.28 M1 ⊕ M1 ⊕ Z1	√	1	1	×	-	-
N81.9.29 M1 ⊕ M2 ⊕ Z1	√	1	1	×	-	-
N81.9.30 M1 ⊕ Z1 ⊕ Z1	√	1	1	×	-	-
N81.9.31 M1 ⊕ Z1 ⊕ Z2	√	1	1	√	$4/m$	$\mathrm{A_u}$
N81.9.32 Z1 ⊕ Z1 ⊕ Z1	√	3	3	√	$4/m$	$\mathrm{B_u} \oplus \mathrm{B_u} \oplus \mathrm{B_u}$
N81.9.33 Z1 ⊕ Z1 ⊕ Z2	√	3	3	√	$4/m$	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B_u}$
N81.10.1 GM2 ⊕ GM3GM4	√	3	3	√	4	$\mathrm{B} \oplus {}^2\mathrm{E} \oplus {}^1\mathrm{E}$
N81.10.2 GM2 ⊕ Z3Z4	√	1	1	×	-	-
N81.10.3 GM2 ⊕ M3M4	√	1	1	√	4	B

Non-coplanar SSGs with parent space group $P\bar{4}$ (No. 81) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N81.10.4 GM2 $\oplus$ A3A4	$\surd$	1	1	$\times$	-	-
N81.10.5 A1 $\oplus$ GM3GM4	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{B_u} \oplus {}^2\mathrm{E_g} \oplus {}^1\mathrm{E_g}$
N81.10.6 A1 $\oplus$ Z3Z4	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{B_u}$
N81.10.7 A1 $\oplus$ M3M4	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{B_u}$
N81.10.8 A1 $\oplus$ A3A4	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{B_u} \oplus {}^2\mathrm{E_u} \oplus {}^1\mathrm{E_u}$
N81.10.9 M1 $\oplus$ GM3GM4	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{B_u} \oplus {}^2\mathrm{E_g} \oplus {}^1\mathrm{E_g}$
N81.10.10 M1 $\oplus$ Z3Z4	$\surd$	1	1	$\times$	-	-
N81.10.11 M1 $\oplus$ M3M4	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{B_u} \oplus {}^2\mathrm{E_u} \oplus {}^1\mathrm{E_u}$
N81.10.12 M1 $\oplus$ A3A4	$\surd$	1	1	$\times$	-	-
N81.10.13 Z1 $\oplus$ GM3GM4	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{B_u} \oplus {}^2\mathrm{E_g} \oplus {}^1\mathrm{E_g}$
N81.10.14 Z1 $\oplus$ Z3Z4	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{B_u} \oplus {}^2\mathrm{E_u} \oplus {}^1\mathrm{E_u}$
N81.10.15 Z1 $\oplus$ M3M4	$\surd$	1	1	$\times$	-	-
N81.10.16 Z1 $\oplus$ A3A4	$\surd$	1	1	$\times$	-	-
N81.13.1 GM2 $\oplus$ X1	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{B_g}$
N81.13.2 GM2 $\oplus$ R1	$\surd$	1	1	$\times$	-	-
N81.13.3 A1 $\oplus$ X1	$\times$	-	-	-	-	-
N81.13.4 A1 $\oplus$ R1	$\times$	-	-	-	-	-
N81.13.5 M1 $\oplus$ X1	$\times$	-	-	-	-	-
N81.13.6 M1 $\oplus$ X2	$\times$	-	-	-	-	-
N81.13.7 M1 $\oplus$ R1	$\times$	-	-	-	-	-
N81.13.8 M1 $\oplus$ R2	$\times$	-	-	-	-	-
N81.13.9 Z1 $\oplus$ X1	$\times$	-	-	-	-	-
N81.13.10 Z1 $\oplus$ R1	$\times$	-	-	-	-	-
N81.14.1 GM2 $\oplus$ LD1	$\surd$	1	1	$\surd$	$\bar{4}$	B
N81.14.2 GM2 $\oplus$ V1	$\surd$	1	1	$\surd$	$\bar{4}$	B
N81.14.3 A1 $\oplus$ LD1	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
N81.14.4 A1 $\oplus$ V1	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
N81.14.5 M1 $\oplus$ LD1	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
N81.14.6 M1 $\oplus$ V1	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
N81.14.7 Z1 $\oplus$ LD1	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
N81.14.8 Z1 $\oplus$ V1	$\surd$	1	1	$\times$	-	-

TABLE S244: Collinear SSGs with parent space group $I\bar{4}$ (No. 82).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L82.1.1 GM1	1	$4/m$	$\mathrm{A_g}$
L82.2.1 GM2	1	$4/m$	$\mathrm{B_g}$
L82.2.2 M1	0	-	-

TABLE S245: Coplanar SSGs with parent space group $I\bar{4}$ (No. 82).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P82.1.1 GM1	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B_u}$
P82.2.1 GM2	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B_g}$
P82.2.2 M1	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_g}$

Coplanar SSGs with parent space group $I\bar{4}$ (No. 82) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P82.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{B_g} \oplus \mathrm{B_g} \oplus \mathrm{B_u}$
P82.3.2 GM2 $\oplus$ M1	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{B_g}$
P82.3.3 M1 $\oplus$ M1	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{B_u}$
P82.3.4 M1 $\oplus$ M2	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
P82.4.1 GM3GM4	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{B_u} \oplus {}^2\mathrm{E_g} \oplus {}^1\mathrm{E_g}$
P82.4.2 M3M4	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{B_u}$
P82.4.3 P1PA1	$\surd$	1	1	$\times$	-	-
P82.7.1 X1	$\times$	-	-	-	-	-
P82.8.1 LD1	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$

TABLE S246: Non-coplanar SSGs with parent space group $I\bar{4}$ (No. 82).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N82.1.1 GM1	$\surd$	3	3	$\surd$	$\bar{4}$	$\mathrm{A} \oplus \mathrm{A} \oplus \mathrm{A}$
N82.2.1 GM2	$\surd$	3	3	$\surd$	4	$\mathrm{A} \oplus \mathrm{A} \oplus \mathrm{B}$
N82.2.2 M1	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B_u}$
N82.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$\bar{4}$	$\mathrm{A} \oplus \mathrm{B} \oplus \mathrm{B}$
N82.3.2 GM2 $\oplus$ M1	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B_g}$
N82.3.3 M1 $\oplus$ M1	$\surd$	1	1	$\surd$	$\bar{4}$	A
N82.3.4 M1 $\oplus$ M2	$\surd$	1	1	$\surd$	4	A
N82.4.1 GM3GM4	$\surd$	3	3	$\surd$	$\bar{4}$	$\mathrm{A} \oplus {}^2\mathrm{E} \oplus {}^1\mathrm{E}$
N82.4.2 M3M4	$\surd$	1	1	$\surd$	$\bar{4}$	A
N82.4.3 P1PA1	$\surd$	1	1	$\surd$	$\bar{4}$	A
N82.7.1 X1	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_g}$
N82.8.1 LD1	$\surd$	1	1	$\surd$	4	A
N82.9.1 GM2 $\oplus$ GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	4	$\mathrm{B} \oplus \mathrm{B} \oplus \mathrm{B}$
N82.9.2 GM2 $\oplus$ GM2 $\oplus$ M1	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{B_g} \oplus \mathrm{B_g} \oplus \mathrm{B_u}$
N82.9.3 GM2 $\oplus$ M1 $\oplus$ M1	$\surd$	1	1	$\surd$	4	B
N82.9.4 GM2 $\oplus$ M1 $\oplus$ M2	$\surd$	1	1	$\surd$	$\bar{4}$	B
N82.9.5 M1 $\oplus$ M1 $\oplus$ M1	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{B_u} \oplus \mathrm{B_u} \oplus \mathrm{B_u}$
N82.9.6 M1 $\oplus$ M1 $\oplus$ M2	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B_u}$
N82.10.1 GM2 $\oplus$ GM3GM4	$\surd$	3	3	$\surd$	4	$\mathrm{B} \oplus {}^2\mathrm{E} \oplus {}^1\mathrm{E}$
N82.10.2 GM2 $\oplus$ M3M4	$\surd$	1	1	$\surd$	4	B
N82.10.3 GM2 $\oplus$ P1PA1	$\surd$	1	1	$\times$	-	-
N82.10.4 M1 $\oplus$ GM3GM4	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{B_u} \oplus {}^2\mathrm{E_g} \oplus {}^1\mathrm{E_g}$
N82.10.5 M1 $\oplus$ M3M4	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{B_u} \oplus {}^2\mathrm{E_u} \oplus {}^1\mathrm{E_u}$
N82.10.6 M1 $\oplus$ P1PA1	$\surd$	1	1	$\times$	-	-
N82.10.7 M1 $\oplus$ P3PA3	$\surd$	1	1	$\times$	-	-
N82.13.1 GM2 $\oplus$ X1	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{B_g}$
N82.13.2 M1 $\oplus$ X1	$\times$	-	-	-	-	-
N82.13.3 M1 $\oplus$ X2	$\times$	-	-	-	-	-
N82.14.1 GM2 $\oplus$ LD1	$\surd$	1	1	$\surd$	$\bar{4}$	B
N82.14.2 M1 $\oplus$ LD1	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$

TABLE S247: Collinear SSGs with parent space group $P4/m$ (No. 83).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L83.1.1 $\mathrm{GM1}^{+}$	1	$4/m$	$\mathrm{A_g}$
L83.2.1 $\mathrm{GM1}^{-}$	0	-	-
L83.2.2 $\mathrm{GM2}^{+}$	1	$4/m$	$\mathrm{B_g}$
L83.2.3 $\mathrm{GM2}^{-}$	0	-	-
L83.2.4 $\mathrm{A1}^{+}$	0	-	-
L83.2.5 $\mathrm{M1}^{+}$	0	-	-
L83.2.6 $\mathrm{M1}^{-}$	0	-	-
L83.2.7 $\mathrm{Z1}^{+}$	0	-	-
L83.2.8 $\mathrm{Z2}^{+}$	0	-	-

TABLE S248: Coplanar SSGs with parent space group $P4/m$ (No. 83).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P83.1.1 $\mathrm{GM1}^{+}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_g}\oplus\mathrm{A_g}$
P83.2.1 $\mathrm{GM1}^{-}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_g}\oplus\mathrm{A_u}$
P83.2.2 $\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_g}\oplus\mathrm{B_g}$
P83.2.3 $\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_g}\oplus\mathrm{B_u}$
P83.2.4 $\mathrm{A1}^{+}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_g}$
P83.2.5 $\mathrm{M1}^{+}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_g}$
P83.2.6 $\mathrm{M1}^{-}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_g}$
P83.2.7 $\mathrm{Z1}^{+}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_g}$
P83.2.8 $\mathrm{Z2}^{+}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_g}$
P83.3.1 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}$	$\surd$	0	0	$\surd$	-	-
P83.3.2 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{B_g}\oplus\mathrm{B_u}$
P83.3.3 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
P83.3.4 $\mathrm{GM1}^{-}\oplus\mathrm{A1}^{+}$	$\surd$	1	1	$\times$	-	-
P83.3.5 $\mathrm{GM1}^{-}\oplus\mathrm{M1}^{+}$	$\surd$	1	1	$\times$	-	-
P83.3.6 $\mathrm{GM1}^{-}\oplus\mathrm{M1}^{-}$	$\surd$	1	1	$\times$	-	-
P83.3.7 $\mathrm{GM1}^{-}\oplus\mathrm{Z1}^{+}$	$\surd$	1	1	$\times$	-	-
P83.3.8 $\mathrm{GM1}^{-}\oplus\mathrm{Z2}^{+}$	$\surd$	1	1	$\times$	-	-
P83.3.9 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{B_g}\oplus\mathrm{B_g}$
P83.3.10 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_u}\oplus\mathrm{B_g}$
P83.3.11 $\mathrm{GM2}^{+}\oplus\mathrm{A1}^{+}$	$\surd$	1	0	$\times$	-	-
P83.3.12 $\mathrm{GM2}^{+}\oplus\mathrm{M1}^{+}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{B_g}$
P83.3.13 $\mathrm{GM2}^{+}\oplus\mathrm{M1}^{-}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{B_g}$
P83.3.14 $\mathrm{GM2}^{+}\oplus\mathrm{Z1}^{+}$	$\surd$	1	0	$\times$	-	-
P83.3.15 $\mathrm{GM2}^{+}\oplus\mathrm{Z2}^{+}$	$\surd$	1	0	$\times$	-	-
P83.3.16 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
P83.3.17 $\mathrm{GM2}^{-}\oplus\mathrm{A1}^{+}$	$\surd$	1	1	$\times$	-	-
P83.3.18 $\mathrm{GM2}^{-}\oplus\mathrm{M1}^{+}$	$\surd$	1	1	$\times$	-	-
P83.3.19 $\mathrm{GM2}^{-}\oplus\mathrm{M1}^{-}$	$\surd$	1	1	$\times$	-	-
P83.3.20 $\mathrm{GM2}^{-}\oplus\mathrm{Z1}^{+}$	$\surd$	1	1	$\times$	-	-
P83.3.21 $\mathrm{GM2}^{-}\oplus\mathrm{Z2}^{+}$	$\surd$	1	1	$\times$	-	-
P83.3.22 $\mathrm{A1}^{+}\oplus\mathrm{A1}^{+}$	$\surd$	1	0	$\times$	-	-
P83.3.23 $\mathrm{A1}^{+}\oplus\mathrm{A1}^{-}$	$\surd$	1	1	$\times$	-	-
P83.3.24 $\mathrm{A1}^{+}\oplus\mathrm{A2}^{+}$	$\surd$	1	0	$\times$	-	-

Coplanar SSGs with parent space group $P4/m$ (No. 83) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P83.3.25 $A1^+ \oplus A2^-$	$\surd$	1	1	$\times$	-	-
P83.3.26 $A1^+ \oplus M1^+$	$\times$	-	-	-	-	-
P83.3.27 $A1^+ \oplus M2^+$	$\times$	-	-	-	-	-
P83.3.28 $A1^+ \oplus M1^-$	$\times$	-	-	-	-	-
P83.3.29 $A1^+ \oplus M2^-$	$\times$	-	-	-	-	-
P83.3.30 $A1^+ \oplus Z1^+$	$\times$	-	-	-	-	-
P83.3.31 $A1^+ \oplus Z1^-$	$\times$	-	-	-	-	-
P83.3.32 $A1^+ \oplus Z2^+$	$\times$	-	-	-	-	-
P83.3.33 $A1^+ \oplus Z2^-$	$\times$	-	-	-	-	-
P83.3.34 $M1^+ \oplus M1^+$	$\surd$	1	0	$\times$	-	-
P83.3.35 $M1^+ \oplus M2^+$	$\surd$	1	0	$\times$	-	-
P83.3.36 $M1^+ \oplus M1^-$	$\surd$	1	1	$\times$	-	-
P83.3.37 $M1^+ \oplus M2^-$	$\surd$	1	1	$\times$	-	-
P83.3.38 $M1^+ \oplus Z1^+$	$\times$	-	-	-	-	-
P83.3.39 $M1^+ \oplus Z2^+$	$\times$	-	-	-	-	-
P83.3.40 $M1^- \oplus M1^-$	$\surd$	1	0	$\times$	-	-
P83.3.41 $M1^- \oplus M2^-$	$\surd$	1	0	$\times$	-	-
P83.3.42 $M1^- \oplus Z1^+$	$\times$	-	-	-	-	-
P83.3.43 $M1^- \oplus Z2^+$	$\times$	-	-	-	-	-
P83.3.44 $Z1^+ \oplus Z1^+$	$\surd$	1	0	$\times$	-	-
P83.3.45 $Z1^+ \oplus Z1^-$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
P83.3.46 $Z1^+ \oplus Z2^+$	$\surd$	1	0	$\times$	-	-
P83.3.47 $Z1^+ \oplus Z2^-$	$\surd$	1	1	$\times$	-	-
P83.3.48 $Z2^+ \oplus Z2^+$	$\surd$	1	0	$\times$	-	-
P83.3.49 $Z2^+ \oplus Z2^-$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
P83.4.1 $GM3^+GM4^+$	$\surd$	2	2	$\surd$	$4/m$	${}^2\mathrm{E_g} \oplus {}^1\mathrm{E_g}$
P83.4.2 $GM3^-GM4^-$	$\surd$	0	0	$\surd$	-	-
P83.4.3 $Z3^+Z4^+$	$\surd$	1	0	$\times$	-	-
P83.4.4 $M3^+M4^+$	$\surd$	1	0	$\times$	-	-
P83.4.5 $M3^-M4^-$	$\surd$	1	0	$\times$	-	-
P83.4.6 $A3^+A4^+$	$\surd$	1	0	$\times$	-	-
P83.7.1 $X1^+$	$\times$	-	-	-	-	-
P83.7.2 $X1^-$	$\times$	-	-	-	-	-
P83.7.3 $R1^+$	$\times$	-	-	-	-	-
P83.8.1 LD1	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
P83.8.2 LD2	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
P83.8.3 V1	$\surd$	1	1	$\times$	-	-

TABLE S249: Non-coplanar SSGs with parent space group $P4/m$ (No. 83).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N83.1.1 $GM1^+$	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{A_g}$
N83.2.1 $GM1^-$	$\surd$	2	2	$\surd$	4	$\mathrm{A} \oplus \mathrm{A}$
N83.2.2 $GM2^+$	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B_g}$
N83.2.3 $GM2^-$	$\surd$	2	2	$\surd$	$\bar{4}$	$\mathrm{A} \oplus \mathrm{A}$
N83.2.4 $A1^+$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_g} \oplus \mathrm{A_g}$

Non-coplanar SSGs with parent space group $P4/m$ (No. 83) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N83.2.5 $\mathrm{M1}^{+}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_g}\oplus\mathrm{A_g}$
N83.2.6 $\mathrm{M1}^{-}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_g}\oplus\mathrm{A_g}$
N83.2.7 $\mathrm{Z1}^{+}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_g}\oplus\mathrm{A_g}$
N83.2.8 $\mathrm{Z2}^{+}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_g}\oplus\mathrm{A_g}$
N83.3.1 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}$	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_g}\oplus\mathrm{A_u}\oplus\mathrm{A_u}$
N83.3.2 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	$\bar{4}$	$\mathrm{A}\oplus\mathrm{B}$
N83.3.3 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_g}\oplus\mathrm{A_u}\oplus\mathrm{B_u}$
N83.3.4 $\mathrm{GM1}^{-}\oplus\mathrm{A1}^{+}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_g}\oplus\mathrm{A_u}$
N83.3.5 $\mathrm{GM1}^{-}\oplus\mathrm{M1}^{+}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_g}\oplus\mathrm{A_u}$
N83.3.6 $\mathrm{GM1}^{-}\oplus\mathrm{M1}^{-}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_g}\oplus\mathrm{A_u}$
N83.3.7 $\mathrm{GM1}^{-}\oplus\mathrm{Z1}^{+}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_g}\oplus\mathrm{A_u}$
N83.3.8 $\mathrm{GM1}^{-}\oplus\mathrm{Z2}^{+}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_g}\oplus\mathrm{A_u}$
N83.3.9 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}$	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_g}\oplus\mathrm{B_g}\oplus\mathrm{B_g}$
N83.3.10 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	4	$\mathrm{A}\oplus\mathrm{B}$
N83.3.11 $\mathrm{GM2}^{+}\oplus\mathrm{A1}^{+}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_g}\oplus\mathrm{B_g}$
N83.3.12 $\mathrm{GM2}^{+}\oplus\mathrm{M1}^{+}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_g}\oplus\mathrm{B_g}$
N83.3.13 $\mathrm{GM2}^{+}\oplus\mathrm{M1}^{-}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_g}\oplus\mathrm{B_g}$
N83.3.14 $\mathrm{GM2}^{+}\oplus\mathrm{Z1}^{+}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_g}\oplus\mathrm{B_g}$
N83.3.15 $\mathrm{GM2}^{+}\oplus\mathrm{Z2}^{+}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_g}\oplus\mathrm{B_g}$
N83.3.16 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_g}\oplus\mathrm{B_u}\oplus\mathrm{B_u}$
N83.3.17 $\mathrm{GM2}^{-}\oplus\mathrm{A1}^{+}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_g}\oplus\mathrm{B_u}$
N83.3.18 $\mathrm{GM2}^{-}\oplus\mathrm{M1}^{+}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_g}\oplus\mathrm{B_u}$
N83.3.19 $\mathrm{GM2}^{-}\oplus\mathrm{M1}^{-}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_g}\oplus\mathrm{B_u}$
N83.3.20 $\mathrm{GM2}^{-}\oplus\mathrm{Z1}^{+}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_g}\oplus\mathrm{B_u}$
N83.3.21 $\mathrm{GM2}^{-}\oplus\mathrm{Z2}^{+}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_g}\oplus\mathrm{B_u}$
N83.3.22 $\mathrm{A1}^{+}\oplus\mathrm{A1}^{+}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_g}$
N83.3.23 $\mathrm{A1}^{+}\oplus\mathrm{A1}^{-}$	$\surd$	1	1	$\surd$	4	A
N83.3.24 $\mathrm{A1}^{+}\oplus\mathrm{A2}^{+}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_g}$
N83.3.25 $\mathrm{A1}^{+}\oplus\mathrm{A2}^{-}$	$\surd$	1	1	$\surd$	$\bar{4}$	A
N83.3.26 $\mathrm{A1}^{+}\oplus\mathrm{M1}^{+}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_g}$
N83.3.27 $\mathrm{A1}^{+}\oplus\mathrm{M2}^{+}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_g}$
N83.3.28 $\mathrm{A1}^{+}\oplus\mathrm{M1}^{-}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_g}$
N83.3.29 $\mathrm{A1}^{+}\oplus\mathrm{M2}^{-}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_g}$
N83.3.30 $\mathrm{A1}^{+}\oplus\mathrm{Z1}^{+}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_g}$
N83.3.31 $\mathrm{A1}^{+}\oplus\mathrm{Z1}^{-}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_g}$
N83.3.32 $\mathrm{A1}^{+}\oplus\mathrm{Z2}^{+}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_g}$
N83.3.33 $\mathrm{A1}^{+}\oplus\mathrm{Z2}^{-}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_g}$
N83.3.34 $\mathrm{M1}^{+}\oplus\mathrm{M1}^{+}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_g}$
N83.3.35 $\mathrm{M1}^{+}\oplus\mathrm{M2}^{+}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_g}$
N83.3.36 $\mathrm{M1}^{+}\oplus\mathrm{M1}^{-}$	$\surd$	1	1	$\surd$	4	A
N83.3.37 $\mathrm{M1}^{+}\oplus\mathrm{M2}^{-}$	$\surd$	1	1	$\surd$	$\bar{4}$	A
N83.3.38 $\mathrm{M1}^{+}\oplus\mathrm{Z1}^{+}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_g}$
N83.3.39 $\mathrm{M1}^{+}\oplus\mathrm{Z2}^{+}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_g}$
N83.3.40 $\mathrm{M1}^{-}\oplus\mathrm{M1}^{-}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_g}$
N83.3.41 $\mathrm{M1}^{-}\oplus\mathrm{M2}^{-}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_g}$
N83.3.42 $\mathrm{M1}^{-}\oplus\mathrm{Z1}^{+}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_g}$

Non-coplanar SSGs with parent space group $P4/m$ (No. 83) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N83.3.43 $\mathrm{M1^-} \oplus \mathrm{Z2^+}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_g}$
N83.3.44 $\mathrm{Z1^+} \oplus \mathrm{Z1^+}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_g}$
N83.3.45 $\mathrm{Z1^+} \oplus \mathrm{Z1^-}$	$\surd$	1	1	$\surd$	4	A
N83.3.46 $\mathrm{Z1^+} \oplus \mathrm{Z2^+}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_g}$
N83.3.47 $\mathrm{Z1^+} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\surd$	$\bar{4}$	A
N83.3.48 $\mathrm{Z2^+} \oplus \mathrm{Z2^+}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_g}$
N83.3.49 $\mathrm{Z2^+} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\surd$	4	A
N83.4.1 $\mathrm{GM3^+GM4^+}$	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_g} \oplus {}^2\mathrm{E_g} \oplus {}^1\mathrm{E_g}$
N83.4.2 $\mathrm{GM3^-GM4^-}$	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_g} \oplus {}^2\mathrm{E_u} \oplus {}^1\mathrm{E_u}$
N83.4.3 $\mathrm{Z3^+Z4^+}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_g}$
N83.4.4 $\mathrm{M3^+M4^+}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_g}$
N83.4.5 $\mathrm{M3^-M4^-}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_g}$
N83.4.6 $\mathrm{A3^+A4^+}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_g}$
N83.7.1 $\mathrm{X1^+}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_g}$
N83.7.2 $\mathrm{X1^-}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_g}$
N83.7.3 $\mathrm{R1^+}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_g}$
N83.8.1 LD1	$\surd$	1	1	$\surd$	4	A
N83.8.2 LD2	$\surd$	1	1	$\surd$	4	A
N83.8.3 V1	$\surd$	1	1	$\surd$	4	A
N83.9.1 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM1^-}$	$\surd$	0	0	$\surd$	-	-
N83.9.2 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM2^+}$	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{B_g} \oplus \mathrm{B_u} \oplus \mathrm{B_u}$
N83.9.3 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM2^-}$	$\surd$	0	0	$\surd$	-	-
N83.9.4 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{A1^+}$	$\surd$	0	0	$\surd$	-	-
N83.9.5 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{M1^+}$	$\surd$	0	0	$\surd$	-	-
N83.9.6 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{M1^-}$	$\surd$	0	0	$\surd$	-	-
N83.9.7 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{Z1^+}$	$\surd$	0	0	$\surd$	-	-
N83.9.8 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{Z2^+}$	$\surd$	0	0	$\surd$	-	-
N83.9.9 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{GM2^+}$	$\surd$	2	2	$\surd$	4	$\mathrm{B} \oplus \mathrm{B}$
N83.9.10 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{GM2^-}$	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_u} \oplus \mathrm{B_g} \oplus \mathrm{B_u}$
N83.9.11 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{A1^+}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{B_g} \oplus \mathrm{B_u}$
N83.9.12 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{M1^+}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{B_g} \oplus \mathrm{B_u}$
N83.9.13 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{B_g} \oplus \mathrm{B_u}$
N83.9.14 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{Z1^+}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{B_g} \oplus \mathrm{B_u}$
N83.9.15 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{Z2^+}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{B_g} \oplus \mathrm{B_u}$
N83.9.16 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{GM2^-}$	$\surd$	0	0	$\surd$	-	-
N83.9.17 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{A1^+}$	$\surd$	0	0	$\surd$	-	-
N83.9.18 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{M1^+}$	$\surd$	0	0	$\surd$	-	-
N83.9.19 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{M1^-}$	$\surd$	0	0	$\surd$	-	-
N83.9.20 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{Z1^+}$	$\surd$	0	0	$\surd$	-	-
N83.9.21 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{Z2^+}$	$\surd$	0	0	$\surd$	-	-
N83.9.22 $\mathrm{GM1^-} \oplus \mathrm{A1^+} \oplus \mathrm{A1^+}$	$\surd$	1	0	$\times$	-	-
N83.9.23 $\mathrm{GM1^-} \oplus \mathrm{A1^+} \oplus \mathrm{A1^-}$	$\surd$	1	1	$\times$	-	-
N83.9.24 $\mathrm{GM1^-} \oplus \mathrm{A1^+} \oplus \mathrm{A2^+}$	$\surd$	1	0	$\times$	-	-
N83.9.25 $\mathrm{GM1^-} \oplus \mathrm{A1^+} \oplus \mathrm{A2^-}$	$\surd$	1	1	$\times$	-	-
N83.9.26 $\mathrm{GM1^-} \oplus \mathrm{A1^+} \oplus \mathrm{M1^+}$	$\surd$	1	0	$\times$	-	-
N83.9.27 $\mathrm{GM1^-} \oplus \mathrm{A1^+} \oplus \mathrm{M2^+}$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $P4/m$ (No. 83) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N83.9.28 $\mathrm{GM1^-} \oplus \mathrm{A1^+} \oplus \mathrm{M1^-}$	$\surd$	1	0	$\times$	-	-
N83.9.29 $\mathrm{GM1^-} \oplus \mathrm{A1^+} \oplus \mathrm{M2^-}$	$\surd$	1	0	$\times$	-	-
N83.9.30 $\mathrm{GM1^-} \oplus \mathrm{A1^+} \oplus \mathrm{Z1^+}$	$\surd$	1	0	$\times$	-	-
N83.9.31 $\mathrm{GM1^-} \oplus \mathrm{A1^+} \oplus \mathrm{Z1^-}$	$\surd$	1	0	$\times$	-	-
N83.9.32 $\mathrm{GM1^-} \oplus \mathrm{A1^+} \oplus \mathrm{Z2^+}$	$\surd$	1	0	$\times$	-	-
N83.9.33 $\mathrm{GM1^-} \oplus \mathrm{A1^+} \oplus \mathrm{Z2^-}$	$\surd$	1	0	$\times$	-	-
N83.9.34 $\mathrm{GM1^-} \oplus \mathrm{M1^+} \oplus \mathrm{M1^+}$	$\surd$	1	0	$\times$	-	-
N83.9.35 $\mathrm{GM1^-} \oplus \mathrm{M1^+} \oplus \mathrm{M2^+}$	$\surd$	1	0	$\times$	-	-
N83.9.36 $\mathrm{GM1^-} \oplus \mathrm{M1^+} \oplus \mathrm{M1^-}$	$\surd$	1	1	$\times$	-	-
N83.9.37 $\mathrm{GM1^-} \oplus \mathrm{M1^+} \oplus \mathrm{M2^-}$	$\surd$	1	1	$\times$	-	-
N83.9.38 $\mathrm{GM1^-} \oplus \mathrm{M1^+} \oplus \mathrm{Z1^+}$	$\surd$	1	0	$\times$	-	-
N83.9.39 $\mathrm{GM1^-} \oplus \mathrm{M1^+} \oplus \mathrm{Z2^+}$	$\surd$	1	0	$\times$	-	-
N83.9.40 $\mathrm{GM1^-} \oplus \mathrm{M1^-} \oplus \mathrm{M1^-}$	$\surd$	1	0	$\times$	-	-
N83.9.41 $\mathrm{GM1^-} \oplus \mathrm{M1^-} \oplus \mathrm{M2^-}$	$\surd$	1	0	$\times$	-	-
N83.9.42 $\mathrm{GM1^-} \oplus \mathrm{M1^-} \oplus \mathrm{Z1^+}$	$\surd$	1	0	$\times$	-	-
N83.9.43 $\mathrm{GM1^-} \oplus \mathrm{M1^-} \oplus \mathrm{Z2^+}$	$\surd$	1	0	$\times$	-	-
N83.9.44 $\mathrm{GM1^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z1^+}$	$\surd$	1	0	$\times$	-	-
N83.9.45 $\mathrm{GM1^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z1^-}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
N83.9.46 $\mathrm{GM1^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z2^+}$	$\surd$	1	0	$\times$	-	-
N83.9.47 $\mathrm{GM1^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
N83.9.48 $\mathrm{GM1^-} \oplus \mathrm{Z2^+} \oplus \mathrm{Z2^+}$	$\surd$	1	0	$\times$	-	-
N83.9.49 $\mathrm{GM1^-} \oplus \mathrm{Z2^+} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
N83.9.50 $\mathrm{GM2^+} \oplus \mathrm{GM2^+} \oplus \mathrm{GM2^+}$	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{B_g} \oplus \mathrm{B_g} \oplus \mathrm{B_g}$
N83.9.51 $\mathrm{GM2^+} \oplus \mathrm{GM2^+} \oplus \mathrm{GM2^-}$	$\surd$	2	2	$\surd$	$\bar{4}$	$\mathrm{B} \oplus \mathrm{B}$
N83.9.52 $\mathrm{GM2^+} \oplus \mathrm{GM2^+} \oplus \mathrm{A1^+}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{B_g} \oplus \mathrm{B_g}$
N83.9.53 $\mathrm{GM2^+} \oplus \mathrm{GM2^+} \oplus \mathrm{M1^+}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{B_g} \oplus \mathrm{B_g}$
N83.9.54 $\mathrm{GM2^+} \oplus \mathrm{GM2^+} \oplus \mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{B_g} \oplus \mathrm{B_g}$
N83.9.55 $\mathrm{GM2^+} \oplus \mathrm{GM2^+} \oplus \mathrm{Z1^+}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{B_g} \oplus \mathrm{B_g}$
N83.9.56 $\mathrm{GM2^+} \oplus \mathrm{GM2^+} \oplus \mathrm{Z2^+}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{B_g} \oplus \mathrm{B_g}$
N83.9.57 $\mathrm{GM2^+} \oplus \mathrm{GM2^-} \oplus \mathrm{GM2^-}$	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B_g}$
N83.9.58 $\mathrm{GM2^+} \oplus \mathrm{GM2^-} \oplus \mathrm{A1^+}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_u} \oplus \mathrm{B_g}$
N83.9.59 $\mathrm{GM2^+} \oplus \mathrm{GM2^-} \oplus \mathrm{M1^+}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_u} \oplus \mathrm{B_g}$
N83.9.60 $\mathrm{GM2^+} \oplus \mathrm{GM2^-} \oplus \mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_u} \oplus \mathrm{B_g}$
N83.9.61 $\mathrm{GM2^+} \oplus \mathrm{GM2^-} \oplus \mathrm{Z1^+}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_u} \oplus \mathrm{B_g}$
N83.9.62 $\mathrm{GM2^+} \oplus \mathrm{GM2^-} \oplus \mathrm{Z2^+}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_u} \oplus \mathrm{B_g}$
N83.9.63 $\mathrm{GM2^+} \oplus \mathrm{A1^+} \oplus \mathrm{A1^+}$	$\surd$	1	1	$\times$	-	-
N83.9.64 $\mathrm{GM2^+} \oplus \mathrm{A1^+} \oplus \mathrm{A1^-}$	$\surd$	1	1	$\surd$	$\bar{4}$	B
N83.9.65 $\mathrm{GM2^+} \oplus \mathrm{A1^+} \oplus \mathrm{A2^+}$	$\surd$	1	1	$\times$	-	-
N83.9.66 $\mathrm{GM2^+} \oplus \mathrm{A1^+} \oplus \mathrm{A2^-}$	$\surd$	1	1	$\times$	-	-
N83.9.67 $\mathrm{GM2^+} \oplus \mathrm{A1^+} \oplus \mathrm{M1^+}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{B_g}$
N83.9.68 $\mathrm{GM2^+} \oplus \mathrm{A1^+} \oplus \mathrm{M2^+}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{B_g}$
N83.9.69 $\mathrm{GM2^+} \oplus \mathrm{A1^+} \oplus \mathrm{M1^-}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{B_g}$
N83.9.70 $\mathrm{GM2^+} \oplus \mathrm{A1^+} \oplus \mathrm{M2^-}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{B_g}$
N83.9.71 $\mathrm{GM2^+} \oplus \mathrm{A1^+} \oplus \mathrm{Z1^+}$	$\surd$	1	1	$\times$	-	-
N83.9.72 $\mathrm{GM2^+} \oplus \mathrm{A1^+} \oplus \mathrm{Z1^-}$	$\surd$	1	1	$\times$	-	-
N83.9.73 $\mathrm{GM2^+} \oplus \mathrm{A1^+} \oplus \mathrm{Z2^+}$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $P4/m$ (No. 83) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N83.9.74 $\mathrm{GM2}^{+}\oplus\mathrm{A1}^{+}\oplus\mathrm{Z2}^{-}$	$\surd$	1	1	$\times$	-	-
N83.9.75 $\mathrm{GM2}^{+}\oplus\mathrm{M1}^{+}\oplus\mathrm{M1}^{+}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{B_g}$
N83.9.76 $\mathrm{GM2}^{+}\oplus\mathrm{M1}^{+}\oplus\mathrm{M2}^{+}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{B_g}$
N83.9.77 $\mathrm{GM2}^{+}\oplus\mathrm{M1}^{+}\oplus\mathrm{M1}^{-}$	$\surd$	1	1	$\surd$	$\bar{4}$	B
N83.9.78 $\mathrm{GM2}^{+}\oplus\mathrm{M1}^{+}\oplus\mathrm{M2}^{-}$	$\surd$	1	1	$\surd$	4	B
N83.9.79 $\mathrm{GM2}^{+}\oplus\mathrm{M1}^{+}\oplus\mathrm{Z1}^{+}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{B_g}$
N83.9.80 $\mathrm{GM2}^{+}\oplus\mathrm{M1}^{+}\oplus\mathrm{Z2}^{+}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{B_g}$
N83.9.81 $\mathrm{GM2}^{+}\oplus\mathrm{M1}^{-}\oplus\mathrm{M1}^{-}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{B_g}$
N83.9.82 $\mathrm{GM2}^{+}\oplus\mathrm{M1}^{-}\oplus\mathrm{M2}^{-}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{B_g}$
N83.9.83 $\mathrm{GM2}^{+}\oplus\mathrm{M1}^{-}\oplus\mathrm{Z1}^{+}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{B_g}$
N83.9.84 $\mathrm{GM2}^{+}\oplus\mathrm{M1}^{-}\oplus\mathrm{Z2}^{+}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{B_g}$
N83.9.85 $\mathrm{GM2}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z1}^{+}$	$\surd$	1	1	$\times$	-	-
N83.9.86 $\mathrm{GM2}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z1}^{-}$	$\surd$	1	1	$\surd$	$\bar{4}$	B
N83.9.87 $\mathrm{GM2}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z2}^{+}$	$\surd$	1	1	$\times$	-	-
N83.9.88 $\mathrm{GM2}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z2}^{-}$	$\surd$	1	1	$\times$	-	-
N83.9.89 $\mathrm{GM2}^{+}\oplus\mathrm{Z2}^{+}\oplus\mathrm{Z2}^{+}$	$\surd$	1	1	$\times$	-	-
N83.9.90 $\mathrm{GM2}^{+}\oplus\mathrm{Z2}^{+}\oplus\mathrm{Z2}^{-}$	$\surd$	1	1	$\surd$	$\bar{4}$	B
N83.9.91 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
N83.9.92 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{A1}^{+}$	$\surd$	0	0	$\surd$	-	-
N83.9.93 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{M1}^{+}$	$\surd$	0	0	$\surd$	-	-
N83.9.94 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{M1}^{-}$	$\surd$	0	0	$\surd$	-	-
N83.9.95 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{Z1}^{+}$	$\surd$	0	0	$\surd$	-	-
N83.9.96 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{Z2}^{+}$	$\surd$	0	0	$\surd$	-	-
N83.9.97 $\mathrm{GM2}^{-}\oplus\mathrm{A1}^{+}\oplus\mathrm{A1}^{+}$	$\surd$	1	0	$\times$	-	-
N83.9.98 $\mathrm{GM2}^{-}\oplus\mathrm{A1}^{+}\oplus\mathrm{A1}^{-}$	$\surd$	1	1	$\times$	-	-
N83.9.99 $\mathrm{GM2}^{-}\oplus\mathrm{A1}^{+}\oplus\mathrm{A2}^{+}$	$\surd$	1	0	$\times$	-	-
N83.9.100 $\mathrm{GM2}^{-}\oplus\mathrm{A1}^{+}\oplus\mathrm{A2}^{-}$	$\surd$	1	1	$\times$	-	-
N83.9.101 $\mathrm{GM2}^{-}\oplus\mathrm{A1}^{+}\oplus\mathrm{M1}^{+}$	$\surd$	1	0	$\times$	-	-
N83.9.102 $\mathrm{GM2}^{-}\oplus\mathrm{A1}^{+}\oplus\mathrm{M2}^{+}$	$\surd$	1	0	$\times$	-	-
N83.9.103 $\mathrm{GM2}^{-}\oplus\mathrm{A1}^{+}\oplus\mathrm{M1}^{-}$	$\surd$	1	0	$\times$	-	-
N83.9.104 $\mathrm{GM2}^{-}\oplus\mathrm{A1}^{+}\oplus\mathrm{M2}^{-}$	$\surd$	1	0	$\times$	-	-
N83.9.105 $\mathrm{GM2}^{-}\oplus\mathrm{A1}^{+}\oplus\mathrm{Z1}^{+}$	$\surd$	1	0	$\times$	-	-
N83.9.106 $\mathrm{GM2}^{-}\oplus\mathrm{A1}^{+}\oplus\mathrm{Z1}^{-}$	$\surd$	1	0	$\times$	-	-
N83.9.107 $\mathrm{GM2}^{-}\oplus\mathrm{A1}^{+}\oplus\mathrm{Z2}^{+}$	$\surd$	1	0	$\times$	-	-
N83.9.108 $\mathrm{GM2}^{-}\oplus\mathrm{A1}^{+}\oplus\mathrm{Z2}^{-}$	$\surd$	1	0	$\times$	-	-
N83.9.109 $\mathrm{GM2}^{-}\oplus\mathrm{M1}^{+}\oplus\mathrm{M1}^{+}$	$\surd$	1	0	$\times$	-	-
N83.9.110 $\mathrm{GM2}^{-}\oplus\mathrm{M1}^{+}\oplus\mathrm{M2}^{+}$	$\surd$	1	0	$\times$	-	-
N83.9.111 $\mathrm{GM2}^{-}\oplus\mathrm{M1}^{+}\oplus\mathrm{M1}^{-}$	$\surd$	1	1	$\times$	-	-
N83.9.112 $\mathrm{GM2}^{-}\oplus\mathrm{M1}^{+}\oplus\mathrm{M2}^{-}$	$\surd$	1	1	$\times$	-	-
N83.9.113 $\mathrm{GM2}^{-}\oplus\mathrm{M1}^{+}\oplus\mathrm{Z1}^{+}$	$\surd$	1	0	$\times$	-	-
N83.9.114 $\mathrm{GM2}^{-}\oplus\mathrm{M1}^{+}\oplus\mathrm{Z2}^{+}$	$\surd$	1	0	$\times$	-	-
N83.9.115 $\mathrm{GM2}^{-}\oplus\mathrm{M1}^{-}\oplus\mathrm{M1}^{-}$	$\surd$	1	0	$\times$	-	-
N83.9.116 $\mathrm{GM2}^{-}\oplus\mathrm{M1}^{-}\oplus\mathrm{M2}^{-}$	$\surd$	1	0	$\times$	-	-
N83.9.117 $\mathrm{GM2}^{-}\oplus\mathrm{M1}^{-}\oplus\mathrm{Z1}^{+}$	$\surd$	1	0	$\times$	-	-
N83.9.118 $\mathrm{GM2}^{-}\oplus\mathrm{M1}^{-}\oplus\mathrm{Z2}^{+}$	$\surd$	1	0	$\times$	-	-
N83.9.119 $\mathrm{GM2}^{-}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z1}^{+}$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $P4/m$ (No. 83) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N83.9.120 $\mathrm{GM2^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z1^-}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
N83.9.121 $\mathrm{GM2^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z2^+}$	$\surd$	1	0	$\times$	-	-
N83.9.122 $\mathrm{GM2^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
N83.9.123 $\mathrm{GM2^-} \oplus \mathrm{Z2^+} \oplus \mathrm{Z2^+}$	$\surd$	1	0	$\times$	-	-
N83.9.124 $\mathrm{GM2^-} \oplus \mathrm{Z2^+} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
N83.9.125 $\mathrm{A1^+} \oplus \mathrm{A1^+} \oplus \mathrm{A1^+}$	$\surd$	0	0	$\surd$	-	-
N83.9.126 $\mathrm{A1^+} \oplus \mathrm{A1^+} \oplus \mathrm{A1^-}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_u} \oplus \mathrm{A_u}$
N83.9.127 $\mathrm{A1^+} \oplus \mathrm{A1^+} \oplus \mathrm{A2^+}$	$\surd$	0	0	$\surd$	-	-
N83.9.128 $\mathrm{A1^+} \oplus \mathrm{A1^+} \oplus \mathrm{A2^-}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{B_u} \oplus \mathrm{B_u}$
N83.9.129 $\mathrm{A1^+} \oplus \mathrm{A1^-} \oplus \mathrm{A2^+}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_u} \oplus \mathrm{B_u}$
N83.9.130 $\mathrm{A1^+} \oplus \mathrm{A1^+} \oplus \mathrm{M1^+}$	$\surd$	1	0	$\times$	-	-
N83.9.131 $\mathrm{A1^+} \oplus \mathrm{A1^+} \oplus \mathrm{M2^+}$	$\surd$	1	0	$\times$	-	-
N83.9.132 $\mathrm{A1^+} \oplus \mathrm{A1^-} \oplus \mathrm{M1^+}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
N83.9.133 $\mathrm{A1^+} \oplus \mathrm{A1^-} \oplus \mathrm{M2^+}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
N83.9.134 $\mathrm{A1^+} \oplus \mathrm{A2^+} \oplus \mathrm{M1^+}$	$\surd$	1	0	$\times$	-	-
N83.9.135 $\mathrm{A1^+} \oplus \mathrm{A2^-} \oplus \mathrm{M1^+}$	$\surd$	1	1	$\times$	-	-
N83.9.136 $\mathrm{A1^+} \oplus \mathrm{A1^+} \oplus \mathrm{M1^-}$	$\surd$	1	0	$\times$	-	-
N83.9.137 $\mathrm{A1^+} \oplus \mathrm{A1^+} \oplus \mathrm{M2^-}$	$\surd$	1	0	$\times$	-	-
N83.9.138 $\mathrm{A1^+} \oplus \mathrm{A1^-} \oplus \mathrm{M1^-}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
N83.9.139 $\mathrm{A1^+} \oplus \mathrm{A1^-} \oplus \mathrm{M2^-}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
N83.9.140 $\mathrm{A1^+} \oplus \mathrm{A2^+} \oplus \mathrm{M1^-}$	$\surd$	1	0	$\times$	-	-
N83.9.141 $\mathrm{A1^+} \oplus \mathrm{A2^-} \oplus \mathrm{M1^-}$	$\surd$	1	1	$\times$	-	-
N83.9.142 $\mathrm{A1^+} \oplus \mathrm{A1^+} \oplus \mathrm{Z1^+}$	$\surd$	1	0	$\times$	-	-
N83.9.143 $\mathrm{A1^+} \oplus \mathrm{A1^+} \oplus \mathrm{Z1^-}$	$\surd$	1	0	$\times$	-	-
N83.9.144 $\mathrm{A1^+} \oplus \mathrm{A1^-} \oplus \mathrm{Z1^+}$	$\surd$	1	1	$\times$	-	-
N83.9.145 $\mathrm{A1^+} \oplus \mathrm{A2^+} \oplus \mathrm{Z1^+}$	$\surd$	1	0	$\times$	-	-
N83.9.146 $\mathrm{A1^+} \oplus \mathrm{A2^+} \oplus \mathrm{Z1^-}$	$\surd$	1	0	$\times$	-	-
N83.9.147 $\mathrm{A1^+} \oplus \mathrm{A2^-} \oplus \mathrm{Z1^+}$	$\surd$	1	1	$\times$	-	-
N83.9.148 $\mathrm{A1^+} \oplus \mathrm{A1^+} \oplus \mathrm{Z2^+}$	$\surd$	1	0	$\times$	-	-
N83.9.149 $\mathrm{A1^+} \oplus \mathrm{A1^+} \oplus \mathrm{Z2^-}$	$\surd$	1	0	$\times$	-	-
N83.9.150 $\mathrm{A1^+} \oplus \mathrm{A1^-} \oplus \mathrm{Z2^+}$	$\surd$	1	1	$\times$	-	-
N83.9.151 $\mathrm{A1^+} \oplus \mathrm{A2^+} \oplus \mathrm{Z2^+}$	$\surd$	1	0	$\times$	-	-
N83.9.152 $\mathrm{A1^+} \oplus \mathrm{A2^+} \oplus \mathrm{Z2^-}$	$\surd$	1	0	$\times$	-	-
N83.9.153 $\mathrm{A1^+} \oplus \mathrm{A2^-} \oplus \mathrm{Z2^+}$	$\surd$	1	1	$\times$	-	-
N83.9.154 $\mathrm{A1^+} \oplus \mathrm{M1^+} \oplus \mathrm{M1^+}$	$\surd$	1	0	$\times$	-	-
N83.9.155 $\mathrm{A1^+} \oplus \mathrm{M1^+} \oplus \mathrm{M2^+}$	$\surd$	1	0	$\times$	-	-
N83.9.156 $\mathrm{A1^+} \oplus \mathrm{M2^+} \oplus \mathrm{M2^+}$	$\surd$	1	0	$\times$	-	-
N83.9.157 $\mathrm{A1^+} \oplus \mathrm{M1^+} \oplus \mathrm{M1^-}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
N83.9.158 $\mathrm{A1^+} \oplus \mathrm{M1^+} \oplus \mathrm{M2^-}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{B_u}$
N83.9.159 $\mathrm{A1^+} \oplus \mathrm{M2^+} \oplus \mathrm{M1^-}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{B_u}$
N83.9.160 $\mathrm{A1^+} \oplus \mathrm{M2^+} \oplus \mathrm{M2^-}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
N83.9.161 $\mathrm{A1^+} \oplus \mathrm{M1^+} \oplus \mathrm{Z1^+}$	$\times$	-	-	-	-	-
N83.9.162 $\mathrm{A1^+} \oplus \mathrm{M1^+} \oplus \mathrm{Z1^-}$	$\times$	-	-	-	-	-
N83.9.163 $\mathrm{A1^+} \oplus \mathrm{M2^+} \oplus \mathrm{Z1^+}$	$\times$	-	-	-	-	-
N83.9.164 $\mathrm{A1^+} \oplus \mathrm{M2^+} \oplus \mathrm{Z1^-}$	$\times$	-	-	-	-	-
N83.9.165 $\mathrm{A1^+} \oplus \mathrm{M1^+} \oplus \mathrm{Z2^+}$	$\times$	-	-	-	-	-

Non-coplanar SSGs with parent space group $P4/m$ (No. 83) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N83.9.166 $\mathrm{A1}^+ \oplus \mathrm{M1}^+ \oplus \mathrm{Z2}^-$	$\times$	-	-	-	-	-
N83.9.167 $\mathrm{A1}^+ \oplus \mathrm{M2}^+ \oplus \mathrm{Z2}^+$	$\times$	-	-	-	-	-
N83.9.168 $\mathrm{A1}^+ \oplus \mathrm{M2}^+ \oplus \mathrm{Z2}^-$	$\times$	-	-	-	-	-
N83.9.169 $\mathrm{A1}^+ \oplus \mathrm{M1}^- \oplus \mathrm{M1}^-$	$\surd$	1	0	$\times$	-	-
N83.9.170 $\mathrm{A1}^+ \oplus \mathrm{M1}^- \oplus \mathrm{M2}^-$	$\surd$	1	0	$\times$	-	-
N83.9.171 $\mathrm{A1}^+ \oplus \mathrm{M2}^- \oplus \mathrm{M2}^-$	$\surd$	1	0	$\times$	-	-
N83.9.172 $\mathrm{A1}^+ \oplus \mathrm{M1}^- \oplus \mathrm{Z1}^+$	$\times$	-	-	-	-	-
N83.9.173 $\mathrm{A1}^+ \oplus \mathrm{M1}^- \oplus \mathrm{Z1}^-$	$\times$	-	-	-	-	-
N83.9.174 $\mathrm{A1}^+ \oplus \mathrm{M2}^- \oplus \mathrm{Z1}^+$	$\times$	-	-	-	-	-
N83.9.175 $\mathrm{A1}^+ \oplus \mathrm{M2}^- \oplus \mathrm{Z1}^-$	$\times$	-	-	-	-	-
N83.9.176 $\mathrm{A1}^+ \oplus \mathrm{M1}^- \oplus \mathrm{Z2}^+$	$\times$	-	-	-	-	-
N83.9.177 $\mathrm{A1}^+ \oplus \mathrm{M1}^- \oplus \mathrm{Z2}^-$	$\times$	-	-	-	-	-
N83.9.178 $\mathrm{A1}^+ \oplus \mathrm{M2}^- \oplus \mathrm{Z2}^+$	$\times$	-	-	-	-	-
N83.9.179 $\mathrm{A1}^+ \oplus \mathrm{M2}^- \oplus \mathrm{Z2}^-$	$\times$	-	-	-	-	-
N83.9.180 $\mathrm{A1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N83.9.181 $\mathrm{A1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
N83.9.182 $\mathrm{A1}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N83.9.183 $\mathrm{A1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N83.9.184 $\mathrm{A1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{B_u}$
N83.9.185 $\mathrm{A1}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{B_u}$
N83.9.186 $\mathrm{A1}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-
N83.9.187 $\mathrm{A1}^+ \oplus \mathrm{Z2}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N83.9.188 $\mathrm{A1}^+ \oplus \mathrm{Z2}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
N83.9.189 $\mathrm{A1}^+ \oplus \mathrm{Z2}^- \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-
N83.9.190 $\mathrm{M1}^+ \oplus \mathrm{M1}^+ \oplus \mathrm{M1}^+$	$\surd$	0	0	$\surd$	-	-
N83.9.191 $\mathrm{M1}^+ \oplus \mathrm{M1}^+ \oplus \mathrm{M2}^+$	$\surd$	0	0	$\surd$	-	-
N83.9.192 $\mathrm{M1}^+ \oplus \mathrm{M1}^+ \oplus \mathrm{M1}^-$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_u} \oplus \mathrm{A_u}$
N83.9.193 $\mathrm{M1}^+ \oplus \mathrm{M1}^+ \oplus \mathrm{M2}^-$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{B_u} \oplus \mathrm{B_u}$
N83.9.194 $\mathrm{M1}^+ \oplus \mathrm{M2}^+ \oplus \mathrm{M1}^-$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_u} \oplus \mathrm{B_u}$
N83.9.195 $\mathrm{M1}^+ \oplus \mathrm{M1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N83.9.196 $\mathrm{M1}^+ \oplus \mathrm{M2}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N83.9.197 $\mathrm{M1}^+ \oplus \mathrm{M1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N83.9.198 $\mathrm{M1}^+ \oplus \mathrm{M2}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N83.9.199 $\mathrm{M1}^+ \oplus \mathrm{M1}^- \oplus \mathrm{M1}^-$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_u} \oplus \mathrm{A_u}$
N83.9.200 $\mathrm{M1}^+ \oplus \mathrm{M1}^- \oplus \mathrm{M2}^-$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_u} \oplus \mathrm{B_u}$
N83.9.201 $\mathrm{M1}^+ \oplus \mathrm{M2}^- \oplus \mathrm{M2}^-$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{B_u} \oplus \mathrm{B_u}$
N83.9.202 $\mathrm{M1}^+ \oplus \mathrm{M1}^- \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\times$	-	-
N83.9.203 $\mathrm{M1}^+ \oplus \mathrm{M2}^- \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\times$	-	-
N83.9.204 $\mathrm{M1}^+ \oplus \mathrm{M1}^- \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\times$	-	-
N83.9.205 $\mathrm{M1}^+ \oplus \mathrm{M2}^- \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\times$	-	-
N83.9.206 $\mathrm{M1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N83.9.207 $\mathrm{M1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
N83.9.208 $\mathrm{M1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N83.9.209 $\mathrm{M1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\times$	-	-
N83.9.210 $\mathrm{M1}^+ \oplus \mathrm{Z2}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N83.9.211 $\mathrm{M1}^+ \oplus \mathrm{Z2}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$

Non-coplanar SSGs with parent space group $P4/m$ (No. 83) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N83.9.212 $\mathrm{M1^-}\oplus\mathrm{M1^-}\oplus\mathrm{M1^-}$	$\surd$	0	0	$\surd$	-	-
N83.9.213 $\mathrm{M1^-}\oplus\mathrm{M1^-}\oplus\mathrm{M2^-}$	$\surd$	0	0	$\surd$	-	-
N83.9.214 $\mathrm{M1^-}\oplus\mathrm{M1^-}\oplus\mathrm{Z1^+}$	$\surd$	1	0	$\times$	-	-
N83.9.215 $\mathrm{M1^-}\oplus\mathrm{M2^-}\oplus\mathrm{Z1^+}$	$\surd$	1	0	$\times$	-	-
N83.9.216 $\mathrm{M1^-}\oplus\mathrm{M1^-}\oplus\mathrm{Z2^+}$	$\surd$	1	0	$\times$	-	-
N83.9.217 $\mathrm{M1^-}\oplus\mathrm{M2^-}\oplus\mathrm{Z2^+}$	$\surd$	1	0	$\times$	-	-
N83.9.218 $\mathrm{M1^-}\oplus\mathrm{Z1^+}\oplus\mathrm{Z1^+}$	$\surd$	1	0	$\times$	-	-
N83.9.219 $\mathrm{M1^-}\oplus\mathrm{Z1^+}\oplus\mathrm{Z1^-}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
N83.9.220 $\mathrm{M1^-}\oplus\mathrm{Z1^+}\oplus\mathrm{Z2^+}$	$\surd$	1	0	$\times$	-	-
N83.9.221 $\mathrm{M1^-}\oplus\mathrm{Z1^+}\oplus\mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
N83.9.222 $\mathrm{M1^-}\oplus\mathrm{Z2^+}\oplus\mathrm{Z2^+}$	$\surd$	1	0	$\times$	-	-
N83.9.223 $\mathrm{M1^-}\oplus\mathrm{Z2^+}\oplus\mathrm{Z2^-}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
N83.9.224 $\mathrm{Z1^+}\oplus\mathrm{Z1^+}\oplus\mathrm{Z1^+}$	$\surd$	0	0	$\surd$	-	-
N83.9.225 $\mathrm{Z1^+}\oplus\mathrm{Z1^+}\oplus\mathrm{Z1^-}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_u}\oplus\mathrm{A_u}$
N83.9.226 $\mathrm{Z1^+}\oplus\mathrm{Z1^+}\oplus\mathrm{Z2^+}$	$\surd$	0	0	$\surd$	-	-
N83.9.227 $\mathrm{Z1^+}\oplus\mathrm{Z1^+}\oplus\mathrm{Z2^-}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{B_u}\oplus\mathrm{B_u}$
N83.9.228 $\mathrm{Z1^+}\oplus\mathrm{Z1^-}\oplus\mathrm{Z2^+}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_u}\oplus\mathrm{B_u}$
N83.9.229 $\mathrm{Z1^+}\oplus\mathrm{Z2^+}\oplus\mathrm{Z2^+}$	$\surd$	0	0	$\surd$	-	-
N83.9.230 $\mathrm{Z1^+}\oplus\mathrm{Z2^+}\oplus\mathrm{Z2^-}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_u}\oplus\mathrm{B_u}$
N83.9.231 $\mathrm{Z1^+}\oplus\mathrm{Z2^-}\oplus\mathrm{Z2^-}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{B_u}\oplus\mathrm{B_u}$
N83.9.232 $\mathrm{Z2^+}\oplus\mathrm{Z2^+}\oplus\mathrm{Z2^+}$	$\surd$	0	0	$\surd$	-	-
N83.9.233 $\mathrm{Z2^+}\oplus\mathrm{Z2^+}\oplus\mathrm{Z2^-}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_u}\oplus\mathrm{A_u}$
N83.10.1 $\mathrm{GM1^-}\oplus\mathrm{GM3^+GM4^+}$	$\surd$	2	2	$\surd$	4	$^2\mathrm{E}\oplus{}^1\mathrm{E}$
N83.10.2 $\mathrm{GM1^-}\oplus\mathrm{GM3^-GM4^-}$	$\surd$	0	0	$\surd$	-	-
N83.10.3 $\mathrm{GM1^-}\oplus\mathrm{Z3^+Z4^+}$	$\surd$	1	0	$\times$	-	-
N83.10.4 $\mathrm{GM1^-}\oplus\mathrm{M3^+M4^+}$	$\surd$	1	0	$\times$	-	-
N83.10.5 $\mathrm{GM1^-}\oplus\mathrm{M3^-M4^-}$	$\surd$	1	0	$\times$	-	-
N83.10.6 $\mathrm{GM1^-}\oplus\mathrm{A3^+A4^+}$	$\surd$	1	0	$\times$	-	-
N83.10.7 $\mathrm{GM2^+}\oplus\mathrm{GM3^+GM4^+}$	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{B_g}\oplus{}^2\mathrm{E_g}\oplus{}^1\mathrm{E_g}$
N83.10.8 $\mathrm{GM2^+}\oplus\mathrm{GM3^-GM4^-}$	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{B_g}\oplus{}^2\mathrm{E_u}\oplus{}^1\mathrm{E_u}$
N83.10.9 $\mathrm{GM2^+}\oplus\mathrm{Z3^+Z4^+}$	$\surd$	1	1	$\times$	-	-
N83.10.10 $\mathrm{GM2^+}\oplus\mathrm{M3^+M4^+}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{B_g}$
N83.10.11 $\mathrm{GM2^+}\oplus\mathrm{M3^-M4^-}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{B_g}$
N83.10.12 $\mathrm{GM2^+}\oplus\mathrm{A3^+A4^+}$	$\surd$	1	1	$\times$	-	-
N83.10.13 $\mathrm{GM2^-}\oplus\mathrm{GM3^+GM4^+}$	$\surd$	2	2	$\surd$	$\bar{4}$	$^2\mathrm{E}\oplus{}^1\mathrm{E}$
N83.10.14 $\mathrm{GM2^-}\oplus\mathrm{GM3^-GM4^-}$	$\surd$	0	0	$\surd$	-	-
N83.10.15 $\mathrm{GM2^-}\oplus\mathrm{Z3^+Z4^+}$	$\surd$	1	0	$\times$	-	-
N83.10.16 $\mathrm{GM2^-}\oplus\mathrm{M3^+M4^+}$	$\surd$	1	0	$\times$	-	-
N83.10.17 $\mathrm{GM2^-}\oplus\mathrm{M3^-M4^-}$	$\surd$	1	0	$\times$	-	-
N83.10.18 $\mathrm{GM2^-}\oplus\mathrm{A3^+A4^+}$	$\surd$	1	0	$\times$	-	-
N83.10.19 $\mathrm{A1^+}\oplus\mathrm{GM3^+GM4^+}$	$\surd$	2	2	$\surd$	$4/m$	$^2\mathrm{E_g}\oplus{}^1\mathrm{E_g}$
N83.10.20 $\mathrm{A1^+}\oplus\mathrm{GM3^-GM4^-}$	$\surd$	0	0	$\surd$	-	-
N83.10.21 $\mathrm{A1^+}\oplus\mathrm{Z3^+Z4^+}$	$\surd$	1	0	$\times$	-	-
N83.10.22 $\mathrm{A1^+}\oplus\mathrm{Z3^-Z4^-}$	$\surd$	1	0	$\times$	-	-
N83.10.23 $\mathrm{A1^+}\oplus\mathrm{M3^+M4^+}$	$\surd$	1	0	$\times$	-	-
N83.10.24 $\mathrm{A1^+}\oplus\mathrm{M3^-M4^-}$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $P4/m$ (No. 83) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N83.10.25 $\mathrm{A1^+}\oplus\mathrm{A3^+A4^+}$	$\surd$	0	0	$\surd$	-	-
N83.10.26 $\mathrm{A1^+}\oplus\mathrm{A3^-A4^-}$	$\surd$	2	2	$\surd$	$4/m$	${}^2\mathrm{E_u}\oplus{}^1\mathrm{E_u}$
N83.10.27 $\mathrm{M1^+}\oplus\mathrm{GM3^+GM4^+}$	$\surd$	2	2	$\surd$	$4/m$	${}^2\mathrm{E_g}\oplus{}^1\mathrm{E_g}$
N83.10.28 $\mathrm{M1^+}\oplus\mathrm{GM3^-GM4^-}$	$\surd$	0	0	$\surd$	-	-
N83.10.29 $\mathrm{M1^+}\oplus\mathrm{Z3^+Z4^+}$	$\surd$	1	0	$\times$	-	-
N83.10.30 $\mathrm{M1^+}\oplus\mathrm{M3^+M4^+}$	$\surd$	0	0	$\surd$	-	-
N83.10.31 $\mathrm{M1^+}\oplus\mathrm{M3^-M4^-}$	$\surd$	2	2	$\surd$	$4/m$	${}^2\mathrm{E_u}\oplus{}^1\mathrm{E_u}$
N83.10.32 $\mathrm{M1^+}\oplus\mathrm{A3^+A4^+}$	$\surd$	1	0	$\times$	-	-
N83.10.33 $\mathrm{M1^-}\oplus\mathrm{GM3^+GM4^+}$	$\surd$	2	2	$\surd$	$4/m$	${}^2\mathrm{E_g}\oplus{}^1\mathrm{E_g}$
N83.10.34 $\mathrm{M1^-}\oplus\mathrm{GM3^-GM4^-}$	$\surd$	0	0	$\surd$	-	-
N83.10.35 $\mathrm{M1^-}\oplus\mathrm{Z3^+Z4^+}$	$\surd$	1	0	$\times$	-	-
N83.10.36 $\mathrm{M1^-}\oplus\mathrm{M3^+M4^+}$	$\surd$	2	2	$\surd$	$4/m$	${}^2\mathrm{E_u}\oplus{}^1\mathrm{E_u}$
N83.10.37 $\mathrm{M1^-}\oplus\mathrm{M3^-M4^-}$	$\surd$	0	0	$\surd$	-	-
N83.10.38 $\mathrm{M1^-}\oplus\mathrm{A3^+A4^+}$	$\surd$	1	0	$\times$	-	-
N83.10.39 $\mathrm{Z1^+}\oplus\mathrm{GM3^+GM4^+}$	$\surd$	2	2	$\surd$	$4/m$	${}^2\mathrm{E_g}\oplus{}^1\mathrm{E_g}$
N83.10.40 $\mathrm{Z1^+}\oplus\mathrm{GM3^-GM4^-}$	$\surd$	0	0	$\surd$	-	-
N83.10.41 $\mathrm{Z1^+}\oplus\mathrm{Z3^+Z4^+}$	$\surd$	0	0	$\surd$	-	-
N83.10.42 $\mathrm{Z1^+}\oplus\mathrm{Z3^-Z4^-}$	$\surd$	2	2	$\surd$	$4/m$	${}^2\mathrm{E_u}\oplus{}^1\mathrm{E_u}$
N83.10.43 $\mathrm{Z1^+}\oplus\mathrm{M3^+M4^+}$	$\surd$	1	0	$\times$	-	-
N83.10.44 $\mathrm{Z1^+}\oplus\mathrm{M3^-M4^-}$	$\surd$	1	0	$\times$	-	-
N83.10.45 $\mathrm{Z1^+}\oplus\mathrm{A3^+A4^+}$	$\surd$	1	0	$\times$	-	-
N83.10.46 $\mathrm{Z1^+}\oplus\mathrm{A3^-A4^-}$	$\surd$	1	0	$\times$	-	-
N83.10.47 $\mathrm{Z2^+}\oplus\mathrm{GM3^+GM4^+}$	$\surd$	2	2	$\surd$	$4/m$	${}^2\mathrm{E_g}\oplus{}^1\mathrm{E_g}$
N83.10.48 $\mathrm{Z2^+}\oplus\mathrm{GM3^-GM4^-}$	$\surd$	0	0	$\surd$	-	-
N83.10.49 $\mathrm{Z2^+}\oplus\mathrm{Z3^+Z4^+}$	$\surd$	0	0	$\surd$	-	-
N83.10.50 $\mathrm{Z2^+}\oplus\mathrm{Z3^-Z4^-}$	$\surd$	2	2	$\surd$	$4/m$	${}^2\mathrm{E_u}\oplus{}^1\mathrm{E_u}$
N83.10.51 $\mathrm{Z2^+}\oplus\mathrm{M3^+M4^+}$	$\surd$	1	0	$\times$	-	-
N83.10.52 $\mathrm{Z2^+}\oplus\mathrm{M3^-M4^-}$	$\surd$	1	0	$\times$	-	-
N83.10.53 $\mathrm{Z2^+}\oplus\mathrm{A3^+A4^+}$	$\surd$	1	0	$\times$	-	-
N83.10.54 $\mathrm{Z2^+}\oplus\mathrm{A3^-A4^-}$	$\surd$	1	0	$\times$	-	-
N83.13.1 $\mathrm{GM1^-}\oplus\mathrm{X1^+}$	$\surd$	1	0	$\times$	-	-
N83.13.2 $\mathrm{GM1^-}\oplus\mathrm{X1^-}$	$\surd$	1	0	$\times$	-	-
N83.13.3 $\mathrm{GM1^-}\oplus\mathrm{R1^+}$	$\surd$	1	0	$\times$	-	-
N83.13.4 $\mathrm{GM2^+}\oplus\mathrm{X1^+}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{B_g}$
N83.13.5 $\mathrm{GM2^+}\oplus\mathrm{X1^-}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{B_g}$
N83.13.6 $\mathrm{GM2^+}\oplus\mathrm{R1^+}$	$\surd$	1	1	$\times$	-	-
N83.13.7 $\mathrm{GM2^-}\oplus\mathrm{X1^+}$	$\surd$	1	0	$\times$	-	-
N83.13.8 $\mathrm{GM2^-}\oplus\mathrm{X1^-}$	$\surd$	1	0	$\times$	-	-
N83.13.9 $\mathrm{GM2^-}\oplus\mathrm{R1^+}$	$\surd$	1	0	$\times$	-	-
N83.13.10 $\mathrm{A1^+}\oplus\mathrm{X1^+}$	$\times$	-	-	-	-	-
N83.13.11 $\mathrm{A1^+}\oplus\mathrm{X2^-}$	$\times$	-	-	-	-	-
N83.13.12 $\mathrm{A1^+}\oplus\mathrm{X1^-}$	$\times$	-	-	-	-	-
N83.13.13 $\mathrm{A1^+}\oplus\mathrm{X2^+}$	$\times$	-	-	-	-	-
N83.13.14 $\mathrm{A1^+}\oplus\mathrm{R1^+}$	$\times$	-	-	-	-	-
N83.13.15 $\mathrm{A1^+}\oplus\mathrm{R1^-}$	$\times$	-	-	-	-	-
N83.13.16 $\mathrm{A1^+}\oplus\mathrm{R2^+}$	$\times$	-	-	-	-	-

Non-coplanar SSGs with parent space group $P4/m$ (No. 83) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N83.13.17 $\mathrm{A1}^{+}\oplus\mathrm{R2}^{-}$	$\times$	-	-	-	-	-
N83.13.18 $\mathrm{M1}^{+}\oplus\mathrm{X1}^{+}$	$\times$	-	-	-	-	-
N83.13.19 $\mathrm{M1}^{+}\oplus\mathrm{X2}^{-}$	$\times$	-	-	-	-	-
N83.13.20 $\mathrm{M1}^{+}\oplus\mathrm{X1}^{-}$	$\times$	-	-	-	-	-
N83.13.21 $\mathrm{M1}^{+}\oplus\mathrm{X2}^{+}$	$\times$	-	-	-	-	-
N83.13.22 $\mathrm{M1}^{+}\oplus\mathrm{R1}^{+}$	$\times$	-	-	-	-	-
N83.13.23 $\mathrm{M1}^{+}\oplus\mathrm{R2}^{+}$	$\times$	-	-	-	-	-
N83.13.24 $\mathrm{M1}^{-}\oplus\mathrm{X1}^{+}$	$\times$	-	-	-	-	-
N83.13.25 $\mathrm{M1}^{-}\oplus\mathrm{X2}^{-}$	$\times$	-	-	-	-	-
N83.13.26 $\mathrm{M1}^{-}\oplus\mathrm{X1}^{-}$	$\times$	-	-	-	-	-
N83.13.27 $\mathrm{M1}^{-}\oplus\mathrm{X2}^{+}$	$\times$	-	-	-	-	-
N83.13.28 $\mathrm{M1}^{-}\oplus\mathrm{R1}^{+}$	$\times$	-	-	-	-	-
N83.13.29 $\mathrm{M1}^{-}\oplus\mathrm{R2}^{+}$	$\times$	-	-	-	-	-
N83.13.30 $\mathrm{Z1}^{+}\oplus\mathrm{X1}^{+}$	$\times$	-	-	-	-	-
N83.13.31 $\mathrm{Z1}^{+}\oplus\mathrm{X1}^{-}$	$\times$	-	-	-	-	-
N83.13.32 $\mathrm{Z1}^{+}\oplus\mathrm{R1}^{+}$	$\times$	-	-	-	-	-
N83.13.33 $\mathrm{Z1}^{+}\oplus\mathrm{R1}^{-}$	$\times$	-	-	-	-	-
N83.13.34 $\mathrm{Z2}^{+}\oplus\mathrm{X1}^{+}$	$\times$	-	-	-	-	-
N83.13.35 $\mathrm{Z2}^{+}\oplus\mathrm{X1}^{-}$	$\times$	-	-	-	-	-
N83.13.36 $\mathrm{Z2}^{+}\oplus\mathrm{R1}^{+}$	$\times$	-	-	-	-	-
N83.13.37 $\mathrm{Z2}^{+}\oplus\mathrm{R1}^{-}$	$\times$	-	-	-	-	-
N83.14.1 $\mathrm{GM1}^{-}\oplus\mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
N83.14.2 $\mathrm{GM1}^{-}\oplus\mathrm{LD2}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
N83.14.3 $\mathrm{GM1}^{-}\oplus\mathrm{V1}$	$\surd$	1	1	$\times$	-	-
N83.14.4 $\mathrm{GM2}^{+}\oplus\mathrm{LD1}$	$\surd$	1	1	$\surd$	$\bar{4}$	B
N83.14.5 $\mathrm{GM2}^{+}\oplus\mathrm{LD2}$	$\surd$	1	1	$\surd$	$\bar{4}$	B
N83.14.6 $\mathrm{GM2}^{+}\oplus\mathrm{V1}$	$\surd$	1	1	$\surd$	$\bar{4}$	B
N83.14.7 $\mathrm{GM2}^{-}\oplus\mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
N83.14.8 $\mathrm{GM2}^{-}\oplus\mathrm{LD2}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
N83.14.9 $\mathrm{GM2}^{-}\oplus\mathrm{V1}$	$\surd$	1	1	$\times$	-	-
N83.14.10 $\mathrm{A1}^{+}\oplus\mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
N83.14.11 $\mathrm{A1}^{+}\oplus\mathrm{LD2}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
N83.14.12 $\mathrm{A1}^{+}\oplus\mathrm{V1}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
N83.14.13 $\mathrm{A1}^{+}\oplus\mathrm{V2}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
N83.14.14 $\mathrm{M1}^{+}\oplus\mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
N83.14.15 $\mathrm{M1}^{+}\oplus\mathrm{LD2}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
N83.14.16 $\mathrm{M1}^{+}\oplus\mathrm{V1}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
N83.14.17 $\mathrm{M1}^{+}\oplus\mathrm{V2}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
N83.14.18 $\mathrm{M1}^{-}\oplus\mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
N83.14.19 $\mathrm{M1}^{-}\oplus\mathrm{LD2}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
N83.14.20 $\mathrm{M1}^{-}\oplus\mathrm{V1}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
N83.14.21 $\mathrm{M1}^{-}\oplus\mathrm{V2}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
N83.14.22 $\mathrm{Z1}^{+}\oplus\mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
N83.14.23 $\mathrm{Z1}^{+}\oplus\mathrm{LD2}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
N83.14.24 $\mathrm{Z1}^{+}\oplus\mathrm{V1}$	$\surd$	1	1	$\times$	-	-
N83.14.25 $\mathrm{Z2}^{+}\oplus\mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$

Non-coplanar SSGs with parent space group $P4/m$ (No. 83) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N83.14.26 $\mathrm{Z2}^{+} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
N83.14.27 $\mathrm{Z2}^{+} \oplus \mathrm{V1}$	$\surd$	1	1	$\times$	-	-

TABLE S250: Collinear SSGs with parent space group $P4_2/m$ (No. 84).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L84.1.1 $\mathrm{GM1}^{+}$	1	$4/m$	$\mathrm{A_g}$
L84.2.1 $\mathrm{GM1}^{-}$	0	-	-
L84.2.2 $\mathrm{GM2}^{+}$	1	$4/m$	$\mathrm{B_g}$
L84.2.3 $\mathrm{GM2}^{-}$	0	-	-
L84.2.4 $\mathrm{M1}^{+}$	0	-	-
L84.2.5 $\mathrm{M1}^{-}$	0	-	-

TABLE S251: Coplanar SSGs with parent space group $P4_2/m$ (No. 84).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P84.1.1 $\mathrm{GM1}^{+}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_g} \oplus \mathrm{A_g}$
P84.2.1 $\mathrm{GM1}^{-}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_g} \oplus \mathrm{A_u}$
P84.2.2 $\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_g} \oplus \mathrm{B_g}$
P84.2.3 $\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_g} \oplus \mathrm{B_u}$
P84.2.4 $\mathrm{M1}^{+}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_g}$
P84.2.5 $\mathrm{M1}^{-}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_g}$
P84.3.1 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-}$	$\surd$	0	0	$\surd$	-	-
P84.3.2 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{B_g} \oplus \mathrm{B_u}$
P84.3.3 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
P84.3.4 $\mathrm{GM1}^{-} \oplus \mathrm{M1}^{+}$	$\surd$	1	1	$\times$	-	-
P84.3.5 $\mathrm{GM1}^{-} \oplus \mathrm{M1}^{-}$	$\surd$	1	1	$\times$	-	-
P84.3.6 $\mathrm{GM2}^{+} \oplus \mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{B_g} \oplus \mathrm{B_g}$
P84.3.7 $\mathrm{GM2}^{+} \oplus \mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_u} \oplus \mathrm{B_g}$
P84.3.8 $\mathrm{GM2}^{+} \oplus \mathrm{M1}^{+}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{B_g}$
P84.3.9 $\mathrm{GM2}^{+} \oplus \mathrm{M1}^{-}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{B_g}$
P84.3.10 $\mathrm{GM2}^{-} \oplus \mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
P84.3.11 $\mathrm{GM2}^{-} \oplus \mathrm{M1}^{+}$	$\surd$	1	1	$\times$	-	-
P84.3.12 $\mathrm{GM2}^{-} \oplus \mathrm{M1}^{-}$	$\surd$	1	1	$\times$	-	-
P84.3.13 $\mathrm{M1}^{+} \oplus \mathrm{M1}^{+}$	$\surd$	1	0	$\times$	-	-
P84.3.14 $\mathrm{M1}^{+} \oplus \mathrm{M2}^{+}$	$\surd$	1	0	$\times$	-	-
P84.3.15 $\mathrm{M1}^{+} \oplus \mathrm{M1}^{-}$	$\surd$	1	1	$\times$	-	-
P84.3.16 $\mathrm{M1}^{+} \oplus \mathrm{M2}^{-}$	$\surd$	1	1	$\times$	-	-
P84.3.17 $\mathrm{M1}^{-} \oplus \mathrm{M1}^{-}$	$\surd$	1	0	$\times$	-	-
P84.3.18 $\mathrm{M1}^{-} \oplus \mathrm{M2}^{-}$	$\surd$	1	0	$\times$	-	-
P84.4.1 $\mathrm{GM3}^{+}\mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	$4/m$	${}^{2}\mathrm{E_g} \oplus {}^{1}\mathrm{E_g}$
P84.4.2 $\mathrm{GM3}^{-}\mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
P84.4.3 $\mathrm{M3}^{+}\mathrm{M4}^{+}$	$\surd$	1	0	$\times$	-	-
P84.4.4 $\mathrm{M3}^{-}\mathrm{M4}^{-}$	$\surd$	1	0	$\times$	-	-

Coplanar SSGs with parent space group $P4_2/m$ (No. 84) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P84.6.1 A1	$\surd$	1	1	$\times$	-	-
P84.6.2 A2	$\surd$	1	1	$\times$	-	-
P84.6.3 Z1	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
P84.6.4 Z2	$\surd$	1	1	$\times$	-	-
P84.7.1 $\mathrm{X1^+}$	$\times$	-	-	-	-	-
P84.7.2 $\mathrm{X1^-}$	$\times$	-	-	-	-	-
P84.7.3 $\mathrm{R1^+}$	$\times$	-	-	-	-	-
P84.8.1 LD1	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
P84.8.2 V1	$\surd$	1	1	$\times$	-	-

TABLE S252: Non-coplanar SSGs with parent space group $P4_2/m$ (No. 84).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N84.1.1 $\mathrm{GM1^+}$	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_g\oplus A_g\oplus A_g}$
N84.2.1 $\mathrm{GM1^-}$	$\surd$	2	2	$\surd$	4	$\mathrm{A\oplus A}$
N84.2.2 $\mathrm{GM2^+}$	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_g\oplus A_g\oplus B_g}$
N84.2.3 $\mathrm{GM2^-}$	$\surd$	2	2	$\surd$	$\bar{4}$	$\mathrm{A\oplus A}$
N84.2.4 $\mathrm{M1^+}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_g\oplus A_g}$
N84.2.5 $\mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_g\oplus A_g}$
N84.3.1 $\mathrm{GM1^-\oplus GM1^-}$	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_g\oplus A_u\oplus A_u}$
N84.3.2 $\mathrm{GM1^-\oplus GM2^+}$	$\surd$	2	2	$\surd$	$\bar{4}$	$\mathrm{A\oplus B}$
N84.3.3 $\mathrm{GM1^-\oplus GM2^-}$	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_g\oplus A_u\oplus B_u}$
N84.3.4 $\mathrm{GM1^-\oplus M1^+}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_g\oplus A_u}$
N84.3.5 $\mathrm{GM1^-\oplus M1^-}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_g\oplus A_u}$
N84.3.6 $\mathrm{GM2^+\oplus GM2^+}$	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_g\oplus B_g\oplus B_g}$
N84.3.7 $\mathrm{GM2^+\oplus GM2^-}$	$\surd$	2	2	$\surd$	4	$\mathrm{A\oplus B}$
N84.3.8 $\mathrm{GM2^+\oplus M1^+}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_g\oplus B_g}$
N84.3.9 $\mathrm{GM2^+\oplus M1^-}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_g\oplus B_g}$
N84.3.10 $\mathrm{GM2^-\oplus GM2^-}$	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_g\oplus B_u\oplus B_u}$
N84.3.11 $\mathrm{GM2^-\oplus M1^+}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_g\oplus B_u}$
N84.3.12 $\mathrm{GM2^-\oplus M1^-}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_g\oplus B_u}$
N84.3.13 $\mathrm{M1^+\oplus M1^+}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_g}$
N84.3.14 $\mathrm{M1^+\oplus M2^+}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_g}$
N84.3.15 $\mathrm{M1^+\oplus M1^-}$	$\surd$	1	1	$\surd$	4	A
N84.3.16 $\mathrm{M1^+\oplus M2^-}$	$\surd$	1	1	$\surd$	$\bar{4}$	A
N84.3.17 $\mathrm{M1^-\oplus M1^-}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_g}$
N84.3.18 $\mathrm{M1^-\oplus M2^-}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_g}$
N84.4.1 $\mathrm{GM3^+GM4^+}$	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_g\oplus {}^2E_g\oplus {}^1E_g}$
N84.4.2 $\mathrm{GM3^-GM4^-}$	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_g\oplus {}^2E_u\oplus {}^1E_u}$
N84.4.3 $\mathrm{M3^+M4^+}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_g}$
N84.4.4 $\mathrm{M3^-M4^-}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_g}$
N84.6.1 A1	$\surd$	1	1	$\surd$	4	A
N84.6.2 A2	$\surd$	1	1	$\surd$	$\bar{4}$	A
N84.6.3 Z1	$\surd$	1	1	$\surd$	4	A
N84.6.4 Z2	$\surd$	1	1	$\surd$	$\bar{4}$	A

Non-coplanar SSGs with parent space group $P4_2/m$ (No. 84) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N84.7.1 $\mathrm{X1^+}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_g}$
N84.7.2 $\mathrm{X1^-}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_g}$
N84.7.3 $\mathrm{R1^+}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_g}$
N84.8.1 LD1	$\surd$	1	1	$\surd$	4	A
N84.8.2 V1	$\surd$	1	1	$\surd$	4	A
N84.9.1 $\mathrm{GM1^-}\oplus\mathrm{GM1^-}\oplus\mathrm{GM1^-}$	$\surd$	0	0	$\surd$	-	-
N84.9.2 $\mathrm{GM1^-}\oplus\mathrm{GM1^-}\oplus\mathrm{GM2^+}$	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{B_g}\oplus\mathrm{B_u}\oplus\mathrm{B_u}$
N84.9.3 $\mathrm{GM1^-}\oplus\mathrm{GM1^-}\oplus\mathrm{GM2^-}$	$\surd$	0	0	$\surd$	-	-
N84.9.4 $\mathrm{GM1^-}\oplus\mathrm{GM1^-}\oplus\mathrm{M1^+}$	$\surd$	0	0	$\surd$	-	-
N84.9.5 $\mathrm{GM1^-}\oplus\mathrm{GM1^-}\oplus\mathrm{M1^-}$	$\surd$	0	0	$\surd$	-	-
N84.9.6 $\mathrm{GM1^-}\oplus\mathrm{GM2^+}\oplus\mathrm{GM2^+}$	$\surd$	2	2	$\surd$	4	$\mathrm{B}\oplus\mathrm{B}$
N84.9.7 $\mathrm{GM1^-}\oplus\mathrm{GM2^+}\oplus\mathrm{GM2^-}$	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_u}\oplus\mathrm{B_g}\oplus\mathrm{B_u}$
N84.9.8 $\mathrm{GM1^-}\oplus\mathrm{GM2^+}\oplus\mathrm{M1^+}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{B_g}\oplus\mathrm{B_u}$
N84.9.9 $\mathrm{GM1^-}\oplus\mathrm{GM2^+}\oplus\mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{B_g}\oplus\mathrm{B_u}$
N84.9.10 $\mathrm{GM1^-}\oplus\mathrm{GM2^-}\oplus\mathrm{GM2^-}$	$\surd$	0	0	$\surd$	-	-
N84.9.11 $\mathrm{GM1^-}\oplus\mathrm{GM2^-}\oplus\mathrm{M1^+}$	$\surd$	0	0	$\surd$	-	-
N84.9.12 $\mathrm{GM1^-}\oplus\mathrm{GM2^-}\oplus\mathrm{M1^-}$	$\surd$	0	0	$\surd$	-	-
N84.9.13 $\mathrm{GM1^-}\oplus\mathrm{M1^+}\oplus\mathrm{M1^+}$	$\surd$	1	0	$\times$	-	-
N84.9.14 $\mathrm{GM1^-}\oplus\mathrm{M1^+}\oplus\mathrm{M2^+}$	$\surd$	1	0	$\times$	-	-
N84.9.15 $\mathrm{GM1^-}\oplus\mathrm{M1^+}\oplus\mathrm{M1^-}$	$\surd$	1	1	$\times$	-	-
N84.9.16 $\mathrm{GM1^-}\oplus\mathrm{M1^+}\oplus\mathrm{M2^-}$	$\surd$	1	1	$\times$	-	-
N84.9.17 $\mathrm{GM1^-}\oplus\mathrm{M1^-}\oplus\mathrm{M1^-}$	$\surd$	1	0	$\times$	-	-
N84.9.18 $\mathrm{GM1^-}\oplus\mathrm{M1^-}\oplus\mathrm{M2^-}$	$\surd$	1	0	$\times$	-	-
N84.9.19 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{GM2^+}$	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{B_g}\oplus\mathrm{B_g}\oplus\mathrm{B_g}$
N84.9.20 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{GM2^-}$	$\surd$	2	2	$\surd$	$\bar{4}$	$\mathrm{B}\oplus\mathrm{B}$
N84.9.21 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{M1^+}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{B_g}\oplus\mathrm{B_g}$
N84.9.22 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{B_g}\oplus\mathrm{B_g}$
N84.9.23 $\mathrm{GM2^+}\oplus\mathrm{GM2^-}\oplus\mathrm{GM2^-}$	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_u}\oplus\mathrm{A_u}\oplus\mathrm{B_g}$
N84.9.24 $\mathrm{GM2^+}\oplus\mathrm{GM2^-}\oplus\mathrm{M1^+}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_u}\oplus\mathrm{B_g}$
N84.9.25 $\mathrm{GM2^+}\oplus\mathrm{GM2^-}\oplus\mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_u}\oplus\mathrm{B_g}$
N84.9.26 $\mathrm{GM2^+}\oplus\mathrm{M1^+}\oplus\mathrm{M1^+}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{B_g}$
N84.9.27 $\mathrm{GM2^+}\oplus\mathrm{M1^+}\oplus\mathrm{M2^+}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{B_g}$
N84.9.28 $\mathrm{GM2^+}\oplus\mathrm{M1^+}\oplus\mathrm{M1^-}$	$\surd$	1	1	$\surd$	$\bar{4}$	B
N84.9.29 $\mathrm{GM2^+}\oplus\mathrm{M1^+}\oplus\mathrm{M2^-}$	$\surd$	1	1	$\surd$	4	B
N84.9.30 $\mathrm{GM2^+}\oplus\mathrm{M1^-}\oplus\mathrm{M1^-}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{B_g}$
N84.9.31 $\mathrm{GM2^+}\oplus\mathrm{M1^-}\oplus\mathrm{M2^-}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{B_g}$
N84.9.32 $\mathrm{GM2^-}\oplus\mathrm{GM2^-}\oplus\mathrm{GM2^-}$	$\surd$	0	0	$\surd$	-	-
N84.9.33 $\mathrm{GM2^-}\oplus\mathrm{GM2^-}\oplus\mathrm{M1^+}$	$\surd$	0	0	$\surd$	-	-
N84.9.34 $\mathrm{GM2^-}\oplus\mathrm{GM2^-}\oplus\mathrm{M1^-}$	$\surd$	0	0	$\surd$	-	-
N84.9.35 $\mathrm{GM2^-}\oplus\mathrm{M1^+}\oplus\mathrm{M1^+}$	$\surd$	1	0	$\times$	-	-
N84.9.36 $\mathrm{GM2^-}\oplus\mathrm{M1^+}\oplus\mathrm{M2^+}$	$\surd$	1	0	$\times$	-	-
N84.9.37 $\mathrm{GM2^-}\oplus\mathrm{M1^+}\oplus\mathrm{M1^-}$	$\surd$	1	1	$\times$	-	-
N84.9.38 $\mathrm{GM2^-}\oplus\mathrm{M1^+}\oplus\mathrm{M2^-}$	$\surd$	1	1	$\times$	-	-
N84.9.39 $\mathrm{GM2^-}\oplus\mathrm{M1^-}\oplus\mathrm{M1^-}$	$\surd$	1	0	$\times$	-	-
N84.9.40 $\mathrm{GM2^-}\oplus\mathrm{M1^-}\oplus\mathrm{M2^-}$	$\surd$	1	0	$\times$	-	-
N84.9.41 $\mathrm{M1^+}\oplus\mathrm{M1^+}\oplus\mathrm{M1^+}$	$\surd$	0	0	$\surd$	-	-

Non-coplanar SSGs with parent space group $P4_2/m$ (No. 84) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N84.9.42 $\mathrm{M1^+} \oplus \mathrm{M1^+} \oplus \mathrm{M2^+}$	$\surd$	0	0	$\surd$	-	-
N84.9.43 $\mathrm{M1^+} \oplus \mathrm{M1^+} \oplus \mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_u} \oplus \mathrm{A_u}$
N84.9.44 $\mathrm{M1^+} \oplus \mathrm{M1^+} \oplus \mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{B_u} \oplus \mathrm{B_u}$
N84.9.45 $\mathrm{M1^+} \oplus \mathrm{M2^+} \oplus \mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_u} \oplus \mathrm{B_u}$
N84.9.46 $\mathrm{M1^+} \oplus \mathrm{M1^-} \oplus \mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_u} \oplus \mathrm{A_u}$
N84.9.47 $\mathrm{M1^+} \oplus \mathrm{M1^-} \oplus \mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_u} \oplus \mathrm{B_u}$
N84.9.48 $\mathrm{M1^+} \oplus \mathrm{M2^-} \oplus \mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{B_u} \oplus \mathrm{B_u}$
N84.9.49 $\mathrm{M1^-} \oplus \mathrm{M1^-} \oplus \mathrm{M1^-}$	$\surd$	0	0	$\surd$	-	-
N84.9.50 $\mathrm{M1^-} \oplus \mathrm{M1^-} \oplus \mathrm{M2^-}$	$\surd$	0	0	$\surd$	-	-
N84.10.1 $\mathrm{GM1^-} \oplus \mathrm{GM3^+GM4^+}$	$\surd$	2	2	$\surd$	4	$^2\mathrm{E} \oplus {}^1\mathrm{E}$
N84.10.2 $\mathrm{GM1^-} \oplus \mathrm{GM3^-GM4^-}$	$\surd$	0	0	$\surd$	-	-
N84.10.3 $\mathrm{GM1^-} \oplus \mathrm{M3^+M4^+}$	$\surd$	1	0	$\times$	-	-
N84.10.4 $\mathrm{GM1^-} \oplus \mathrm{M3^-M4^-}$	$\surd$	1	0	$\times$	-	-
N84.10.5 $\mathrm{GM2^+} \oplus \mathrm{GM3^+GM4^+}$	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{B_g} \oplus {}^2\mathrm{E_g} \oplus {}^1\mathrm{E_g}$
N84.10.6 $\mathrm{GM2^+} \oplus \mathrm{GM3^-GM4^-}$	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{B_g} \oplus {}^2\mathrm{E_u} \oplus {}^1\mathrm{E_u}$
N84.10.7 $\mathrm{GM2^+} \oplus \mathrm{M3^+M4^+}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{B_g}$
N84.10.8 $\mathrm{GM2^+} \oplus \mathrm{M3^-M4^-}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{B_g}$
N84.10.9 $\mathrm{GM2^-} \oplus \mathrm{GM3^+GM4^+}$	$\surd$	2	2	$\surd$	$\bar{4}$	$^2\mathrm{E} \oplus {}^1\mathrm{E}$
N84.10.10 $\mathrm{GM2^-} \oplus \mathrm{GM3^-GM4^-}$	$\surd$	0	0	$\surd$	-	-
N84.10.11 $\mathrm{GM2^-} \oplus \mathrm{M3^+M4^+}$	$\surd$	1	0	$\times$	-	-
N84.10.12 $\mathrm{GM2^-} \oplus \mathrm{M3^-M4^-}$	$\surd$	1	0	$\times$	-	-
N84.10.13 $\mathrm{M1^+} \oplus \mathrm{GM3^+GM4^+}$	$\surd$	2	2	$\surd$	$4/m$	$^2\mathrm{E_g} \oplus {}^1\mathrm{E_g}$
N84.10.14 $\mathrm{M1^+} \oplus \mathrm{GM3^-GM4^-}$	$\surd$	0	0	$\surd$	-	-
N84.10.15 $\mathrm{M1^+} \oplus \mathrm{M3^+M4^+}$	$\surd$	0	0	$\surd$	-	-
N84.10.16 $\mathrm{M1^+} \oplus \mathrm{M3^-M4^-}$	$\surd$	2	2	$\surd$	$4/m$	$^2\mathrm{E_u} \oplus {}^1\mathrm{E_u}$
N84.10.17 $\mathrm{M1^-} \oplus \mathrm{GM3^+GM4^+}$	$\surd$	2	2	$\surd$	$4/m$	$^2\mathrm{E_g} \oplus {}^1\mathrm{E_g}$
N84.10.18 $\mathrm{M1^-} \oplus \mathrm{GM3^-GM4^-}$	$\surd$	0	0	$\surd$	-	-
N84.10.19 $\mathrm{M1^-} \oplus \mathrm{M3^+M4^+}$	$\surd$	2	2	$\surd$	$4/m$	$^2\mathrm{E_u} \oplus {}^1\mathrm{E_u}$
N84.10.20 $\mathrm{M1^-} \oplus \mathrm{M3^-M4^-}$	$\surd$	0	0	$\surd$	-	-
N84.12.1 $\mathrm{GM1^-} \oplus \mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N84.12.2 $\mathrm{GM1^-} \oplus \mathrm{A2}$	$\surd$	1	1	$\times$	-	-
N84.12.3 $\mathrm{GM1^-} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
N84.12.4 $\mathrm{GM1^-} \oplus \mathrm{Z2}$	$\surd$	1	1	$\times$	-	-
N84.12.5 $\mathrm{GM2^+} \oplus \mathrm{A1}$	$\surd$	1	1	$\surd$	$\bar{4}$	B
N84.12.6 $\mathrm{GM2^+} \oplus \mathrm{A2}$	$\surd$	1	1	$\times$	-	-
N84.12.7 $\mathrm{GM2^+} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$\bar{4}$	B
N84.12.8 $\mathrm{GM2^+} \oplus \mathrm{Z2}$	$\surd$	1	1	$\times$	-	-
N84.12.9 $\mathrm{GM2^-} \oplus \mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N84.12.10 $\mathrm{GM2^-} \oplus \mathrm{A2}$	$\surd$	1	1	$\times$	-	-
N84.12.11 $\mathrm{GM2^-} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
N84.12.12 $\mathrm{GM2^-} \oplus \mathrm{Z2}$	$\surd$	1	1	$\times$	-	-
N84.12.13 $\mathrm{M1^+} \oplus \mathrm{A1}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
N84.12.14 $\mathrm{M1^+} \oplus \mathrm{A2}$	$\surd$	1	1	$\times$	-	-
N84.12.15 $\mathrm{M1^+} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
N84.12.16 $\mathrm{M1^+} \oplus \mathrm{Z2}$	$\surd$	1	1	$\times$	-	-
N84.12.17 $\mathrm{M1^-} \oplus \mathrm{A1}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$

Non-coplanar SSGs with parent space group $P4_2/m$ (No. 84) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N84.12.18 $\mathrm{M1^-}\oplus\mathrm{A2}$	$\surd$	1	1	$\times$	-	-
N84.12.19 $\mathrm{M1^-}\oplus\mathrm{Z1}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
N84.12.20 $\mathrm{M1^-}\oplus\mathrm{Z2}$	$\surd$	1	1	$\times$	-	-
N84.13.1 $\mathrm{GM1^-}\oplus\mathrm{X1^+}$	$\surd$	1	0	$\times$	-	-
N84.13.2 $\mathrm{GM1^-}\oplus\mathrm{X1^-}$	$\surd$	1	0	$\times$	-	-
N84.13.3 $\mathrm{GM1^-}\oplus\mathrm{R1^+}$	$\surd$	1	0	$\times$	-	-
N84.13.4 $\mathrm{GM2^+}\oplus\mathrm{X1^+}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{B_g}$
N84.13.5 $\mathrm{GM2^+}\oplus\mathrm{X1^-}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{B_g}$
N84.13.6 $\mathrm{GM2^+}\oplus\mathrm{R1^+}$	$\surd$	1	1	$\times$	-	-
N84.13.7 $\mathrm{GM2^-}\oplus\mathrm{X1^+}$	$\surd$	1	0	$\times$	-	-
N84.13.8 $\mathrm{GM2^-}\oplus\mathrm{X1^-}$	$\surd$	1	0	$\times$	-	-
N84.13.9 $\mathrm{GM2^-}\oplus\mathrm{R1^+}$	$\surd$	1	0	$\times$	-	-
N84.13.10 $\mathrm{M1^+}\oplus\mathrm{X1^+}$	$\times$	-	-	-	-	-
N84.13.11 $\mathrm{M1^+}\oplus\mathrm{X2^-}$	$\times$	-	-	-	-	-
N84.13.12 $\mathrm{M1^+}\oplus\mathrm{X1^-}$	$\times$	-	-	-	-	-
N84.13.13 $\mathrm{M1^+}\oplus\mathrm{X2^+}$	$\times$	-	-	-	-	-
N84.13.14 $\mathrm{M1^+}\oplus\mathrm{R1^+}$	$\times$	-	-	-	-	-
N84.13.15 $\mathrm{M1^+}\oplus\mathrm{R2^+}$	$\times$	-	-	-	-	-
N84.13.16 $\mathrm{M1^-}\oplus\mathrm{X1^+}$	$\times$	-	-	-	-	-
N84.13.17 $\mathrm{M1^-}\oplus\mathrm{X2^-}$	$\times$	-	-	-	-	-
N84.13.18 $\mathrm{M1^-}\oplus\mathrm{X1^-}$	$\times$	-	-	-	-	-
N84.13.19 $\mathrm{M1^-}\oplus\mathrm{X2^+}$	$\times$	-	-	-	-	-
N84.13.20 $\mathrm{M1^-}\oplus\mathrm{R1^+}$	$\times$	-	-	-	-	-
N84.13.21 $\mathrm{M1^-}\oplus\mathrm{R2^+}$	$\times$	-	-	-	-	-
N84.14.1 $\mathrm{GM1^-}\oplus\mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
N84.14.2 $\mathrm{GM1^-}\oplus\mathrm{V1}$	$\surd$	1	1	$\times$	-	-
N84.14.3 $\mathrm{GM2^+}\oplus\mathrm{LD1}$	$\surd$	1	1	$\surd$	$\bar{4}$	B
N84.14.4 $\mathrm{GM2^+}\oplus\mathrm{V1}$	$\surd$	1	1	$\surd$	$\bar{4}$	B
N84.14.5 $\mathrm{GM2^-}\oplus\mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
N84.14.6 $\mathrm{GM2^-}\oplus\mathrm{V1}$	$\surd$	1	1	$\times$	-	-
N84.14.7 $\mathrm{M1^+}\oplus\mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
N84.14.8 $\mathrm{M1^+}\oplus\mathrm{V1}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
N84.14.9 $\mathrm{M1^-}\oplus\mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
N84.14.10 $\mathrm{M1^-}\oplus\mathrm{V1}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$

TABLE S253: Collinear SSGs with parent space group $P4/n$ (No. 85).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L85.1.1 $\mathrm{GM1^+}$	1	$4/m$	$\mathrm{A_g}$
L85.2.1 $\mathrm{GM1^-}$	0	-	-
L85.2.2 $\mathrm{GM2^+}$	1	$4/m$	$\mathrm{B_g}$
L85.2.3 $\mathrm{GM2^-}$	0	-	-
L85.2.4 $\mathrm{Z1^+}$	0	-	-
L85.2.5 $\mathrm{Z2^+}$	0	-	-

TABLE S254: Coplanar SSGs with parent space group $P4/n$ (No. 85).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P85.1.1 $\mathrm{GM1}^{+}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_g}\oplus\mathrm{A_g}$
P85.2.1 $\mathrm{GM1}^{-}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_g}\oplus\mathrm{A_u}$
P85.2.2 $\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_g}\oplus\mathrm{B_g}$
P85.2.3 $\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_g}\oplus\mathrm{B_u}$
P85.2.4 $\mathrm{Z1}^{+}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_g}$
P85.2.5 $\mathrm{Z2}^{+}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_g}$
P85.3.1 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}$	$\surd$	0	0	$\surd$	-	-
P85.3.2 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{B_g}\oplus\mathrm{B_u}$
P85.3.3 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
P85.3.4 $\mathrm{GM1}^{-}\oplus\mathrm{Z1}^{+}$	$\surd$	1	1	$\times$	-	-
P85.3.5 $\mathrm{GM1}^{-}\oplus\mathrm{Z2}^{+}$	$\surd$	1	1	$\times$	-	-
P85.3.6 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{B_g}\oplus\mathrm{B_g}$
P85.3.7 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_u}\oplus\mathrm{B_g}$
P85.3.8 $\mathrm{GM2}^{+}\oplus\mathrm{Z1}^{+}$	$\surd$	1	0	$\times$	-	-
P85.3.9 $\mathrm{GM2}^{+}\oplus\mathrm{Z2}^{+}$	$\surd$	1	0	$\times$	-	-
P85.3.10 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
P85.3.11 $\mathrm{GM2}^{-}\oplus\mathrm{Z1}^{+}$	$\surd$	1	1	$\times$	-	-
P85.3.12 $\mathrm{GM2}^{-}\oplus\mathrm{Z2}^{+}$	$\surd$	1	1	$\times$	-	-
P85.3.13 $\mathrm{Z1}^{+}\oplus\mathrm{Z1}^{+}$	$\surd$	1	0	$\times$	-	-
P85.3.14 $\mathrm{Z1}^{+}\oplus\mathrm{Z1}^{-}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
P85.3.15 $\mathrm{Z1}^{+}\oplus\mathrm{Z2}^{+}$	$\surd$	1	0	$\times$	-	-
P85.3.16 $\mathrm{Z1}^{+}\oplus\mathrm{Z2}^{-}$	$\surd$	1	1	$\times$	-	-
P85.3.17 $\mathrm{Z2}^{+}\oplus\mathrm{Z2}^{+}$	$\surd$	1	0	$\times$	-	-
P85.3.18 $\mathrm{Z2}^{+}\oplus\mathrm{Z2}^{-}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
P85.4.1 $\mathrm{GM3}^{+}\mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	$4/m$	${}^{2}\mathrm{E_g}\oplus{}^{1}\mathrm{E_g}$
P85.4.2 $\mathrm{GM3}^{-}\mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
P85.4.3 $\mathrm{Z3}^{+}\mathrm{Z4}^{+}$	$\surd$	1	0	$\times$	-	-
P85.6.1 A1	$\surd$	1	1	$\times$	-	-
P85.6.2 A2	$\surd$	1	1	$\times$	-	-
P85.6.3 M1	$\surd$	1	1	$\times$	-	-
P85.6.4 M2	$\surd$	1	1	$\times$	-	-
P85.8.1 LD1	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
P85.8.2 LD2	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
P85.8.3 V1	$\surd$	1	1	$\times$	-	-

TABLE S255: Non-coplanar SSGs with parent space group $P4/n$ (No. 85).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N85.1.1 $\mathrm{GM1}^{+}$	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{A_g}$
N85.2.1 $\mathrm{GM1}^{-}$	$\surd$	2	2	$\surd$	4	$\mathrm{A}\oplus\mathrm{A}$
N85.2.2 $\mathrm{GM2}^{+}$	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{B_g}$
N85.2.3 $\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	$\bar{4}$	$\mathrm{A}\oplus\mathrm{A}$
N85.2.4 $\mathrm{Z1}^{+}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_g}\oplus\mathrm{A_g}$
N85.2.5 $\mathrm{Z2}^{+}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_g}\oplus\mathrm{A_g}$
N85.3.1 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}$	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_g}\oplus\mathrm{A_u}\oplus\mathrm{A_u}$
N85.3.2 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	$\bar{4}$	$\mathrm{A}\oplus\mathrm{B}$

Non-coplanar SSGs with parent space group $P4/n$ (No. 85) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N85.3.3 $\mathrm{GM1^-}\oplus\mathrm{GM2^-}$	√	3	3	√	$4/m$	$\mathrm{A_g}\oplus\mathrm{A_u}\oplus\mathrm{B_u}$
N85.3.4 $\mathrm{GM1^-}\oplus\mathrm{Z1^+}$	√	2	2	√	$4/m$	$\mathrm{A_g}\oplus\mathrm{A_u}$
N85.3.5 $\mathrm{GM1^-}\oplus\mathrm{Z2^+}$	√	2	2	√	$4/m$	$\mathrm{A_g}\oplus\mathrm{A_u}$
N85.3.6 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}$	√	3	3	√	$4/m$	$\mathrm{A_g}\oplus\mathrm{B_g}\oplus\mathrm{B_g}$
N85.3.7 $\mathrm{GM2^+}\oplus\mathrm{GM2^-}$	√	2	2	√	4	$\mathrm{A}\oplus\mathrm{B}$
N85.3.8 $\mathrm{GM2^+}\oplus\mathrm{Z1^+}$	√	2	2	√	$4/m$	$\mathrm{A_g}\oplus\mathrm{B_g}$
N85.3.9 $\mathrm{GM2^+}\oplus\mathrm{Z2^+}$	√	2	2	√	$4/m$	$\mathrm{A_g}\oplus\mathrm{B_g}$
N85.3.10 $\mathrm{GM2^-}\oplus\mathrm{GM2^-}$	√	3	3	√	$4/m$	$\mathrm{A_g}\oplus\mathrm{B_u}\oplus\mathrm{B_u}$
N85.3.11 $\mathrm{GM2^-}\oplus\mathrm{Z1^+}$	√	2	2	√	$4/m$	$\mathrm{A_g}\oplus\mathrm{B_u}$
N85.3.12 $\mathrm{GM2^-}\oplus\mathrm{Z2^+}$	√	2	2	√	$4/m$	$\mathrm{A_g}\oplus\mathrm{B_u}$
N85.3.13 $\mathrm{Z1^+}\oplus\mathrm{Z1^+}$	√	1	1	√	$4/m$	$\mathrm{A_g}$
N85.3.14 $\mathrm{Z1^+}\oplus\mathrm{Z1^-}$	√	1	1	√	4	A
N85.3.15 $\mathrm{Z1^+}\oplus\mathrm{Z2^+}$	√	1	1	√	$4/m$	$\mathrm{A_g}$
N85.3.16 $\mathrm{Z1^+}\oplus\mathrm{Z2^-}$	√	1	1	√	$\bar{4}$	A
N85.3.17 $\mathrm{Z2^+}\oplus\mathrm{Z2^+}$	√	1	1	√	$4/m$	$\mathrm{A_g}$
N85.3.18 $\mathrm{Z2^+}\oplus\mathrm{Z2^-}$	√	1	1	√	4	A
N85.4.1 $\mathrm{GM3^+GM4^+}$	√	3	3	√	$4/m$	$\mathrm{A_g}\oplus{}^2\mathrm{E_g}\oplus{}^1\mathrm{E_g}$
N85.4.2 $\mathrm{GM3^-GM4^-}$	√	3	3	√	$4/m$	$\mathrm{A_g}\oplus{}^2\mathrm{E_u}\oplus{}^1\mathrm{E_u}$
N85.4.3 $\mathrm{Z3^+Z4^+}$	√	1	1	√	$4/m$	$\mathrm{A_g}$
N85.6.1 A1	√	1	1	√	4	A
N85.6.2 A2	√	1	1	√	$\bar{4}$	A
N85.6.3 M1	√	1	1	√	4	A
N85.6.4 M2	√	1	1	√	$\bar{4}$	A
N85.8.1 LD1	√	1	1	√	4	A
N85.8.2 LD2	√	1	1	√	4	A
N85.8.3 V1	√	1	1	√	4	A
N85.9.1 $\mathrm{GM1^-}\oplus\mathrm{GM1^-}\oplus\mathrm{GM1^-}$	√	0	0	√	-	-
N85.9.2 $\mathrm{GM1^-}\oplus\mathrm{GM1^-}\oplus\mathrm{GM2^+}$	√	3	3	√	$4/m$	$\mathrm{B_g}\oplus\mathrm{B_u}\oplus\mathrm{B_u}$
N85.9.3 $\mathrm{GM1^-}\oplus\mathrm{GM1^-}\oplus\mathrm{GM2^-}$	√	0	0	√	-	-
N85.9.4 $\mathrm{GM1^-}\oplus\mathrm{GM1^-}\oplus\mathrm{Z1^+}$	√	0	0	√	-	-
N85.9.5 $\mathrm{GM1^-}\oplus\mathrm{GM1^-}\oplus\mathrm{Z2^+}$	√	0	0	√	-	-
N85.9.6 $\mathrm{GM1^-}\oplus\mathrm{GM2^+}\oplus\mathrm{GM2^+}$	√	2	2	√	4	$\mathrm{B}\oplus\mathrm{B}$
N85.9.7 $\mathrm{GM1^-}\oplus\mathrm{GM2^+}\oplus\mathrm{GM2^-}$	√	3	3	√	$4/m$	$\mathrm{A_u}\oplus\mathrm{B_g}\oplus\mathrm{B_u}$
N85.9.8 $\mathrm{GM1^-}\oplus\mathrm{GM2^+}\oplus\mathrm{Z1^+}$	√	2	2	√	$4/m$	$\mathrm{B_g}\oplus\mathrm{B_u}$
N85.9.9 $\mathrm{GM1^-}\oplus\mathrm{GM2^+}\oplus\mathrm{Z2^+}$	√	2	2	√	$4/m$	$\mathrm{B_g}\oplus\mathrm{B_u}$
N85.9.10 $\mathrm{GM1^-}\oplus\mathrm{GM2^-}\oplus\mathrm{GM2^-}$	√	0	0	√	-	-
N85.9.11 $\mathrm{GM1^-}\oplus\mathrm{GM2^-}\oplus\mathrm{Z1^+}$	√	0	0	√	-	-
N85.9.12 $\mathrm{GM1^-}\oplus\mathrm{GM2^-}\oplus\mathrm{Z2^+}$	√	0	0	√	-	-
N85.9.13 $\mathrm{GM1^-}\oplus\mathrm{Z1^+}\oplus\mathrm{Z1^+}$	√	1	0	×	-	-
N85.9.14 $\mathrm{GM1^-}\oplus\mathrm{Z1^+}\oplus\mathrm{Z1^-}$	√	1	1	√	$4/m$	$\mathrm{A_u}$
N85.9.15 $\mathrm{GM1^-}\oplus\mathrm{Z1^+}\oplus\mathrm{Z2^+}$	√	1	0	×	-	-
N85.9.16 $\mathrm{GM1^-}\oplus\mathrm{Z1^+}\oplus\mathrm{Z2^-}$	√	1	1	×	-	-
N85.9.17 $\mathrm{GM1^-}\oplus\mathrm{Z2^+}\oplus\mathrm{Z2^+}$	√	1	0	×	-	-
N85.9.18 $\mathrm{GM1^-}\oplus\mathrm{Z2^+}\oplus\mathrm{Z2^-}$	√	1	1	√	$4/m$	$\mathrm{A_u}$
N85.9.19 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{GM2^+}$	√	3	3	√	$4/m$	$\mathrm{B_g}\oplus\mathrm{B_g}\oplus\mathrm{B_g}$
N85.9.20 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{GM2^-}$	√	2	2	√	$\bar{4}$	$\mathrm{B}\oplus\mathrm{B}$

Non-coplanar SSGs with parent space group $P4/n$ (No. 85) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N85.9.21 $\mathrm{GM2^+} \oplus \mathrm{GM2^+} \oplus \mathrm{Z1^+}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{B_g} \oplus \mathrm{B_g}$
N85.9.22 $\mathrm{GM2^+} \oplus \mathrm{GM2^+} \oplus \mathrm{Z2^+}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{B_g} \oplus \mathrm{B_g}$
N85.9.23 $\mathrm{GM2^+} \oplus \mathrm{GM2^-} \oplus \mathrm{GM2^-}$	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B_g}$
N85.9.24 $\mathrm{GM2^+} \oplus \mathrm{GM2^-} \oplus \mathrm{Z1^+}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_u} \oplus \mathrm{B_g}$
N85.9.25 $\mathrm{GM2^+} \oplus \mathrm{GM2^-} \oplus \mathrm{Z2^+}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_u} \oplus \mathrm{B_g}$
N85.9.26 $\mathrm{GM2^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z1^+}$	$\surd$	1	1	$\times$	-	-
N85.9.27 $\mathrm{GM2^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z1^-}$	$\surd$	1	1	$\surd$	$\bar{4}$	B
N85.9.28 $\mathrm{GM2^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z2^+}$	$\surd$	1	1	$\times$	-	-
N85.9.29 $\mathrm{GM2^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
N85.9.30 $\mathrm{GM2^+} \oplus \mathrm{Z2^+} \oplus \mathrm{Z2^+}$	$\surd$	1	1	$\times$	-	-
N85.9.31 $\mathrm{GM2^+} \oplus \mathrm{Z2^+} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\surd$	$\bar{4}$	B
N85.9.32 $\mathrm{GM2^-} \oplus \mathrm{GM2^-} \oplus \mathrm{GM2^-}$	$\surd$	0	0	$\surd$	-	-
N85.9.33 $\mathrm{GM2^-} \oplus \mathrm{GM2^-} \oplus \mathrm{Z1^+}$	$\surd$	0	0	$\surd$	-	-
N85.9.34 $\mathrm{GM2^-} \oplus \mathrm{GM2^-} \oplus \mathrm{Z2^+}$	$\surd$	0	0	$\surd$	-	-
N85.9.35 $\mathrm{GM2^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z1^+}$	$\surd$	1	0	$\times$	-	-
N85.9.36 $\mathrm{GM2^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z1^-}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
N85.9.37 $\mathrm{GM2^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z2^+}$	$\surd$	1	0	$\times$	-	-
N85.9.38 $\mathrm{GM2^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
N85.9.39 $\mathrm{GM2^-} \oplus \mathrm{Z2^+} \oplus \mathrm{Z2^+}$	$\surd$	1	0	$\times$	-	-
N85.9.40 $\mathrm{GM2^-} \oplus \mathrm{Z2^+} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
N85.9.41 $\mathrm{Z1^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z1^+}$	$\surd$	0	0	$\surd$	-	-
N85.9.42 $\mathrm{Z1^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z1^-}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_u} \oplus \mathrm{A_u}$
N85.9.43 $\mathrm{Z1^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z2^+}$	$\surd$	0	0	$\surd$	-	-
N85.9.44 $\mathrm{Z1^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z2^-}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{B_u} \oplus \mathrm{B_u}$
N85.9.45 $\mathrm{Z1^+} \oplus \mathrm{Z1^-} \oplus \mathrm{Z2^+}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_u} \oplus \mathrm{B_u}$
N85.9.46 $\mathrm{Z1^+} \oplus \mathrm{Z2^+} \oplus \mathrm{Z2^+}$	$\surd$	0	0	$\surd$	-	-
N85.9.47 $\mathrm{Z1^+} \oplus \mathrm{Z2^+} \oplus \mathrm{Z2^-}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_u} \oplus \mathrm{B_u}$
N85.9.48 $\mathrm{Z1^+} \oplus \mathrm{Z2^-} \oplus \mathrm{Z2^-}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{B_u} \oplus \mathrm{B_u}$
N85.9.49 $\mathrm{Z2^+} \oplus \mathrm{Z2^+} \oplus \mathrm{Z2^+}$	$\surd$	0	0	$\surd$	-	-
N85.9.50 $\mathrm{Z2^+} \oplus \mathrm{Z2^+} \oplus \mathrm{Z2^-}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_u} \oplus \mathrm{A_u}$
N85.10.1 $\mathrm{GM1^-} \oplus \mathrm{GM3^+GM4^+}$	$\surd$	2	2	$\surd$	4	$^2\mathrm{E} \oplus {}^1\mathrm{E}$
N85.10.2 $\mathrm{GM1^-} \oplus \mathrm{GM3^-GM4^-}$	$\surd$	0	0	$\surd$	-	-
N85.10.3 $\mathrm{GM1^-} \oplus \mathrm{Z3^+Z4^+}$	$\surd$	1	0	$\times$	-	-
N85.10.4 $\mathrm{GM2^+} \oplus \mathrm{GM3^+GM4^+}$	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{B_g} \oplus {}^2\mathrm{E_g} \oplus {}^1\mathrm{E_g}$
N85.10.5 $\mathrm{GM2^+} \oplus \mathrm{GM3^-GM4^-}$	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{B_g} \oplus {}^2\mathrm{E_u} \oplus {}^1\mathrm{E_u}$
N85.10.6 $\mathrm{GM2^+} \oplus \mathrm{Z3^+Z4^+}$	$\surd$	1	1	$\times$	-	-
N85.10.7 $\mathrm{GM2^-} \oplus \mathrm{GM3^+GM4^+}$	$\surd$	2	2	$\surd$	$\bar{4}$	$^2\mathrm{E} \oplus {}^1\mathrm{E}$
N85.10.8 $\mathrm{GM2^-} \oplus \mathrm{GM3^-GM4^-}$	$\surd$	0	0	$\surd$	-	-
N85.10.9 $\mathrm{GM2^-} \oplus \mathrm{Z3^+Z4^+}$	$\surd$	1	0	$\times$	-	-
N85.10.10 $\mathrm{Z1^+} \oplus \mathrm{GM3^+GM4^+}$	$\surd$	2	2	$\surd$	$4/m$	$^2\mathrm{E_g} \oplus {}^1\mathrm{E_g}$
N85.10.11 $\mathrm{Z1^+} \oplus \mathrm{GM3^-GM4^-}$	$\surd$	0	0	$\surd$	-	-
N85.10.12 $\mathrm{Z1^+} \oplus \mathrm{Z3^+Z4^+}$	$\surd$	0	0	$\surd$	-	-
N85.10.13 $\mathrm{Z1^+} \oplus \mathrm{Z3^-Z4^-}$	$\surd$	2	2	$\surd$	$4/m$	$^2\mathrm{E_u} \oplus {}^1\mathrm{E_u}$
N85.10.14 $\mathrm{Z2^+} \oplus \mathrm{GM3^+GM4^+}$	$\surd$	2	2	$\surd$	$4/m$	$^2\mathrm{E_g} \oplus {}^1\mathrm{E_g}$
N85.10.15 $\mathrm{Z2^+} \oplus \mathrm{GM3^-GM4^-}$	$\surd$	0	0	$\surd$	-	-
N85.10.16 $\mathrm{Z2^+} \oplus \mathrm{Z3^+Z4^+}$	$\surd$	0	0	$\surd$	-	-

Non-coplanar SSGs with parent space group $P4/n$ (No. 85) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N85.10.17 Z2$^+$ ⊕ Z3$^-$Z4$^-$	√	2	2	√	$4/m$	$^2\mathrm{E_u} \oplus {}^1\mathrm{E_u}$
N85.12.1 GM1$^-$ ⊕ A1	√	1	1	×	-	-
N85.12.2 GM1$^-$ ⊕ A2	√	1	1	×	-	-
N85.12.3 GM1$^-$ ⊕ M1	√	1	1	×	-	-
N85.12.4 GM1$^-$ ⊕ M2	√	1	1	×	-	-
N85.12.5 GM2$^+$ ⊕ A1	√	1	1	√	$\bar{4}$	B
N85.12.6 GM2$^+$ ⊕ A2	√	1	1	×	-	-
N85.12.7 GM2$^+$ ⊕ M1	√	1	1	√	$\bar{4}$	B
N85.12.8 GM2$^+$ ⊕ M2	√	1	1	√	4	B
N85.12.9 GM2$^-$ ⊕ A1	√	1	1	×	-	-
N85.12.10 GM2$^-$ ⊕ A2	√	1	1	×	-	-
N85.12.11 GM2$^-$ ⊕ M1	√	1	1	×	-	-
N85.12.12 GM2$^-$ ⊕ M2	√	1	1	×	-	-
N85.12.13 Z1$^+$ ⊕ A1	√	1	1	×	-	-
N85.12.14 Z1$^+$ ⊕ A2	√	1	1	×	-	-
N85.12.15 Z1$^+$ ⊕ M1	√	1	1	×	-	-
N85.12.16 Z1$^+$ ⊕ M2	√	1	1	×	-	-
N85.12.17 Z2$^+$ ⊕ A1	√	1	1	×	-	-
N85.12.18 Z2$^+$ ⊕ A2	√	1	1	×	-	-
N85.12.19 Z2$^+$ ⊕ M1	√	1	1	×	-	-
N85.12.20 Z2$^+$ ⊕ M2	√	1	1	×	-	-
N85.14.1 GM1$^-$ ⊕ LD1	√	1	1	√	$4/m$	$\mathrm{A_u}$
N85.14.2 GM1$^-$ ⊕ LD2	√	1	1	√	$4/m$	$\mathrm{A_u}$
N85.14.3 GM1$^-$ ⊕ V1	√	1	1	×	-	-
N85.14.4 GM2$^+$ ⊕ LD1	√	1	1	√	$\bar{4}$	B
N85.14.5 GM2$^+$ ⊕ LD2	√	1	1	√	$\bar{4}$	B
N85.14.6 GM2$^+$ ⊕ V1	√	1	1	√	$\bar{4}$	B
N85.14.7 GM2$^-$ ⊕ LD1	√	1	1	√	$4/m$	$\mathrm{A_u}$
N85.14.8 GM2$^-$ ⊕ LD2	√	1	1	√	$4/m$	$\mathrm{A_u}$
N85.14.9 GM2$^-$ ⊕ V1	√	1	1	×	-	-
N85.14.10 Z1$^+$ ⊕ LD1	√	1	1	√	$4/m$	$\mathrm{A_u}$
N85.14.11 Z1$^+$ ⊕ LD2	√	1	1	√	$4/m$	$\mathrm{A_u}$
N85.14.12 Z1$^+$ ⊕ V1	√	1	1	×	-	-
N85.14.13 Z2$^+$ ⊕ LD1	√	1	1	√	$4/m$	$\mathrm{A_u}$
N85.14.14 Z2$^+$ ⊕ LD2	√	1	1	√	$4/m$	$\mathrm{A_u}$
N85.14.15 Z2$^+$ ⊕ V1	√	1	1	×	-	-

TABLE S256: Collinear SSGs with parent space group $P4_2/n$ (No. 86).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L86.1.1 GM1$^+$	1	$4/m$	$\mathrm{A_g}$
L86.2.1 GM1$^-$	0	-	-
L86.2.2 GM2$^+$	1	$4/m$	$\mathrm{B_g}$
L86.2.3 GM2$^-$	0	-	-
L86.2.4 A1$^+$	0	-	-

TABLE S257: Coplanar SSGs with parent space group $P4_2/n$ (No. 86).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P86.1.1 $\mathrm{GM1}^+$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_g}\oplus\mathrm{A_g}$
P86.2.1 $\mathrm{GM1}^-$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_g}\oplus\mathrm{A_u}$
P86.2.2 $\mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_g}\oplus\mathrm{B_g}$
P86.2.3 $\mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_g}\oplus\mathrm{B_u}$
P86.2.4 $\mathrm{A1}^+$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_g}$
P86.3.1 $\mathrm{GM1}^-\oplus\mathrm{GM1}^-$	$\surd$	0	0	$\surd$	-	-
P86.3.2 $\mathrm{GM1}^-\oplus\mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{B_g}\oplus\mathrm{B_u}$
P86.3.3 $\mathrm{GM1}^-\oplus\mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
P86.3.4 $\mathrm{GM1}^-\oplus\mathrm{A1}^+$	$\surd$	1	1	$\times$	-	-
P86.3.5 $\mathrm{GM2}^+\oplus\mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{B_g}\oplus\mathrm{B_g}$
P86.3.6 $\mathrm{GM2}^+\oplus\mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_u}\oplus\mathrm{B_g}$
P86.3.7 $\mathrm{GM2}^+\oplus\mathrm{A1}^+$	$\surd$	1	0	$\times$	-	-
P86.3.8 $\mathrm{GM2}^-\oplus\mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
P86.3.9 $\mathrm{GM2}^-\oplus\mathrm{A1}^+$	$\surd$	1	1	$\times$	-	-
P86.3.10 $\mathrm{A1}^+\oplus\mathrm{A1}^+$	$\surd$	1	0	$\times$	-	-
P86.3.11 $\mathrm{A1}^+\oplus\mathrm{A1}^-$	$\surd$	1	1	$\times$	-	-
P86.3.12 $\mathrm{A1}^+\oplus\mathrm{A2}^+$	$\surd$	1	0	$\times$	-	-
P86.3.13 $\mathrm{A1}^+\oplus\mathrm{A2}^-$	$\surd$	1	1	$\times$	-	-
P86.4.1 $\mathrm{GM3}^+\mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$4/m$	$^2\mathrm{E_g}\oplus{}^1\mathrm{E_g}$
P86.4.2 $\mathrm{GM3}^-\mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
P86.4.3 $\mathrm{A3}^+\mathrm{A4}^+$	$\surd$	1	0	$\times$	-	-
P86.6.1 M1	$\surd$	1	1	$\times$	-	-
P86.6.2 M2	$\surd$	1	1	$\times$	-	-
P86.6.3 Z1	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
P86.6.4 Z2	$\surd$	1	1	$\times$	-	-
P86.8.1 LD1	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
P86.8.2 V1	$\surd$	1	1	$\times$	-	-

TABLE S258: Non-coplanar SSGs with parent space group $P4_2/n$ (No. 86).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N86.1.1 $\mathrm{GM1}^+$	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{A_g}$
N86.2.1 $\mathrm{GM1}^-$	$\surd$	2	2	$\surd$	4	$\mathrm{A}\oplus\mathrm{A}$
N86.2.2 $\mathrm{GM2}^+$	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{B_g}$
N86.2.3 $\mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$\bar{4}$	$\mathrm{A}\oplus\mathrm{A}$
N86.2.4 $\mathrm{A1}^+$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_g}\oplus\mathrm{A_g}$
N86.3.1 $\mathrm{GM1}^-\oplus\mathrm{GM1}^-$	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_g}\oplus\mathrm{A_u}\oplus\mathrm{A_u}$
N86.3.2 $\mathrm{GM1}^-\oplus\mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$\bar{4}$	$\mathrm{A}\oplus\mathrm{B}$
N86.3.3 $\mathrm{GM1}^-\oplus\mathrm{GM2}^-$	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_g}\oplus\mathrm{A_u}\oplus\mathrm{B_u}$
N86.3.4 $\mathrm{GM1}^-\oplus\mathrm{A1}^+$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_g}\oplus\mathrm{A_u}$
N86.3.5 $\mathrm{GM2}^+\oplus\mathrm{GM2}^+$	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_g}\oplus\mathrm{B_g}\oplus\mathrm{B_g}$
N86.3.6 $\mathrm{GM2}^+\oplus\mathrm{GM2}^-$	$\surd$	2	2	$\surd$	4	$\mathrm{A}\oplus\mathrm{B}$
N86.3.7 $\mathrm{GM2}^+\oplus\mathrm{A1}^+$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_g}\oplus\mathrm{B_g}$
N86.3.8 $\mathrm{GM2}^-\oplus\mathrm{GM2}^-$	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_g}\oplus\mathrm{B_u}\oplus\mathrm{B_u}$
N86.3.9 $\mathrm{GM2}^-\oplus\mathrm{A1}^+$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_g}\oplus\mathrm{B_u}$
N86.3.10 $\mathrm{A1}^+\oplus\mathrm{A1}^+$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_g}$

Non-coplanar SSGs with parent space group $P4_2/n$ (No. 86) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N86.3.11 $\mathrm{A1^+} \oplus \mathrm{A1^-}$	√	1	1	√	4	A
N86.3.12 $\mathrm{A1^+} \oplus \mathrm{A2^+}$	√	1	1	√	$4/m$	$\mathrm{A_g}$
N86.3.13 $\mathrm{A1^+} \oplus \mathrm{A2^-}$	√	1	1	√	$\bar{4}$	A
N86.4.1 $\mathrm{GM3^+GM4^+}$	√	3	3	√	$4/m$	$\mathrm{A_g} \oplus {}^2\mathrm{E_g} \oplus {}^1\mathrm{E_g}$
N86.4.2 $\mathrm{GM3^-GM4^-}$	√	3	3	√	$4/m$	$\mathrm{A_g} \oplus {}^2\mathrm{E_u} \oplus {}^1\mathrm{E_u}$
N86.4.3 $\mathrm{A3^+A4^+}$	√	1	1	√	$4/m$	$\mathrm{A_g}$
N86.6.1 M1	√	1	1	√	4	A
N86.6.2 M2	√	1	1	√	$\bar{4}$	A
N86.6.3 Z1	√	1	1	√	4	A
N86.6.4 Z2	√	1	1	√	$\bar{4}$	A
N86.8.1 LD1	√	1	1	√	4	A
N86.8.2 V1	√	1	1	√	4	A
N86.9.1 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM1^-}$	√	0	0	√	-	-
N86.9.2 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM2^+}$	√	3	3	√	$4/m$	$\mathrm{B_g} \oplus \mathrm{B_u} \oplus \mathrm{B_u}$
N86.9.3 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM2^-}$	√	0	0	√	-	-
N86.9.4 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{A1^+}$	√	0	0	√	-	-
N86.9.5 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{GM2^+}$	√	2	2	√	4	$\mathrm{B} \oplus \mathrm{B}$
N86.9.6 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{GM2^-}$	√	3	3	√	$4/m$	$\mathrm{A_u} \oplus \mathrm{B_g} \oplus \mathrm{B_u}$
N86.9.7 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{A1^+}$	√	2	2	√	$4/m$	$\mathrm{B_g} \oplus \mathrm{B_u}$
N86.9.8 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{GM2^-}$	√	0	0	√	-	-
N86.9.9 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{A1^+}$	√	0	0	√	-	-
N86.9.10 $\mathrm{GM1^-} \oplus \mathrm{A1^+} \oplus \mathrm{A1^+}$	√	1	0	×	-	-
N86.9.11 $\mathrm{GM1^-} \oplus \mathrm{A1^+} \oplus \mathrm{A1^-}$	√	1	1	×	-	-
N86.9.12 $\mathrm{GM1^-} \oplus \mathrm{A1^+} \oplus \mathrm{A2^+}$	√	1	0	×	-	-
N86.9.13 $\mathrm{GM1^-} \oplus \mathrm{A1^+} \oplus \mathrm{A2^-}$	√	1	1	×	-	-
N86.9.14 $\mathrm{GM2^+} \oplus \mathrm{GM2^+} \oplus \mathrm{GM2^+}$	√	3	3	√	$4/m$	$\mathrm{B_g} \oplus \mathrm{B_g} \oplus \mathrm{B_g}$
N86.9.15 $\mathrm{GM2^+} \oplus \mathrm{GM2^+} \oplus \mathrm{GM2^-}$	√	2	2	√	$\bar{4}$	$\mathrm{B} \oplus \mathrm{B}$
N86.9.16 $\mathrm{GM2^+} \oplus \mathrm{GM2^+} \oplus \mathrm{A1^+}$	√	2	2	√	$4/m$	$\mathrm{B_g} \oplus \mathrm{B_g}$
N86.9.17 $\mathrm{GM2^+} \oplus \mathrm{GM2^-} \oplus \mathrm{GM2^-}$	√	3	3	√	$4/m$	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B_g}$
N86.9.18 $\mathrm{GM2^+} \oplus \mathrm{GM2^-} \oplus \mathrm{A1^+}$	√	2	2	√	$4/m$	$\mathrm{A_u} \oplus \mathrm{B_g}$
N86.9.19 $\mathrm{GM2^+} \oplus \mathrm{A1^+} \oplus \mathrm{A1^+}$	√	1	1	×	-	-
N86.9.20 $\mathrm{GM2^+} \oplus \mathrm{A1^+} \oplus \mathrm{A1^-}$	√	1	1	√	$\bar{4}$	B
N86.9.21 $\mathrm{GM2^+} \oplus \mathrm{A1^+} \oplus \mathrm{A2^+}$	√	1	1	×	-	-
N86.9.22 $\mathrm{GM2^+} \oplus \mathrm{A1^+} \oplus \mathrm{A2^-}$	√	1	1	×	-	-
N86.9.23 $\mathrm{GM2^-} \oplus \mathrm{GM2^-} \oplus \mathrm{GM2^-}$	√	0	0	√	-	-
N86.9.24 $\mathrm{GM2^-} \oplus \mathrm{GM2^-} \oplus \mathrm{A1^+}$	√	0	0	√	-	-
N86.9.25 $\mathrm{GM2^-} \oplus \mathrm{A1^+} \oplus \mathrm{A1^+}$	√	1	0	×	-	-
N86.9.26 $\mathrm{GM2^-} \oplus \mathrm{A1^+} \oplus \mathrm{A1^-}$	√	1	1	×	-	-
N86.9.27 $\mathrm{GM2^-} \oplus \mathrm{A1^+} \oplus \mathrm{A2^+}$	√	1	0	×	-	-
N86.9.28 $\mathrm{GM2^-} \oplus \mathrm{A1^+} \oplus \mathrm{A2^-}$	√	1	1	×	-	-
N86.9.29 $\mathrm{A1^+} \oplus \mathrm{A1^+} \oplus \mathrm{A1^+}$	√	0	0	√	-	-
N86.9.30 $\mathrm{A1^+} \oplus \mathrm{A1^+} \oplus \mathrm{A1^-}$	√	2	2	√	$4/m$	$\mathrm{A_u} \oplus \mathrm{A_u}$
N86.9.31 $\mathrm{A1^+} \oplus \mathrm{A1^+} \oplus \mathrm{A2^+}$	√	0	0	√	-	-
N86.9.32 $\mathrm{A1^+} \oplus \mathrm{A1^+} \oplus \mathrm{A2^-}$	√	2	2	√	$4/m$	$\mathrm{B_u} \oplus \mathrm{B_u}$
N86.9.33 $\mathrm{A1^+} \oplus \mathrm{A1^-} \oplus \mathrm{A2^+}$	√	2	2	√	$4/m$	$\mathrm{A_u} \oplus \mathrm{B_u}$
N86.10.1 $\mathrm{GM1^-} \oplus \mathrm{GM3^+GM4^+}$	√	2	2	√	4	${}^2\mathrm{E} \oplus {}^1\mathrm{E}$

Non-coplanar SSGs with parent space group $P4_2/n$ (No. 86) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N86.10.2 $\mathrm{GM1^-} \oplus \mathrm{GM3^-GM4^-}$	$\surd$	0	0	$\surd$	-	-
N86.10.3 $\mathrm{GM1^-} \oplus \mathrm{A3^+A4^+}$	$\surd$	1	0	$\times$	-	-
N86.10.4 $\mathrm{GM2^+} \oplus \mathrm{GM3^+GM4^+}$	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{B_g} \oplus {}^2\mathrm{E_g} \oplus {}^1\mathrm{E_g}$
N86.10.5 $\mathrm{GM2^+} \oplus \mathrm{GM3^-GM4^-}$	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{B_g} \oplus {}^2\mathrm{E_u} \oplus {}^1\mathrm{E_u}$
N86.10.6 $\mathrm{GM2^+} \oplus \mathrm{A3^+A4^+}$	$\surd$	1	1	$\times$	-	-
N86.10.7 $\mathrm{GM2^-} \oplus \mathrm{GM3^+GM4^+}$	$\surd$	2	2	$\surd$	$\bar{4}$	${}^2\mathrm{E} \oplus {}^1\mathrm{E}$
N86.10.8 $\mathrm{GM2^-} \oplus \mathrm{GM3^-GM4^-}$	$\surd$	0	0	$\surd$	-	-
N86.10.9 $\mathrm{GM2^-} \oplus \mathrm{A3^+A4^+}$	$\surd$	1	0	$\times$	-	-
N86.10.10 $\mathrm{A1^+} \oplus \mathrm{GM3^+GM4^+}$	$\surd$	2	2	$\surd$	$4/m$	${}^2\mathrm{E_g} \oplus {}^1\mathrm{E_g}$
N86.10.11 $\mathrm{A1^+} \oplus \mathrm{GM3^-GM4^-}$	$\surd$	0	0	$\surd$	-	-
N86.10.12 $\mathrm{A1^+} \oplus \mathrm{A3^+A4^+}$	$\surd$	0	0	$\surd$	-	-
N86.10.13 $\mathrm{A1^+} \oplus \mathrm{A3^-A4^-}$	$\surd$	2	2	$\surd$	$4/m$	${}^2\mathrm{E_u} \oplus {}^1\mathrm{E_u}$
N86.12.1 $\mathrm{GM1^-} \oplus \mathrm{M1}$	$\surd$	1	1	$\times$	-	-
N86.12.2 $\mathrm{GM1^-} \oplus \mathrm{M2}$	$\surd$	1	1	$\times$	-	-
N86.12.3 $\mathrm{GM1^-} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
N86.12.4 $\mathrm{GM1^-} \oplus \mathrm{Z2}$	$\surd$	1	1	$\times$	-	-
N86.12.5 $\mathrm{GM2^+} \oplus \mathrm{M1}$	$\surd$	1	1	$\surd$	$\bar{4}$	B
N86.12.6 $\mathrm{GM2^+} \oplus \mathrm{M2}$	$\surd$	1	1	$\surd$	4	B
N86.12.7 $\mathrm{GM2^+} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$\bar{4}$	B
N86.12.8 $\mathrm{GM2^+} \oplus \mathrm{Z2}$	$\surd$	1	1	$\times$	-	-
N86.12.9 $\mathrm{GM2^-} \oplus \mathrm{M1}$	$\surd$	1	1	$\times$	-	-
N86.12.10 $\mathrm{GM2^-} \oplus \mathrm{M2}$	$\surd$	1	1	$\times$	-	-
N86.12.11 $\mathrm{GM2^-} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
N86.12.12 $\mathrm{GM2^-} \oplus \mathrm{Z2}$	$\surd$	1	1	$\times$	-	-
N86.12.13 $\mathrm{A1^+} \oplus \mathrm{M1}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
N86.12.14 $\mathrm{A1^+} \oplus \mathrm{M2}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{B_u}$
N86.12.15 $\mathrm{A1^+} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
N86.12.16 $\mathrm{A1^+} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{B_u}$
N86.14.1 $\mathrm{GM1^-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
N86.14.2 $\mathrm{GM1^-} \oplus \mathrm{V1}$	$\surd$	1	1	$\times$	-	-
N86.14.3 $\mathrm{GM2^+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$\bar{4}$	B
N86.14.4 $\mathrm{GM2^+} \oplus \mathrm{V1}$	$\surd$	1	1	$\surd$	$\bar{4}$	B
N86.14.5 $\mathrm{GM2^-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
N86.14.6 $\mathrm{GM2^-} \oplus \mathrm{V1}$	$\surd$	1	1	$\times$	-	-
N86.14.7 $\mathrm{A1^+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
N86.14.8 $\mathrm{A1^+} \oplus \mathrm{V1}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$

TABLE S259: Collinear SSGs with parent space group $I4/m$ (No. 87).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L87.1.1 $\mathrm{GM1^+}$	1	$4/m$	$\mathrm{A_g}$
L87.2.1 $\mathrm{GM1^-}$	0	-	-
L87.2.2 $\mathrm{GM2^+}$	1	$4/m$	$\mathrm{B_g}$
L87.2.3 $\mathrm{GM2^-}$	0	-	-
L87.2.4 $\mathrm{M1^+}$	0	-	-
L87.2.5 $\mathrm{M1^-}$	0	-	-

Collinear SSGs with parent space group $I4/m$ (No. 87)(continued)

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L87.2.6 $\mathrm{M2}^{+}$	0	-	-
L87.2.7 $\mathrm{M2}^{-}$	0	-	-

TABLE S260: Coplanar SSGs with parent space group $I4/m$ (No. 87).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P87.1.1 $\mathrm{GM1}^{+}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_g}\oplus\mathrm{A_g}$
P87.2.1 $\mathrm{GM1}^{-}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_g}\oplus\mathrm{A_u}$
P87.2.2 $\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_g}\oplus\mathrm{B_g}$
P87.2.3 $\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_g}\oplus\mathrm{B_u}$
P87.2.4 $\mathrm{M1}^{+}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_g}$
P87.2.5 $\mathrm{M1}^{-}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_g}$
P87.2.6 $\mathrm{M2}^{+}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_g}$
P87.2.7 $\mathrm{M2}^{-}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_g}$
P87.3.1 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}$	$\surd$	0	0	$\surd$	-	-
P87.3.2 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{B_g}\oplus\mathrm{B_u}$
P87.3.3 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
P87.3.4 $\mathrm{GM1}^{-}\oplus\mathrm{M1}^{+}$	$\surd$	1	1	$\times$	-	-
P87.3.5 $\mathrm{GM1}^{-}\oplus\mathrm{M1}^{-}$	$\surd$	1	1	$\times$	-	-
P87.3.6 $\mathrm{GM1}^{-}\oplus\mathrm{M2}^{+}$	$\surd$	1	1	$\times$	-	-
P87.3.7 $\mathrm{GM1}^{-}\oplus\mathrm{M2}^{-}$	$\surd$	1	1	$\times$	-	-
P87.3.8 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{B_g}\oplus\mathrm{B_g}$
P87.3.9 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_u}\oplus\mathrm{B_g}$
P87.3.10 $\mathrm{GM2}^{+}\oplus\mathrm{M1}^{+}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{B_g}$
P87.3.11 $\mathrm{GM2}^{+}\oplus\mathrm{M1}^{-}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{B_g}$
P87.3.12 $\mathrm{GM2}^{+}\oplus\mathrm{M2}^{+}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{B_g}$
P87.3.13 $\mathrm{GM2}^{+}\oplus\mathrm{M2}^{-}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{B_g}$
P87.3.14 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
P87.3.15 $\mathrm{GM2}^{-}\oplus\mathrm{M1}^{+}$	$\surd$	1	1	$\times$	-	-
P87.3.16 $\mathrm{GM2}^{-}\oplus\mathrm{M1}^{-}$	$\surd$	1	1	$\times$	-	-
P87.3.17 $\mathrm{GM2}^{-}\oplus\mathrm{M2}^{+}$	$\surd$	1	1	$\times$	-	-
P87.3.18 $\mathrm{GM2}^{-}\oplus\mathrm{M2}^{-}$	$\surd$	1	1	$\times$	-	-
P87.3.19 $\mathrm{M1}^{+}\oplus\mathrm{M1}^{+}$	$\surd$	1	0	$\times$	-	-
P87.3.20 $\mathrm{M1}^{+}\oplus\mathrm{M1}^{-}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
P87.3.21 $\mathrm{M1}^{+}\oplus\mathrm{M2}^{+}$	$\surd$	1	0	$\times$	-	-
P87.3.22 $\mathrm{M1}^{+}\oplus\mathrm{M2}^{-}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{B_u}$
P87.3.23 $\mathrm{M1}^{-}\oplus\mathrm{M1}^{-}$	$\surd$	1	0	$\times$	-	-
P87.3.24 $\mathrm{M1}^{-}\oplus\mathrm{M2}^{+}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{B_u}$
P87.3.25 $\mathrm{M1}^{-}\oplus\mathrm{M2}^{-}$	$\surd$	1	0	$\times$	-	-
P87.3.26 $\mathrm{M2}^{+}\oplus\mathrm{M2}^{+}$	$\surd$	1	0	$\times$	-	-
P87.3.27 $\mathrm{M2}^{+}\oplus\mathrm{M2}^{-}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
P87.3.28 $\mathrm{M2}^{-}\oplus\mathrm{M2}^{-}$	$\surd$	1	0	$\times$	-	-
P87.4.1 $\mathrm{GM3}^{+}\mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	$4/m$	${}^{2}\mathrm{E_g}\oplus{}^{1}\mathrm{E_g}$
P87.4.2 $\mathrm{GM3}^{-}\mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
P87.4.3 $\mathrm{M3}^{+}\mathrm{M4}^{+}$	$\surd$	1	0	$\times$	-	-
P87.4.4 $\mathrm{M3}^{-}\mathrm{M4}^{-}$	$\surd$	1	0	$\times$	-	-

Coplanar SSGs with parent space group $I4/m$ (No. 87) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P87.7.1 $\mathrm{X1}^{+}$	$\times$	-	-	-	-	-
P87.7.2 $\mathrm{X1}^{-}$	$\times$	-	-	-	-	-
P87.7.3 $\mathrm{X2}^{+}$	$\times$	-	-	-	-	-
P87.7.4 $\mathrm{X2}^{-}$	$\times$	-	-	-	-	-
P87.7.5 P1	$\surd$	1	1	$\times$	-	-
P87.8.1 LD1	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
P87.8.2 LD2	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$

TABLE S261: Non-coplanar SSGs with parent space group $I4/m$ (No. 87).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N87.1.1 $\mathrm{GM1}^{+}$	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{A_g}$
N87.2.1 $\mathrm{GM1}^{-}$	$\surd$	2	2	$\surd$	4	$\mathrm{A}\oplus\mathrm{A}$
N87.2.2 $\mathrm{GM2}^{+}$	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{B_g}$
N87.2.3 $\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	$\bar{4}$	$\mathrm{A}\oplus\mathrm{A}$
N87.2.4 $\mathrm{M1}^{+}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_g}\oplus\mathrm{A_g}$
N87.2.5 $\mathrm{M1}^{-}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_g}\oplus\mathrm{A_g}$
N87.2.6 $\mathrm{M2}^{+}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_g}\oplus\mathrm{A_g}$
N87.2.7 $\mathrm{M2}^{-}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_g}\oplus\mathrm{A_g}$
N87.3.1 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}$	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_g}\oplus\mathrm{A_u}\oplus\mathrm{A_u}$
N87.3.2 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	$\bar{4}$	$\mathrm{A}\oplus\mathrm{B}$
N87.3.3 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_g}\oplus\mathrm{A_u}\oplus\mathrm{B_u}$
N87.3.4 $\mathrm{GM1}^{-}\oplus\mathrm{M1}^{+}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_g}\oplus\mathrm{A_u}$
N87.3.5 $\mathrm{GM1}^{-}\oplus\mathrm{M1}^{-}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_g}\oplus\mathrm{A_u}$
N87.3.6 $\mathrm{GM1}^{-}\oplus\mathrm{M2}^{+}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_g}\oplus\mathrm{A_u}$
N87.3.7 $\mathrm{GM1}^{-}\oplus\mathrm{M2}^{-}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_g}\oplus\mathrm{A_u}$
N87.3.8 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}$	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_g}\oplus\mathrm{B_g}\oplus\mathrm{B_g}$
N87.3.9 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	4	$\mathrm{A}\oplus\mathrm{B}$
N87.3.10 $\mathrm{GM2}^{+}\oplus\mathrm{M1}^{+}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_g}\oplus\mathrm{B_g}$
N87.3.11 $\mathrm{GM2}^{+}\oplus\mathrm{M1}^{-}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_g}\oplus\mathrm{B_g}$
N87.3.12 $\mathrm{GM2}^{+}\oplus\mathrm{M2}^{+}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_g}\oplus\mathrm{B_g}$
N87.3.13 $\mathrm{GM2}^{+}\oplus\mathrm{M2}^{-}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_g}\oplus\mathrm{B_g}$
N87.3.14 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_g}\oplus\mathrm{B_u}\oplus\mathrm{B_u}$
N87.3.15 $\mathrm{GM2}^{-}\oplus\mathrm{M1}^{+}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_g}\oplus\mathrm{B_u}$
N87.3.16 $\mathrm{GM2}^{-}\oplus\mathrm{M1}^{-}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_g}\oplus\mathrm{B_u}$
N87.3.17 $\mathrm{GM2}^{-}\oplus\mathrm{M2}^{+}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_g}\oplus\mathrm{B_u}$
N87.3.18 $\mathrm{GM2}^{-}\oplus\mathrm{M2}^{-}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_g}\oplus\mathrm{B_u}$
N87.3.19 $\mathrm{M1}^{+}\oplus\mathrm{M1}^{+}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_g}$
N87.3.20 $\mathrm{M1}^{+}\oplus\mathrm{M1}^{-}$	$\surd$	1	1	$\surd$	4	A
N87.3.21 $\mathrm{M1}^{+}\oplus\mathrm{M2}^{+}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_g}$
N87.3.22 $\mathrm{M1}^{+}\oplus\mathrm{M2}^{-}$	$\surd$	1	1	$\surd$	$\bar{4}$	A
N87.3.23 $\mathrm{M1}^{-}\oplus\mathrm{M1}^{-}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_g}$
N87.3.24 $\mathrm{M1}^{-}\oplus\mathrm{M2}^{+}$	$\surd$	1	1	$\surd$	$\bar{4}$	A
N87.3.25 $\mathrm{M1}^{-}\oplus\mathrm{M2}^{-}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_g}$
N87.3.26 $\mathrm{M2}^{+}\oplus\mathrm{M2}^{+}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_g}$
N87.3.27 $\mathrm{M2}^{+}\oplus\mathrm{M2}^{-}$	$\surd$	1	1	$\surd$	4	A

Non-coplanar SSGs with parent space group $I4/m$ (No. 87) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N87.3.28 $\mathrm{M2^-} \oplus \mathrm{M2^-}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_g}$
N87.4.1 $\mathrm{GM3^+GM4^+}$	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_g} \oplus {}^2\mathrm{E_g} \oplus {}^1\mathrm{E_g}$
N87.4.2 $\mathrm{GM3^-GM4^-}$	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_g} \oplus {}^2\mathrm{E_u} \oplus {}^1\mathrm{E_u}$
N87.4.3 $\mathrm{M3^+M4^+}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_g}$
N87.4.4 $\mathrm{M3^-M4^-}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_g}$
N87.7.1 $\mathrm{X1^+}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_g}$
N87.7.2 $\mathrm{X1^-}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_g}$
N87.7.3 $\mathrm{X2^+}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_g}$
N87.7.4 $\mathrm{X2^-}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_g}$
N87.7.5 P1	$\surd$	1	1	$\surd$	$\bar{4}$	A
N87.8.1 LD1	$\surd$	1	1	$\surd$	4	A
N87.8.2 LD2	$\surd$	1	1	$\surd$	4	A
N87.9.1 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM1^-}$	$\surd$	0	0	$\surd$	-	-
N87.9.2 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM2^+}$	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{B_g} \oplus \mathrm{B_u} \oplus \mathrm{B_u}$
N87.9.3 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM2^-}$	$\surd$	0	0	$\surd$	-	-
N87.9.4 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{M1^+}$	$\surd$	0	0	$\surd$	-	-
N87.9.5 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{M1^-}$	$\surd$	0	0	$\surd$	-	-
N87.9.6 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{M2^+}$	$\surd$	0	0	$\surd$	-	-
N87.9.7 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{M2^-}$	$\surd$	0	0	$\surd$	-	-
N87.9.8 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{GM2^+}$	$\surd$	2	2	$\surd$	4	$\mathrm{B} \oplus \mathrm{B}$
N87.9.9 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{GM2^-}$	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_u} \oplus \mathrm{B_g} \oplus \mathrm{B_u}$
N87.9.10 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{M1^+}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{B_g} \oplus \mathrm{B_u}$
N87.9.11 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{B_g} \oplus \mathrm{B_u}$
N87.9.12 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{M2^+}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{B_g} \oplus \mathrm{B_u}$
N87.9.13 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{B_g} \oplus \mathrm{B_u}$
N87.9.14 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{GM2^-}$	$\surd$	0	0	$\surd$	-	-
N87.9.15 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{M1^+}$	$\surd$	0	0	$\surd$	-	-
N87.9.16 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{M1^-}$	$\surd$	0	0	$\surd$	-	-
N87.9.17 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{M2^+}$	$\surd$	0	0	$\surd$	-	-
N87.9.18 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{M2^-}$	$\surd$	0	0	$\surd$	-	-
N87.9.19 $\mathrm{GM1^-} \oplus \mathrm{M1^+} \oplus \mathrm{M1^+}$	$\surd$	1	0	$\times$	-	-
N87.9.20 $\mathrm{GM1^-} \oplus \mathrm{M1^+} \oplus \mathrm{M1^-}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
N87.9.21 $\mathrm{GM1^-} \oplus \mathrm{M1^+} \oplus \mathrm{M2^+}$	$\surd$	1	0	$\times$	-	-
N87.9.22 $\mathrm{GM1^-} \oplus \mathrm{M1^+} \oplus \mathrm{M2^-}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{B_u}$
N87.9.23 $\mathrm{GM1^-} \oplus \mathrm{M1^-} \oplus \mathrm{M1^-}$	$\surd$	1	0	$\times$	-	-
N87.9.24 $\mathrm{GM1^-} \oplus \mathrm{M1^-} \oplus \mathrm{M2^+}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{B_u}$
N87.9.25 $\mathrm{GM1^-} \oplus \mathrm{M1^-} \oplus \mathrm{M2^-}$	$\surd$	1	0	$\times$	-	-
N87.9.26 $\mathrm{GM1^-} \oplus \mathrm{M2^+} \oplus \mathrm{M2^+}$	$\surd$	1	0	$\times$	-	-
N87.9.27 $\mathrm{GM1^-} \oplus \mathrm{M2^+} \oplus \mathrm{M2^-}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
N87.9.28 $\mathrm{GM1^-} \oplus \mathrm{M2^-} \oplus \mathrm{M2^-}$	$\surd$	1	0	$\times$	-	-
N87.9.29 $\mathrm{GM2^+} \oplus \mathrm{GM2^+} \oplus \mathrm{GM2^+}$	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{B_g} \oplus \mathrm{B_g} \oplus \mathrm{B_g}$
N87.9.30 $\mathrm{GM2^+} \oplus \mathrm{GM2^+} \oplus \mathrm{GM2^-}$	$\surd$	2	2	$\surd$	$\bar{4}$	$\mathrm{B} \oplus \mathrm{B}$
N87.9.31 $\mathrm{GM2^+} \oplus \mathrm{GM2^+} \oplus \mathrm{M1^+}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{B_g} \oplus \mathrm{B_g}$
N87.9.32 $\mathrm{GM2^+} \oplus \mathrm{GM2^+} \oplus \mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{B_g} \oplus \mathrm{B_g}$
N87.9.33 $\mathrm{GM2^+} \oplus \mathrm{GM2^+} \oplus \mathrm{M2^+}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{B_g} \oplus \mathrm{B_g}$
N87.9.34 $\mathrm{GM2^+} \oplus \mathrm{GM2^+} \oplus \mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{B_g} \oplus \mathrm{B_g}$

Non-coplanar SSGs with parent space group $I4/m$ (No. 87) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N87.9.35 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B_g}$
N87.9.36 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{M1}^+$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_u} \oplus \mathrm{B_g}$
N87.9.37 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{M1}^-$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_u} \oplus \mathrm{B_g}$
N87.9.38 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{M2}^+$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_u} \oplus \mathrm{B_g}$
N87.9.39 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{M2}^-$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_u} \oplus \mathrm{B_g}$
N87.9.40 $\mathrm{GM2}^+ \oplus \mathrm{M1}^+ \oplus \mathrm{M1}^+$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{B_g}$
N87.9.41 $\mathrm{GM2}^+ \oplus \mathrm{M1}^+ \oplus \mathrm{M1}^-$	$\surd$	1	1	$\surd$	$\bar{4}$	B
N87.9.42 $\mathrm{GM2}^+ \oplus \mathrm{M1}^+ \oplus \mathrm{M2}^+$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{B_g}$
N87.9.43 $\mathrm{GM2}^+ \oplus \mathrm{M1}^+ \oplus \mathrm{M2}^-$	$\surd$	1	1	$\surd$	4	B
N87.9.44 $\mathrm{GM2}^+ \oplus \mathrm{M1}^- \oplus \mathrm{M1}^-$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{B_g}$
N87.9.45 $\mathrm{GM2}^+ \oplus \mathrm{M1}^- \oplus \mathrm{M2}^+$	$\surd$	1	1	$\surd$	4	B
N87.9.46 $\mathrm{GM2}^+ \oplus \mathrm{M1}^- \oplus \mathrm{M2}^-$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{B_g}$
N87.9.47 $\mathrm{GM2}^+ \oplus \mathrm{M2}^+ \oplus \mathrm{M2}^+$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{B_g}$
N87.9.48 $\mathrm{GM2}^+ \oplus \mathrm{M2}^+ \oplus \mathrm{M2}^-$	$\surd$	1	1	$\surd$	$\bar{4}$	B
N87.9.49 $\mathrm{GM2}^+ \oplus \mathrm{M2}^- \oplus \mathrm{M2}^-$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{B_g}$
N87.9.50 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
N87.9.51 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{M1}^+$	$\surd$	0	0	$\surd$	-	-
N87.9.52 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{M1}^-$	$\surd$	0	0	$\surd$	-	-
N87.9.53 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{M2}^+$	$\surd$	0	0	$\surd$	-	-
N87.9.54 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{M2}^-$	$\surd$	0	0	$\surd$	-	-
N87.9.55 $\mathrm{GM2}^- \oplus \mathrm{M1}^+ \oplus \mathrm{M1}^+$	$\surd$	1	0	$\times$	-	-
N87.9.56 $\mathrm{GM2}^- \oplus \mathrm{M1}^+ \oplus \mathrm{M1}^-$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
N87.9.57 $\mathrm{GM2}^- \oplus \mathrm{M1}^+ \oplus \mathrm{M2}^+$	$\surd$	1	0	$\times$	-	-
N87.9.58 $\mathrm{GM2}^- \oplus \mathrm{M1}^+ \oplus \mathrm{M2}^-$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{B_u}$
N87.9.59 $\mathrm{GM2}^- \oplus \mathrm{M1}^- \oplus \mathrm{M1}^-$	$\surd$	1	0	$\times$	-	-
N87.9.60 $\mathrm{GM2}^- \oplus \mathrm{M1}^- \oplus \mathrm{M2}^+$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{B_u}$
N87.9.61 $\mathrm{GM2}^- \oplus \mathrm{M1}^- \oplus \mathrm{M2}^-$	$\surd$	1	0	$\times$	-	-
N87.9.62 $\mathrm{GM2}^- \oplus \mathrm{M2}^+ \oplus \mathrm{M2}^+$	$\surd$	1	0	$\times$	-	-
N87.9.63 $\mathrm{GM2}^- \oplus \mathrm{M2}^+ \oplus \mathrm{M2}^-$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
N87.9.64 $\mathrm{GM2}^- \oplus \mathrm{M2}^- \oplus \mathrm{M2}^-$	$\surd$	1	0	$\times$	-	-
N87.9.65 $\mathrm{M1}^+ \oplus \mathrm{M1}^+ \oplus \mathrm{M1}^+$	$\surd$	0	0	$\surd$	-	-
N87.9.66 $\mathrm{M1}^+ \oplus \mathrm{M1}^+ \oplus \mathrm{M1}^-$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_u} \oplus \mathrm{A_u}$
N87.9.67 $\mathrm{M1}^+ \oplus \mathrm{M1}^+ \oplus \mathrm{M2}^+$	$\surd$	0	0	$\surd$	-	-
N87.9.68 $\mathrm{M1}^+ \oplus \mathrm{M1}^+ \oplus \mathrm{M2}^-$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{B_u} \oplus \mathrm{B_u}$
N87.9.69 $\mathrm{M1}^+ \oplus \mathrm{M1}^- \oplus \mathrm{M1}^-$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_u} \oplus \mathrm{A_u}$
N87.9.70 $\mathrm{M1}^+ \oplus \mathrm{M1}^- \oplus \mathrm{M2}^+$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_u} \oplus \mathrm{B_u}$
N87.9.71 $\mathrm{M1}^+ \oplus \mathrm{M1}^- \oplus \mathrm{M2}^-$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_u} \oplus \mathrm{B_u}$
N87.9.72 $\mathrm{M1}^+ \oplus \mathrm{M2}^+ \oplus \mathrm{M2}^+$	$\surd$	0	0	$\surd$	-	-
N87.9.73 $\mathrm{M1}^+ \oplus \mathrm{M2}^+ \oplus \mathrm{M2}^-$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_u} \oplus \mathrm{B_u}$
N87.9.74 $\mathrm{M1}^+ \oplus \mathrm{M2}^- \oplus \mathrm{M2}^-$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{B_u} \oplus \mathrm{B_u}$
N87.9.75 $\mathrm{M1}^- \oplus \mathrm{M1}^- \oplus \mathrm{M1}^-$	$\surd$	0	0	$\surd$	-	-
N87.9.76 $\mathrm{M1}^- \oplus \mathrm{M1}^- \oplus \mathrm{M2}^+$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{B_u} \oplus \mathrm{B_u}$
N87.9.77 $\mathrm{M1}^- \oplus \mathrm{M1}^- \oplus \mathrm{M2}^-$	$\surd$	0	0	$\surd$	-	-
N87.9.78 $\mathrm{M1}^- \oplus \mathrm{M2}^+ \oplus \mathrm{M2}^+$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{B_u} \oplus \mathrm{B_u}$
N87.9.79 $\mathrm{M1}^- \oplus \mathrm{M2}^+ \oplus \mathrm{M2}^-$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_u} \oplus \mathrm{B_u}$
N87.9.80 $\mathrm{M1}^- \oplus \mathrm{M2}^- \oplus \mathrm{M2}^-$	$\surd$	0	0	$\surd$	-	-

Non-coplanar SSGs with parent space group $I4/m$ (No. 87) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N87.9.81 $\mathrm{M2^+} \oplus \mathrm{M2^+} \oplus \mathrm{M2^+}$	$\surd$	0	0	$\surd$	-	-
N87.9.82 $\mathrm{M2^+} \oplus \mathrm{M2^+} \oplus \mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_u} \oplus \mathrm{A_u}$
N87.9.83 $\mathrm{M2^+} \oplus \mathrm{M2^-} \oplus \mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_u} \oplus \mathrm{A_u}$
N87.9.84 $\mathrm{M2^-} \oplus \mathrm{M2^-} \oplus \mathrm{M2^-}$	$\surd$	0	0	$\surd$	-	-
N87.10.1 $\mathrm{GM1^-} \oplus \mathrm{GM3^+GM4^+}$	$\surd$	2	2	$\surd$	4	$^2\mathrm{E} \oplus {}^1\mathrm{E}$
N87.10.2 $\mathrm{GM1^-} \oplus \mathrm{GM3^-GM4^-}$	$\surd$	0	0	$\surd$	-	-
N87.10.3 $\mathrm{GM1^-} \oplus \mathrm{M3^+M4^+}$	$\surd$	1	0	$\times$	-	-
N87.10.4 $\mathrm{GM1^-} \oplus \mathrm{M3^-M4^-}$	$\surd$	1	0	$\times$	-	-
N87.10.5 $\mathrm{GM2^+} \oplus \mathrm{GM3^+GM4^+}$	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{B_g} \oplus {}^2\mathrm{E_g} \oplus {}^1\mathrm{E_g}$
N87.10.6 $\mathrm{GM2^+} \oplus \mathrm{GM3^-GM4^-}$	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{B_g} \oplus {}^2\mathrm{E_u} \oplus {}^1\mathrm{E_u}$
N87.10.7 $\mathrm{GM2^+} \oplus \mathrm{M3^+M4^+}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{B_g}$
N87.10.8 $\mathrm{GM2^+} \oplus \mathrm{M3^-M4^-}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{B_g}$
N87.10.9 $\mathrm{GM2^-} \oplus \mathrm{GM3^+GM4^+}$	$\surd$	2	2	$\surd$	$\bar{4}$	$^2\mathrm{E} \oplus {}^1\mathrm{E}$
N87.10.10 $\mathrm{GM2^-} \oplus \mathrm{GM3^-GM4^-}$	$\surd$	0	0	$\surd$	-	-
N87.10.11 $\mathrm{GM2^-} \oplus \mathrm{M3^+M4^+}$	$\surd$	1	0	$\times$	-	-
N87.10.12 $\mathrm{GM2^-} \oplus \mathrm{M3^-M4^-}$	$\surd$	1	0	$\times$	-	-
N87.10.13 $\mathrm{M1^+} \oplus \mathrm{GM3^+GM4^+}$	$\surd$	2	2	$\surd$	$4/m$	$^2\mathrm{E_g} \oplus {}^1\mathrm{E_g}$
N87.10.14 $\mathrm{M1^+} \oplus \mathrm{GM3^-GM4^-}$	$\surd$	0	0	$\surd$	-	-
N87.10.15 $\mathrm{M1^+} \oplus \mathrm{M3^+M4^+}$	$\surd$	0	0	$\surd$	-	-
N87.10.16 $\mathrm{M1^+} \oplus \mathrm{M3^-M4^-}$	$\surd$	2	2	$\surd$	$4/m$	$^2\mathrm{E_u} \oplus {}^1\mathrm{E_u}$
N87.10.17 $\mathrm{M1^-} \oplus \mathrm{GM3^+GM4^+}$	$\surd$	2	2	$\surd$	$4/m$	$^2\mathrm{E_g} \oplus {}^1\mathrm{E_g}$
N87.10.18 $\mathrm{M1^-} \oplus \mathrm{GM3^-GM4^-}$	$\surd$	0	0	$\surd$	-	-
N87.10.19 $\mathrm{M1^-} \oplus \mathrm{M3^+M4^+}$	$\surd$	2	2	$\surd$	$4/m$	$^2\mathrm{E_u} \oplus {}^1\mathrm{E_u}$
N87.10.20 $\mathrm{M1^-} \oplus \mathrm{M3^-M4^-}$	$\surd$	0	0	$\surd$	-	-
N87.10.21 $\mathrm{M2^+} \oplus \mathrm{GM3^+GM4^+}$	$\surd$	2	2	$\surd$	$4/m$	$^2\mathrm{E_g} \oplus {}^1\mathrm{E_g}$
N87.10.22 $\mathrm{M2^+} \oplus \mathrm{GM3^-GM4^-}$	$\surd$	0	0	$\surd$	-	-
N87.10.23 $\mathrm{M2^+} \oplus \mathrm{M3^+M4^+}$	$\surd$	0	0	$\surd$	-	-
N87.10.24 $\mathrm{M2^+} \oplus \mathrm{M3^-M4^-}$	$\surd$	2	2	$\surd$	$4/m$	$^2\mathrm{E_u} \oplus {}^1\mathrm{E_u}$
N87.10.25 $\mathrm{M2^-} \oplus \mathrm{GM3^+GM4^+}$	$\surd$	2	2	$\surd$	$4/m$	$^2\mathrm{E_g} \oplus {}^1\mathrm{E_g}$
N87.10.26 $\mathrm{M2^-} \oplus \mathrm{GM3^-GM4^-}$	$\surd$	0	0	$\surd$	-	-
N87.10.27 $\mathrm{M2^-} \oplus \mathrm{M3^+M4^+}$	$\surd$	2	2	$\surd$	$4/m$	$^2\mathrm{E_u} \oplus {}^1\mathrm{E_u}$
N87.10.28 $\mathrm{M2^-} \oplus \mathrm{M3^-M4^-}$	$\surd$	0	0	$\surd$	-	-
N87.13.1 $\mathrm{GM1^-} \oplus \mathrm{X1^+}$	$\surd$	1	0	$\times$	-	-
N87.13.2 $\mathrm{GM1^-} \oplus \mathrm{X1^-}$	$\surd$	1	0	$\times$	-	-
N87.13.3 $\mathrm{GM1^-} \oplus \mathrm{X2^+}$	$\surd$	1	0	$\times$	-	-
N87.13.4 $\mathrm{GM1^-} \oplus \mathrm{X2^-}$	$\surd$	1	0	$\times$	-	-
N87.13.5 $\mathrm{GM1^-} \oplus \mathrm{P1}$	$\surd$	1	1	$\times$	-	-
N87.13.6 $\mathrm{GM2^+} \oplus \mathrm{X1^+}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{B_g}$
N87.13.7 $\mathrm{GM2^+} \oplus \mathrm{X1^-}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{B_g}$
N87.13.8 $\mathrm{GM2^+} \oplus \mathrm{X2^+}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{B_g}$
N87.13.9 $\mathrm{GM2^+} \oplus \mathrm{X2^-}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{B_g}$
N87.13.10 $\mathrm{GM2^+} \oplus \mathrm{P1}$	$\surd$	1	1	$\times$	-	-
N87.13.11 $\mathrm{GM2^-} \oplus \mathrm{X1^+}$	$\surd$	1	0	$\times$	-	-
N87.13.12 $\mathrm{GM2^-} \oplus \mathrm{X1^-}$	$\surd$	1	0	$\times$	-	-
N87.13.13 $\mathrm{GM2^-} \oplus \mathrm{X2^+}$	$\surd$	1	0	$\times$	-	-
N87.13.14 $\mathrm{GM2^-} \oplus \mathrm{X2^-}$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $I4/m$ (No. 87) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N87.13.15 $\mathrm{GM2^-} \oplus \mathrm{P1}$	$\surd$	1	1	$\times$	-	-
N87.13.16 $\mathrm{M1^+} \oplus \mathrm{X1^+}$	$\times$	-	-	-	-	-
N87.13.17 $\mathrm{M1^+} \oplus \mathrm{X1^-}$	$\times$	-	-	-	-	-
N87.13.18 $\mathrm{M1^+} \oplus \mathrm{X2^+}$	$\times$	-	-	-	-	-
N87.13.19 $\mathrm{M1^+} \oplus \mathrm{X2^-}$	$\times$	-	-	-	-	-
N87.13.20 $\mathrm{M1^+} \oplus \mathrm{P1}$	$\surd$	1	1	$\times$	-	-
N87.13.21 $\mathrm{M1^-} \oplus \mathrm{X1^+}$	$\times$	-	-	-	-	-
N87.13.22 $\mathrm{M1^-} \oplus \mathrm{X1^-}$	$\times$	-	-	-	-	-
N87.13.23 $\mathrm{M1^-} \oplus \mathrm{X2^+}$	$\times$	-	-	-	-	-
N87.13.24 $\mathrm{M1^-} \oplus \mathrm{X2^-}$	$\times$	-	-	-	-	-
N87.13.25 $\mathrm{M1^-} \oplus \mathrm{P1}$	$\surd$	1	1	$\times$	-	-
N87.13.26 $\mathrm{M2^+} \oplus \mathrm{X1^+}$	$\times$	-	-	-	-	-
N87.13.27 $\mathrm{M2^+} \oplus \mathrm{X1^-}$	$\times$	-	-	-	-	-
N87.13.28 $\mathrm{M2^+} \oplus \mathrm{X2^+}$	$\times$	-	-	-	-	-
N87.13.29 $\mathrm{M2^+} \oplus \mathrm{X2^-}$	$\times$	-	-	-	-	-
N87.13.30 $\mathrm{M2^+} \oplus \mathrm{P1}$	$\surd$	1	1	$\times$	-	-
N87.13.31 $\mathrm{M2^-} \oplus \mathrm{X1^+}$	$\times$	-	-	-	-	-
N87.13.32 $\mathrm{M2^-} \oplus \mathrm{X1^-}$	$\times$	-	-	-	-	-
N87.13.33 $\mathrm{M2^-} \oplus \mathrm{X2^+}$	$\times$	-	-	-	-	-
N87.13.34 $\mathrm{M2^-} \oplus \mathrm{X2^-}$	$\times$	-	-	-	-	-
N87.13.35 $\mathrm{M2^-} \oplus \mathrm{P1}$	$\surd$	1	1	$\times$	-	-
N87.14.1 $\mathrm{GM1^-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
N87.14.2 $\mathrm{GM1^-} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
N87.14.3 $\mathrm{GM2^+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$\bar{4}$	B
N87.14.4 $\mathrm{GM2^+} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	$\bar{4}$	B
N87.14.5 $\mathrm{GM2^-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
N87.14.6 $\mathrm{GM2^-} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
N87.14.7 $\mathrm{M1^+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
N87.14.8 $\mathrm{M1^+} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
N87.14.9 $\mathrm{M1^-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
N87.14.10 $\mathrm{M1^-} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
N87.14.11 $\mathrm{M2^+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
N87.14.12 $\mathrm{M2^+} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
N87.14.13 $\mathrm{M2^-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
N87.14.14 $\mathrm{M2^-} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$

TABLE S262: Collinear SSGs with parent space group $I4_1/a$ (No. 88).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L88.1.1 $\mathrm{GM1^+}$	1	$4/m$	$\mathrm{A_g}$
L88.2.1 $\mathrm{GM1^-}$	0	-	-
L88.2.2 $\mathrm{GM2^+}$	1	$4/m$	$\mathrm{B_g}$
L88.2.3 $\mathrm{GM2^-}$	0	-	-

TABLE S263: Coplanar SSGs with parent space group $I4_1/a$ (No. 88).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P88.1.1 $\mathrm{GM1}^{+}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_g}\oplus\mathrm{A_g}$
P88.2.1 $\mathrm{GM1}^{-}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_g}\oplus\mathrm{A_u}$
P88.2.2 $\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_g}\oplus\mathrm{B_g}$
P88.2.3 $\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_g}\oplus\mathrm{B_u}$
P88.3.1 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}$	$\surd$	0	0	$\surd$	-	-
P88.3.2 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{B_g}\oplus\mathrm{B_u}$
P88.3.3 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
P88.3.4 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{B_g}\oplus\mathrm{B_g}$
P88.3.5 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	$4/m$	$\mathrm{A_u}\oplus\mathrm{B_g}$
P88.3.6 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
P88.4.1 $\mathrm{GM3}^{+}\mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	$4/m$	${}^2\mathrm{E_g}\oplus{}^1\mathrm{E_g}$
P88.4.2 $\mathrm{GM3}^{-}\mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
P88.6.1 M1	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
P88.6.2 M2	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{B_u}$
P88.8.1 LD1	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$

TABLE S264: Non-coplanar SSGs with parent space group $I4_1/a$ (No. 88).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N88.1.1 $\mathrm{GM1}^{+}$	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{A_g}$
N88.2.1 $\mathrm{GM1}^{-}$	$\surd$	2	2	$\surd$	4	$\mathrm{A}\oplus\mathrm{A}$
N88.2.2 $\mathrm{GM2}^{+}$	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{B_g}$
N88.2.3 $\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	$\bar{4}$	$\mathrm{A}\oplus\mathrm{A}$
N88.3.1 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}$	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_g}\oplus\mathrm{A_u}\oplus\mathrm{A_u}$
N88.3.2 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	$\bar{4}$	$\mathrm{A}\oplus\mathrm{B}$
N88.3.3 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_g}\oplus\mathrm{A_u}\oplus\mathrm{B_u}$
N88.3.4 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}$	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_g}\oplus\mathrm{B_g}\oplus\mathrm{B_g}$
N88.3.5 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	4	$\mathrm{A}\oplus\mathrm{B}$
N88.3.6 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_g}\oplus\mathrm{B_u}\oplus\mathrm{B_u}$
N88.4.1 $\mathrm{GM3}^{+}\mathrm{GM4}^{+}$	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_g}\oplus{}^2\mathrm{E_g}\oplus{}^1\mathrm{E_g}$
N88.4.2 $\mathrm{GM3}^{-}\mathrm{GM4}^{-}$	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_g}\oplus{}^2\mathrm{E_u}\oplus{}^1\mathrm{E_u}$
N88.6.1 M1	$\surd$	1	1	$\surd$	4	A
N88.6.2 M2	$\surd$	1	1	$\surd$	$\bar{4}$	A
N88.8.1 LD1	$\surd$	1	1	$\surd$	4	A
N88.9.1 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}$	$\surd$	0	0	$\surd$	-	-
N88.9.2 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}$	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{B_g}\oplus\mathrm{B_u}\oplus\mathrm{B_u}$
N88.9.3 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
N88.9.4 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	4	$\mathrm{B}\oplus\mathrm{B}$
N88.9.5 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}$	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_u}\oplus\mathrm{B_g}\oplus\mathrm{B_u}$
N88.9.6 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
N88.9.7 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}$	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{B_g}\oplus\mathrm{B_g}\oplus\mathrm{B_g}$
N88.9.8 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	$\bar{4}$	$\mathrm{B}\oplus\mathrm{B}$
N88.9.9 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{A_u}\oplus\mathrm{A_u}\oplus\mathrm{B_g}$
N88.9.10 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
N88.10.1 $\mathrm{GM1}^{-}\oplus\mathrm{GM3}^{+}\mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	4	${}^2\mathrm{E}\oplus{}^1\mathrm{E}$

Non-coplanar SSGs with parent space group $I4_1/a$ (No. 88) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N88.10.2 $\mathrm{GM1^-} \oplus \mathrm{GM3^-GM4^-}$	$\surd$	0	0	$\surd$	-	-
N88.10.3 $\mathrm{GM2^+} \oplus \mathrm{GM3^+GM4^+}$	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{B_g} \oplus {}^2\mathrm{E_g} \oplus {}^1\mathrm{E_g}$
N88.10.4 $\mathrm{GM2^+} \oplus \mathrm{GM3^-GM4^-}$	$\surd$	3	3	$\surd$	$4/m$	$\mathrm{B_g} \oplus {}^2\mathrm{E_u} \oplus {}^1\mathrm{E_u}$
N88.10.5 $\mathrm{GM2^-} \oplus \mathrm{GM3^+GM4^+}$	$\surd$	2	2	$\surd$	$\bar{4}$	${}^2\mathrm{E} \oplus {}^1\mathrm{E}$
N88.10.6 $\mathrm{GM2^-} \oplus \mathrm{GM3^-GM4^-}$	$\surd$	0	0	$\surd$	-	-
N88.12.1 $\mathrm{GM1^-} \oplus \mathrm{M1}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
N88.12.2 $\mathrm{GM1^-} \oplus \mathrm{M2}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{B_u}$
N88.12.3 $\mathrm{GM2^+} \oplus \mathrm{M1}$	$\surd$	1	1	$\surd$	$\bar{4}$	B
N88.12.4 $\mathrm{GM2^+} \oplus \mathrm{M2}$	$\surd$	1	1	$\surd$	4	B
N88.12.5 $\mathrm{GM2^-} \oplus \mathrm{M1}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
N88.12.6 $\mathrm{GM2^-} \oplus \mathrm{M2}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{B_u}$
N88.14.1 $\mathrm{GM1^-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$
N88.14.2 $\mathrm{GM2^+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$\bar{4}$	B
N88.14.3 $\mathrm{GM2^-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/m$	$\mathrm{A_u}$

TABLE S265: Collinear SSGs with parent space group $P422$ (No. 89).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L89.1.1 GM1	1	$4/mmm$	$\mathrm{A1_g}$
L89.2.1 GM2	1	$4/mmm$	$\mathrm{B1_g}$
L89.2.2 GM3	1	$4/mmm$	$\mathrm{A2_g}$
L89.2.3 GM4	1	$4/mmm$	$\mathrm{B2_g}$
L89.2.4 A1	0	-	-
L89.2.5 M1	0	-	-
L89.2.6 M2	0	-	-
L89.2.7 Z1	0	-	-
L89.2.8 Z2	0	-	-

TABLE S266: Coplanar SSGs with parent space group $P422$ (No. 89).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P89.1.1 GM1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A1_u}$
P89.2.1 GM2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
P89.2.2 GM3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
P89.2.3 GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
P89.2.4 A1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P89.2.5 M1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P89.2.6 M2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P89.2.7 Z1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P89.2.8 Z2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P89.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
P89.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g} \oplus \mathrm{B2_u}$
P89.3.3 GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$
P89.3.4 GM2 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
P89.3.5 GM2 $\oplus$ M1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$

Coplanar SSGs with parent space group $P422$ (No. 89) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P89.3.6 GM2 ⊕ M2	√	1	1	√	$4/mmm$	$\mathrm{B1_g}$
P89.3.7 GM2 ⊕ Z1	√	1	1	×	-	-
P89.3.8 GM2 ⊕ Z2	√	1	1	×	-	-
P89.3.9 GM3 ⊕ GM3	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
P89.3.10 GM3 ⊕ GM4	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g} \oplus \mathrm{B2_g}$
P89.3.11 GM3 ⊕ A1	√	1	1	×	-	-
P89.3.12 GM3 ⊕ M1	√	1	1	×	-	-
P89.3.13 GM3 ⊕ M2	√	1	1	×	-	-
P89.3.14 GM3 ⊕ Z1	√	1	1	×	-	-
P89.3.15 GM3 ⊕ Z2	√	1	1	×	-	-
P89.3.16 GM4 ⊕ GM4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
P89.3.17 GM4 ⊕ A1	√	1	1	×	-	-
P89.3.18 GM4 ⊕ M1	√	1	1	×	-	-
P89.3.19 GM4 ⊕ M2	√	1	1	×	-	-
P89.3.20 GM4 ⊕ Z1	√	1	1	×	-	-
P89.3.21 GM4 ⊕ Z2	√	1	1	×	-	-
P89.3.22 A1 ⊕ A1	√	1	1	×	-	-
P89.3.23 A1 ⊕ A2	√	1	1	×	-	-
P89.3.24 A1 ⊕ A3	√	1	1	×	-	-
P89.3.25 A1 ⊕ A4	√	1	1	×	-	-
P89.3.26 A1 ⊕ M1	×	-	-	-	-	-
P89.3.27 A1 ⊕ M4	×	-	-	-	-	-
P89.3.28 A1 ⊕ M2	×	-	-	-	-	-
P89.3.29 A1 ⊕ M3	×	-	-	-	-	-
P89.3.30 A1 ⊕ Z1	×	-	-	-	-	-
P89.3.31 A1 ⊕ Z3	×	-	-	-	-	-
P89.3.32 A1 ⊕ Z2	×	-	-	-	-	-
P89.3.33 A1 ⊕ Z4	×	-	-	-	-	-
P89.3.34 M1 ⊕ M1	√	1	1	×	-	-
P89.3.35 M1 ⊕ M4	√	1	1	×	-	-
P89.3.36 M1 ⊕ M2	√	1	1	×	-	-
P89.3.37 M1 ⊕ M3	√	1	1	×	-	-
P89.3.38 M1 ⊕ Z1	×	-	-	-	-	-
P89.3.39 M1 ⊕ Z2	×	-	-	-	-	-
P89.3.40 M2 ⊕ M2	√	1	1	×	-	-
P89.3.41 M2 ⊕ M3	√	1	1	×	-	-
P89.3.42 M2 ⊕ Z1	×	-	-	-	-	-
P89.3.43 M2 ⊕ Z2	×	-	-	-	-	-
P89.3.44 Z1 ⊕ Z1	√	1	1	×	-	-
P89.3.45 Z1 ⊕ Z3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
P89.3.46 Z1 ⊕ Z2	√	1	1	×	-	-
P89.3.47 Z1 ⊕ Z4	√	1	1	×	-	-
P89.3.48 Z2 ⊕ Z2	√	1	1	×	-	-
P89.3.49 Z2 ⊕ Z4	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
P89.6.1 GM5	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{E_g}$
P89.6.2 A5	√	1	1	×	-	-

Coplanar SSGs with parent space group $P422$ (No. 89) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P89.6.3 M5	$\surd$	1	1	$\times$	-	-
P89.6.4 Z5	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P89.7.1 R1	$\times$	-	-	-	-	-
P89.7.2 X1	$\times$	-	-	-	-	-
P89.7.3 X2	$\times$	-	-	-	-	-
P89.8.1 LD1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P89.8.2 LD2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P89.8.3 LD3	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P89.8.4 V1	$\surd$	1	1	$\times$	-	-
P89.8.5 V3	$\surd$	1	1	$\times$	-	-

TABLE S267: Non-coplanar SSGs with parent space group $P422$ (No. 89).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N89.1.1 GM1	$\surd$	3	3	$\surd$	422	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{A1}$
N89.2.1 GM2	$\surd$	3	3	$\surd$	$\bar{4}2m$	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{B1}$
N89.2.2 GM3	$\surd$	3	3	$\surd$	$4mm$	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{A2}$
N89.2.3 GM4	$\surd$	3	3	$\surd$	$\bar{4}m2$	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{A2}$
N89.2.4 A1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A1_u}$
N89.2.5 M1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A1_u}$
N89.2.6 M2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A1_u}$
N89.2.7 Z1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A1_u}$
N89.2.8 Z2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A1_u}$
N89.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	422	$\mathrm{A1}\oplus\mathrm{B1}\oplus\mathrm{B1}$
N89.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$\bar{4}m2$	$\mathrm{A1}\oplus\mathrm{B1}\oplus\mathrm{B2}$
N89.3.3 GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4mm$	$\mathrm{A1}\oplus\mathrm{B1}\oplus\mathrm{B2}$
N89.3.4 GM2 $\oplus$ A1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B1_u}$
N89.3.5 GM2 $\oplus$ M1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B1_u}$
N89.3.6 GM2 $\oplus$ M2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B1_u}$
N89.3.7 GM2 $\oplus$ Z1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B1_u}$
N89.3.8 GM2 $\oplus$ Z2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B1_u}$
N89.3.9 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	422	$\mathrm{A1}\oplus\mathrm{A2}\oplus\mathrm{A2}$
N89.3.10 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	$\bar{4}2m$	$\mathrm{A1}\oplus\mathrm{B2}\oplus\mathrm{A2}$
N89.3.11 GM3 $\oplus$ A1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_u}$
N89.3.12 GM3 $\oplus$ M1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_u}$
N89.3.13 GM3 $\oplus$ M2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_u}$
N89.3.14 GM3 $\oplus$ Z1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_u}$
N89.3.15 GM3 $\oplus$ Z2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_u}$
N89.3.16 GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	422	$\mathrm{A1}\oplus\mathrm{B2}\oplus\mathrm{B2}$
N89.3.17 GM4 $\oplus$ A1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_g}\oplus\mathrm{B2_u}$
N89.3.18 GM4 $\oplus$ M1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_g}\oplus\mathrm{B2_u}$
N89.3.19 GM4 $\oplus$ M2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_g}\oplus\mathrm{B2_u}$
N89.3.20 GM4 $\oplus$ Z1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_g}\oplus\mathrm{B2_u}$
N89.3.21 GM4 $\oplus$ Z2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_g}\oplus\mathrm{B2_u}$
N89.3.22 A1 $\oplus$ A1	$\surd$	1	1	$\surd$	422	$\mathrm{A1}$
N89.3.23 A1 $\oplus$ A2	$\surd$	1	1	$\surd$	$\bar{4}2m$	$\mathrm{A1}$

Non-coplanar SSGs with parent space group $P422$ (No. 89) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N89.3.24 A1 ⊕ A3	√	1	1	√	$4mm$	A1
N89.3.25 A1 ⊕ A4	√	1	1	√	$\bar{4}m2$	A1
N89.3.26 A1 ⊕ M1	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N89.3.27 A1 ⊕ M4	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N89.3.28 A1 ⊕ M2	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N89.3.29 A1 ⊕ M3	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N89.3.30 A1 ⊕ Z1	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N89.3.31 A1 ⊕ Z3	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N89.3.32 A1 ⊕ Z2	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N89.3.33 A1 ⊕ Z4	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N89.3.34 M1 ⊕ M1	√	1	1	√	422	A1
N89.3.35 M1 ⊕ M4	√	1	1	√	$\bar{4}m2$	A1
N89.3.36 M1 ⊕ M2	√	1	1	√	$\bar{4}2m$	A1
N89.3.37 M1 ⊕ M3	√	1	1	√	$4mm$	A1
N89.3.38 M1 ⊕ Z1	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N89.3.39 M1 ⊕ Z2	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N89.3.40 M2 ⊕ M2	√	1	1	√	422	A1
N89.3.41 M2 ⊕ M3	√	1	1	√	$\bar{4}m2$	A1
N89.3.42 M2 ⊕ Z1	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N89.3.43 M2 ⊕ Z2	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N89.3.44 Z1 ⊕ Z1	√	1	1	√	422	A1
N89.3.45 Z1 ⊕ Z3	√	1	1	√	$4mm$	A1
N89.3.46 Z1 ⊕ Z2	√	1	1	√	$\bar{4}2m$	A1
N89.3.47 Z1 ⊕ Z4	√	1	1	√	$\bar{4}m2$	A1
N89.3.48 Z2 ⊕ Z2	√	1	1	√	422	A1
N89.3.49 Z2 ⊕ Z4	√	1	1	√	$4mm$	A1
N89.6.1 GM5	√	3	3	√	$4mm$	A1 ⊕ E
N89.6.2 A5	√	1	1	√	$4mm$	A1
N89.6.3 M5	√	1	1	√	$4mm$	A1
N89.6.4 Z5	√	1	1	√	$4mm$	A1
N89.7.1 R1	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N89.7.2 X1	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N89.7.3 X2	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N89.8.1 LD1	√	1	1	√	$4mm$	A1
N89.8.2 LD2	√	1	1	√	$4mm$	A1
N89.8.3 LD3	√	1	1	√	$4mm$	A1
N89.8.4 V1	√	1	1	√	$4mm$	A1
N89.8.5 V3	√	1	1	√	$4mm$	A1
N89.9.1 GM2 ⊕ GM2 ⊕ GM2	√	3	3	√	$\bar{4}2m$	B1 ⊕ B1 ⊕ B1
N89.9.2 GM2 ⊕ GM2 ⊕ GM3	√	3	3	√	$4mm$	B1 ⊕ B1 ⊕ A2
N89.9.3 GM2 ⊕ GM2 ⊕ GM4	√	3	3	√	$\bar{4}m2$	B1 ⊕ B1 ⊕ A2
N89.9.4 GM2 ⊕ GM2 ⊕ A1	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N89.9.5 GM2 ⊕ GM2 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N89.9.6 GM2 ⊕ GM2 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N89.9.7 GM2 ⊕ GM2 ⊕ Z1	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N89.9.8 GM2 ⊕ GM2 ⊕ Z2	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$

Non-coplanar SSGs with parent space group $P422$ (No. 89) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N89.9.9 GM2 ⊕ GM3 ⊕ GM3	√	3	3	√	$\bar{4}2m$	$\mathrm{B1}\oplus\mathrm{A2}\oplus\mathrm{A2}$
N89.9.10 GM2 ⊕ GM3 ⊕ GM4	√	3	3	√	422	$\mathrm{B1}\oplus\mathrm{A2}\oplus\mathrm{B2}$
N89.9.11 GM2 ⊕ GM3 ⊕ A1	√	3	3	√	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_g}\oplus\mathrm{B2_u}$
N89.9.12 GM2 ⊕ GM3 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_g}\oplus\mathrm{B2_u}$
N89.9.13 GM2 ⊕ GM3 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_g}\oplus\mathrm{B2_u}$
N89.9.14 GM2 ⊕ GM3 ⊕ Z1	√	3	3	√	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_g}\oplus\mathrm{B2_u}$
N89.9.15 GM2 ⊕ GM3 ⊕ Z2	√	3	3	√	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_g}\oplus\mathrm{B2_u}$
N89.9.16 GM2 ⊕ GM4 ⊕ GM4	√	3	3	√	$\bar{4}2m$	$\mathrm{B1}\oplus\mathrm{B2}\oplus\mathrm{B2}$
N89.9.17 GM2 ⊕ GM4 ⊕ A1	√	3	3	√	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_u}\oplus\mathrm{B2_g}$
N89.9.18 GM2 ⊕ GM4 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_u}\oplus\mathrm{B2_g}$
N89.9.19 GM2 ⊕ GM4 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_u}\oplus\mathrm{B2_g}$
N89.9.20 GM2 ⊕ GM4 ⊕ Z1	√	3	3	√	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_u}\oplus\mathrm{B2_g}$
N89.9.21 GM2 ⊕ GM4 ⊕ Z2	√	3	3	√	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_u}\oplus\mathrm{B2_g}$
N89.9.22 GM2 ⊕ A1 ⊕ A1	√	1	1	×	-	-
N89.9.23 GM2 ⊕ A1 ⊕ A2	√	1	1	×	-	-
N89.9.24 GM2 ⊕ A1 ⊕ A3	√	1	1	√	$\bar{4}m2$	$\mathrm{B1}$
N89.9.25 GM2 ⊕ A1 ⊕ A4	√	1	1	×	-	-
N89.9.26 GM2 ⊕ A1 ⊕ M1	√	1	1	√	$4/mmm$	$\mathrm{B1_g}$
N89.9.27 GM2 ⊕ A1 ⊕ M4	√	1	1	√	$4/mmm$	$\mathrm{B1_g}$
N89.9.28 GM2 ⊕ A1 ⊕ M2	√	1	1	√	$4/mmm$	$\mathrm{B1_g}$
N89.9.29 GM2 ⊕ A1 ⊕ M3	√	1	1	√	$4/mmm$	$\mathrm{B1_g}$
N89.9.30 GM2 ⊕ A1 ⊕ Z1	√	1	1	×	-	-
N89.9.31 GM2 ⊕ A1 ⊕ Z3	√	1	1	×	-	-
N89.9.32 GM2 ⊕ A1 ⊕ Z2	√	1	1	×	-	-
N89.9.33 GM2 ⊕ A1 ⊕ Z4	√	1	1	×	-	-
N89.9.34 GM2 ⊕ M1 ⊕ M1	√	1	1	√	$\bar{4}2m$	$\mathrm{B1}$
N89.9.35 GM2 ⊕ M1 ⊕ M4	√	1	1	√	$4mm$	$\mathrm{B1}$
N89.9.36 GM2 ⊕ M1 ⊕ M2	√	1	1	√	422	$\mathrm{B1}$
N89.9.37 GM2 ⊕ M1 ⊕ M3	√	1	1	√	$\bar{4}m2$	$\mathrm{B1}$
N89.9.38 GM2 ⊕ M1 ⊕ Z1	√	1	1	√	$4/mmm$	$\mathrm{B1_g}$
N89.9.39 GM2 ⊕ M1 ⊕ Z2	√	1	1	√	$4/mmm$	$\mathrm{B1_g}$
N89.9.40 GM2 ⊕ M2 ⊕ M2	√	1	1	√	$\bar{4}2m$	$\mathrm{B1}$
N89.9.41 GM2 ⊕ M2 ⊕ M3	√	1	1	√	$4mm$	$\mathrm{B1}$
N89.9.42 GM2 ⊕ M2 ⊕ Z1	√	1	1	√	$4/mmm$	$\mathrm{B1_g}$
N89.9.43 GM2 ⊕ M2 ⊕ Z2	√	1	1	√	$4/mmm$	$\mathrm{B1_g}$
N89.9.44 GM2 ⊕ Z1 ⊕ Z1	√	1	1	×	-	-
N89.9.45 GM2 ⊕ Z1 ⊕ Z3	√	1	1	√	$\bar{4}m2$	$\mathrm{B1}$
N89.9.46 GM2 ⊕ Z1 ⊕ Z2	√	1	1	×	-	-
N89.9.47 GM2 ⊕ Z1 ⊕ Z4	√	1	1	×	-	-
N89.9.48 GM2 ⊕ Z2 ⊕ Z2	√	1	1	×	-	-
N89.9.49 GM2 ⊕ Z2 ⊕ Z4	√	1	1	√	$\bar{4}m2$	$\mathrm{B1}$
N89.9.50 GM3 ⊕ GM3 ⊕ GM3	√	3	3	√	$4mm$	$\mathrm{A2}\oplus\mathrm{A2}\oplus\mathrm{A2}$
N89.9.51 GM3 ⊕ GM3 ⊕ GM4	√	3	3	√	$\bar{4}m2$	$\mathrm{B2}\oplus\mathrm{B2}\oplus\mathrm{A2}$
N89.9.52 GM3 ⊕ GM3 ⊕ A1	√	3	3	√	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A2_g}\oplus\mathrm{A2_g}$
N89.9.53 GM3 ⊕ GM3 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A2_g}\oplus\mathrm{A2_g}$
N89.9.54 GM3 ⊕ GM3 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A2_g}\oplus\mathrm{A2_g}$

Non-coplanar SSGs with parent space group $P422$ (No. 89) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N89.9.55 GM3 ⊕ GM3 ⊕ Z1	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
N89.9.56 GM3 ⊕ GM3 ⊕ Z2	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
N89.9.57 GM3 ⊕ GM4 ⊕ GM4	√	3	3	√	$4mm$	$\mathrm{B2} \oplus \mathrm{B2} \oplus \mathrm{A2}$
N89.9.58 GM3 ⊕ GM4 ⊕ A1	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g} \oplus \mathrm{B2_g}$
N89.9.59 GM3 ⊕ GM4 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g} \oplus \mathrm{B2_g}$
N89.9.60 GM3 ⊕ GM4 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g} \oplus \mathrm{B2_g}$
N89.9.61 GM3 ⊕ GM4 ⊕ Z1	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g} \oplus \mathrm{B2_g}$
N89.9.62 GM3 ⊕ GM4 ⊕ Z2	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g} \oplus \mathrm{B2_g}$
N89.9.63 GM3 ⊕ A1 ⊕ A1	√	1	1	×	-	-
N89.9.64 GM3 ⊕ A1 ⊕ A2	√	1	1	×	-	-
N89.9.65 GM3 ⊕ A1 ⊕ A3	√	1	1	×	-	-
N89.9.66 GM3 ⊕ A1 ⊕ A4	√	1	1	×	-	-
N89.9.67 GM3 ⊕ A1 ⊕ M1	√	1	1	×	-	-
N89.9.68 GM3 ⊕ A1 ⊕ M4	√	1	1	×	-	-
N89.9.69 GM3 ⊕ A1 ⊕ M2	√	1	1	×	-	-
N89.9.70 GM3 ⊕ A1 ⊕ M3	√	1	1	×	-	-
N89.9.71 GM3 ⊕ A1 ⊕ Z1	√	1	1	×	-	-
N89.9.72 GM3 ⊕ A1 ⊕ Z3	√	1	1	×	-	-
N89.9.73 GM3 ⊕ A1 ⊕ Z2	√	1	1	×	-	-
N89.9.74 GM3 ⊕ A1 ⊕ Z4	√	1	1	×	-	-
N89.9.75 GM3 ⊕ M1 ⊕ M1	√	1	1	×	-	-
N89.9.76 GM3 ⊕ M1 ⊕ M4	√	1	1	×	-	-
N89.9.77 GM3 ⊕ M1 ⊕ M2	√	1	1	×	-	-
N89.9.78 GM3 ⊕ M1 ⊕ M3	√	1	1	×	-	-
N89.9.79 GM3 ⊕ M1 ⊕ Z1	√	1	1	×	-	-
N89.9.80 GM3 ⊕ M1 ⊕ Z2	√	1	1	×	-	-
N89.9.81 GM3 ⊕ M2 ⊕ M2	√	1	1	×	-	-
N89.9.82 GM3 ⊕ M2 ⊕ M3	√	1	1	×	-	-
N89.9.83 GM3 ⊕ M2 ⊕ Z1	√	1	1	×	-	-
N89.9.84 GM3 ⊕ M2 ⊕ Z2	√	1	1	×	-	-
N89.9.85 GM3 ⊕ Z1 ⊕ Z1	√	1	1	×	-	-
N89.9.86 GM3 ⊕ Z1 ⊕ Z3	√	1	1	√	422	A2
N89.9.87 GM3 ⊕ Z1 ⊕ Z2	√	1	1	×	-	-
N89.9.88 GM3 ⊕ Z1 ⊕ Z4	√	1	1	×	-	-
N89.9.89 GM3 ⊕ Z2 ⊕ Z2	√	1	1	×	-	-
N89.9.90 GM3 ⊕ Z2 ⊕ Z4	√	1	1	√	422	A2
N89.9.91 GM4 ⊕ GM4 ⊕ GM4	√	3	3	√	$\bar{4}m2$	$\mathrm{A2} \oplus \mathrm{A2} \oplus \mathrm{A2}$
N89.9.92 GM4 ⊕ GM4 ⊕ A1	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N89.9.93 GM4 ⊕ GM4 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N89.9.94 GM4 ⊕ GM4 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N89.9.95 GM4 ⊕ GM4 ⊕ Z1	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N89.9.96 GM4 ⊕ GM4 ⊕ Z2	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N89.9.97 GM4 ⊕ A1 ⊕ A1	√	1	1	×	-	-
N89.9.98 GM4 ⊕ A1 ⊕ A2	√	1	1	×	-	-
N89.9.99 GM4 ⊕ A1 ⊕ A3	√	1	1	×	-	-
N89.9.100 GM4 ⊕ A1 ⊕ A4	√	1	1	×	-	-

Non-coplanar SSGs with parent space group $P422$ (No. 89) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N89.9.101 GM4 ⊕ A1 ⊕ M1	√	1	1	×	-	-
N89.9.102 GM4 ⊕ A1 ⊕ M4	√	1	1	×	-	-
N89.9.103 GM4 ⊕ A1 ⊕ M2	√	1	1	×	-	-
N89.9.104 GM4 ⊕ A1 ⊕ M3	√	1	1	×	-	-
N89.9.105 GM4 ⊕ A1 ⊕ Z1	√	1	1	×	-	-
N89.9.106 GM4 ⊕ A1 ⊕ Z3	√	1	1	×	-	-
N89.9.107 GM4 ⊕ A1 ⊕ Z2	√	1	1	×	-	-
N89.9.108 GM4 ⊕ A1 ⊕ Z4	√	1	1	×	-	-
N89.9.109 GM4 ⊕ M1 ⊕ M1	√	1	1	×	-	-
N89.9.110 GM4 ⊕ M1 ⊕ M4	√	1	1	×	-	-
N89.9.111 GM4 ⊕ M1 ⊕ M2	√	1	1	×	-	-
N89.9.112 GM4 ⊕ M1 ⊕ M3	√	1	1	×	-	-
N89.9.113 GM4 ⊕ M1 ⊕ Z1	√	1	1	×	-	-
N89.9.114 GM4 ⊕ M1 ⊕ Z2	√	1	1	×	-	-
N89.9.115 GM4 ⊕ M2 ⊕ M2	√	1	1	×	-	-
N89.9.116 GM4 ⊕ M2 ⊕ M3	√	1	1	×	-	-
N89.9.117 GM4 ⊕ M2 ⊕ Z1	√	1	1	×	-	-
N89.9.118 GM4 ⊕ M2 ⊕ Z2	√	1	1	×	-	-
N89.9.119 GM4 ⊕ Z1 ⊕ Z1	√	1	1	×	-	-
N89.9.120 GM4 ⊕ Z1 ⊕ Z3	√	1	1	√	$\bar{4}2m$	B2
N89.9.121 GM4 ⊕ Z1 ⊕ Z2	√	1	1	×	-	-
N89.9.122 GM4 ⊕ Z1 ⊕ Z4	√	1	1	×	-	-
N89.9.123 GM4 ⊕ Z2 ⊕ Z2	√	1	1	×	-	-
N89.9.124 GM4 ⊕ Z2 ⊕ Z4	√	1	1	√	$\bar{4}2m$	B2
N89.9.125 A1 ⊕ A1 ⊕ A1	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A1_u}$
N89.9.126 A1 ⊕ A1 ⊕ A2	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N89.9.127 A1 ⊕ A1 ⊕ A3	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N89.9.128 A1 ⊕ A1 ⊕ A4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N89.9.129 A1 ⊕ A2 ⊕ A3	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N89.9.130 A1 ⊕ A1 ⊕ M1	√	1	1	×	-	-
N89.9.131 A1 ⊕ A1 ⊕ M4	√	1	1	×	-	-
N89.9.132 A1 ⊕ A2 ⊕ M1	√	1	1	×	-	-
N89.9.133 A1 ⊕ A3 ⊕ M1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N89.9.134 A1 ⊕ A3 ⊕ M4	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N89.9.135 A1 ⊕ A4 ⊕ M1	√	1	1	×	-	-
N89.9.136 A1 ⊕ A1 ⊕ M2	√	1	1	×	-	-
N89.9.137 A1 ⊕ A1 ⊕ M3	√	1	1	×	-	-
N89.9.138 A1 ⊕ A2 ⊕ M2	√	1	1	×	-	-
N89.9.139 A1 ⊕ A3 ⊕ M2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N89.9.140 A1 ⊕ A3 ⊕ M3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N89.9.141 A1 ⊕ A4 ⊕ M2	√	1	1	×	-	-
N89.9.142 A1 ⊕ A1 ⊕ Z1	√	1	1	×	-	-
N89.9.143 A1 ⊕ A1 ⊕ Z3	√	1	1	×	-	-
N89.9.144 A1 ⊕ A2 ⊕ Z1	√	1	1	×	-	-
N89.9.145 A1 ⊕ A3 ⊕ Z1	√	1	1	×	-	-
N89.9.146 A1 ⊕ A4 ⊕ Z1	√	1	1	×	-	-

Non-coplanar SSGs with parent space group $P422$ (No. 89) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N89.9.147 A1 ⊕ A4 ⊕ Z3	√	1	1	×	-	-
N89.9.148 A1 ⊕ A1 ⊕ Z2	√	1	1	×	-	-
N89.9.149 A1 ⊕ A1 ⊕ Z4	√	1	1	×	-	-
N89.9.150 A1 ⊕ A2 ⊕ Z2	√	1	1	×	-	-
N89.9.151 A1 ⊕ A3 ⊕ Z2	√	1	1	×	-	-
N89.9.152 A1 ⊕ A4 ⊕ Z2	√	1	1	×	-	-
N89.9.153 A1 ⊕ A4 ⊕ Z4	√	1	1	×	-	-
N89.9.154 A1 ⊕ M1 ⊕ M1	√	1	1	×	-	-
N89.9.155 A1 ⊕ M1 ⊕ M4	√	1	1	√	$4/mmm$	$\mathrm{B2_u}$
N89.9.156 A1 ⊕ M4 ⊕ M4	√	1	1	×	-	-
N89.9.157 A1 ⊕ M1 ⊕ M2	√	1	1	×	-	-
N89.9.158 A1 ⊕ M1 ⊕ M3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N89.9.159 A1 ⊕ M4 ⊕ M2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N89.9.160 A1 ⊕ M4 ⊕ M3	√	1	1	×	-	-
N89.9.161 A1 ⊕ M1 ⊕ Z1	×	-	-	-	-	-
N89.9.162 A1 ⊕ M1 ⊕ Z3	×	-	-	-	-	-
N89.9.163 A1 ⊕ M4 ⊕ Z1	×	-	-	-	-	-
N89.9.164 A1 ⊕ M4 ⊕ Z3	×	-	-	-	-	-
N89.9.165 A1 ⊕ M1 ⊕ Z2	×	-	-	-	-	-
N89.9.166 A1 ⊕ M1 ⊕ Z4	×	-	-	-	-	-
N89.9.167 A1 ⊕ M4 ⊕ Z2	×	-	-	-	-	-
N89.9.168 A1 ⊕ M4 ⊕ Z4	×	-	-	-	-	-
N89.9.169 A1 ⊕ M2 ⊕ M2	√	1	1	×	-	-
N89.9.170 A1 ⊕ M2 ⊕ M3	√	1	1	√	$4/mmm$	$\mathrm{B2_u}$
N89.9.171 A1 ⊕ M3 ⊕ M3	√	1	1	×	-	-
N89.9.172 A1 ⊕ M2 ⊕ Z1	×	-	-	-	-	-
N89.9.173 A1 ⊕ M2 ⊕ Z3	×	-	-	-	-	-
N89.9.174 A1 ⊕ M3 ⊕ Z1	×	-	-	-	-	-
N89.9.175 A1 ⊕ M3 ⊕ Z3	×	-	-	-	-	-
N89.9.176 A1 ⊕ M2 ⊕ Z2	×	-	-	-	-	-
N89.9.177 A1 ⊕ M2 ⊕ Z4	×	-	-	-	-	-
N89.9.178 A1 ⊕ M3 ⊕ Z2	×	-	-	-	-	-
N89.9.179 A1 ⊕ M3 ⊕ Z4	×	-	-	-	-	-
N89.9.180 A1 ⊕ Z1 ⊕ Z1	√	1	1	×	-	-
N89.9.181 A1 ⊕ Z1 ⊕ Z3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N89.9.182 A1 ⊕ Z3 ⊕ Z3	√	1	1	×	-	-
N89.9.183 A1 ⊕ Z1 ⊕ Z2	√	1	1	×	-	-
N89.9.184 A1 ⊕ Z1 ⊕ Z4	√	1	1	√	$4/mmm$	$\mathrm{B2_u}$
N89.9.185 A1 ⊕ Z3 ⊕ Z2	√	1	1	√	$4/mmm$	$\mathrm{B2_u}$
N89.9.186 A1 ⊕ Z3 ⊕ Z4	√	1	1	×	-	-
N89.9.187 A1 ⊕ Z2 ⊕ Z2	√	1	1	×	-	-
N89.9.188 A1 ⊕ Z2 ⊕ Z4	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N89.9.189 A1 ⊕ Z4 ⊕ Z4	√	1	1	×	-	-
N89.9.190 M1 ⊕ M1 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A1_u}$
N89.9.191 M1 ⊕ M1 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N89.9.192 M1 ⊕ M1 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$

Non-coplanar SSGs with parent space group $P422$ (No. 89) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N89.9.193 M1 ⊕ M1 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N89.9.194 M1 ⊕ M4 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N89.9.195 M1 ⊕ M1 ⊕ Z1	√	1	1	×	-	-
N89.9.196 M1 ⊕ M4 ⊕ Z1	√	1	1	×	-	-
N89.9.197 M1 ⊕ M1 ⊕ Z2	√	1	1	×	-	-
N89.9.198 M1 ⊕ M4 ⊕ Z2	√	1	1	×	-	-
N89.9.199 M1 ⊕ M2 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N89.9.200 M1 ⊕ M2 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N89.9.201 M1 ⊕ M3 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N89.9.202 M1 ⊕ M2 ⊕ Z1	√	1	1	×	-	-
N89.9.203 M1 ⊕ M3 ⊕ Z1	√	1	1	×	-	-
N89.9.204 M1 ⊕ M2 ⊕ Z2	√	1	1	×	-	-
N89.9.205 M1 ⊕ M3 ⊕ Z2	√	1	1	×	-	-
N89.9.206 M1 ⊕ Z1 ⊕ Z1	√	1	1	×	-	-
N89.9.207 M1 ⊕ Z1 ⊕ Z3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N89.9.208 M1 ⊕ Z1 ⊕ Z2	√	1	1	×	-	-
N89.9.209 M1 ⊕ Z1 ⊕ Z4	√	1	1	×	-	-
N89.9.210 M1 ⊕ Z2 ⊕ Z2	√	1	1	×	-	-
N89.9.211 M1 ⊕ Z2 ⊕ Z4	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N89.9.212 M2 ⊕ M2 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A1_u}$
N89.9.213 M2 ⊕ M2 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N89.9.214 M2 ⊕ M2 ⊕ Z1	√	1	1	×	-	-
N89.9.215 M2 ⊕ M3 ⊕ Z1	√	1	1	×	-	-
N89.9.216 M2 ⊕ M2 ⊕ Z2	√	1	1	×	-	-
N89.9.217 M2 ⊕ M3 ⊕ Z2	√	1	1	×	-	-
N89.9.218 M2 ⊕ Z1 ⊕ Z1	√	1	1	×	-	-
N89.9.219 M2 ⊕ Z1 ⊕ Z3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N89.9.220 M2 ⊕ Z1 ⊕ Z2	√	1	1	×	-	-
N89.9.221 M2 ⊕ Z1 ⊕ Z4	√	1	1	×	-	-
N89.9.222 M2 ⊕ Z2 ⊕ Z2	√	1	1	×	-	-
N89.9.223 M2 ⊕ Z2 ⊕ Z4	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N89.9.224 Z1 ⊕ Z1 ⊕ Z1	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A1_u}$
N89.9.225 Z1 ⊕ Z1 ⊕ Z3	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N89.9.226 Z1 ⊕ Z1 ⊕ Z2	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N89.9.227 Z1 ⊕ Z1 ⊕ Z4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N89.9.228 Z1 ⊕ Z3 ⊕ Z2	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N89.9.229 Z1 ⊕ Z2 ⊕ Z2	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N89.9.230 Z1 ⊕ Z2 ⊕ Z4	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N89.9.231 Z1 ⊕ Z4 ⊕ Z4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N89.9.232 Z2 ⊕ Z2 ⊕ Z2	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A1_u}$
N89.9.233 Z2 ⊕ Z2 ⊕ Z4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N89.12.1 GM2 ⊕ GM5	√	3	3	√	$\bar{4}m2$	$\mathrm{B1} \oplus \mathrm{E}$
N89.12.2 GM2 ⊕ A5	√	1	1	√	$\bar{4}m2$	B1
N89.12.3 GM2 ⊕ M5	√	1	1	√	$\bar{4}m2$	B1
N89.12.4 GM2 ⊕ Z5	√	1	1	√	$\bar{4}m2$	B1
N89.12.5 GM3 ⊕ GM5	√	3	3	√	422	$\mathrm{A2} \oplus \mathrm{E}$

Non-coplanar SSGs with parent space group $P422$ (No. 89) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N89.12.6 GM3 ⊕ A5	√	1	1	×	-	-
N89.12.7 GM3 ⊕ M5	√	1	1	×	-	-
N89.12.8 GM3 ⊕ Z5	√	1	1	√	422	A2
N89.12.9 GM4 ⊕ GM5	√	3	3	√	$\bar{4}2m$	B2 ⊕ E
N89.12.10 GM4 ⊕ A5	√	1	1	×	-	-
N89.12.11 GM4 ⊕ M5	√	1	1	×	-	-
N89.12.12 GM4 ⊕ Z5	√	1	1	√	$\bar{4}2m$	B2
N89.12.13 A1 ⊕ GM5	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{E_g}$
N89.12.14 A1 ⊕ A5	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{E_u}$
N89.12.15 A1 ⊕ M5	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N89.12.16 A1 ⊕ Z5	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N89.12.17 M1 ⊕ GM5	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{E_g}$
N89.12.18 M1 ⊕ A5	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N89.12.19 M1 ⊕ M5	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{E_u}$
N89.12.20 M1 ⊕ Z5	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N89.12.21 M2 ⊕ GM5	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{E_g}$
N89.12.22 M2 ⊕ A5	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N89.12.23 M2 ⊕ M5	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{E_u}$
N89.12.24 M2 ⊕ Z5	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N89.12.25 Z1 ⊕ GM5	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{E_g}$
N89.12.26 Z1 ⊕ A5	√	1	1	×	-	-
N89.12.27 Z1 ⊕ M5	√	1	1	×	-	-
N89.12.28 Z1 ⊕ Z5	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{E_u}$
N89.12.29 Z2 ⊕ GM5	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{E_g}$
N89.12.30 Z2 ⊕ A5	√	1	1	×	-	-
N89.12.31 Z2 ⊕ M5	√	1	1	×	-	-
N89.12.32 Z2 ⊕ Z5	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{E_u}$
N89.13.1 GM2 ⊕ R1	√	1	1	×	-	-
N89.13.2 GM2 ⊕ X1	√	1	1	×	-	-
N89.13.3 GM2 ⊕ X2	√	1	1	×	-	-
N89.13.4 GM3 ⊕ R1	√	1	1	×	-	-
N89.13.5 GM3 ⊕ X1	√	1	1	×	-	-
N89.13.6 GM3 ⊕ X2	√	1	1	×	-	-
N89.13.7 GM4 ⊕ R1	√	1	1	×	-	-
N89.13.8 GM4 ⊕ X1	√	1	1	√	$4/mmm$	$\mathrm{B2_g}$
N89.13.9 GM4 ⊕ X2	√	1	1	√	$4/mmm$	$\mathrm{B2_g}$
N89.13.10 A1 ⊕ R1	×	-	-	-	-	-
N89.13.11 A1 ⊕ R2	×	-	-	-	-	-
N89.13.12 A1 ⊕ R3	×	-	-	-	-	-
N89.13.13 A1 ⊕ R4	×	-	-	-	-	-
N89.13.14 A1 ⊕ X1	×	-	-	-	-	-
N89.13.15 A1 ⊕ X4	×	-	-	-	-	-
N89.13.16 A1 ⊕ X2	×	-	-	-	-	-
N89.13.17 A1 ⊕ X3	×	-	-	-	-	-
N89.13.18 M1 ⊕ R1	×	-	-	-	-	-
N89.13.19 M1 ⊕ R3	×	-	-	-	-	-

Non-coplanar SSGs with parent space group $P422$ (No. 89) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N89.13.20 M1 ⊕ X1	×	-	-	-	-	-
N89.13.21 M1 ⊕ X4	×	-	-	-	-	-
N89.13.22 M1 ⊕ X2	×	-	-	-	-	-
N89.13.23 M1 ⊕ X3	×	-	-	-	-	-
N89.13.24 M2 ⊕ R1	×	-	-	-	-	-
N89.13.25 M2 ⊕ R3	×	-	-	-	-	-
N89.13.26 M2 ⊕ X1	×	-	-	-	-	-
N89.13.27 M2 ⊕ X4	×	-	-	-	-	-
N89.13.28 M2 ⊕ X2	×	-	-	-	-	-
N89.13.29 M2 ⊕ X3	×	-	-	-	-	-
N89.13.30 Z1 ⊕ R1	×	-	-	-	-	-
N89.13.31 Z1 ⊕ R2	×	-	-	-	-	-
N89.13.32 Z1 ⊕ X1	×	-	-	-	-	-
N89.13.33 Z1 ⊕ X2	×	-	-	-	-	-
N89.13.34 Z2 ⊕ R1	×	-	-	-	-	-
N89.13.35 Z2 ⊕ R2	×	-	-	-	-	-
N89.13.36 Z2 ⊕ X1	×	-	-	-	-	-
N89.13.37 Z2 ⊕ X2	×	-	-	-	-	-
N89.14.1 GM2 ⊕ LD1	√	1	1	√	$\bar{4}m2$	B1
N89.14.2 GM2 ⊕ LD2	√	1	1	√	$\bar{4}m2$	B1
N89.14.3 GM2 ⊕ LD3	√	1	1	√	$\bar{4}m2$	B1
N89.14.4 GM2 ⊕ V1	√	1	1	√	$\bar{4}m2$	B1
N89.14.5 GM2 ⊕ V3	√	1	1	√	$\bar{4}m2$	B1
N89.14.6 GM3 ⊕ LD1	√	1	1	√	422	A2
N89.14.7 GM3 ⊕ LD2	√	1	1	√	422	A2
N89.14.8 GM3 ⊕ LD3	√	1	1	√	422	A2
N89.14.9 GM3 ⊕ V1	√	1	1	×	-	-
N89.14.10 GM3 ⊕ V3	√	1	1	×	-	-
N89.14.11 GM4 ⊕ LD1	√	1	1	√	$\bar{4}2m$	B2
N89.14.12 GM4 ⊕ LD2	√	1	1	√	$\bar{4}2m$	B2
N89.14.13 GM4 ⊕ LD3	√	1	1	√	$\bar{4}2m$	B2
N89.14.14 GM4 ⊕ V1	√	1	1	×	-	-
N89.14.15 GM4 ⊕ V3	√	1	1	×	-	-
N89.14.16 A1 ⊕ LD1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N89.14.17 A1 ⊕ LD2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N89.14.18 A1 ⊕ LD3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N89.14.19 A1 ⊕ V1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N89.14.20 A1 ⊕ V2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N89.14.21 A1 ⊕ V3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N89.14.22 M1 ⊕ LD1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N89.14.23 M1 ⊕ LD2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N89.14.24 M1 ⊕ LD3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N89.14.25 M1 ⊕ V1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N89.14.26 M1 ⊕ V2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N89.14.27 M1 ⊕ V3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N89.14.28 M2 ⊕ LD1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$

Non-coplanar SSGs with parent space group $P422$ (No. 89) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N89.14.29 M2 $\oplus$ LD2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N89.14.30 M2 $\oplus$ LD3	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N89.14.31 M2 $\oplus$ V1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N89.14.32 M2 $\oplus$ V2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N89.14.33 M2 $\oplus$ V3	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N89.14.34 Z1 $\oplus$ LD1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N89.14.35 Z1 $\oplus$ LD2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N89.14.36 Z1 $\oplus$ LD3	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N89.14.37 Z1 $\oplus$ V1	$\surd$	1	1	$\times$	-	-
N89.14.38 Z1 $\oplus$ V3	$\surd$	1	1	$\times$	-	-
N89.14.39 Z2 $\oplus$ LD1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N89.14.40 Z2 $\oplus$ LD2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N89.14.41 Z2 $\oplus$ LD3	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N89.14.42 Z2 $\oplus$ V1	$\surd$	1	1	$\times$	-	-
N89.14.43 Z2 $\oplus$ V3	$\surd$	1	1	$\times$	-	-

TABLE S268: Collinear SSGs with parent space group $P42_12$ (No. 90).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L90.1.1 GM1	1	$4/mmm$	$\mathrm{A1_g}$
L90.2.1 GM2	1	$4/mmm$	$\mathrm{B1_g}$
L90.2.2 GM3	1	$4/mmm$	$\mathrm{A2_g}$
L90.2.3 GM4	1	$4/mmm$	$\mathrm{B2_g}$
L90.2.4 Z1	0	-	-
L90.2.5 Z2	0	-	-

TABLE S269: Coplanar SSGs with parent space group $P42_12$ (No. 90).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P90.1.1 GM1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A1_u}$
P90.2.1 GM2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
P90.2.2 GM3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
P90.2.3 GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
P90.2.4 Z1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P90.2.5 Z2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P90.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
P90.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g} \oplus \mathrm{B2_u}$
P90.3.3 GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$
P90.3.4 GM2 $\oplus$ Z1	$\surd$	1	1	$\times$	-	-
P90.3.5 GM2 $\oplus$ Z2	$\surd$	1	1	$\times$	-	-
P90.3.6 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
P90.3.7 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g} \oplus \mathrm{B2_g}$
P90.3.8 GM3 $\oplus$ Z1	$\surd$	1	1	$\times$	-	-
P90.3.9 GM3 $\oplus$ Z2	$\surd$	1	1	$\times$	-	-
P90.3.10 GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$

Coplanar SSGs with parent space group $P42_12$ (No. 90) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P90.3.11 GM4 $\oplus$ Z1	$\surd$	1	1	$\times$	-	-
P90.3.12 GM4 $\oplus$ Z2	$\surd$	1	1	$\times$	-	-
P90.3.13 Z1 $\oplus$ Z1	$\surd$	1	1	$\times$	-	-
P90.3.14 Z1 $\oplus$ Z3	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P90.3.15 Z1 $\oplus$ Z2	$\surd$	1	1	$\times$	-	-
P90.3.16 Z1 $\oplus$ Z4	$\surd$	1	1	$\times$	-	-
P90.3.17 Z2 $\oplus$ Z2	$\surd$	1	1	$\times$	-	-
P90.3.18 Z2 $\oplus$ Z4	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P90.4.1 M1M4	$\surd$	1	1	$\times$	-	-
P90.4.2 M2M3	$\surd$	1	1	$\times$	-	-
P90.4.3 A1A4	$\surd$	1	1	$\times$	-	-
P90.6.1 GM5	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{E_g}$
P90.6.2 A5	$\surd$	1	1	$\times$	-	-
P90.6.3 M5	$\surd$	1	1	$\times$	-	-
P90.6.4 Z5	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P90.8.1 LD1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P90.8.2 LD2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P90.8.3 LD3	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$

TABLE S270: Non-coplanar SSGs with parent space group $P42_12$ (No. 90).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N90.1.1 GM1	$\surd$	3	3	$\surd$	422	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{A1}$
N90.2.1 GM2	$\surd$	3	3	$\surd$	$\bar{4}2m$	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{B1}$
N90.2.2 GM3	$\surd$	3	3	$\surd$	$4mm$	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{A2}$
N90.2.3 GM4	$\surd$	3	3	$\surd$	$\bar{4}m2$	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{A2}$
N90.2.4 Z1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A1_u}$
N90.2.5 Z2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A1_u}$
N90.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	422	$\mathrm{A1} \oplus \mathrm{B1} \oplus \mathrm{B1}$
N90.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$\bar{4}m2$	$\mathrm{A1} \oplus \mathrm{B1} \oplus \mathrm{B2}$
N90.3.3 GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4mm$	$\mathrm{A1} \oplus \mathrm{B1} \oplus \mathrm{B2}$
N90.3.4 GM2 $\oplus$ Z1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N90.3.5 GM2 $\oplus$ Z2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N90.3.6 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	422	$\mathrm{A1} \oplus \mathrm{A2} \oplus \mathrm{A2}$
N90.3.7 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	$\bar{4}2m$	$\mathrm{A1} \oplus \mathrm{B2} \oplus \mathrm{A2}$
N90.3.8 GM3 $\oplus$ Z1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
N90.3.9 GM3 $\oplus$ Z2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
N90.3.10 GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	422	$\mathrm{A1} \oplus \mathrm{B2} \oplus \mathrm{B2}$
N90.3.11 GM4 $\oplus$ Z1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N90.3.12 GM4 $\oplus$ Z2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N90.3.13 Z1 $\oplus$ Z1	$\surd$	1	1	$\surd$	422	A1
N90.3.14 Z1 $\oplus$ Z3	$\surd$	1	1	$\surd$	$4mm$	A1
N90.3.15 Z1 $\oplus$ Z2	$\surd$	1	1	$\surd$	$\bar{4}2m$	A1
N90.3.16 Z1 $\oplus$ Z4	$\surd$	1	1	$\surd$	$\bar{4}m2$	A1
N90.3.17 Z2 $\oplus$ Z2	$\surd$	1	1	$\surd$	422	A1
N90.3.18 Z2 $\oplus$ Z4	$\surd$	1	1	$\surd$	$4mm$	A1

Non-coplanar SSGs with parent space group $P42_12$ (No. 90) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N90.4.1 M1M4	√	1	1	√	422	A1
N90.4.2 M2M3	√	1	1	√	422	A1
N90.4.3 A1A4	√	1	1	√	422	A1
N90.6.1 GM5	√	3	3	√	$4mm$	$\mathrm{A1}\oplus\mathrm{E}$
N90.6.2 A5	√	1	1	√	$\bar{4}2m$	A1
N90.6.3 M5	√	1	1	√	$\bar{4}2m$	A1
N90.6.4 Z5	√	1	1	√	$4mm$	A1
N90.8.1 LD1	√	1	1	√	$4mm$	A1
N90.8.2 LD2	√	1	1	√	$4mm$	A1
N90.8.3 LD3	√	1	1	√	$4mm$	A1
N90.9.1 GM2 ⊕ GM2 ⊕ GM2	√	3	3	√	$\bar{4}2m$	$\mathrm{B1}\oplus\mathrm{B1}\oplus\mathrm{B1}$
N90.9.2 GM2 ⊕ GM2 ⊕ GM3	√	3	3	√	$4mm$	$\mathrm{B1}\oplus\mathrm{B1}\oplus\mathrm{A2}$
N90.9.3 GM2 ⊕ GM2 ⊕ GM4	√	3	3	√	$\bar{4}m2$	$\mathrm{B1}\oplus\mathrm{B1}\oplus\mathrm{A2}$
N90.9.4 GM2 ⊕ GM2 ⊕ Z1	√	3	3	√	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B1_g}\oplus\mathrm{B1_g}$
N90.9.5 GM2 ⊕ GM2 ⊕ Z2	√	3	3	√	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B1_g}\oplus\mathrm{B1_g}$
N90.9.6 GM2 ⊕ GM3 ⊕ GM3	√	3	3	√	$\bar{4}2m$	$\mathrm{B1}\oplus\mathrm{A2}\oplus\mathrm{A2}$
N90.9.7 GM2 ⊕ GM3 ⊕ GM4	√	3	3	√	422	$\mathrm{B1}\oplus\mathrm{A2}\oplus\mathrm{B2}$
N90.9.8 GM2 ⊕ GM3 ⊕ Z1	√	3	3	√	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_g}\oplus\mathrm{B2_u}$
N90.9.9 GM2 ⊕ GM3 ⊕ Z2	√	3	3	√	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_g}\oplus\mathrm{B2_u}$
N90.9.10 GM2 ⊕ GM4 ⊕ GM4	√	3	3	√	$\bar{4}2m$	$\mathrm{B1}\oplus\mathrm{B2}\oplus\mathrm{B2}$
N90.9.11 GM2 ⊕ GM4 ⊕ Z1	√	3	3	√	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_u}\oplus\mathrm{B2_g}$
N90.9.12 GM2 ⊕ GM4 ⊕ Z2	√	3	3	√	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_u}\oplus\mathrm{B2_g}$
N90.9.13 GM2 ⊕ Z1 ⊕ Z1	√	1	1	×	-	-
N90.9.14 GM2 ⊕ Z1 ⊕ Z3	√	1	1	√	$\bar{4}m2$	B1
N90.9.15 GM2 ⊕ Z1 ⊕ Z2	√	1	1	×	-	-
N90.9.16 GM2 ⊕ Z1 ⊕ Z4	√	1	1	×	-	-
N90.9.17 GM2 ⊕ Z2 ⊕ Z2	√	1	1	×	-	-
N90.9.18 GM2 ⊕ Z2 ⊕ Z4	√	1	1	√	$\bar{4}m2$	B1
N90.9.19 GM3 ⊕ GM3 ⊕ GM3	√	3	3	√	$4mm$	$\mathrm{A2}\oplus\mathrm{A2}\oplus\mathrm{A2}$
N90.9.20 GM3 ⊕ GM3 ⊕ GM4	√	3	3	√	$\bar{4}m2$	$\mathrm{B2}\oplus\mathrm{B2}\oplus\mathrm{A2}$
N90.9.21 GM3 ⊕ GM3 ⊕ Z1	√	3	3	√	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A2_g}\oplus\mathrm{A2_g}$
N90.9.22 GM3 ⊕ GM3 ⊕ Z2	√	3	3	√	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A2_g}\oplus\mathrm{A2_g}$
N90.9.23 GM3 ⊕ GM4 ⊕ GM4	√	3	3	√	$4mm$	$\mathrm{B2}\oplus\mathrm{B2}\oplus\mathrm{A2}$
N90.9.24 GM3 ⊕ GM4 ⊕ Z1	√	3	3	√	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{A2_g}\oplus\mathrm{B2_g}$
N90.9.25 GM3 ⊕ GM4 ⊕ Z2	√	3	3	√	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{A2_g}\oplus\mathrm{B2_g}$
N90.9.26 GM3 ⊕ Z1 ⊕ Z1	√	1	1	×	-	-
N90.9.27 GM3 ⊕ Z1 ⊕ Z3	√	1	1	√	422	A2
N90.9.28 GM3 ⊕ Z1 ⊕ Z2	√	1	1	×	-	-
N90.9.29 GM3 ⊕ Z1 ⊕ Z4	√	1	1	×	-	-
N90.9.30 GM3 ⊕ Z2 ⊕ Z2	√	1	1	×	-	-
N90.9.31 GM3 ⊕ Z2 ⊕ Z4	√	1	1	√	422	A2
N90.9.32 GM4 ⊕ GM4 ⊕ GM4	√	3	3	√	$\bar{4}m2$	$\mathrm{A2}\oplus\mathrm{A2}\oplus\mathrm{A2}$
N90.9.33 GM4 ⊕ GM4 ⊕ Z1	√	3	3	√	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B2_g}\oplus\mathrm{B2_g}$
N90.9.34 GM4 ⊕ GM4 ⊕ Z2	√	3	3	√	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B2_g}\oplus\mathrm{B2_g}$
N90.9.35 GM4 ⊕ Z1 ⊕ Z1	√	1	1	×	-	-
N90.9.36 GM4 ⊕ Z1 ⊕ Z3	√	1	1	√	$\bar{4}2m$	B2

Non-coplanar SSGs with parent space group $P42_12$ (No. 90) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N90.9.37 GM4 ⊕ Z1 ⊕ Z2	√	1	1	×	-	-
N90.9.38 GM4 ⊕ Z1 ⊕ Z4	√	1	1	×	-	-
N90.9.39 GM4 ⊕ Z2 ⊕ Z2	√	1	1	×	-	-
N90.9.40 GM4 ⊕ Z2 ⊕ Z4	√	1	1	√	$\bar{4}2m$	B2
N90.9.41 Z1 ⊕ Z1 ⊕ Z1	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A1_u}$
N90.9.42 Z1 ⊕ Z1 ⊕ Z3	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N90.9.43 Z1 ⊕ Z1 ⊕ Z2	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N90.9.44 Z1 ⊕ Z1 ⊕ Z4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N90.9.45 Z1 ⊕ Z3 ⊕ Z2	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N90.9.46 Z1 ⊕ Z2 ⊕ Z2	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N90.9.47 Z1 ⊕ Z2 ⊕ Z4	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N90.9.48 Z1 ⊕ Z4 ⊕ Z4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N90.9.49 Z2 ⊕ Z2 ⊕ Z2	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A1_u}$
N90.9.50 Z2 ⊕ Z2 ⊕ Z4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N90.10.1 GM2 ⊕ M1M4	√	1	1	√	$\bar{4}2m$	B1
N90.10.2 GM2 ⊕ M2M3	√	1	1	√	$\bar{4}2m$	B1
N90.10.3 GM2 ⊕ A1A4	√	1	1	×	-	-
N90.10.4 GM3 ⊕ M1M4	√	1	1	×	-	-
N90.10.5 GM3 ⊕ M2M3	√	1	1	×	-	-
N90.10.6 GM3 ⊕ A1A4	√	1	1	×	-	-
N90.10.7 GM4 ⊕ M1M4	√	1	1	×	-	-
N90.10.8 GM4 ⊕ M2M3	√	1	1	×	-	-
N90.10.9 GM4 ⊕ A1A4	√	1	1	×	-	-
N90.10.10 Z1 ⊕ M1M4	√	1	1	×	-	-
N90.10.11 Z1 ⊕ M2M3	√	1	1	×	-	-
N90.10.12 Z1 ⊕ A1A4	√	1	1	×	-	-
N90.10.13 Z1 ⊕ A2A3	√	1	1	×	-	-
N90.10.14 Z2 ⊕ M1M4	√	1	1	×	-	-
N90.10.15 Z2 ⊕ M2M3	√	1	1	×	-	-
N90.10.16 Z2 ⊕ A1A4	√	1	1	×	-	-
N90.10.17 Z2 ⊕ A2A3	√	1	1	×	-	-
N90.12.1 GM2 ⊕ GM5	√	3	3	√	$\bar{4}m2$	$\mathrm{B1} \oplus \mathrm{E}$
N90.12.2 GM2 ⊕ A5	√	1	1	×	-	-
N90.12.3 GM2 ⊕ M5	√	1	1	√	422	B1
N90.12.4 GM2 ⊕ Z5	√	1	1	√	$\bar{4}m2$	B1
N90.12.5 GM3 ⊕ GM5	√	3	3	√	422	$\mathrm{A2} \oplus \mathrm{E}$
N90.12.6 GM3 ⊕ A5	√	1	1	×	-	-
N90.12.7 GM3 ⊕ M5	√	1	1	×	-	-
N90.12.8 GM3 ⊕ Z5	√	1	1	√	422	A2
N90.12.9 GM4 ⊕ GM5	√	3	3	√	$\bar{4}2m$	$\mathrm{B2} \oplus \mathrm{E}$
N90.12.10 GM4 ⊕ A5	√	1	1	×	-	-
N90.12.11 GM4 ⊕ M5	√	1	1	×	-	-
N90.12.12 GM4 ⊕ Z5	√	1	1	√	$\bar{4}2m$	B2
N90.12.13 Z1 ⊕ GM5	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{E_g}$
N90.12.14 Z1 ⊕ A5	√	1	1	×	-	-
N90.12.15 Z1 ⊕ M5	√	1	1	×	-	-

Non-coplanar SSGs with parent space group $P42_12$ (No. 90) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N90.12.16 Z1 $\oplus$ Z5	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{E_u}$
N90.12.17 Z2 $\oplus$ GM5	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{E_g}$
N90.12.18 Z2 $\oplus$ A5	$\surd$	1	1	$\times$	-	-
N90.12.19 Z2 $\oplus$ M5	$\surd$	1	1	$\times$	-	-
N90.12.20 Z2 $\oplus$ Z5	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{E_u}$
N90.14.1 GM2 $\oplus$ LD1	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N90.14.2 GM2 $\oplus$ LD2	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N90.14.3 GM2 $\oplus$ LD3	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N90.14.4 GM3 $\oplus$ LD1	$\surd$	1	1	$\surd$	422	A2
N90.14.5 GM3 $\oplus$ LD2	$\surd$	1	1	$\surd$	422	A2
N90.14.6 GM3 $\oplus$ LD3	$\surd$	1	1	$\surd$	422	A2
N90.14.7 GM4 $\oplus$ LD1	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N90.14.8 GM4 $\oplus$ LD2	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N90.14.9 GM4 $\oplus$ LD3	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N90.14.10 Z1 $\oplus$ LD1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N90.14.11 Z1 $\oplus$ LD2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N90.14.12 Z1 $\oplus$ LD3	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N90.14.13 Z2 $\oplus$ LD1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N90.14.14 Z2 $\oplus$ LD2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N90.14.15 Z2 $\oplus$ LD3	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$

TABLE S271: Collinear SSGs with parent space group $P4_122$ (No. 91).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L91.1.1 GM1	1	$4/mmm$	$\mathrm{A1_g}$
L91.2.1 GM2	1	$4/mmm$	$\mathrm{B1_g}$
L91.2.2 GM3	1	$4/mmm$	$\mathrm{A2_g}$
L91.2.3 GM4	1	$4/mmm$	$\mathrm{B2_g}$
L91.2.4 M1	0	-	-
L91.2.5 M2	0	-	-

TABLE S272: Coplanar SSGs with parent space group $P4_122$ (No. 91).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P91.1.1 GM1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A1_u}$
P91.2.1 GM2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
P91.2.2 GM3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
P91.2.3 GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
P91.2.4 M1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P91.2.5 M2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P91.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
P91.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g} \oplus \mathrm{B2_u}$
P91.3.3 GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$
P91.3.4 GM2 $\oplus$ M1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
P91.3.5 GM2 $\oplus$ M2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$

Coplanar SSGs with parent space group $P4_122$ (No. 91) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P91.3.6 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
P91.3.7 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g} \oplus \mathrm{B2_g}$
P91.3.8 GM3 $\oplus$ M1	$\surd$	1	1	$\times$	-	-
P91.3.9 GM3 $\oplus$ M2	$\surd$	1	1	$\times$	-	-
P91.3.10 GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
P91.3.11 GM4 $\oplus$ M1	$\surd$	1	1	$\times$	-	-
P91.3.12 GM4 $\oplus$ M2	$\surd$	1	1	$\times$	-	-
P91.3.13 M1 $\oplus$ M1	$\surd$	1	1	$\times$	-	-
P91.3.14 M1 $\oplus$ M4	$\surd$	1	1	$\times$	-	-
P91.3.15 M1 $\oplus$ M2	$\surd$	1	1	$\times$	-	-
P91.3.16 M1 $\oplus$ M3	$\surd$	1	1	$\times$	-	-
P91.3.17 M2 $\oplus$ M2	$\surd$	1	1	$\times$	-	-
P91.3.18 M2 $\oplus$ M3	$\surd$	1	1	$\times$	-	-
P91.6.1 GM5	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{E_g}$
P91.6.2 A1	$\surd$	1	1	$\times$	-	-
P91.6.3 M5	$\surd$	1	1	$\times$	-	-
P91.6.4 Z1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P91.6.5 Z2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P91.7.1 X1	$\times$	-	-	-	-	-
P91.7.2 X2	$\times$	-	-	-	-	-
P91.8.1 LD1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P91.8.2 V1	$\surd$	1	1	$\times$	-	-

TABLE S273: Non-coplanar SSGs with parent space group $P4_122$ (No. 91).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N91.1.1 GM1	$\surd$	3	3	$\surd$	422	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{A1}$
N91.2.1 GM2	$\surd$	3	3	$\surd$	$\bar{4}2m$	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{B1}$
N91.2.2 GM3	$\surd$	3	3	$\surd$	$4mm$	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{A2}$
N91.2.3 GM4	$\surd$	3	3	$\surd$	$\bar{4}m2$	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{A2}$
N91.2.4 M1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A1_u}$
N91.2.5 M2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A1_u}$
N91.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	422	$\mathrm{A1} \oplus \mathrm{B1} \oplus \mathrm{B1}$
N91.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$\bar{4}m2$	$\mathrm{A1} \oplus \mathrm{B1} \oplus \mathrm{B2}$
N91.3.3 GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4mm$	$\mathrm{A1} \oplus \mathrm{B1} \oplus \mathrm{B2}$
N91.3.4 GM2 $\oplus$ M1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N91.3.5 GM2 $\oplus$ M2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N91.3.6 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	422	$\mathrm{A1} \oplus \mathrm{A2} \oplus \mathrm{A2}$
N91.3.7 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	$\bar{4}2m$	$\mathrm{A1} \oplus \mathrm{B2} \oplus \mathrm{A2}$
N91.3.8 GM3 $\oplus$ M1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
N91.3.9 GM3 $\oplus$ M2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
N91.3.10 GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	422	$\mathrm{A1} \oplus \mathrm{B2} \oplus \mathrm{B2}$
N91.3.11 GM4 $\oplus$ M1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N91.3.12 GM4 $\oplus$ M2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N91.3.13 M1 $\oplus$ M1	$\surd$	1	1	$\surd$	422	$\mathrm{A1}$
N91.3.14 M1 $\oplus$ M4	$\surd$	1	1	$\surd$	$\bar{4}m2$	$\mathrm{A1}$

Non-coplanar SSGs with parent space group $P4_122$ (No. 91) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N91.3.15 M1 ⊕ M2	√	1	1	√	$\bar{4}2m$	A1
N91.3.16 M1 ⊕ M3	√	1	1	√	$4mm$	A1
N91.3.17 M2 ⊕ M2	√	1	1	√	422	A1
N91.3.18 M2 ⊕ M3	√	1	1	√	$\bar{4}m2$	A1
N91.6.1 GM5	√	3	3	√	$4mm$	A1 ⊕ E
N91.6.2 A1	√	1	1	√	$4mm$	A1
N91.6.3 M5	√	1	1	√	$4mm$	A1
N91.6.4 Z1	√	1	1	√	$4mm$	A1
N91.6.5 Z2	√	1	1	√	$4mm$	A1
N91.7.1 X1	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N91.7.2 X2	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N91.8.1 LD1	√	1	1	√	$4mm$	A1
N91.8.2 V1	√	1	1	√	$4mm$	A1
N91.9.1 GM2 ⊕ GM2 ⊕ GM2	√	3	3	√	$\bar{4}2m$	B1 ⊕ B1 ⊕ B1
N91.9.2 GM2 ⊕ GM2 ⊕ GM3	√	3	3	√	$4mm$	B1 ⊕ B1 ⊕ A2
N91.9.3 GM2 ⊕ GM2 ⊕ GM4	√	3	3	√	$\bar{4}m2$	B1 ⊕ B1 ⊕ A2
N91.9.4 GM2 ⊕ GM2 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N91.9.5 GM2 ⊕ GM2 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N91.9.6 GM2 ⊕ GM3 ⊕ GM3	√	3	3	√	$\bar{4}2m$	B1 ⊕ A2 ⊕ A2
N91.9.7 GM2 ⊕ GM3 ⊕ GM4	√	3	3	√	422	B1 ⊕ A2 ⊕ B2
N91.9.8 GM2 ⊕ GM3 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g} \oplus \mathrm{B2_u}$
N91.9.9 GM2 ⊕ GM3 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g} \oplus \mathrm{B2_u}$
N91.9.10 GM2 ⊕ GM4 ⊕ GM4	√	3	3	√	$\bar{4}2m$	B1 ⊕ B2 ⊕ B2
N91.9.11 GM2 ⊕ GM4 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$
N91.9.12 GM2 ⊕ GM4 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$
N91.9.13 GM2 ⊕ M1 ⊕ M1	√	1	1	√	$\bar{4}2m$	B1
N91.9.14 GM2 ⊕ M1 ⊕ M4	√	1	1	√	$4mm$	B1
N91.9.15 GM2 ⊕ M1 ⊕ M2	√	1	1	√	422	B1
N91.9.16 GM2 ⊕ M1 ⊕ M3	√	1	1	√	$\bar{4}m2$	B1
N91.9.17 GM2 ⊕ M2 ⊕ M2	√	1	1	√	$\bar{4}2m$	B1
N91.9.18 GM2 ⊕ M2 ⊕ M3	√	1	1	√	$4mm$	B1
N91.9.19 GM3 ⊕ GM3 ⊕ GM3	√	3	3	√	$4mm$	A2 ⊕ A2 ⊕ A2
N91.9.20 GM3 ⊕ GM3 ⊕ GM4	√	3	3	√	$\bar{4}m2$	B2 ⊕ B2 ⊕ A2
N91.9.21 GM3 ⊕ GM3 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
N91.9.22 GM3 ⊕ GM3 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
N91.9.23 GM3 ⊕ GM4 ⊕ GM4	√	3	3	√	$4mm$	B2 ⊕ B2 ⊕ A2
N91.9.24 GM3 ⊕ GM4 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g} \oplus \mathrm{B2_g}$
N91.9.25 GM3 ⊕ GM4 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g} \oplus \mathrm{B2_g}$
N91.9.26 GM3 ⊕ M1 ⊕ M1	√	1	1	×	-	-
N91.9.27 GM3 ⊕ M1 ⊕ M4	√	1	1	×	-	-
N91.9.28 GM3 ⊕ M1 ⊕ M2	√	1	1	×	-	-
N91.9.29 GM3 ⊕ M1 ⊕ M3	√	1	1	×	-	-
N91.9.30 GM3 ⊕ M2 ⊕ M2	√	1	1	×	-	-
N91.9.31 GM3 ⊕ M2 ⊕ M3	√	1	1	×	-	-
N91.9.32 GM4 ⊕ GM4 ⊕ GM4	√	3	3	√	$\bar{4}m2$	A2 ⊕ A2 ⊕ A2
N91.9.33 GM4 ⊕ GM4 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$

Non-coplanar SSGs with parent space group $P4_122$ (No. 91) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N91.9.34 GM4 ⊕ GM4 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N91.9.35 GM4 ⊕ M1 ⊕ M1	√	1	1	×	-	-
N91.9.36 GM4 ⊕ M1 ⊕ M4	√	1	1	×	-	-
N91.9.37 GM4 ⊕ M1 ⊕ M2	√	1	1	×	-	-
N91.9.38 GM4 ⊕ M1 ⊕ M3	√	1	1	×	-	-
N91.9.39 GM4 ⊕ M2 ⊕ M2	√	1	1	×	-	-
N91.9.40 GM4 ⊕ M2 ⊕ M3	√	1	1	×	-	-
N91.9.41 M1 ⊕ M1 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A1_u}$
N91.9.42 M1 ⊕ M1 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N91.9.43 M1 ⊕ M1 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N91.9.44 M1 ⊕ M1 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N91.9.45 M1 ⊕ M4 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N91.9.46 M1 ⊕ M2 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N91.9.47 M1 ⊕ M2 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N91.9.48 M1 ⊕ M3 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N91.9.49 M2 ⊕ M2 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A1_u}$
N91.9.50 M2 ⊕ M2 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N91.12.1 GM2 ⊕ GM5	√	3	3	√	$\bar{4}m2$	$\mathrm{B1} \oplus \mathrm{E}$
N91.12.2 GM2 ⊕ A1	√	1	1	√	$\bar{4}m2$	B1
N91.12.3 GM2 ⊕ M5	√	1	1	√	$\bar{4}m2$	B1
N91.12.4 GM2 ⊕ Z1	√	1	1	√	$\bar{4}m2$	B1
N91.12.5 GM2 ⊕ Z2	√	1	1	√	$\bar{4}m2$	B1
N91.12.6 GM3 ⊕ GM5	√	3	3	√	422	$\mathrm{A2} \oplus \mathrm{E}$
N91.12.7 GM3 ⊕ A1	√	1	1	×	-	-
N91.12.8 GM3 ⊕ M5	√	1	1	×	-	-
N91.12.9 GM3 ⊕ Z1	√	1	1	√	422	A2
N91.12.10 GM3 ⊕ Z2	√	1	1	√	422	A2
N91.12.11 GM4 ⊕ GM5	√	3	3	√	$\bar{4}2m$	$\mathrm{B2} \oplus \mathrm{E}$
N91.12.12 GM4 ⊕ A1	√	1	1	×	-	-
N91.12.13 GM4 ⊕ M5	√	1	1	×	-	-
N91.12.14 GM4 ⊕ Z1	√	1	1	√	$\bar{4}2m$	B2
N91.12.15 GM4 ⊕ Z2	√	1	1	√	$\bar{4}2m$	B2
N91.12.16 M1 ⊕ GM5	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{E_g}$
N91.12.17 M1 ⊕ A1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N91.12.18 M1 ⊕ A2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N91.12.19 M1 ⊕ M5	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{E_u}$
N91.12.20 M1 ⊕ Z1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N91.12.21 M1 ⊕ Z2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N91.12.22 M2 ⊕ GM5	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{E_g}$
N91.12.23 M2 ⊕ A1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N91.12.24 M2 ⊕ A2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N91.12.25 M2 ⊕ M5	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{E_u}$
N91.12.26 M2 ⊕ Z1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N91.12.27 M2 ⊕ Z2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N91.13.1 GM2 ⊕ X1	√	1	1	×	-	-
N91.13.2 GM2 ⊕ X2	√	1	1	×	-	-

Non-coplanar SSGs with parent space group $P4_122$ (No. 91) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N91.13.3 GM3 $\oplus$ X1	$\surd$	1	1	$\times$	-	-
N91.13.4 GM3 $\oplus$ X2	$\surd$	1	1	$\times$	-	-
N91.13.5 GM4 $\oplus$ X1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_g}$
N91.13.6 GM4 $\oplus$ X2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_g}$
N91.13.7 M1 $\oplus$ X1	$\times$	-	-	-	-	-
N91.13.8 M1 $\oplus$ X4	$\times$	-	-	-	-	-
N91.13.9 M1 $\oplus$ X2	$\times$	-	-	-	-	-
N91.13.10 M1 $\oplus$ X3	$\times$	-	-	-	-	-
N91.13.11 M2 $\oplus$ X1	$\times$	-	-	-	-	-
N91.13.12 M2 $\oplus$ X4	$\times$	-	-	-	-	-
N91.13.13 M2 $\oplus$ X2	$\times$	-	-	-	-	-
N91.13.14 M2 $\oplus$ X3	$\times$	-	-	-	-	-
N91.14.1 GM2 $\oplus$ LD1	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N91.14.2 GM2 $\oplus$ V1	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N91.14.3 GM3 $\oplus$ LD1	$\surd$	1	1	$\surd$	422	A2
N91.14.4 GM3 $\oplus$ V1	$\surd$	1	1	$\times$	-	-
N91.14.5 GM4 $\oplus$ LD1	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N91.14.6 GM4 $\oplus$ V1	$\surd$	1	1	$\times$	-	-
N91.14.7 M1 $\oplus$ LD1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N91.14.8 M1 $\oplus$ V1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N91.14.9 M2 $\oplus$ LD1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N91.14.10 M2 $\oplus$ V1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$

TABLE S274: Collinear SSGs with parent space group $P4_12_12$ (No. 92).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L92.1.1 GM1	1	$4/mmm$	$\mathrm{A1_g}$
L92.2.1 GM2	1	$4/mmm$	$\mathrm{B1_g}$
L92.2.2 GM3	1	$4/mmm$	$\mathrm{A2_g}$
L92.2.3 GM4	1	$4/mmm$	$\mathrm{B2_g}$

TABLE S275: Coplanar SSGs with parent space group $P4_12_12$ (No. 92).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P92.1.1 GM1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A1_u}$
P92.2.1 GM2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
P92.2.2 GM3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
P92.2.3 GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
P92.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
P92.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g} \oplus \mathrm{B2_u}$
P92.3.3 GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$
P92.3.4 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
P92.3.5 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g} \oplus \mathrm{B2_g}$
P92.3.6 GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
P92.4.1 M1M4	$\surd$	1	1	$\times$	-	-
P92.4.2 M2M3	$\surd$	1	1	$\times$	-	-

Coplanar SSGs with parent space group $P4_12_12$ (No. 92) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P92.6.1 GM5	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{E_g}$
P92.6.2 M5	$\surd$	1	1	$\times$	-	-
P92.6.3 Z1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P92.6.4 Z2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P92.8.1 LD1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$

TABLE S276: Non-coplanar SSGs with parent space group $P4_12_12$ (No. 92).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N92.1.1 GM1	$\surd$	3	3	$\surd$	422	A1 $\oplus$ A1 $\oplus$ A1
N92.2.1 GM2	$\surd$	3	3	$\surd$	$\bar{4}2m$	A1 $\oplus$ A1 $\oplus$ B1
N92.2.2 GM3	$\surd$	3	3	$\surd$	$4mm$	A1 $\oplus$ A1 $\oplus$ A2
N92.2.3 GM4	$\surd$	3	3	$\surd$	$\bar{4}m2$	A1 $\oplus$ A1 $\oplus$ A2
N92.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	422	A1 $\oplus$ B1 $\oplus$ B1
N92.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$\bar{4}m2$	A1 $\oplus$ B1 $\oplus$ B2
N92.3.3 GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4mm$	A1 $\oplus$ B1 $\oplus$ B2
N92.3.4 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	422	A1 $\oplus$ A2 $\oplus$ A2
N92.3.5 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	$\bar{4}2m$	A1 $\oplus$ B2 $\oplus$ A2
N92.3.6 GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	422	A1 $\oplus$ B2 $\oplus$ B2
N92.4.1 M1M4	$\surd$	1	1	$\surd$	422	A1
N92.4.2 M2M3	$\surd$	1	1	$\surd$	422	A1
N92.6.1 GM5	$\surd$	3	3	$\surd$	$4mm$	A1 $\oplus$ E
N92.6.2 M5	$\surd$	1	1	$\surd$	$\bar{4}2m$	A1
N92.6.3 Z1	$\surd$	1	1	$\surd$	$4mm$	A1
N92.6.4 Z2	$\surd$	1	1	$\surd$	$4mm$	A1
N92.8.1 LD1	$\surd$	1	1	$\surd$	$4mm$	A1
N92.9.1 GM2 $\oplus$ GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$\bar{4}2m$	B1 $\oplus$ B1 $\oplus$ B1
N92.9.2 GM2 $\oplus$ GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$4mm$	B1 $\oplus$ B1 $\oplus$ A2
N92.9.3 GM2 $\oplus$ GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	$\bar{4}m2$	B1 $\oplus$ B1 $\oplus$ A2
N92.9.4 GM2 $\oplus$ GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	$\bar{4}2m$	B1 $\oplus$ A2 $\oplus$ A2
N92.9.5 GM2 $\oplus$ GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	422	B1 $\oplus$ A2 $\oplus$ B2
N92.9.6 GM2 $\oplus$ GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	$\bar{4}2m$	B1 $\oplus$ B2 $\oplus$ B2
N92.9.7 GM3 $\oplus$ GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	$4mm$	A2 $\oplus$ A2 $\oplus$ A2
N92.9.8 GM3 $\oplus$ GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	$\bar{4}m2$	B2 $\oplus$ B2 $\oplus$ A2
N92.9.9 GM3 $\oplus$ GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4mm$	B2 $\oplus$ B2 $\oplus$ A2
N92.9.10 GM4 $\oplus$ GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	$\bar{4}m2$	A2 $\oplus$ A2 $\oplus$ A2
N92.10.1 GM2 $\oplus$ M1M4	$\surd$	1	1	$\surd$	$\bar{4}2m$	B1
N92.10.2 GM2 $\oplus$ M2M3	$\surd$	1	1	$\surd$	$\bar{4}2m$	B1
N92.10.3 GM3 $\oplus$ M1M4	$\surd$	1	1	$\times$	-	-
N92.10.4 GM3 $\oplus$ M2M3	$\surd$	1	1	$\times$	-	-
N92.10.5 GM4 $\oplus$ M1M4	$\surd$	1	1	$\times$	-	-
N92.10.6 GM4 $\oplus$ M2M3	$\surd$	1	1	$\times$	-	-
N92.12.1 GM2 $\oplus$ GM5	$\surd$	3	3	$\surd$	$\bar{4}m2$	B1 $\oplus$ E
N92.12.2 GM2 $\oplus$ M5	$\surd$	1	1	$\surd$	422	B1
N92.12.3 GM2 $\oplus$ Z1	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N92.12.4 GM2 $\oplus$ Z2	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1

Non-coplanar SSGs with parent space group $P4_12_12$ (No. 92) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N92.12.5 GM3 $\oplus$ GM5	$\surd$	3	3	$\surd$	422	$\mathrm{A2}\oplus\mathrm{E}$
N92.12.6 GM3 $\oplus$ M5	$\surd$	1	1	$\times$	-	-
N92.12.7 GM3 $\oplus$ Z1	$\surd$	1	1	$\surd$	422	A2
N92.12.8 GM3 $\oplus$ Z2	$\surd$	1	1	$\surd$	422	A2
N92.12.9 GM4 $\oplus$ GM5	$\surd$	3	3	$\surd$	$\bar{4}2m$	$\mathrm{B2}\oplus\mathrm{E}$
N92.12.10 GM4 $\oplus$ M5	$\surd$	1	1	$\times$	-	-
N92.12.11 GM4 $\oplus$ Z1	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N92.12.12 GM4 $\oplus$ Z2	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N92.14.1 GM2 $\oplus$ LD1	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N92.14.2 GM3 $\oplus$ LD1	$\surd$	1	1	$\surd$	422	A2
N92.14.3 GM4 $\oplus$ LD1	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2

TABLE S277: Collinear SSGs with parent space group $P4_222$ (No. 93).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L93.1.1 GM1	1	$4/mmm$	$\mathrm{A1_g}$
L93.2.1 GM2	1	$4/mmm$	$\mathrm{B1_g}$
L93.2.2 GM3	1	$4/mmm$	$\mathrm{A2_g}$
L93.2.3 GM4	1	$4/mmm$	$\mathrm{B2_g}$
L93.2.4 A1	0	-	-
L93.2.5 M1	0	-	-
L93.2.6 M2	0	-	-
L93.2.7 Z1	0	-	-
L93.2.8 Z2	0	-	-

TABLE S278: Coplanar SSGs with parent space group $P4_222$ (No. 93).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P93.1.1 GM1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A1_u}$
P93.2.1 GM2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B1_u}$
P93.2.2 GM3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_u}$
P93.2.3 GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_g}\oplus\mathrm{B2_u}$
P93.2.4 A1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P93.2.5 M1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P93.2.6 M2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P93.2.7 Z1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P93.2.8 Z2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P93.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B1_g}\oplus\mathrm{B1_g}$
P93.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_g}\oplus\mathrm{B2_u}$
P93.3.3 GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_u}\oplus\mathrm{B2_g}$
P93.3.4 GM2 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
P93.3.5 GM2 $\oplus$ M1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
P93.3.6 GM2 $\oplus$ M2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
P93.3.7 GM2 $\oplus$ Z1	$\surd$	1	1	$\times$	-	-
P93.3.8 GM2 $\oplus$ Z2	$\surd$	1	1	$\times$	-	-

Coplanar SSGs with parent space group $P4_222$ (No. 93) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P93.3.9 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
P93.3.10 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g} \oplus \mathrm{B2_g}$
P93.3.11 GM3 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
P93.3.12 GM3 $\oplus$ M1	$\surd$	1	1	$\times$	-	-
P93.3.13 GM3 $\oplus$ M2	$\surd$	1	1	$\times$	-	-
P93.3.14 GM3 $\oplus$ Z1	$\surd$	1	1	$\times$	-	-
P93.3.15 GM3 $\oplus$ Z2	$\surd$	1	1	$\times$	-	-
P93.3.16 GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
P93.3.17 GM4 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
P93.3.18 GM4 $\oplus$ M1	$\surd$	1	1	$\times$	-	-
P93.3.19 GM4 $\oplus$ M2	$\surd$	1	1	$\times$	-	-
P93.3.20 GM4 $\oplus$ Z1	$\surd$	1	1	$\times$	-	-
P93.3.21 GM4 $\oplus$ Z2	$\surd$	1	1	$\times$	-	-
P93.3.22 A1 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
P93.3.23 A1 $\oplus$ A2	$\surd$	1	1	$\times$	-	-
P93.3.24 A1 $\oplus$ A3	$\surd$	1	1	$\times$	-	-
P93.3.25 A1 $\oplus$ A4	$\surd$	1	1	$\times$	-	-
P93.3.26 A1 $\oplus$ M1	$\times$	-	-	-	-	-
P93.3.27 A1 $\oplus$ M4	$\times$	-	-	-	-	-
P93.3.28 A1 $\oplus$ M2	$\times$	-	-	-	-	-
P93.3.29 A1 $\oplus$ M3	$\times$	-	-	-	-	-
P93.3.30 A1 $\oplus$ Z1	$\times$	-	-	-	-	-
P93.3.31 A1 $\oplus$ Z3	$\times$	-	-	-	-	-
P93.3.32 A1 $\oplus$ Z2	$\times$	-	-	-	-	-
P93.3.33 A1 $\oplus$ Z4	$\times$	-	-	-	-	-
P93.3.34 M1 $\oplus$ M1	$\surd$	1	1	$\times$	-	-
P93.3.35 M1 $\oplus$ M4	$\surd$	1	1	$\times$	-	-
P93.3.36 M1 $\oplus$ M2	$\surd$	1	1	$\times$	-	-
P93.3.37 M1 $\oplus$ M3	$\surd$	1	1	$\times$	-	-
P93.3.38 M1 $\oplus$ Z1	$\times$	-	-	-	-	-
P93.3.39 M1 $\oplus$ Z2	$\times$	-	-	-	-	-
P93.3.40 M2 $\oplus$ M2	$\surd$	1	1	$\times$	-	-
P93.3.41 M2 $\oplus$ M3	$\surd$	1	1	$\times$	-	-
P93.3.42 M2 $\oplus$ Z1	$\times$	-	-	-	-	-
P93.3.43 M2 $\oplus$ Z2	$\times$	-	-	-	-	-
P93.3.44 Z1 $\oplus$ Z1	$\surd$	1	1	$\times$	-	-
P93.3.45 Z1 $\oplus$ Z3	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P93.3.46 Z1 $\oplus$ Z2	$\surd$	1	1	$\times$	-	-
P93.3.47 Z1 $\oplus$ Z4	$\surd$	1	1	$\times$	-	-
P93.3.48 Z2 $\oplus$ Z2	$\surd$	1	1	$\times$	-	-
P93.3.49 Z2 $\oplus$ Z4	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P93.6.1 GM5	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{E_g}$
P93.6.2 A5	$\surd$	1	1	$\times$	-	-
P93.6.3 M5	$\surd$	1	1	$\times$	-	-
P93.6.4 Z5	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P93.7.1 R1	$\times$	-	-	-	-	-

Coplanar SSGs with parent space group $P4_222$ (No. 93) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P93.7.2 X1	×	-	-	-	-	-
P93.7.3 X2	×	-	-	-	-	-
P93.8.1 LD1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
P93.8.2 LD3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
P93.8.3 V1	√	1	1	×	-	-
P93.8.4 V3	√	1	1	×	-	-

TABLE S279: Non-coplanar SSGs with parent space group $P4_222$ (No. 93).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N93.1.1 GM1	√	3	3	√	422	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{A1}$
N93.2.1 GM2	√	3	3	√	$\bar{4}2m$	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{B1}$
N93.2.2 GM3	√	3	3	√	$4mm$	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{A2}$
N93.2.3 GM4	√	3	3	√	$\bar{4}m2$	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{A2}$
N93.2.4 A1	√	3	3	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A1_u}$
N93.2.5 M1	√	3	3	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A1_u}$
N93.2.6 M2	√	3	3	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A1_u}$
N93.2.7 Z1	√	3	3	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A1_u}$
N93.2.8 Z2	√	3	3	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A1_u}$
N93.3.1 GM2 ⊕ GM2	√	3	3	√	422	$\mathrm{A1}\oplus\mathrm{B1}\oplus\mathrm{B1}$
N93.3.2 GM2 ⊕ GM3	√	3	3	√	$\bar{4}m2$	$\mathrm{A1}\oplus\mathrm{B1}\oplus\mathrm{B2}$
N93.3.3 GM2 ⊕ GM4	√	3	3	√	$4mm$	$\mathrm{A1}\oplus\mathrm{B1}\oplus\mathrm{B2}$
N93.3.4 GM2 ⊕ A1	√	3	3	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B1_u}$
N93.3.5 GM2 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B1_u}$
N93.3.6 GM2 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B1_u}$
N93.3.7 GM2 ⊕ Z1	√	3	3	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B1_u}$
N93.3.8 GM2 ⊕ Z2	√	3	3	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B1_u}$
N93.3.9 GM3 ⊕ GM3	√	3	3	√	422	$\mathrm{A1}\oplus\mathrm{A2}\oplus\mathrm{A2}$
N93.3.10 GM3 ⊕ GM4	√	3	3	√	$\bar{4}2m$	$\mathrm{A1}\oplus\mathrm{B2}\oplus\mathrm{A2}$
N93.3.11 GM3 ⊕ A1	√	3	3	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_u}$
N93.3.12 GM3 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_u}$
N93.3.13 GM3 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_u}$
N93.3.14 GM3 ⊕ Z1	√	3	3	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_u}$
N93.3.15 GM3 ⊕ Z2	√	3	3	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_u}$
N93.3.16 GM4 ⊕ GM4	√	3	3	√	422	$\mathrm{A1}\oplus\mathrm{B2}\oplus\mathrm{B2}$
N93.3.17 GM4 ⊕ A1	√	3	3	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_g}\oplus\mathrm{B2_u}$
N93.3.18 GM4 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_g}\oplus\mathrm{B2_u}$
N93.3.19 GM4 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_g}\oplus\mathrm{B2_u}$
N93.3.20 GM4 ⊕ Z1	√	3	3	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_g}\oplus\mathrm{B2_u}$
N93.3.21 GM4 ⊕ Z2	√	3	3	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_g}\oplus\mathrm{B2_u}$
N93.3.22 A1 ⊕ A1	√	1	1	√	422	$\mathrm{A1}$
N93.3.23 A1 ⊕ A2	√	1	1	√	$\bar{4}2m$	$\mathrm{A1}$
N93.3.24 A1 ⊕ A3	√	1	1	√	$4mm$	$\mathrm{A1}$
N93.3.25 A1 ⊕ A4	√	1	1	√	$\bar{4}m2$	$\mathrm{A1}$
N93.3.26 A1 ⊕ M1	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N93.3.27 A1 ⊕ M4	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$

Non-coplanar SSGs with parent space group $P4_222$ (No. 93) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N93.3.28 A1 ⊕ M2	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N93.3.29 A1 ⊕ M3	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N93.3.30 A1 ⊕ Z1	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N93.3.31 A1 ⊕ Z3	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N93.3.32 A1 ⊕ Z2	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N93.3.33 A1 ⊕ Z4	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N93.3.34 M1 ⊕ M1	√	1	1	√	422	A1
N93.3.35 M1 ⊕ M4	√	1	1	√	$\bar{4}m2$	A1
N93.3.36 M1 ⊕ M2	√	1	1	√	$\bar{4}2m$	A1
N93.3.37 M1 ⊕ M3	√	1	1	√	$4mm$	A1
N93.3.38 M1 ⊕ Z1	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N93.3.39 M1 ⊕ Z2	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N93.3.40 M2 ⊕ M2	√	1	1	√	422	A1
N93.3.41 M2 ⊕ M3	√	1	1	√	$\bar{4}m2$	A1
N93.3.42 M2 ⊕ Z1	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N93.3.43 M2 ⊕ Z2	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N93.3.44 Z1 ⊕ Z1	√	1	1	√	422	A1
N93.3.45 Z1 ⊕ Z3	√	1	1	√	$4mm$	A1
N93.3.46 Z1 ⊕ Z2	√	1	1	√	$\bar{4}2m$	A1
N93.3.47 Z1 ⊕ Z4	√	1	1	√	$\bar{4}m2$	A1
N93.3.48 Z2 ⊕ Z2	√	1	1	√	422	A1
N93.3.49 Z2 ⊕ Z4	√	1	1	√	$4mm$	A1
N93.6.1 GM5	√	3	3	√	$4mm$	$\mathrm{A1 \oplus E}$
N93.6.2 A5	√	1	1	√	$4mm$	A1
N93.6.3 M5	√	1	1	√	$4mm$	A1
N93.6.4 Z5	√	1	1	√	$4mm$	A1
N93.7.1 R1	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N93.7.2 X1	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N93.7.3 X2	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N93.8.1 LD1	√	1	1	√	$4mm$	A1
N93.8.2 LD3	√	1	1	√	$4mm$	A1
N93.8.3 V1	√	1	1	√	$4mm$	A1
N93.8.4 V3	√	1	1	√	$4mm$	A1
N93.9.1 GM2 ⊕ GM2 ⊕ GM2	√	3	3	√	$\bar{4}2m$	$\mathrm{B1 \oplus B1 \oplus B1}$
N93.9.2 GM2 ⊕ GM2 ⊕ GM3	√	3	3	√	$4mm$	$\mathrm{B1 \oplus B1 \oplus A2}$
N93.9.3 GM2 ⊕ GM2 ⊕ GM4	√	3	3	√	$\bar{4}m2$	$\mathrm{B1 \oplus B1 \oplus A2}$
N93.9.4 GM2 ⊕ GM2 ⊕ A1	√	3	3	√	$4/mmm$	$\mathrm{A1_u \oplus B1_g \oplus B1_g}$
N93.9.5 GM2 ⊕ GM2 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{A1_u \oplus B1_g \oplus B1_g}$
N93.9.6 GM2 ⊕ GM2 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A1_u \oplus B1_g \oplus B1_g}$
N93.9.7 GM2 ⊕ GM2 ⊕ Z1	√	3	3	√	$4/mmm$	$\mathrm{A1_u \oplus B1_g \oplus B1_g}$
N93.9.8 GM2 ⊕ GM2 ⊕ Z2	√	3	3	√	$4/mmm$	$\mathrm{A1_u \oplus B1_g \oplus B1_g}$
N93.9.9 GM2 ⊕ GM3 ⊕ GM3	√	3	3	√	$\bar{4}2m$	$\mathrm{B1 \oplus A2 \oplus A2}$
N93.9.10 GM2 ⊕ GM3 ⊕ GM4	√	3	3	√	422	$\mathrm{B1 \oplus A2 \oplus B2}$
N93.9.11 GM2 ⊕ GM3 ⊕ A1	√	3	3	√	$4/mmm$	$\mathrm{B1_g \oplus A2_g \oplus B2_u}$
N93.9.12 GM2 ⊕ GM3 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{B1_g \oplus A2_g \oplus B2_u}$
N93.9.13 GM2 ⊕ GM3 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{B1_g \oplus A2_g \oplus B2_u}$

Non-coplanar SSGs with parent space group $P4_222$ (No. 93) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N93.9.14 GM2 ⊕ GM3 ⊕ Z1	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g} \oplus \mathrm{B2_u}$
N93.9.15 GM2 ⊕ GM3 ⊕ Z2	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g} \oplus \mathrm{B2_u}$
N93.9.16 GM2 ⊕ GM4 ⊕ GM4	√	3	3	√	$\bar{4}2m$	$\mathrm{B1} \oplus \mathrm{B2} \oplus \mathrm{B2}$
N93.9.17 GM2 ⊕ GM4 ⊕ A1	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$
N93.9.18 GM2 ⊕ GM4 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$
N93.9.19 GM2 ⊕ GM4 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$
N93.9.20 GM2 ⊕ GM4 ⊕ Z1	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$
N93.9.21 GM2 ⊕ GM4 ⊕ Z2	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$
N93.9.22 GM2 ⊕ A1 ⊕ A1	√	1	1	×	-	-
N93.9.23 GM2 ⊕ A1 ⊕ A2	√	1	1	×	-	-
N93.9.24 GM2 ⊕ A1 ⊕ A3	√	1	1	√	$\bar{4}m2$	B1
N93.9.25 GM2 ⊕ A1 ⊕ A4	√	1	1	×	-	-
N93.9.26 GM2 ⊕ A1 ⊕ M1	√	1	1	√	$4/mmm$	$\mathrm{B1_g}$
N93.9.27 GM2 ⊕ A1 ⊕ M4	√	1	1	√	$4/mmm$	$\mathrm{B1_g}$
N93.9.28 GM2 ⊕ A1 ⊕ M2	√	1	1	√	$4/mmm$	$\mathrm{B1_g}$
N93.9.29 GM2 ⊕ A1 ⊕ M3	√	1	1	√	$4/mmm$	$\mathrm{B1_g}$
N93.9.30 GM2 ⊕ A1 ⊕ Z1	√	1	1	×	-	-
N93.9.31 GM2 ⊕ A1 ⊕ Z3	√	1	1	×	-	-
N93.9.32 GM2 ⊕ A1 ⊕ Z2	√	1	1	×	-	-
N93.9.33 GM2 ⊕ A1 ⊕ Z4	√	1	1	×	-	-
N93.9.34 GM2 ⊕ M1 ⊕ M1	√	1	1	√	$\bar{4}2m$	B1
N93.9.35 GM2 ⊕ M1 ⊕ M4	√	1	1	√	$4mm$	B1
N93.9.36 GM2 ⊕ M1 ⊕ M2	√	1	1	√	422	B1
N93.9.37 GM2 ⊕ M1 ⊕ M3	√	1	1	√	$\bar{4}m2$	B1
N93.9.38 GM2 ⊕ M1 ⊕ Z1	√	1	1	√	$4/mmm$	$\mathrm{B1_g}$
N93.9.39 GM2 ⊕ M1 ⊕ Z2	√	1	1	√	$4/mmm$	$\mathrm{B1_g}$
N93.9.40 GM2 ⊕ M2 ⊕ M2	√	1	1	√	$\bar{4}2m$	B1
N93.9.41 GM2 ⊕ M2 ⊕ M3	√	1	1	√	$4mm$	B1
N93.9.42 GM2 ⊕ M2 ⊕ Z1	√	1	1	√	$4/mmm$	$\mathrm{B1_g}$
N93.9.43 GM2 ⊕ M2 ⊕ Z2	√	1	1	√	$4/mmm$	$\mathrm{B1_g}$
N93.9.44 GM2 ⊕ Z1 ⊕ Z1	√	1	1	×	-	-
N93.9.45 GM2 ⊕ Z1 ⊕ Z3	√	1	1	√	$\bar{4}m2$	B1
N93.9.46 GM2 ⊕ Z1 ⊕ Z2	√	1	1	×	-	-
N93.9.47 GM2 ⊕ Z1 ⊕ Z4	√	1	1	×	-	-
N93.9.48 GM2 ⊕ Z2 ⊕ Z2	√	1	1	×	-	-
N93.9.49 GM2 ⊕ Z2 ⊕ Z4	√	1	1	√	$\bar{4}m2$	B1
N93.9.50 GM3 ⊕ GM3 ⊕ GM3	√	3	3	√	$4mm$	$\mathrm{A2} \oplus \mathrm{A2} \oplus \mathrm{A2}$
N93.9.51 GM3 ⊕ GM3 ⊕ GM4	√	3	3	√	$\bar{4}m2$	$\mathrm{B2} \oplus \mathrm{B2} \oplus \mathrm{A2}$
N93.9.52 GM3 ⊕ GM3 ⊕ A1	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
N93.9.53 GM3 ⊕ GM3 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
N93.9.54 GM3 ⊕ GM3 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
N93.9.55 GM3 ⊕ GM3 ⊕ Z1	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
N93.9.56 GM3 ⊕ GM3 ⊕ Z2	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
N93.9.57 GM3 ⊕ GM4 ⊕ GM4	√	3	3	√	$4mm$	$\mathrm{B2} \oplus \mathrm{B2} \oplus \mathrm{A2}$
N93.9.58 GM3 ⊕ GM4 ⊕ A1	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g} \oplus \mathrm{B2_g}$
N93.9.59 GM3 ⊕ GM4 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g} \oplus \mathrm{B2_g}$

Non-coplanar SSGs with parent space group $P4_222$ (No. 93) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N93.9.60 GM3 ⊕ GM4 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g} \oplus \mathrm{B2_g}$
N93.9.61 GM3 ⊕ GM4 ⊕ Z1	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g} \oplus \mathrm{B2_g}$
N93.9.62 GM3 ⊕ GM4 ⊕ Z2	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g} \oplus \mathrm{B2_g}$
N93.9.63 GM3 ⊕ A1 ⊕ A1	√	1	1	×	-	-
N93.9.64 GM3 ⊕ A1 ⊕ A2	√	1	1	×	-	-
N93.9.65 GM3 ⊕ A1 ⊕ A3	√	1	1	×	-	-
N93.9.66 GM3 ⊕ A1 ⊕ A4	√	1	1	×	-	-
N93.9.67 GM3 ⊕ A1 ⊕ M1	√	1	1	×	-	-
N93.9.68 GM3 ⊕ A1 ⊕ M4	√	1	1	×	-	-
N93.9.69 GM3 ⊕ A1 ⊕ M2	√	1	1	×	-	-
N93.9.70 GM3 ⊕ A1 ⊕ M3	√	1	1	×	-	-
N93.9.71 GM3 ⊕ A1 ⊕ Z1	√	1	1	×	-	-
N93.9.72 GM3 ⊕ A1 ⊕ Z3	√	1	1	×	-	-
N93.9.73 GM3 ⊕ A1 ⊕ Z2	√	1	1	×	-	-
N93.9.74 GM3 ⊕ A1 ⊕ Z4	√	1	1	×	-	-
N93.9.75 GM3 ⊕ M1 ⊕ M1	√	1	1	×	-	-
N93.9.76 GM3 ⊕ M1 ⊕ M4	√	1	1	×	-	-
N93.9.77 GM3 ⊕ M1 ⊕ M2	√	1	1	×	-	-
N93.9.78 GM3 ⊕ M1 ⊕ M3	√	1	1	×	-	-
N93.9.79 GM3 ⊕ M1 ⊕ Z1	√	1	1	×	-	-
N93.9.80 GM3 ⊕ M1 ⊕ Z2	√	1	1	×	-	-
N93.9.81 GM3 ⊕ M2 ⊕ M2	√	1	1	×	-	-
N93.9.82 GM3 ⊕ M2 ⊕ M3	√	1	1	×	-	-
N93.9.83 GM3 ⊕ M2 ⊕ Z1	√	1	1	×	-	-
N93.9.84 GM3 ⊕ M2 ⊕ Z2	√	1	1	×	-	-
N93.9.85 GM3 ⊕ Z1 ⊕ Z1	√	1	1	×	-	-
N93.9.86 GM3 ⊕ Z1 ⊕ Z3	√	1	1	√	422	A2
N93.9.87 GM3 ⊕ Z1 ⊕ Z2	√	1	1	×	-	-
N93.9.88 GM3 ⊕ Z1 ⊕ Z4	√	1	1	×	-	-
N93.9.89 GM3 ⊕ Z2 ⊕ Z2	√	1	1	×	-	-
N93.9.90 GM3 ⊕ Z2 ⊕ Z4	√	1	1	√	422	A2
N93.9.91 GM4 ⊕ GM4 ⊕ GM4	√	3	3	√	$\bar{4}m2$	A2 ⊕ A2 ⊕ A2
N93.9.92 GM4 ⊕ GM4 ⊕ A1	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N93.9.93 GM4 ⊕ GM4 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N93.9.94 GM4 ⊕ GM4 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N93.9.95 GM4 ⊕ GM4 ⊕ Z1	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N93.9.96 GM4 ⊕ GM4 ⊕ Z2	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N93.9.97 GM4 ⊕ A1 ⊕ A1	√	1	1	×	-	-
N93.9.98 GM4 ⊕ A1 ⊕ A2	√	1	1	×	-	-
N93.9.99 GM4 ⊕ A1 ⊕ A3	√	1	1	×	-	-
N93.9.100 GM4 ⊕ A1 ⊕ A4	√	1	1	×	-	-
N93.9.101 GM4 ⊕ A1 ⊕ M1	√	1	1	×	-	-
N93.9.102 GM4 ⊕ A1 ⊕ M4	√	1	1	×	-	-
N93.9.103 GM4 ⊕ A1 ⊕ M2	√	1	1	×	-	-
N93.9.104 GM4 ⊕ A1 ⊕ M3	√	1	1	×	-	-
N93.9.105 GM4 ⊕ A1 ⊕ Z1	√	1	1	×	-	-

Non-coplanar SSGs with parent space group $P4_222$ (No. 93) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N93.9.106 GM4 ⊕ A1 ⊕ Z3	√	1	1	×	-	-
N93.9.107 GM4 ⊕ A1 ⊕ Z2	√	1	1	×	-	-
N93.9.108 GM4 ⊕ A1 ⊕ Z4	√	1	1	×	-	-
N93.9.109 GM4 ⊕ M1 ⊕ M1	√	1	1	×	-	-
N93.9.110 GM4 ⊕ M1 ⊕ M4	√	1	1	×	-	-
N93.9.111 GM4 ⊕ M1 ⊕ M2	√	1	1	×	-	-
N93.9.112 GM4 ⊕ M1 ⊕ M3	√	1	1	×	-	-
N93.9.113 GM4 ⊕ M1 ⊕ Z1	√	1	1	×	-	-
N93.9.114 GM4 ⊕ M1 ⊕ Z2	√	1	1	×	-	-
N93.9.115 GM4 ⊕ M2 ⊕ M2	√	1	1	×	-	-
N93.9.116 GM4 ⊕ M2 ⊕ M3	√	1	1	×	-	-
N93.9.117 GM4 ⊕ M2 ⊕ Z1	√	1	1	×	-	-
N93.9.118 GM4 ⊕ M2 ⊕ Z2	√	1	1	×	-	-
N93.9.119 GM4 ⊕ Z1 ⊕ Z1	√	1	1	×	-	-
N93.9.120 GM4 ⊕ Z1 ⊕ Z3	√	1	1	√	$\bar{4}2m$	B2
N93.9.121 GM4 ⊕ Z1 ⊕ Z2	√	1	1	×	-	-
N93.9.122 GM4 ⊕ Z1 ⊕ Z4	√	1	1	×	-	-
N93.9.123 GM4 ⊕ Z2 ⊕ Z2	√	1	1	×	-	-
N93.9.124 GM4 ⊕ Z2 ⊕ Z4	√	1	1	√	$\bar{4}2m$	B2
N93.9.125 A1 ⊕ A1 ⊕ A1	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A1_u}$
N93.9.126 A1 ⊕ A1 ⊕ A2	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N93.9.127 A1 ⊕ A1 ⊕ A3	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N93.9.128 A1 ⊕ A1 ⊕ A4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N93.9.129 A1 ⊕ A2 ⊕ A3	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N93.9.130 A1 ⊕ A1 ⊕ M1	√	1	1	×	-	-
N93.9.131 A1 ⊕ A1 ⊕ M4	√	1	1	×	-	-
N93.9.132 A1 ⊕ A2 ⊕ M1	√	1	1	×	-	-
N93.9.133 A1 ⊕ A3 ⊕ M1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N93.9.134 A1 ⊕ A3 ⊕ M4	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N93.9.135 A1 ⊕ A4 ⊕ M1	√	1	1	×	-	-
N93.9.136 A1 ⊕ A1 ⊕ M2	√	1	1	×	-	-
N93.9.137 A1 ⊕ A1 ⊕ M3	√	1	1	×	-	-
N93.9.138 A1 ⊕ A2 ⊕ M2	√	1	1	×	-	-
N93.9.139 A1 ⊕ A3 ⊕ M2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N93.9.140 A1 ⊕ A3 ⊕ M3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N93.9.141 A1 ⊕ A4 ⊕ M2	√	1	1	×	-	-
N93.9.142 A1 ⊕ A1 ⊕ Z1	√	1	1	×	-	-
N93.9.143 A1 ⊕ A1 ⊕ Z3	√	1	1	×	-	-
N93.9.144 A1 ⊕ A2 ⊕ Z1	√	1	1	×	-	-
N93.9.145 A1 ⊕ A3 ⊕ Z1	√	1	1	×	-	-
N93.9.146 A1 ⊕ A4 ⊕ Z1	√	1	1	×	-	-
N93.9.147 A1 ⊕ A4 ⊕ Z3	√	1	1	×	-	-
N93.9.148 A1 ⊕ A1 ⊕ Z2	√	1	1	×	-	-
N93.9.149 A1 ⊕ A1 ⊕ Z4	√	1	1	×	-	-
N93.9.150 A1 ⊕ A2 ⊕ Z2	√	1	1	×	-	-
N93.9.151 A1 ⊕ A3 ⊕ Z2	√	1	1	×	-	-

Non-coplanar SSGs with parent space group $P4_222$ (No. 93) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N93.9.152 A1 ⊕ A4 ⊕ Z2	√	1	1	×	-	-
N93.9.153 A1 ⊕ A4 ⊕ Z4	√	1	1	×	-	-
N93.9.154 A1 ⊕ M1 ⊕ M1	√	1	1	×	-	-
N93.9.155 A1 ⊕ M1 ⊕ M4	√	1	1	√	$4/mmm$	$\mathrm{B2_u}$
N93.9.156 A1 ⊕ M4 ⊕ M4	√	1	1	×	-	-
N93.9.157 A1 ⊕ M1 ⊕ M2	√	1	1	×	-	-
N93.9.158 A1 ⊕ M1 ⊕ M3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N93.9.159 A1 ⊕ M4 ⊕ M2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N93.9.160 A1 ⊕ M4 ⊕ M3	√	1	1	×	-	-
N93.9.161 A1 ⊕ M1 ⊕ Z1	×	-	-	-	-	-
N93.9.162 A1 ⊕ M1 ⊕ Z3	×	-	-	-	-	-
N93.9.163 A1 ⊕ M4 ⊕ Z1	×	-	-	-	-	-
N93.9.164 A1 ⊕ M4 ⊕ Z3	×	-	-	-	-	-
N93.9.165 A1 ⊕ M1 ⊕ Z2	×	-	-	-	-	-
N93.9.166 A1 ⊕ M1 ⊕ Z4	×	-	-	-	-	-
N93.9.167 A1 ⊕ M4 ⊕ Z2	×	-	-	-	-	-
N93.9.168 A1 ⊕ M4 ⊕ Z4	×	-	-	-	-	-
N93.9.169 A1 ⊕ M2 ⊕ M2	√	1	1	×	-	-
N93.9.170 A1 ⊕ M2 ⊕ M3	√	1	1	√	$4/mmm$	$\mathrm{B2_u}$
N93.9.171 A1 ⊕ M3 ⊕ M3	√	1	1	×	-	-
N93.9.172 A1 ⊕ M2 ⊕ Z1	×	-	-	-	-	-
N93.9.173 A1 ⊕ M2 ⊕ Z3	×	-	-	-	-	-
N93.9.174 A1 ⊕ M3 ⊕ Z1	×	-	-	-	-	-
N93.9.175 A1 ⊕ M3 ⊕ Z3	×	-	-	-	-	-
N93.9.176 A1 ⊕ M2 ⊕ Z2	×	-	-	-	-	-
N93.9.177 A1 ⊕ M2 ⊕ Z4	×	-	-	-	-	-
N93.9.178 A1 ⊕ M3 ⊕ Z2	×	-	-	-	-	-
N93.9.179 A1 ⊕ M3 ⊕ Z4	×	-	-	-	-	-
N93.9.180 A1 ⊕ Z1 ⊕ Z1	√	1	1	×	-	-
N93.9.181 A1 ⊕ Z1 ⊕ Z3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N93.9.182 A1 ⊕ Z3 ⊕ Z3	√	1	1	×	-	-
N93.9.183 A1 ⊕ Z1 ⊕ Z2	√	1	1	×	-	-
N93.9.184 A1 ⊕ Z1 ⊕ Z4	√	1	1	√	$4/mmm$	$\mathrm{B2_u}$
N93.9.185 A1 ⊕ Z3 ⊕ Z2	√	1	1	√	$4/mmm$	$\mathrm{B2_u}$
N93.9.186 A1 ⊕ Z3 ⊕ Z4	√	1	1	×	-	-
N93.9.187 A1 ⊕ Z2 ⊕ Z2	√	1	1	×	-	-
N93.9.188 A1 ⊕ Z2 ⊕ Z4	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N93.9.189 A1 ⊕ Z4 ⊕ Z4	√	1	1	×	-	-
N93.9.190 M1 ⊕ M1 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A1_u}$
N93.9.191 M1 ⊕ M1 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N93.9.192 M1 ⊕ M1 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N93.9.193 M1 ⊕ M1 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N93.9.194 M1 ⊕ M4 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N93.9.195 M1 ⊕ M1 ⊕ Z1	√	1	1	×	-	-
N93.9.196 M1 ⊕ M4 ⊕ Z1	√	1	1	×	-	-
N93.9.197 M1 ⊕ M1 ⊕ Z2	√	1	1	×	-	-

Non-coplanar SSGs with parent space group $P4_222$ (No. 93) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N93.9.198 M1 ⊕ M4 ⊕ Z2	√	1	1	×	-	-
N93.9.199 M1 ⊕ M2 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N93.9.200 M1 ⊕ M2 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N93.9.201 M1 ⊕ M3 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N93.9.202 M1 ⊕ M2 ⊕ Z1	√	1	1	×	-	-
N93.9.203 M1 ⊕ M3 ⊕ Z1	√	1	1	×	-	-
N93.9.204 M1 ⊕ M2 ⊕ Z2	√	1	1	×	-	-
N93.9.205 M1 ⊕ M3 ⊕ Z2	√	1	1	×	-	-
N93.9.206 M1 ⊕ Z1 ⊕ Z1	√	1	1	×	-	-
N93.9.207 M1 ⊕ Z1 ⊕ Z3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N93.9.208 M1 ⊕ Z1 ⊕ Z2	√	1	1	×	-	-
N93.9.209 M1 ⊕ Z1 ⊕ Z4	√	1	1	×	-	-
N93.9.210 M1 ⊕ Z2 ⊕ Z2	√	1	1	×	-	-
N93.9.211 M1 ⊕ Z2 ⊕ Z4	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N93.9.212 M2 ⊕ M2 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A1_u}$
N93.9.213 M2 ⊕ M2 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N93.9.214 M2 ⊕ M2 ⊕ Z1	√	1	1	×	-	-
N93.9.215 M2 ⊕ M3 ⊕ Z1	√	1	1	×	-	-
N93.9.216 M2 ⊕ M2 ⊕ Z2	√	1	1	×	-	-
N93.9.217 M2 ⊕ M3 ⊕ Z2	√	1	1	×	-	-
N93.9.218 M2 ⊕ Z1 ⊕ Z1	√	1	1	×	-	-
N93.9.219 M2 ⊕ Z1 ⊕ Z3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N93.9.220 M2 ⊕ Z1 ⊕ Z2	√	1	1	×	-	-
N93.9.221 M2 ⊕ Z1 ⊕ Z4	√	1	1	×	-	-
N93.9.222 M2 ⊕ Z2 ⊕ Z2	√	1	1	×	-	-
N93.9.223 M2 ⊕ Z2 ⊕ Z4	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N93.9.224 Z1 ⊕ Z1 ⊕ Z1	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A1_u}$
N93.9.225 Z1 ⊕ Z1 ⊕ Z3	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N93.9.226 Z1 ⊕ Z1 ⊕ Z2	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N93.9.227 Z1 ⊕ Z1 ⊕ Z4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N93.9.228 Z1 ⊕ Z3 ⊕ Z2	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N93.9.229 Z1 ⊕ Z2 ⊕ Z2	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N93.9.230 Z1 ⊕ Z2 ⊕ Z4	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N93.9.231 Z1 ⊕ Z4 ⊕ Z4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N93.9.232 Z2 ⊕ Z2 ⊕ Z2	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A1_u}$
N93.9.233 Z2 ⊕ Z2 ⊕ Z4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N93.12.1 GM2 ⊕ GM5	√	3	3	√	$\bar{4}m2$	$\mathrm{B1} \oplus \mathrm{E}$
N93.12.2 GM2 ⊕ A5	√	1	1	√	$\bar{4}m2$	B1
N93.12.3 GM2 ⊕ M5	√	1	1	√	$\bar{4}m2$	B1
N93.12.4 GM2 ⊕ Z5	√	1	1	√	$\bar{4}m2$	B1
N93.12.5 GM3 ⊕ GM5	√	3	3	√	422	$\mathrm{A2} \oplus \mathrm{E}$
N93.12.6 GM3 ⊕ A5	√	1	1	×	-	-
N93.12.7 GM3 ⊕ M5	√	1	1	×	-	-
N93.12.8 GM3 ⊕ Z5	√	1	1	√	422	A2
N93.12.9 GM4 ⊕ GM5	√	3	3	√	$\bar{4}2m$	$\mathrm{B2} \oplus \mathrm{E}$
N93.12.10 GM4 ⊕ A5	√	1	1	×	-	-

Non-coplanar SSGs with parent space group $P4_222$ (No. 93) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N93.12.11 GM4 ⊕ M5	√	1	1	×	-	-
N93.12.12 GM4 ⊕ Z5	√	1	1	√	$\bar{4}2m$	B2
N93.12.13 A1 ⊕ GM5	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{E_g}$
N93.12.14 A1 ⊕ A5	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{E_u}$
N93.12.15 A1 ⊕ M5	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N93.12.16 A1 ⊕ Z5	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N93.12.17 M1 ⊕ GM5	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{E_g}$
N93.12.18 M1 ⊕ A5	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N93.12.19 M1 ⊕ M5	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{E_u}$
N93.12.20 M1 ⊕ Z5	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N93.12.21 M2 ⊕ GM5	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{E_g}$
N93.12.22 M2 ⊕ A5	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N93.12.23 M2 ⊕ M5	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{E_u}$
N93.12.24 M2 ⊕ Z5	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N93.12.25 Z1 ⊕ GM5	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{E_g}$
N93.12.26 Z1 ⊕ A5	√	1	1	×	-	-
N93.12.27 Z1 ⊕ M5	√	1	1	×	-	-
N93.12.28 Z1 ⊕ Z5	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{E_u}$
N93.12.29 Z2 ⊕ GM5	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{E_g}$
N93.12.30 Z2 ⊕ A5	√	1	1	×	-	-
N93.12.31 Z2 ⊕ M5	√	1	1	×	-	-
N93.12.32 Z2 ⊕ Z5	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{E_u}$
N93.13.1 GM2 ⊕ R1	√	1	1	×	-	-
N93.13.2 GM2 ⊕ X1	√	1	1	×	-	-
N93.13.3 GM2 ⊕ X2	√	1	1	×	-	-
N93.13.4 GM3 ⊕ R1	√	1	1	×	-	-
N93.13.5 GM3 ⊕ X1	√	1	1	×	-	-
N93.13.6 GM3 ⊕ X2	√	1	1	×	-	-
N93.13.7 GM4 ⊕ R1	√	1	1	×	-	-
N93.13.8 GM4 ⊕ X1	√	1	1	√	$4/mmm$	$\mathrm{B2_g}$
N93.13.9 GM4 ⊕ X2	√	1	1	√	$4/mmm$	$\mathrm{B2_g}$
N93.13.10 A1 ⊕ R1	×	-	-	-	-	-
N93.13.11 A1 ⊕ R2	×	-	-	-	-	-
N93.13.12 A1 ⊕ R3	×	-	-	-	-	-
N93.13.13 A1 ⊕ R4	×	-	-	-	-	-
N93.13.14 A1 ⊕ X1	×	-	-	-	-	-
N93.13.15 A1 ⊕ X4	×	-	-	-	-	-
N93.13.16 A1 ⊕ X2	×	-	-	-	-	-
N93.13.17 A1 ⊕ X3	×	-	-	-	-	-
N93.13.18 M1 ⊕ R1	×	-	-	-	-	-
N93.13.19 M1 ⊕ R3	×	-	-	-	-	-
N93.13.20 M1 ⊕ X1	×	-	-	-	-	-
N93.13.21 M1 ⊕ X4	×	-	-	-	-	-
N93.13.22 M1 ⊕ X2	×	-	-	-	-	-
N93.13.23 M1 ⊕ X3	×	-	-	-	-	-
N93.13.24 M2 ⊕ R1	×	-	-	-	-	-

Non-coplanar SSGs with parent space group $P4_222$ (No. 93) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N93.13.25 M2 ⊕ R3	×	-	-	-	-	-
N93.13.26 M2 ⊕ X1	×	-	-	-	-	-
N93.13.27 M2 ⊕ X4	×	-	-	-	-	-
N93.13.28 M2 ⊕ X2	×	-	-	-	-	-
N93.13.29 M2 ⊕ X3	×	-	-	-	-	-
N93.13.30 Z1 ⊕ R1	×	-	-	-	-	-
N93.13.31 Z1 ⊕ R2	×	-	-	-	-	-
N93.13.32 Z1 ⊕ X1	×	-	-	-	-	-
N93.13.33 Z1 ⊕ X2	×	-	-	-	-	-
N93.13.34 Z2 ⊕ R1	×	-	-	-	-	-
N93.13.35 Z2 ⊕ R2	×	-	-	-	-	-
N93.13.36 Z2 ⊕ X1	×	-	-	-	-	-
N93.13.37 Z2 ⊕ X2	×	-	-	-	-	-
N93.14.1 GM2 ⊕ LD1	√	1	1	√	$\bar{4}m2$	B1
N93.14.2 GM2 ⊕ LD3	√	1	1	√	$\bar{4}m2$	B1
N93.14.3 GM2 ⊕ V1	√	1	1	√	$\bar{4}m2$	B1
N93.14.4 GM2 ⊕ V3	√	1	1	√	$\bar{4}m2$	B1
N93.14.5 GM3 ⊕ LD1	√	1	1	√	422	A2
N93.14.6 GM3 ⊕ LD3	√	1	1	√	422	A2
N93.14.7 GM3 ⊕ V1	√	1	1	×	-	-
N93.14.8 GM3 ⊕ V3	√	1	1	×	-	-
N93.14.9 GM4 ⊕ LD1	√	1	1	√	$\bar{4}2m$	B2
N93.14.10 GM4 ⊕ LD3	√	1	1	√	$\bar{4}2m$	B2
N93.14.11 GM4 ⊕ V1	√	1	1	×	-	-
N93.14.12 GM4 ⊕ V3	√	1	1	×	-	-
N93.14.13 A1 ⊕ LD1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N93.14.14 A1 ⊕ LD3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N93.14.15 A1 ⊕ V1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N93.14.16 A1 ⊕ V3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N93.14.17 M1 ⊕ LD1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N93.14.18 M1 ⊕ LD3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N93.14.19 M1 ⊕ V1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N93.14.20 M1 ⊕ V3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N93.14.21 M2 ⊕ LD1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N93.14.22 M2 ⊕ LD3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N93.14.23 M2 ⊕ V1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N93.14.24 M2 ⊕ V3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N93.14.25 Z1 ⊕ LD1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N93.14.26 Z1 ⊕ LD3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N93.14.27 Z1 ⊕ V1	√	1	1	×	-	-
N93.14.28 Z1 ⊕ V3	√	1	1	×	-	-
N93.14.29 Z2 ⊕ LD1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N93.14.30 Z2 ⊕ LD3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N93.14.31 Z2 ⊕ V1	√	1	1	×	-	-
N93.14.32 Z2 ⊕ V3	√	1	1	×	-	-

TABLE S280: Collinear SSGs with parent space group $P4_22_12$ (No. 94).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L94.1.1 GM1	1	$4/mmm$	$\mathrm{A1_g}$
L94.2.1 GM2	1	$4/mmm$	$\mathrm{B1_g}$
L94.2.2 GM3	1	$4/mmm$	$\mathrm{A2_g}$
L94.2.3 GM4	1	$4/mmm$	$\mathrm{B2_g}$
L94.2.4 Z1	0	-	-
L94.2.5 Z2	0	-	-

TABLE S281: Coplanar SSGs with parent space group $P4_22_12$ (No. 94).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P94.1.1 GM1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A1_u}$
P94.2.1 GM2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B1_u}$
P94.2.2 GM3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_u}$
P94.2.3 GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_g}\oplus\mathrm{B2_u}$
P94.2.4 Z1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P94.2.5 Z2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P94.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B1_g}\oplus\mathrm{B1_g}$
P94.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_g}\oplus\mathrm{B2_u}$
P94.3.3 GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_u}\oplus\mathrm{B2_g}$
P94.3.4 GM2 $\oplus$ Z1	$\surd$	1	1	$\times$	-	-
P94.3.5 GM2 $\oplus$ Z2	$\surd$	1	1	$\times$	-	-
P94.3.6 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A2_g}\oplus\mathrm{A2_g}$
P94.3.7 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{A2_g}\oplus\mathrm{B2_g}$
P94.3.8 GM3 $\oplus$ Z1	$\surd$	1	1	$\times$	-	-
P94.3.9 GM3 $\oplus$ Z2	$\surd$	1	1	$\times$	-	-
P94.3.10 GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B2_g}\oplus\mathrm{B2_g}$
P94.3.11 GM4 $\oplus$ Z1	$\surd$	1	1	$\times$	-	-
P94.3.12 GM4 $\oplus$ Z2	$\surd$	1	1	$\times$	-	-
P94.3.13 Z1 $\oplus$ Z1	$\surd$	1	1	$\times$	-	-
P94.3.14 Z1 $\oplus$ Z3	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P94.3.15 Z1 $\oplus$ Z2	$\surd$	1	1	$\times$	-	-
P94.3.16 Z1 $\oplus$ Z4	$\surd$	1	1	$\times$	-	-
P94.3.17 Z2 $\oplus$ Z2	$\surd$	1	1	$\times$	-	-
P94.3.18 Z2 $\oplus$ Z4	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P94.4.1 M1M4	$\surd$	1	1	$\times$	-	-
P94.4.2 M2M3	$\surd$	1	1	$\times$	-	-
P94.4.3 A1A4	$\surd$	1	1	$\times$	-	-
P94.6.1 GM5	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_u}\oplus\mathrm{E_g}$
P94.6.2 A5	$\surd$	1	1	$\times$	-	-
P94.6.3 M5	$\surd$	1	1	$\times$	-	-
P94.6.4 Z5	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P94.8.1 LD1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P94.8.2 LD3	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$

TABLE S282: Non-coplanar SSGs with parent space group $P4_22_12$ (No. 94).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N94.1.1 GM1	√	3	3	√	422	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{A1}$
N94.2.1 GM2	√	3	3	√	$\bar{4}2m$	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{B1}$
N94.2.2 GM3	√	3	3	√	$4mm$	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{A2}$
N94.2.3 GM4	√	3	3	√	$\bar{4}m2$	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{A2}$
N94.2.4 Z1	√	3	3	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A1_u}$
N94.2.5 Z2	√	3	3	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A1_u}$
N94.3.1 GM2 ⊕ GM2	√	3	3	√	422	$\mathrm{A1}\oplus\mathrm{B1}\oplus\mathrm{B1}$
N94.3.2 GM2 ⊕ GM3	√	3	3	√	$\bar{4}m2$	$\mathrm{A1}\oplus\mathrm{B1}\oplus\mathrm{B2}$
N94.3.3 GM2 ⊕ GM4	√	3	3	√	$4mm$	$\mathrm{A1}\oplus\mathrm{B1}\oplus\mathrm{B2}$
N94.3.4 GM2 ⊕ Z1	√	3	3	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B1_u}$
N94.3.5 GM2 ⊕ Z2	√	3	3	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B1_u}$
N94.3.6 GM3 ⊕ GM3	√	3	3	√	422	$\mathrm{A1}\oplus\mathrm{A2}\oplus\mathrm{A2}$
N94.3.7 GM3 ⊕ GM4	√	3	3	√	$\bar{4}2m$	$\mathrm{A1}\oplus\mathrm{B2}\oplus\mathrm{A2}$
N94.3.8 GM3 ⊕ Z1	√	3	3	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_u}$
N94.3.9 GM3 ⊕ Z2	√	3	3	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_u}$
N94.3.10 GM4 ⊕ GM4	√	3	3	√	422	$\mathrm{A1}\oplus\mathrm{B2}\oplus\mathrm{B2}$
N94.3.11 GM4 ⊕ Z1	√	3	3	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_g}\oplus\mathrm{B2_u}$
N94.3.12 GM4 ⊕ Z2	√	3	3	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_g}\oplus\mathrm{B2_u}$
N94.3.13 Z1 ⊕ Z1	√	1	1	√	422	$\mathrm{A1}$
N94.3.14 Z1 ⊕ Z3	√	1	1	√	$4mm$	$\mathrm{A1}$
N94.3.15 Z1 ⊕ Z2	√	1	1	√	$\bar{4}2m$	$\mathrm{A1}$
N94.3.16 Z1 ⊕ Z4	√	1	1	√	$\bar{4}m2$	$\mathrm{A1}$
N94.3.17 Z2 ⊕ Z2	√	1	1	√	422	$\mathrm{A1}$
N94.3.18 Z2 ⊕ Z4	√	1	1	√	$4mm$	$\mathrm{A1}$
N94.4.1 M1M4	√	1	1	√	422	$\mathrm{A1}$
N94.4.2 M2M3	√	1	1	√	422	$\mathrm{A1}$
N94.4.3 A1A4	√	1	1	√	422	$\mathrm{A1}$
N94.6.1 GM5	√	3	3	√	$4mm$	$\mathrm{A1}\oplus\mathrm{E}$
N94.6.2 A5	√	1	1	√	$\bar{4}2m$	$\mathrm{A1}$
N94.6.3 M5	√	1	1	√	$\bar{4}2m$	$\mathrm{A1}$
N94.6.4 Z5	√	1	1	√	$4mm$	$\mathrm{A1}$
N94.8.1 LD1	√	1	1	√	$4mm$	$\mathrm{A1}$
N94.8.2 LD3	√	1	1	√	$4mm$	$\mathrm{A1}$
N94.9.1 GM2 ⊕ GM2 ⊕ GM2	√	3	3	√	$\bar{4}2m$	$\mathrm{B1}\oplus\mathrm{B1}\oplus\mathrm{B1}$
N94.9.2 GM2 ⊕ GM2 ⊕ GM3	√	3	3	√	$4mm$	$\mathrm{B1}\oplus\mathrm{B1}\oplus\mathrm{A2}$
N94.9.3 GM2 ⊕ GM2 ⊕ GM4	√	3	3	√	$\bar{4}m2$	$\mathrm{B1}\oplus\mathrm{B1}\oplus\mathrm{A2}$
N94.9.4 GM2 ⊕ GM2 ⊕ Z1	√	3	3	√	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B1_g}\oplus\mathrm{B1_g}$
N94.9.5 GM2 ⊕ GM2 ⊕ Z2	√	3	3	√	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B1_g}\oplus\mathrm{B1_g}$
N94.9.6 GM2 ⊕ GM3 ⊕ GM3	√	3	3	√	$\bar{4}2m$	$\mathrm{B1}\oplus\mathrm{A2}\oplus\mathrm{A2}$
N94.9.7 GM2 ⊕ GM3 ⊕ GM4	√	3	3	√	422	$\mathrm{B1}\oplus\mathrm{A2}\oplus\mathrm{B2}$
N94.9.8 GM2 ⊕ GM3 ⊕ Z1	√	3	3	√	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_g}\oplus\mathrm{B2_u}$
N94.9.9 GM2 ⊕ GM3 ⊕ Z2	√	3	3	√	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_g}\oplus\mathrm{B2_u}$
N94.9.10 GM2 ⊕ GM4 ⊕ GM4	√	3	3	√	$\bar{4}2m$	$\mathrm{B1}\oplus\mathrm{B2}\oplus\mathrm{B2}$
N94.9.11 GM2 ⊕ GM4 ⊕ Z1	√	3	3	√	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_u}\oplus\mathrm{B2_g}$
N94.9.12 GM2 ⊕ GM4 ⊕ Z2	√	3	3	√	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_u}\oplus\mathrm{B2_g}$
N94.9.13 GM2 ⊕ Z1 ⊕ Z1	√	1	1	×	-	-

Non-coplanar SSGs with parent space group $P4_22_12$ (No. 94) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N94.9.14 GM2 ⊕ Z1 ⊕ Z3	√	1	1	√	$\bar{4}m2$	B1
N94.9.15 GM2 ⊕ Z1 ⊕ Z2	√	1	1	×	-	-
N94.9.16 GM2 ⊕ Z1 ⊕ Z4	√	1	1	×	-	-
N94.9.17 GM2 ⊕ Z2 ⊕ Z2	√	1	1	×	-	-
N94.9.18 GM2 ⊕ Z2 ⊕ Z4	√	1	1	√	$\bar{4}m2$	B1
N94.9.19 GM3 ⊕ GM3 ⊕ GM3	√	3	3	√	$4mm$	A2 ⊕ A2 ⊕ A2
N94.9.20 GM3 ⊕ GM3 ⊕ GM4	√	3	3	√	$\bar{4}m2$	B2 ⊕ B2 ⊕ A2
N94.9.21 GM3 ⊕ GM3 ⊕ Z1	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
N94.9.22 GM3 ⊕ GM3 ⊕ Z2	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
N94.9.23 GM3 ⊕ GM4 ⊕ GM4	√	3	3	√	$4mm$	B2 ⊕ B2 ⊕ A2
N94.9.24 GM3 ⊕ GM4 ⊕ Z1	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g} \oplus \mathrm{B2_g}$
N94.9.25 GM3 ⊕ GM4 ⊕ Z2	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g} \oplus \mathrm{B2_g}$
N94.9.26 GM3 ⊕ Z1 ⊕ Z1	√	1	1	×	-	-
N94.9.27 GM3 ⊕ Z1 ⊕ Z3	√	1	1	√	422	A2
N94.9.28 GM3 ⊕ Z1 ⊕ Z2	√	1	1	×	-	-
N94.9.29 GM3 ⊕ Z1 ⊕ Z4	√	1	1	×	-	-
N94.9.30 GM3 ⊕ Z2 ⊕ Z2	√	1	1	×	-	-
N94.9.31 GM3 ⊕ Z2 ⊕ Z4	√	1	1	√	422	A2
N94.9.32 GM4 ⊕ GM4 ⊕ GM4	√	3	3	√	$\bar{4}m2$	A2 ⊕ A2 ⊕ A2
N94.9.33 GM4 ⊕ GM4 ⊕ Z1	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N94.9.34 GM4 ⊕ GM4 ⊕ Z2	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N94.9.35 GM4 ⊕ Z1 ⊕ Z1	√	1	1	×	-	-
N94.9.36 GM4 ⊕ Z1 ⊕ Z3	√	1	1	√	$\bar{4}2m$	B2
N94.9.37 GM4 ⊕ Z1 ⊕ Z2	√	1	1	×	-	-
N94.9.38 GM4 ⊕ Z1 ⊕ Z4	√	1	1	×	-	-
N94.9.39 GM4 ⊕ Z2 ⊕ Z2	√	1	1	×	-	-
N94.9.40 GM4 ⊕ Z2 ⊕ Z4	√	1	1	√	$\bar{4}2m$	B2
N94.9.41 Z1 ⊕ Z1 ⊕ Z1	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A1_u}$
N94.9.42 Z1 ⊕ Z1 ⊕ Z3	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N94.9.43 Z1 ⊕ Z1 ⊕ Z2	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N94.9.44 Z1 ⊕ Z1 ⊕ Z4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N94.9.45 Z1 ⊕ Z3 ⊕ Z2	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N94.9.46 Z1 ⊕ Z2 ⊕ Z2	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N94.9.47 Z1 ⊕ Z2 ⊕ Z4	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N94.9.48 Z1 ⊕ Z4 ⊕ Z4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N94.9.49 Z2 ⊕ Z2 ⊕ Z2	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A1_u}$
N94.9.50 Z2 ⊕ Z2 ⊕ Z4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N94.10.1 GM2 ⊕ M1M4	√	1	1	√	$\bar{4}2m$	B1
N94.10.2 GM2 ⊕ M2M3	√	1	1	√	$\bar{4}2m$	B1
N94.10.3 GM2 ⊕ A1A4	√	1	1	×	-	-
N94.10.4 GM3 ⊕ M1M4	√	1	1	×	-	-
N94.10.5 GM3 ⊕ M2M3	√	1	1	×	-	-
N94.10.6 GM3 ⊕ A1A4	√	1	1	×	-	-
N94.10.7 GM4 ⊕ M1M4	√	1	1	×	-	-
N94.10.8 GM4 ⊕ M2M3	√	1	1	×	-	-
N94.10.9 GM4 ⊕ A1A4	√	1	1	×	-	-

Non-coplanar SSGs with parent space group $P4_22_12$ (No. 94) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N94.10.10 Z1 ⊕ M1M4	√	1	1	×	-	-
N94.10.11 Z1 ⊕ M2M3	√	1	1	×	-	-
N94.10.12 Z1 ⊕ A1A4	√	1	1	×	-	-
N94.10.13 Z1 ⊕ A2A3	√	1	1	×	-	-
N94.10.14 Z2 ⊕ M1M4	√	1	1	×	-	-
N94.10.15 Z2 ⊕ M2M3	√	1	1	×	-	-
N94.10.16 Z2 ⊕ A1A4	√	1	1	×	-	-
N94.10.17 Z2 ⊕ A2A3	√	1	1	×	-	-
N94.12.1 GM2 ⊕ GM5	√	3	3	√	$\bar{4}m2$	B1 ⊕ E
N94.12.2 GM2 ⊕ A5	√	1	1	×	-	-
N94.12.3 GM2 ⊕ M5	√	1	1	√	422	B1
N94.12.4 GM2 ⊕ Z5	√	1	1	√	$\bar{4}m2$	B1
N94.12.5 GM3 ⊕ GM5	√	3	3	√	422	A2 ⊕ E
N94.12.6 GM3 ⊕ A5	√	1	1	×	-	-
N94.12.7 GM3 ⊕ M5	√	1	1	×	-	-
N94.12.8 GM3 ⊕ Z5	√	1	1	√	422	A2
N94.12.9 GM4 ⊕ GM5	√	3	3	√	$\bar{4}2m$	B2 ⊕ E
N94.12.10 GM4 ⊕ A5	√	1	1	×	-	-
N94.12.11 GM4 ⊕ M5	√	1	1	×	-	-
N94.12.12 GM4 ⊕ Z5	√	1	1	√	$\bar{4}2m$	B2
N94.12.13 Z1 ⊕ GM5	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{E_g}$
N94.12.14 Z1 ⊕ A5	√	1	1	×	-	-
N94.12.15 Z1 ⊕ M5	√	1	1	×	-	-
N94.12.16 Z1 ⊕ Z5	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{E_u}$
N94.12.17 Z2 ⊕ GM5	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{E_g}$
N94.12.18 Z2 ⊕ A5	√	1	1	×	-	-
N94.12.19 Z2 ⊕ M5	√	1	1	×	-	-
N94.12.20 Z2 ⊕ Z5	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{E_u}$
N94.14.1 GM2 ⊕ LD1	√	1	1	√	$\bar{4}m2$	B1
N94.14.2 GM2 ⊕ LD3	√	1	1	√	$\bar{4}m2$	B1
N94.14.3 GM3 ⊕ LD1	√	1	1	√	422	A2
N94.14.4 GM3 ⊕ LD3	√	1	1	√	422	A2
N94.14.5 GM4 ⊕ LD1	√	1	1	√	$\bar{4}2m$	B2
N94.14.6 GM4 ⊕ LD3	√	1	1	√	$\bar{4}2m$	B2
N94.14.7 Z1 ⊕ LD1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N94.14.8 Z1 ⊕ LD3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N94.14.9 Z2 ⊕ LD1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N94.14.10 Z2 ⊕ LD3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$

TABLE S283: Collinear SSGs with parent space group $P4_322$ (No. 95).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L95.1.1 GM1	1	$4/mmm$	$\mathrm{A1_g}$
L95.2.1 GM2	1	$4/mmm$	$\mathrm{B1_g}$
L95.2.2 GM3	1	$4/mmm$	$\mathrm{A2_g}$
L95.2.3 GM4	1	$4/mmm$	$\mathrm{B2_g}$

Collinear SSGs with parent space group $P4_322$ (No. 95)(continued)

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L95.2.4 M1	0	-	-
L95.2.5 M2	0	-	-

TABLE S284: Coplanar SSGs with parent space group $P4_322$ (No. 95).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P95.1.1 GM1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A1_u}$
P95.2.1 GM2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B1_u}$
P95.2.2 GM3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_u}$
P95.2.3 GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_g}\oplus\mathrm{B2_u}$
P95.2.4 M1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P95.2.5 M2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P95.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B1_g}\oplus\mathrm{B1_g}$
P95.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_g}\oplus\mathrm{B2_u}$
P95.3.3 GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_u}\oplus\mathrm{B2_g}$
P95.3.4 GM2 $\oplus$ M1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
P95.3.5 GM2 $\oplus$ M2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
P95.3.6 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A2_g}\oplus\mathrm{A2_g}$
P95.3.7 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{A2_g}\oplus\mathrm{B2_g}$
P95.3.8 GM3 $\oplus$ M1	$\surd$	1	1	$\times$	-	-
P95.3.9 GM3 $\oplus$ M2	$\surd$	1	1	$\times$	-	-
P95.3.10 GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B2_g}\oplus\mathrm{B2_g}$
P95.3.11 GM4 $\oplus$ M1	$\surd$	1	1	$\times$	-	-
P95.3.12 GM4 $\oplus$ M2	$\surd$	1	1	$\times$	-	-
P95.3.13 M1 $\oplus$ M1	$\surd$	1	1	$\times$	-	-
P95.3.14 M1 $\oplus$ M4	$\surd$	1	1	$\times$	-	-
P95.3.15 M1 $\oplus$ M2	$\surd$	1	1	$\times$	-	-
P95.3.16 M1 $\oplus$ M3	$\surd$	1	1	$\times$	-	-
P95.3.17 M2 $\oplus$ M2	$\surd$	1	1	$\times$	-	-
P95.3.18 M2 $\oplus$ M3	$\surd$	1	1	$\times$	-	-
P95.6.1 GM5	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_u}\oplus\mathrm{E_g}$
P95.6.2 A1	$\surd$	1	1	$\times$	-	-
P95.6.3 M5	$\surd$	1	1	$\times$	-	-
P95.6.4 Z1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P95.6.5 Z2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P95.7.1 X1	$\times$	-	-	-	-	-
P95.7.2 X2	$\times$	-	-	-	-	-
P95.8.1 LD1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P95.8.2 V1	$\surd$	1	1	$\times$	-	-

TABLE S285: Non-coplanar SSGs with parent space group $P4_322$ (No. 95).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N95.1.1 GM1	$\surd$	3	3	$\surd$	422	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{A1}$

Non-coplanar SSGs with parent space group $P4_322$ (No. 95) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N95.2.1 GM2	√	3	3	√	$\bar{4}2m$	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{B1}$
N95.2.2 GM3	√	3	3	√	$4mm$	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{A2}$
N95.2.3 GM4	√	3	3	√	$\bar{4}m2$	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{A2}$
N95.2.4 M1	√	3	3	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A1_u}$
N95.2.5 M2	√	3	3	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A1_u}$
N95.3.1 GM2 ⊕ GM2	√	3	3	√	422	$\mathrm{A1}\oplus\mathrm{B1}\oplus\mathrm{B1}$
N95.3.2 GM2 ⊕ GM3	√	3	3	√	$\bar{4}m2$	$\mathrm{A1}\oplus\mathrm{B1}\oplus\mathrm{B2}$
N95.3.3 GM2 ⊕ GM4	√	3	3	√	$4mm$	$\mathrm{A1}\oplus\mathrm{B1}\oplus\mathrm{B2}$
N95.3.4 GM2 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B1_u}$
N95.3.5 GM2 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B1_u}$
N95.3.6 GM3 ⊕ GM3	√	3	3	√	422	$\mathrm{A1}\oplus\mathrm{A2}\oplus\mathrm{A2}$
N95.3.7 GM3 ⊕ GM4	√	3	3	√	$\bar{4}2m$	$\mathrm{A1}\oplus\mathrm{B2}\oplus\mathrm{A2}$
N95.3.8 GM3 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_u}$
N95.3.9 GM3 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_u}$
N95.3.10 GM4 ⊕ GM4	√	3	3	√	422	$\mathrm{A1}\oplus\mathrm{B2}\oplus\mathrm{B2}$
N95.3.11 GM4 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_g}\oplus\mathrm{B2_u}$
N95.3.12 GM4 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_g}\oplus\mathrm{B2_u}$
N95.3.13 M1 ⊕ M1	√	1	1	√	422	A1
N95.3.14 M1 ⊕ M4	√	1	1	√	$\bar{4}m2$	A1
N95.3.15 M1 ⊕ M2	√	1	1	√	$\bar{4}2m$	A1
N95.3.16 M1 ⊕ M3	√	1	1	√	$4mm$	A1
N95.3.17 M2 ⊕ M2	√	1	1	√	422	A1
N95.3.18 M2 ⊕ M3	√	1	1	√	$\bar{4}m2$	A1
N95.6.1 GM5	√	3	3	√	$4mm$	$\mathrm{A1}\oplus\mathrm{E}$
N95.6.2 A1	√	1	1	√	$4mm$	A1
N95.6.3 M5	√	1	1	√	$4mm$	A1
N95.6.4 Z1	√	1	1	√	$4mm$	A1
N95.6.5 Z2	√	1	1	√	$4mm$	A1
N95.7.1 X1	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N95.7.2 X2	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N95.8.1 LD1	√	1	1	√	$4mm$	A1
N95.8.2 V1	√	1	1	√	$4mm$	A1
N95.9.1 GM2 ⊕ GM2 ⊕ GM2	√	3	3	√	$\bar{4}2m$	$\mathrm{B1}\oplus\mathrm{B1}\oplus\mathrm{B1}$
N95.9.2 GM2 ⊕ GM2 ⊕ GM3	√	3	3	√	$4mm$	$\mathrm{B1}\oplus\mathrm{B1}\oplus\mathrm{A2}$
N95.9.3 GM2 ⊕ GM2 ⊕ GM4	√	3	3	√	$\bar{4}m2$	$\mathrm{B1}\oplus\mathrm{B1}\oplus\mathrm{A2}$
N95.9.4 GM2 ⊕ GM2 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B1_g}\oplus\mathrm{B1_g}$
N95.9.5 GM2 ⊕ GM2 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B1_g}\oplus\mathrm{B1_g}$
N95.9.6 GM2 ⊕ GM3 ⊕ GM3	√	3	3	√	$\bar{4}2m$	$\mathrm{B1}\oplus\mathrm{A2}\oplus\mathrm{A2}$
N95.9.7 GM2 ⊕ GM3 ⊕ GM4	√	3	3	√	422	$\mathrm{B1}\oplus\mathrm{A2}\oplus\mathrm{B2}$
N95.9.8 GM2 ⊕ GM3 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_g}\oplus\mathrm{B2_u}$
N95.9.9 GM2 ⊕ GM3 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_g}\oplus\mathrm{B2_u}$
N95.9.10 GM2 ⊕ GM4 ⊕ GM4	√	3	3	√	$\bar{4}2m$	$\mathrm{B1}\oplus\mathrm{B2}\oplus\mathrm{B2}$
N95.9.11 GM2 ⊕ GM4 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_u}\oplus\mathrm{B2_g}$
N95.9.12 GM2 ⊕ GM4 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_u}\oplus\mathrm{B2_g}$
N95.9.13 GM2 ⊕ M1 ⊕ M1	√	1	1	√	$\bar{4}2m$	B1
N95.9.14 GM2 ⊕ M1 ⊕ M4	√	1	1	√	$4mm$	B1

Non-coplanar SSGs with parent space group $P4_322$ (No. 95) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N95.9.15 GM2 ⊕ M1 ⊕ M2	√	1	1	√	422	B1
N95.9.16 GM2 ⊕ M1 ⊕ M3	√	1	1	√	$\bar{4}m2$	B1
N95.9.17 GM2 ⊕ M2 ⊕ M2	√	1	1	√	$\bar{4}2m$	B1
N95.9.18 GM2 ⊕ M2 ⊕ M3	√	1	1	√	$4mm$	B1
N95.9.19 GM3 ⊕ GM3 ⊕ GM3	√	3	3	√	$4mm$	A2 ⊕ A2 ⊕ A2
N95.9.20 GM3 ⊕ GM3 ⊕ GM4	√	3	3	√	$\bar{4}m2$	B2 ⊕ B2 ⊕ A2
N95.9.21 GM3 ⊕ GM3 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
N95.9.22 GM3 ⊕ GM3 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
N95.9.23 GM3 ⊕ GM4 ⊕ GM4	√	3	3	√	$4mm$	B2 ⊕ B2 ⊕ A2
N95.9.24 GM3 ⊕ GM4 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g} \oplus \mathrm{B2_g}$
N95.9.25 GM3 ⊕ GM4 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g} \oplus \mathrm{B2_g}$
N95.9.26 GM3 ⊕ M1 ⊕ M1	√	1	1	×	-	-
N95.9.27 GM3 ⊕ M1 ⊕ M4	√	1	1	×	-	-
N95.9.28 GM3 ⊕ M1 ⊕ M2	√	1	1	×	-	-
N95.9.29 GM3 ⊕ M1 ⊕ M3	√	1	1	×	-	-
N95.9.30 GM3 ⊕ M2 ⊕ M2	√	1	1	×	-	-
N95.9.31 GM3 ⊕ M2 ⊕ M3	√	1	1	×	-	-
N95.9.32 GM4 ⊕ GM4 ⊕ GM4	√	3	3	√	$\bar{4}m2$	A2 ⊕ A2 ⊕ A2
N95.9.33 GM4 ⊕ GM4 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N95.9.34 GM4 ⊕ GM4 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N95.9.35 GM4 ⊕ M1 ⊕ M1	√	1	1	×	-	-
N95.9.36 GM4 ⊕ M1 ⊕ M4	√	1	1	×	-	-
N95.9.37 GM4 ⊕ M1 ⊕ M2	√	1	1	×	-	-
N95.9.38 GM4 ⊕ M1 ⊕ M3	√	1	1	×	-	-
N95.9.39 GM4 ⊕ M2 ⊕ M2	√	1	1	×	-	-
N95.9.40 GM4 ⊕ M2 ⊕ M3	√	1	1	×	-	-
N95.9.41 M1 ⊕ M1 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A1_u}$
N95.9.42 M1 ⊕ M1 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N95.9.43 M1 ⊕ M1 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N95.9.44 M1 ⊕ M1 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N95.9.45 M1 ⊕ M4 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N95.9.46 M1 ⊕ M2 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N95.9.47 M1 ⊕ M2 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N95.9.48 M1 ⊕ M3 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N95.9.49 M2 ⊕ M2 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A1_u}$
N95.9.50 M2 ⊕ M2 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N95.12.1 GM2 ⊕ GM5	√	3	3	√	$\bar{4}m2$	B1 ⊕ E
N95.12.2 GM2 ⊕ A1	√	1	1	√	$\bar{4}m2$	B1
N95.12.3 GM2 ⊕ M5	√	1	1	√	$\bar{4}m2$	B1
N95.12.4 GM2 ⊕ Z1	√	1	1	√	$\bar{4}m2$	B1
N95.12.5 GM2 ⊕ Z2	√	1	1	√	$\bar{4}m2$	B1
N95.12.6 GM3 ⊕ GM5	√	3	3	√	422	A2 ⊕ E
N95.12.7 GM3 ⊕ A1	√	1	1	×	-	-
N95.12.8 GM3 ⊕ M5	√	1	1	×	-	-
N95.12.9 GM3 ⊕ Z1	√	1	1	√	422	A2
N95.12.10 GM3 ⊕ Z2	√	1	1	√	422	A2

Non-coplanar SSGs with parent space group $P4_322$ (No. 95) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N95.12.11 GM4 ⊕ GM5	√	3	3	√	$\bar{4}2m$	$\mathrm{B2}\oplus\mathrm{E}$
N95.12.12 GM4 ⊕ A1	√	1	1	×	-	-
N95.12.13 GM4 ⊕ M5	√	1	1	×	-	-
N95.12.14 GM4 ⊕ Z1	√	1	1	√	$\bar{4}2m$	B2
N95.12.15 GM4 ⊕ Z2	√	1	1	√	$\bar{4}2m$	B2
N95.12.16 M1 ⊕ GM5	√	3	3	√	$4/mmm$	$\mathrm{A2_u}\oplus\mathrm{E_g}$
N95.12.17 M1 ⊕ A1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N95.12.18 M1 ⊕ A2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N95.12.19 M1 ⊕ M5	√	3	3	√	$4/mmm$	$\mathrm{A2_u}\oplus\mathrm{E_u}$
N95.12.20 M1 ⊕ Z1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N95.12.21 M1 ⊕ Z2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N95.12.22 M2 ⊕ GM5	√	3	3	√	$4/mmm$	$\mathrm{A2_u}\oplus\mathrm{E_g}$
N95.12.23 M2 ⊕ A1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N95.12.24 M2 ⊕ A2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N95.12.25 M2 ⊕ M5	√	3	3	√	$4/mmm$	$\mathrm{A2_u}\oplus\mathrm{E_u}$
N95.12.26 M2 ⊕ Z1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N95.12.27 M2 ⊕ Z2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N95.13.1 GM2 ⊕ X1	√	1	1	×	-	-
N95.13.2 GM2 ⊕ X2	√	1	1	×	-	-
N95.13.3 GM3 ⊕ X1	√	1	1	×	-	-
N95.13.4 GM3 ⊕ X2	√	1	1	×	-	-
N95.13.5 GM4 ⊕ X1	√	1	1	√	$4/mmm$	$\mathrm{B2_g}$
N95.13.6 GM4 ⊕ X2	√	1	1	√	$4/mmm$	$\mathrm{B2_g}$
N95.13.7 M1 ⊕ X1	×	-	-	-	-	-
N95.13.8 M1 ⊕ X4	×	-	-	-	-	-
N95.13.9 M1 ⊕ X2	×	-	-	-	-	-
N95.13.10 M1 ⊕ X3	×	-	-	-	-	-
N95.13.11 M2 ⊕ X1	×	-	-	-	-	-
N95.13.12 M2 ⊕ X4	×	-	-	-	-	-
N95.13.13 M2 ⊕ X2	×	-	-	-	-	-
N95.13.14 M2 ⊕ X3	×	-	-	-	-	-
N95.14.1 GM2 ⊕ LD1	√	1	1	√	$\bar{4}m2$	B1
N95.14.2 GM2 ⊕ V1	√	1	1	√	$\bar{4}m2$	B1
N95.14.3 GM3 ⊕ LD1	√	1	1	√	422	A2
N95.14.4 GM3 ⊕ V1	√	1	1	×	-	-
N95.14.5 GM4 ⊕ LD1	√	1	1	√	$\bar{4}2m$	B2
N95.14.6 GM4 ⊕ V1	√	1	1	×	-	-
N95.14.7 M1 ⊕ LD1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N95.14.8 M1 ⊕ V1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N95.14.9 M2 ⊕ LD1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N95.14.10 M2 ⊕ V1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$

TABLE S286: Collinear SSGs with parent space group $P4_32_12$ (No. 96).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L96.1.1 GM1	1	$4/mmm$	$\mathrm{A1_g}$

Collinear SSGs with parent space group $P4_32_12$ (No. 96)(continued)

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L96.2.1 GM2	1	$4/mmm$	$\mathrm{B1_g}$
L96.2.2 GM3	1	$4/mmm$	$\mathrm{A2_g}$
L96.2.3 GM4	1	$4/mmm$	$\mathrm{B2_g}$

TABLE S287: Coplanar SSGs with parent space group $P4_32_12$ (No. 96).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P96.1.1 GM1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A1_u}$
P96.2.1 GM2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B1_u}$
P96.2.2 GM3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_u}$
P96.2.3 GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_g}\oplus\mathrm{B2_u}$
P96.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B1_g}\oplus\mathrm{B1_g}$
P96.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_g}\oplus\mathrm{B2_u}$
P96.3.3 GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_u}\oplus\mathrm{B2_g}$
P96.3.4 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A2_g}\oplus\mathrm{A2_g}$
P96.3.5 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{A2_g}\oplus\mathrm{B2_g}$
P96.3.6 GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B2_g}\oplus\mathrm{B2_g}$
P96.4.1 M1M4	$\surd$	1	1	$\times$	-	-
P96.4.2 M2M3	$\surd$	1	1	$\times$	-	-
P96.6.1 GM5	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_u}\oplus\mathrm{E_g}$
P96.6.2 M5	$\surd$	1	1	$\times$	-	-
P96.6.3 Z1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P96.6.4 Z2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P96.8.1 LD1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$

TABLE S288: Non-coplanar SSGs with parent space group $P4_32_12$ (No. 96).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N96.1.1 GM1	$\surd$	3	3	$\surd$	422	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{A1}$
N96.2.1 GM2	$\surd$	3	3	$\surd$	$\bar{4}2m$	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{B1}$
N96.2.2 GM3	$\surd$	3	3	$\surd$	$4mm$	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{A2}$
N96.2.3 GM4	$\surd$	3	3	$\surd$	$\bar{4}m2$	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{A2}$
N96.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	422	$\mathrm{A1}\oplus\mathrm{B1}\oplus\mathrm{B1}$
N96.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$\bar{4}m2$	$\mathrm{A1}\oplus\mathrm{B1}\oplus\mathrm{B2}$
N96.3.3 GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4mm$	$\mathrm{A1}\oplus\mathrm{B1}\oplus\mathrm{B2}$
N96.3.4 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	422	$\mathrm{A1}\oplus\mathrm{A2}\oplus\mathrm{A2}$
N96.3.5 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	$\bar{4}2m$	$\mathrm{A1}\oplus\mathrm{B2}\oplus\mathrm{A2}$
N96.3.6 GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	422	$\mathrm{A1}\oplus\mathrm{B2}\oplus\mathrm{B2}$
N96.4.1 M1M4	$\surd$	1	1	$\surd$	422	A1
N96.4.2 M2M3	$\surd$	1	1	$\surd$	422	A1
N96.6.1 GM5	$\surd$	3	3	$\surd$	$4mm$	$\mathrm{A1}\oplus\mathrm{E}$
N96.6.2 M5	$\surd$	1	1	$\surd$	$\bar{4}2m$	A1
N96.6.3 Z1	$\surd$	1	1	$\surd$	$4mm$	A1
N96.6.4 Z2	$\surd$	1	1	$\surd$	$4mm$	A1
N96.8.1 LD1	$\surd$	1	1	$\surd$	$4mm$	A1

Non-coplanar SSGs with parent space group $P4_32_12$ (No. 96) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N96.9.1 GM2 ⊕ GM2 ⊕ GM2	√	3	3	√	$\bar{4}2m$	B1 ⊕ B1 ⊕ B1
N96.9.2 GM2 ⊕ GM2 ⊕ GM3	√	3	3	√	$4mm$	B1 ⊕ B1 ⊕ A2
N96.9.3 GM2 ⊕ GM2 ⊕ GM4	√	3	3	√	$\bar{4}m2$	B1 ⊕ B1 ⊕ A2
N96.9.4 GM2 ⊕ GM3 ⊕ GM3	√	3	3	√	$\bar{4}2m$	B1 ⊕ A2 ⊕ A2
N96.9.5 GM2 ⊕ GM3 ⊕ GM4	√	3	3	√	422	B1 ⊕ A2 ⊕ B2
N96.9.6 GM2 ⊕ GM4 ⊕ GM4	√	3	3	√	$\bar{4}2m$	B1 ⊕ B2 ⊕ B2
N96.9.7 GM3 ⊕ GM3 ⊕ GM3	√	3	3	√	$4mm$	A2 ⊕ A2 ⊕ A2
N96.9.8 GM3 ⊕ GM3 ⊕ GM4	√	3	3	√	$\bar{4}m2$	B2 ⊕ B2 ⊕ A2
N96.9.9 GM3 ⊕ GM4 ⊕ GM4	√	3	3	√	$4mm$	B2 ⊕ B2 ⊕ A2
N96.9.10 GM4 ⊕ GM4 ⊕ GM4	√	3	3	√	$\bar{4}m2$	A2 ⊕ A2 ⊕ A2
N96.10.1 GM2 ⊕ M1M4	√	1	1	√	$\bar{4}2m$	B1
N96.10.2 GM2 ⊕ M2M3	√	1	1	√	$\bar{4}2m$	B1
N96.10.3 GM3 ⊕ M1M4	√	1	1	×	-	-
N96.10.4 GM3 ⊕ M2M3	√	1	1	×	-	-
N96.10.5 GM4 ⊕ M1M4	√	1	1	×	-	-
N96.10.6 GM4 ⊕ M2M3	√	1	1	×	-	-
N96.12.1 GM2 ⊕ GM5	√	3	3	√	$\bar{4}m2$	B1 ⊕ E
N96.12.2 GM2 ⊕ M5	√	1	1	√	422	B1
N96.12.3 GM2 ⊕ Z1	√	1	1	√	$\bar{4}m2$	B1
N96.12.4 GM2 ⊕ Z2	√	1	1	√	$\bar{4}m2$	B1
N96.12.5 GM3 ⊕ GM5	√	3	3	√	422	A2 ⊕ E
N96.12.6 GM3 ⊕ M5	√	1	1	×	-	-
N96.12.7 GM3 ⊕ Z1	√	1	1	√	422	A2
N96.12.8 GM3 ⊕ Z2	√	1	1	√	422	A2
N96.12.9 GM4 ⊕ GM5	√	3	3	√	$\bar{4}2m$	B2 ⊕ E
N96.12.10 GM4 ⊕ M5	√	1	1	×	-	-
N96.12.11 GM4 ⊕ Z1	√	1	1	√	$\bar{4}2m$	B2
N96.12.12 GM4 ⊕ Z2	√	1	1	√	$\bar{4}2m$	B2
N96.14.1 GM2 ⊕ LD1	√	1	1	√	$\bar{4}m2$	B1
N96.14.2 GM3 ⊕ LD1	√	1	1	√	422	A2
N96.14.3 GM4 ⊕ LD1	√	1	1	√	$\bar{4}2m$	B2

TABLE S289: Collinear SSGs with parent space group $I422$ (No. 97).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L97.1.1 GM1	1	$4/mmm$	$\mathrm{A1_g}$
L97.2.1 GM2	1	$4/mmm$	$\mathrm{B1_g}$
L97.2.2 GM3	1	$4/mmm$	$\mathrm{A2_g}$
L97.2.3 GM4	1	$4/mmm$	$\mathrm{B2_g}$
L97.2.4 M1	0	-	-
L97.2.5 M2	0	-	-
L97.2.6 M3	0	-	-
L97.2.7 M4	0	-	-

TABLE S290: Coplanar SSGs with parent space group $I422$ (No. 97).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P97.1.1 GM1	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A1_u}$
P97.2.1 GM2	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
P97.2.2 GM3	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
P97.2.3 GM4	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
P97.2.4 M1	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
P97.2.5 M2	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
P97.2.6 M3	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
P97.2.7 M4	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
P97.3.1 GM2 ⊕ GM2	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
P97.3.2 GM2 ⊕ GM3	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g} \oplus \mathrm{B2_u}$
P97.3.3 GM2 ⊕ GM4	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$
P97.3.4 GM2 ⊕ M1	√	1	1	×	-	-
P97.3.5 GM2 ⊕ M2	√	1	1	×	-	-
P97.3.6 GM2 ⊕ M3	√	1	1	×	-	-
P97.3.7 GM2 ⊕ M4	√	1	1	×	-	-
P97.3.8 GM3 ⊕ GM3	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
P97.3.9 GM3 ⊕ GM4	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g} \oplus \mathrm{B2_g}$
P97.3.10 GM3 ⊕ M1	√	1	1	×	-	-
P97.3.11 GM3 ⊕ M2	√	1	1	×	-	-
P97.3.12 GM3 ⊕ M3	√	1	1	×	-	-
P97.3.13 GM3 ⊕ M4	√	1	1	×	-	-
P97.3.14 GM4 ⊕ GM4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
P97.3.15 GM4 ⊕ M1	√	1	1	√	$4/mmm$	$\mathrm{B2_g}$
P97.3.16 GM4 ⊕ M2	√	1	1	√	$4/mmm$	$\mathrm{B2_g}$
P97.3.17 GM4 ⊕ M3	√	1	1	√	$4/mmm$	$\mathrm{B2_g}$
P97.3.18 GM4 ⊕ M4	√	1	1	√	$4/mmm$	$\mathrm{B2_g}$
P97.3.19 M1 ⊕ M1	√	1	1	×	-	-
P97.3.20 M1 ⊕ M2	√	1	1	√	$4/mmm$	$\mathrm{B1_u}$
P97.3.21 M1 ⊕ M3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
P97.3.22 M1 ⊕ M4	√	1	1	×	-	-
P97.3.23 M2 ⊕ M2	√	1	1	×	-	-
P97.3.24 M2 ⊕ M3	√	1	1	×	-	-
P97.3.25 M2 ⊕ M4	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
P97.3.26 M3 ⊕ M3	√	1	1	×	-	-
P97.3.27 M3 ⊕ M4	√	1	1	√	$4/mmm$	$\mathrm{B1_u}$
P97.3.28 M4 ⊕ M4	√	1	1	×	-	-
P97.6.1 GM5	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{E_g}$
P97.6.2 M5	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
P97.7.1 X1	×	-	-	-	-	-
P97.7.2 X2	×	-	-	-	-	-
P97.7.3 X3	×	-	-	-	-	-
P97.7.4 X4	×	-	-	-	-	-
P97.7.5 P1	√	1	1	×	-	-
P97.8.1 LD1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
P97.8.2 LD2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
P97.8.3 LD3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$

Non-coplanar SSGs with parent space group $I422$ (No. 97) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation

TABLE S291: Non-coplanar SSGs with parent space group $I422$ (No. 97).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N97.1.1 GM1	$\surd$	3	3	$\surd$	422	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{A1}$
N97.2.1 GM2	$\surd$	3	3	$\surd$	$\bar{4}2m$	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{B1}$
N97.2.2 GM3	$\surd$	3	3	$\surd$	$4mm$	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{A2}$
N97.2.3 GM4	$\surd$	3	3	$\surd$	$\bar{4}m2$	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{A2}$
N97.2.4 M1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A1_u}$
N97.2.5 M2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A1_u}$
N97.2.6 M3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A1_u}$
N97.2.7 M4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A1_u}$
N97.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	422	$\mathrm{A1}\oplus\mathrm{B1}\oplus\mathrm{B1}$
N97.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$\bar{4}m2$	$\mathrm{A1}\oplus\mathrm{B1}\oplus\mathrm{B2}$
N97.3.3 GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4mm$	$\mathrm{A1}\oplus\mathrm{B1}\oplus\mathrm{B2}$
N97.3.4 GM2 $\oplus$ M1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B1_u}$
N97.3.5 GM2 $\oplus$ M2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B1_u}$
N97.3.6 GM2 $\oplus$ M3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B1_u}$
N97.3.7 GM2 $\oplus$ M4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B1_u}$
N97.3.8 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	422	$\mathrm{A1}\oplus\mathrm{A2}\oplus\mathrm{A2}$
N97.3.9 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	$\bar{4}2m$	$\mathrm{A1}\oplus\mathrm{B2}\oplus\mathrm{A2}$
N97.3.10 GM3 $\oplus$ M1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_u}$
N97.3.11 GM3 $\oplus$ M2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_u}$
N97.3.12 GM3 $\oplus$ M3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_u}$
N97.3.13 GM3 $\oplus$ M4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_u}$
N97.3.14 GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	422	$\mathrm{A1}\oplus\mathrm{B2}\oplus\mathrm{B2}$
N97.3.15 GM4 $\oplus$ M1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_g}\oplus\mathrm{B2_u}$
N97.3.16 GM4 $\oplus$ M2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_g}\oplus\mathrm{B2_u}$
N97.3.17 GM4 $\oplus$ M3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_g}\oplus\mathrm{B2_u}$
N97.3.18 GM4 $\oplus$ M4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_g}\oplus\mathrm{B2_u}$
N97.3.19 M1 $\oplus$ M1	$\surd$	1	1	$\surd$	422	$\mathrm{A1}$
N97.3.20 M1 $\oplus$ M2	$\surd$	1	1	$\surd$	$\bar{4}2m$	$\mathrm{A1}$
N97.3.21 M1 $\oplus$ M3	$\surd$	1	1	$\surd$	$4mm$	$\mathrm{A1}$
N97.3.22 M1 $\oplus$ M4	$\surd$	1	1	$\surd$	$\bar{4}m2$	$\mathrm{A1}$
N97.3.23 M2 $\oplus$ M2	$\surd$	1	1	$\surd$	422	$\mathrm{A1}$
N97.3.24 M2 $\oplus$ M3	$\surd$	1	1	$\surd$	$\bar{4}m2$	$\mathrm{A1}$
N97.3.25 M2 $\oplus$ M4	$\surd$	1	1	$\surd$	$4mm$	$\mathrm{A1}$
N97.3.26 M3 $\oplus$ M3	$\surd$	1	1	$\surd$	422	$\mathrm{A1}$
N97.3.27 M3 $\oplus$ M4	$\surd$	1	1	$\surd$	$\bar{4}2m$	$\mathrm{A1}$
N97.3.28 M4 $\oplus$ M4	$\surd$	1	1	$\surd$	422	$\mathrm{A1}$
N97.6.1 GM5	$\surd$	3	3	$\surd$	$4mm$	$\mathrm{A1}\oplus\mathrm{E}$
N97.6.2 M5	$\surd$	1	1	$\surd$	$4mm$	$\mathrm{A1}$
N97.7.1 X1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N97.7.2 X2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N97.7.3 X3	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N97.7.4 X4	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$

Non-coplanar SSGs with parent space group $I422$ (No. 97) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N97.7.5 P1	$\surd$	1	1	$\surd$	$\bar{4}2m$	A1
N97.8.1 LD1	$\surd$	1	1	$\surd$	$4mm$	A1
N97.8.2 LD2	$\surd$	1	1	$\surd$	$4mm$	A1
N97.8.3 LD3	$\surd$	1	1	$\surd$	$4mm$	A1
N97.9.1 GM2 $\oplus$ GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$\bar{4}2m$	B1 $\oplus$ B1 $\oplus$ B1
N97.9.2 GM2 $\oplus$ GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$4mm$	B1 $\oplus$ B1 $\oplus$ A2
N97.9.3 GM2 $\oplus$ GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	$\bar{4}m2$	B1 $\oplus$ B1 $\oplus$ A2
N97.9.4 GM2 $\oplus$ GM2 $\oplus$ M1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N97.9.5 GM2 $\oplus$ GM2 $\oplus$ M2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N97.9.6 GM2 $\oplus$ GM2 $\oplus$ M3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N97.9.7 GM2 $\oplus$ GM2 $\oplus$ M4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N97.9.8 GM2 $\oplus$ GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	$\bar{4}2m$	B1 $\oplus$ A2 $\oplus$ A2
N97.9.9 GM2 $\oplus$ GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	422	B1 $\oplus$ A2 $\oplus$ B2
N97.9.10 GM2 $\oplus$ GM3 $\oplus$ M1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g} \oplus \mathrm{B2_u}$
N97.9.11 GM2 $\oplus$ GM3 $\oplus$ M2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g} \oplus \mathrm{B2_u}$
N97.9.12 GM2 $\oplus$ GM3 $\oplus$ M3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g} \oplus \mathrm{B2_u}$
N97.9.13 GM2 $\oplus$ GM3 $\oplus$ M4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g} \oplus \mathrm{B2_u}$
N97.9.14 GM2 $\oplus$ GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	$\bar{4}2m$	B1 $\oplus$ B2 $\oplus$ B2
N97.9.15 GM2 $\oplus$ GM4 $\oplus$ M1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$
N97.9.16 GM2 $\oplus$ GM4 $\oplus$ M2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$
N97.9.17 GM2 $\oplus$ GM4 $\oplus$ M3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$
N97.9.18 GM2 $\oplus$ GM4 $\oplus$ M4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$
N97.9.19 GM2 $\oplus$ M1 $\oplus$ M1	$\surd$	1	1	$\times$	-	-
N97.9.20 GM2 $\oplus$ M1 $\oplus$ M2	$\surd$	1	1	$\surd$	422	B1
N97.9.21 GM2 $\oplus$ M1 $\oplus$ M3	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N97.9.22 GM2 $\oplus$ M1 $\oplus$ M4	$\surd$	1	1	$\times$	-	-
N97.9.23 GM2 $\oplus$ M2 $\oplus$ M2	$\surd$	1	1	$\times$	-	-
N97.9.24 GM2 $\oplus$ M2 $\oplus$ M3	$\surd$	1	1	$\times$	-	-
N97.9.25 GM2 $\oplus$ M2 $\oplus$ M4	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N97.9.26 GM2 $\oplus$ M3 $\oplus$ M3	$\surd$	1	1	$\times$	-	-
N97.9.27 GM2 $\oplus$ M3 $\oplus$ M4	$\surd$	1	1	$\surd$	422	B1
N97.9.28 GM2 $\oplus$ M4 $\oplus$ M4	$\surd$	1	1	$\times$	-	-
N97.9.29 GM3 $\oplus$ GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	$4mm$	A2 $\oplus$ A2 $\oplus$ A2
N97.9.30 GM3 $\oplus$ GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	$\bar{4}m2$	B2 $\oplus$ B2 $\oplus$ A2
N97.9.31 GM3 $\oplus$ GM3 $\oplus$ M1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
N97.9.32 GM3 $\oplus$ GM3 $\oplus$ M2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
N97.9.33 GM3 $\oplus$ GM3 $\oplus$ M3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
N97.9.34 GM3 $\oplus$ GM3 $\oplus$ M4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
N97.9.35 GM3 $\oplus$ GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4mm$	B2 $\oplus$ B2 $\oplus$ A2
N97.9.36 GM3 $\oplus$ GM4 $\oplus$ M1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g} \oplus \mathrm{B2_g}$
N97.9.37 GM3 $\oplus$ GM4 $\oplus$ M2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g} \oplus \mathrm{B2_g}$
N97.9.38 GM3 $\oplus$ GM4 $\oplus$ M3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g} \oplus \mathrm{B2_g}$
N97.9.39 GM3 $\oplus$ GM4 $\oplus$ M4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g} \oplus \mathrm{B2_g}$
N97.9.40 GM3 $\oplus$ M1 $\oplus$ M1	$\surd$	1	1	$\times$	-	-
N97.9.41 GM3 $\oplus$ M1 $\oplus$ M2	$\surd$	1	1	$\surd$	$\bar{4}m2$	B2
N97.9.42 GM3 $\oplus$ M1 $\oplus$ M3	$\surd$	1	1	$\surd$	422	A2

Non-coplanar SSGs with parent space group $I422$ (No. 97) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N97.9.43 GM3 ⊕ M1 ⊕ M4	√	1	1	×	-	-
N97.9.44 GM3 ⊕ M2 ⊕ M2	√	1	1	×	-	-
N97.9.45 GM3 ⊕ M2 ⊕ M3	√	1	1	×	-	-
N97.9.46 GM3 ⊕ M2 ⊕ M4	√	1	1	√	422	A2
N97.9.47 GM3 ⊕ M3 ⊕ M3	√	1	1	×	-	-
N97.9.48 GM3 ⊕ M3 ⊕ M4	√	1	1	√	$\bar{4}m2$	B2
N97.9.49 GM3 ⊕ M4 ⊕ M4	√	1	1	×	-	-
N97.9.50 GM4 ⊕ GM4 ⊕ GM4	√	3	3	√	$\bar{4}m2$	A2 ⊕ A2 ⊕ A2
N97.9.51 GM4 ⊕ GM4 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N97.9.52 GM4 ⊕ GM4 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N97.9.53 GM4 ⊕ GM4 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N97.9.54 GM4 ⊕ GM4 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N97.9.55 GM4 ⊕ M1 ⊕ M1	√	1	1	√	$\bar{4}m2$	A2
N97.9.56 GM4 ⊕ M1 ⊕ M2	√	1	1	√	$4mm$	B2
N97.9.57 GM4 ⊕ M1 ⊕ M3	√	1	1	√	$\bar{4}2m$	B2
N97.9.58 GM4 ⊕ M1 ⊕ M4	√	1	1	√	422	B2
N97.9.59 GM4 ⊕ M2 ⊕ M2	√	1	1	√	$\bar{4}m2$	A2
N97.9.60 GM4 ⊕ M2 ⊕ M3	√	1	1	√	422	B2
N97.9.61 GM4 ⊕ M2 ⊕ M4	√	1	1	√	$\bar{4}2m$	B2
N97.9.62 GM4 ⊕ M3 ⊕ M3	√	1	1	√	$\bar{4}m2$	A2
N97.9.63 GM4 ⊕ M3 ⊕ M4	√	1	1	√	$4mm$	B2
N97.9.64 GM4 ⊕ M4 ⊕ M4	√	1	1	√	$\bar{4}m2$	A2
N97.9.65 M1 ⊕ M1 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A1_u}$
N97.9.66 M1 ⊕ M1 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N97.9.67 M1 ⊕ M1 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N97.9.68 M1 ⊕ M1 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N97.9.69 M1 ⊕ M2 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N97.9.70 M1 ⊕ M2 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N97.9.71 M1 ⊕ M2 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N97.9.72 M1 ⊕ M3 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N97.9.73 M1 ⊕ M3 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N97.9.74 M1 ⊕ M4 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N97.9.75 M2 ⊕ M2 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A1_u}$
N97.9.76 M2 ⊕ M2 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N97.9.77 M2 ⊕ M2 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N97.9.78 M2 ⊕ M3 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N97.9.79 M2 ⊕ M3 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N97.9.80 M2 ⊕ M4 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N97.9.81 M3 ⊕ M3 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A1_u}$
N97.9.82 M3 ⊕ M3 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N97.9.83 M3 ⊕ M4 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N97.9.84 M4 ⊕ M4 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A1_u}$
N97.12.1 GM2 ⊕ GM5	√	3	3	√	$\bar{4}m2$	B1 ⊕ E
N97.12.2 GM2 ⊕ M5	√	1	1	√	$\bar{4}m2$	B1
N97.12.3 GM3 ⊕ GM5	√	3	3	√	422	A2 ⊕ E
N97.12.4 GM3 ⊕ M5	√	1	1	√	422	A2

Non-coplanar SSGs with parent space group $I422$ (No. 97) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N97.12.5 GM4 ⊕ GM5	√	3	3	√	$\bar{4}2m$	$\mathrm{B2} \oplus \mathrm{E}$
N97.12.6 GM4 ⊕ M5	√	1	1	√	$\bar{4}2m$	B2
N97.12.7 M1 ⊕ GM5	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{E_g}$
N97.12.8 M1 ⊕ M5	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{E_u}$
N97.12.9 M2 ⊕ GM5	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{E_g}$
N97.12.10 M2 ⊕ M5	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{E_u}$
N97.12.11 M3 ⊕ GM5	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{E_g}$
N97.12.12 M3 ⊕ M5	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{E_u}$
N97.12.13 M4 ⊕ GM5	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{E_g}$
N97.12.14 M4 ⊕ M5	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{E_u}$
N97.13.1 GM2 ⊕ X1	√	1	1	√	$4/mmm$	$\mathrm{B1_g}$
N97.13.2 GM2 ⊕ X2	√	1	1	√	$4/mmm$	$\mathrm{B1_g}$
N97.13.3 GM2 ⊕ X3	√	1	1	√	$4/mmm$	$\mathrm{B1_g}$
N97.13.4 GM2 ⊕ X4	√	1	1	√	$4/mmm$	$\mathrm{B1_g}$
N97.13.5 GM2 ⊕ P1	√	1	1	×	-	-
N97.13.6 GM3 ⊕ X1	√	1	1	×	-	-
N97.13.7 GM3 ⊕ X2	√	1	1	×	-	-
N97.13.8 GM3 ⊕ X3	√	1	1	×	-	-
N97.13.9 GM3 ⊕ X4	√	1	1	×	-	-
N97.13.10 GM3 ⊕ P1	√	1	1	×	-	-
N97.13.11 GM4 ⊕ X1	√	1	1	×	-	-
N97.13.12 GM4 ⊕ X2	√	1	1	×	-	-
N97.13.13 GM4 ⊕ X3	√	1	1	×	-	-
N97.13.14 GM4 ⊕ X4	√	1	1	×	-	-
N97.13.15 GM4 ⊕ P1	√	1	1	×	-	-
N97.13.16 M1 ⊕ X1	×	-	-	-	-	-
N97.13.17 M1 ⊕ X2	×	-	-	-	-	-
N97.13.18 M1 ⊕ X3	×	-	-	-	-	-
N97.13.19 M1 ⊕ X4	×	-	-	-	-	-
N97.13.20 M1 ⊕ P1	√	1	1	×	-	-
N97.13.21 M2 ⊕ X1	×	-	-	-	-	-
N97.13.22 M2 ⊕ X2	×	-	-	-	-	-
N97.13.23 M2 ⊕ X3	×	-	-	-	-	-
N97.13.24 M2 ⊕ X4	×	-	-	-	-	-
N97.13.25 M2 ⊕ P1	√	1	1	×	-	-
N97.13.26 M3 ⊕ X1	×	-	-	-	-	-
N97.13.27 M3 ⊕ X2	×	-	-	-	-	-
N97.13.28 M3 ⊕ X3	×	-	-	-	-	-
N97.13.29 M3 ⊕ X4	×	-	-	-	-	-
N97.13.30 M3 ⊕ P1	√	1	1	×	-	-
N97.13.31 M4 ⊕ X1	×	-	-	-	-	-
N97.13.32 M4 ⊕ X2	×	-	-	-	-	-
N97.13.33 M4 ⊕ X3	×	-	-	-	-	-
N97.13.34 M4 ⊕ X4	×	-	-	-	-	-
N97.13.35 M4 ⊕ P1	√	1	1	×	-	-
N97.14.1 GM2 ⊕ LD1	√	1	1	√	$\bar{4}m2$	B1

Non-coplanar SSGs with parent space group $I422$ (No. 97) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N97.14.2 GM2 $\oplus$ LD2	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N97.14.3 GM2 $\oplus$ LD3	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N97.14.4 GM3 $\oplus$ LD1	$\surd$	1	1	$\surd$	422	A2
N97.14.5 GM3 $\oplus$ LD2	$\surd$	1	1	$\surd$	422	A2
N97.14.6 GM3 $\oplus$ LD3	$\surd$	1	1	$\surd$	422	A2
N97.14.7 GM4 $\oplus$ LD1	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N97.14.8 GM4 $\oplus$ LD2	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N97.14.9 GM4 $\oplus$ LD3	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N97.14.10 M1 $\oplus$ LD1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N97.14.11 M1 $\oplus$ LD2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N97.14.12 M1 $\oplus$ LD3	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N97.14.13 M2 $\oplus$ LD1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N97.14.14 M2 $\oplus$ LD2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N97.14.15 M2 $\oplus$ LD3	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N97.14.16 M3 $\oplus$ LD1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N97.14.17 M3 $\oplus$ LD2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N97.14.18 M3 $\oplus$ LD3	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N97.14.19 M4 $\oplus$ LD1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N97.14.20 M4 $\oplus$ LD2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N97.14.21 M4 $\oplus$ LD3	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$

TABLE S292: Collinear SSGs with parent space group $I4_122$ (No. 98).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L98.1.1 GM1	1	$4/mmm$	$\mathrm{A1_g}$
L98.2.1 GM2	1	$4/mmm$	$\mathrm{B1_g}$
L98.2.2 GM3	1	$4/mmm$	$\mathrm{A2_g}$
L98.2.3 GM4	1	$4/mmm$	$\mathrm{B2_g}$
L98.2.4 M1	0	-	-
L98.2.5 M2	0	-	-
L98.2.6 M3	0	-	-
L98.2.7 M4	0	-	-

TABLE S293: Coplanar SSGs with parent space group $I4_122$ (No. 98).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P98.1.1 GM1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A1_u}$
P98.2.1 GM2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
P98.2.2 GM3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
P98.2.3 GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
P98.2.4 M1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P98.2.5 M2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P98.2.6 M3	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P98.2.7 M4	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$

Coplanar SSGs with parent space group $I4_122$ (No. 98) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P98.3.1 GM2 ⊕ GM2	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
P98.3.2 GM2 ⊕ GM3	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g} \oplus \mathrm{B2_u}$
P98.3.3 GM2 ⊕ GM4	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$
P98.3.4 GM2 ⊕ M1	√	1	1	×	-	-
P98.3.5 GM2 ⊕ M2	√	1	1	×	-	-
P98.3.6 GM2 ⊕ M3	√	1	1	×	-	-
P98.3.7 GM2 ⊕ M4	√	1	1	×	-	-
P98.3.8 GM3 ⊕ GM3	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
P98.3.9 GM3 ⊕ GM4	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g} \oplus \mathrm{B2_g}$
P98.3.10 GM3 ⊕ M1	√	1	1	×	-	-
P98.3.11 GM3 ⊕ M2	√	1	1	×	-	-
P98.3.12 GM3 ⊕ M3	√	1	1	×	-	-
P98.3.13 GM3 ⊕ M4	√	1	1	×	-	-
P98.3.14 GM4 ⊕ GM4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
P98.3.15 GM4 ⊕ M1	√	1	1	√	$4/mmm$	$\mathrm{B2_g}$
P98.3.16 GM4 ⊕ M2	√	1	1	√	$4/mmm$	$\mathrm{B2_g}$
P98.3.17 GM4 ⊕ M3	√	1	1	√	$4/mmm$	$\mathrm{B2_g}$
P98.3.18 GM4 ⊕ M4	√	1	1	√	$4/mmm$	$\mathrm{B2_g}$
P98.3.19 M1 ⊕ M1	√	1	1	×	-	-
P98.3.20 M1 ⊕ M2	√	1	1	√	$4/mmm$	$\mathrm{B1_u}$
P98.3.21 M1 ⊕ M3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
P98.3.22 M1 ⊕ M4	√	1	1	×	-	-
P98.3.23 M2 ⊕ M2	√	1	1	×	-	-
P98.3.24 M2 ⊕ M3	√	1	1	×	-	-
P98.3.25 M2 ⊕ M4	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
P98.3.26 M3 ⊕ M3	√	1	1	×	-	-
P98.3.27 M3 ⊕ M4	√	1	1	√	$4/mmm$	$\mathrm{B1_u}$
P98.3.28 M4 ⊕ M4	√	1	1	×	-	-
P98.6.1 GM5	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{E_g}$
P98.6.2 M5	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
P98.7.1 X1	×	-	-	-	-	-
P98.7.2 X2	×	-	-	-	-	-
P98.7.3 X3	×	-	-	-	-	-
P98.7.4 X4	×	-	-	-	-	-
P98.8.1 LD1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
P98.8.2 LD3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$

TABLE S294: Non-coplanar SSGs with parent space group $I4_122$ (No. 98).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N98.1.1 GM1	√	3	3	√	422	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{A1}$
N98.2.1 GM2	√	3	3	√	$\bar{4}2m$	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{B1}$
N98.2.2 GM3	√	3	3	√	$4mm$	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{A2}$
N98.2.3 GM4	√	3	3	√	$\bar{4}m2$	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{A2}$
N98.2.4 M1	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A1_u}$
N98.2.5 M2	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A1_u}$

Non-coplanar SSGs with parent space group $I4_122$ (No. 98) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N98.2.6 M3	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A1_u}$
N98.2.7 M4	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A1_u}$
N98.3.1 GM2 ⊕ GM2	√	3	3	√	422	A1 ⊕ B1 ⊕ B1
N98.3.2 GM2 ⊕ GM3	√	3	3	√	$\bar{4}m2$	A1 ⊕ B1 ⊕ B2
N98.3.3 GM2 ⊕ GM4	√	3	3	√	$4mm$	A1 ⊕ B1 ⊕ B2
N98.3.4 GM2 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N98.3.5 GM2 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N98.3.6 GM2 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N98.3.7 GM2 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N98.3.8 GM3 ⊕ GM3	√	3	3	√	422	A1 ⊕ A2 ⊕ A2
N98.3.9 GM3 ⊕ GM4	√	3	3	√	$\bar{4}2m$	A1 ⊕ B2 ⊕ A2
N98.3.10 GM3 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
N98.3.11 GM3 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
N98.3.12 GM3 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
N98.3.13 GM3 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
N98.3.14 GM4 ⊕ GM4	√	3	3	√	422	A1 ⊕ B2 ⊕ B2
N98.3.15 GM4 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N98.3.16 GM4 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N98.3.17 GM4 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N98.3.18 GM4 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N98.3.19 M1 ⊕ M1	√	1	1	√	422	A1
N98.3.20 M1 ⊕ M2	√	1	1	√	$\bar{4}2m$	A1
N98.3.21 M1 ⊕ M3	√	1	1	√	$4mm$	A1
N98.3.22 M1 ⊕ M4	√	1	1	√	$\bar{4}m2$	A1
N98.3.23 M2 ⊕ M2	√	1	1	√	422	A1
N98.3.24 M2 ⊕ M3	√	1	1	√	$\bar{4}m2$	A1
N98.3.25 M2 ⊕ M4	√	1	1	√	$4mm$	A1
N98.3.26 M3 ⊕ M3	√	1	1	√	422	A1
N98.3.27 M3 ⊕ M4	√	1	1	√	$\bar{4}2m$	A1
N98.3.28 M4 ⊕ M4	√	1	1	√	422	A1
N98.6.1 GM5	√	3	3	√	$4mm$	A1 ⊕ E
N98.6.2 M5	√	1	1	√	$4mm$	A1
N98.7.1 X1	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N98.7.2 X2	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N98.7.3 X3	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N98.7.4 X4	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N98.8.1 LD1	√	1	1	√	$4mm$	A1
N98.8.2 LD3	√	1	1	√	$4mm$	A1
N98.9.1 GM2 ⊕ GM2 ⊕ GM2	√	3	3	√	$\bar{4}2m$	B1 ⊕ B1 ⊕ B1
N98.9.2 GM2 ⊕ GM2 ⊕ GM3	√	3	3	√	$4mm$	B1 ⊕ B1 ⊕ A2
N98.9.3 GM2 ⊕ GM2 ⊕ GM4	√	3	3	√	$\bar{4}m2$	B1 ⊕ B1 ⊕ A2
N98.9.4 GM2 ⊕ GM2 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N98.9.5 GM2 ⊕ GM2 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N98.9.6 GM2 ⊕ GM2 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N98.9.7 GM2 ⊕ GM2 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N98.9.8 GM2 ⊕ GM3 ⊕ GM3	√	3	3	√	$\bar{4}2m$	B1 ⊕ A2 ⊕ A2

Non-coplanar SSGs with parent space group $I4_122$ (No. 98) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N98.9.9 GM2 ⊕ GM3 ⊕ GM4	√	3	3	√	422	$\mathrm{B1}\oplus\mathrm{A2}\oplus\mathrm{B2}$
N98.9.10 GM2 ⊕ GM3 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_g}\oplus\mathrm{B2_u}$
N98.9.11 GM2 ⊕ GM3 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_g}\oplus\mathrm{B2_u}$
N98.9.12 GM2 ⊕ GM3 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_g}\oplus\mathrm{B2_u}$
N98.9.13 GM2 ⊕ GM3 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_g}\oplus\mathrm{B2_u}$
N98.9.14 GM2 ⊕ GM4 ⊕ GM4	√	3	3	√	$\bar{4}2m$	$\mathrm{B1}\oplus\mathrm{B2}\oplus\mathrm{B2}$
N98.9.15 GM2 ⊕ GM4 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_u}\oplus\mathrm{B2_g}$
N98.9.16 GM2 ⊕ GM4 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_u}\oplus\mathrm{B2_g}$
N98.9.17 GM2 ⊕ GM4 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_u}\oplus\mathrm{B2_g}$
N98.9.18 GM2 ⊕ GM4 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_u}\oplus\mathrm{B2_g}$
N98.9.19 GM2 ⊕ M1 ⊕ M1	√	1	1	×	-	-
N98.9.20 GM2 ⊕ M1 ⊕ M2	√	1	1	√	422	B1
N98.9.21 GM2 ⊕ M1 ⊕ M3	√	1	1	√	$\bar{4}m2$	B1
N98.9.22 GM2 ⊕ M1 ⊕ M4	√	1	1	×	-	-
N98.9.23 GM2 ⊕ M2 ⊕ M2	√	1	1	×	-	-
N98.9.24 GM2 ⊕ M2 ⊕ M3	√	1	1	×	-	-
N98.9.25 GM2 ⊕ M2 ⊕ M4	√	1	1	√	$\bar{4}m2$	B1
N98.9.26 GM2 ⊕ M3 ⊕ M3	√	1	1	×	-	-
N98.9.27 GM2 ⊕ M3 ⊕ M4	√	1	1	√	422	B1
N98.9.28 GM2 ⊕ M4 ⊕ M4	√	1	1	×	-	-
N98.9.29 GM3 ⊕ GM3 ⊕ GM3	√	3	3	√	$4mm$	$\mathrm{A2}\oplus\mathrm{A2}\oplus\mathrm{A2}$
N98.9.30 GM3 ⊕ GM3 ⊕ GM4	√	3	3	√	$\bar{4}m2$	$\mathrm{B2}\oplus\mathrm{B2}\oplus\mathrm{A2}$
N98.9.31 GM3 ⊕ GM3 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A2_g}\oplus\mathrm{A2_g}$
N98.9.32 GM3 ⊕ GM3 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A2_g}\oplus\mathrm{A2_g}$
N98.9.33 GM3 ⊕ GM3 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A2_g}\oplus\mathrm{A2_g}$
N98.9.34 GM3 ⊕ GM3 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A2_g}\oplus\mathrm{A2_g}$
N98.9.35 GM3 ⊕ GM4 ⊕ GM4	√	3	3	√	$4mm$	$\mathrm{B2}\oplus\mathrm{B2}\oplus\mathrm{A2}$
N98.9.36 GM3 ⊕ GM4 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{A2_g}\oplus\mathrm{B2_g}$
N98.9.37 GM3 ⊕ GM4 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{A2_g}\oplus\mathrm{B2_g}$
N98.9.38 GM3 ⊕ GM4 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{A2_g}\oplus\mathrm{B2_g}$
N98.9.39 GM3 ⊕ GM4 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{A2_g}\oplus\mathrm{B2_g}$
N98.9.40 GM3 ⊕ M1 ⊕ M1	√	1	1	×	-	-
N98.9.41 GM3 ⊕ M1 ⊕ M2	√	1	1	√	$\bar{4}m2$	B2
N98.9.42 GM3 ⊕ M1 ⊕ M3	√	1	1	√	422	A2
N98.9.43 GM3 ⊕ M1 ⊕ M4	√	1	1	×	-	-
N98.9.44 GM3 ⊕ M2 ⊕ M2	√	1	1	×	-	-
N98.9.45 GM3 ⊕ M2 ⊕ M3	√	1	1	×	-	-
N98.9.46 GM3 ⊕ M2 ⊕ M4	√	1	1	√	422	A2
N98.9.47 GM3 ⊕ M3 ⊕ M3	√	1	1	×	-	-
N98.9.48 GM3 ⊕ M3 ⊕ M4	√	1	1	√	$\bar{4}m2$	B2
N98.9.49 GM3 ⊕ M4 ⊕ M4	√	1	1	×	-	-
N98.9.50 GM4 ⊕ GM4 ⊕ GM4	√	3	3	√	$\bar{4}m2$	$\mathrm{A2}\oplus\mathrm{A2}\oplus\mathrm{A2}$
N98.9.51 GM4 ⊕ GM4 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B2_g}\oplus\mathrm{B2_g}$
N98.9.52 GM4 ⊕ GM4 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B2_g}\oplus\mathrm{B2_g}$
N98.9.53 GM4 ⊕ GM4 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B2_g}\oplus\mathrm{B2_g}$
N98.9.54 GM4 ⊕ GM4 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B2_g}\oplus\mathrm{B2_g}$

Non-coplanar SSGs with parent space group $I4_122$ (No. 98) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N98.9.55 GM4 ⊕ M1 ⊕ M1	√	1	1	√	$\bar{4}m2$	A2
N98.9.56 GM4 ⊕ M1 ⊕ M2	√	1	1	√	$4mm$	B2
N98.9.57 GM4 ⊕ M1 ⊕ M3	√	1	1	√	$\bar{4}2m$	B2
N98.9.58 GM4 ⊕ M1 ⊕ M4	√	1	1	√	422	B2
N98.9.59 GM4 ⊕ M2 ⊕ M2	√	1	1	√	$\bar{4}m2$	A2
N98.9.60 GM4 ⊕ M2 ⊕ M3	√	1	1	√	422	B2
N98.9.61 GM4 ⊕ M2 ⊕ M4	√	1	1	√	$\bar{4}2m$	B2
N98.9.62 GM4 ⊕ M3 ⊕ M3	√	1	1	√	$\bar{4}m2$	A2
N98.9.63 GM4 ⊕ M3 ⊕ M4	√	1	1	√	$4mm$	B2
N98.9.64 GM4 ⊕ M4 ⊕ M4	√	1	1	√	$\bar{4}m2$	A2
N98.9.65 M1 ⊕ M1 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A1_u}$
N98.9.66 M1 ⊕ M1 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N98.9.67 M1 ⊕ M1 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N98.9.68 M1 ⊕ M1 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N98.9.69 M1 ⊕ M2 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N98.9.70 M1 ⊕ M2 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N98.9.71 M1 ⊕ M2 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N98.9.72 M1 ⊕ M3 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N98.9.73 M1 ⊕ M3 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N98.9.74 M1 ⊕ M4 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N98.9.75 M2 ⊕ M2 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A1_u}$
N98.9.76 M2 ⊕ M2 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N98.9.77 M2 ⊕ M2 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N98.9.78 M2 ⊕ M3 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N98.9.79 M2 ⊕ M3 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N98.9.80 M2 ⊕ M4 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N98.9.81 M3 ⊕ M3 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A1_u}$
N98.9.82 M3 ⊕ M3 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N98.9.83 M3 ⊕ M4 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N98.9.84 M4 ⊕ M4 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A1_u}$
N98.12.1 GM2 ⊕ GM5	√	3	3	√	$\bar{4}m2$	B1 ⊕ E
N98.12.2 GM2 ⊕ M5	√	1	1	√	$\bar{4}m2$	B1
N98.12.3 GM3 ⊕ GM5	√	3	3	√	422	A2 ⊕ E
N98.12.4 GM3 ⊕ M5	√	1	1	√	422	A2
N98.12.5 GM4 ⊕ GM5	√	3	3	√	$\bar{4}2m$	B2 ⊕ E
N98.12.6 GM4 ⊕ M5	√	1	1	√	$\bar{4}2m$	B2
N98.12.7 M1 ⊕ GM5	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{E_g}$
N98.12.8 M1 ⊕ M5	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{E_u}$
N98.12.9 M2 ⊕ GM5	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{E_g}$
N98.12.10 M2 ⊕ M5	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{E_u}$
N98.12.11 M3 ⊕ GM5	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{E_g}$
N98.12.12 M3 ⊕ M5	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{E_u}$
N98.12.13 M4 ⊕ GM5	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{E_g}$
N98.12.14 M4 ⊕ M5	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{E_u}$
N98.13.1 GM2 ⊕ X1	√	1	1	√	$4/mmm$	$\mathrm{B1_g}$
N98.13.2 GM2 ⊕ X2	√	1	1	√	$4/mmm$	$\mathrm{B1_g}$

Non-coplanar SSGs with parent space group $I4_122$ (No. 98) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N98.13.3 GM2 ⊕ X3	√	1	1	√	$4/mmm$	$\mathrm{B1_g}$
N98.13.4 GM2 ⊕ X4	√	1	1	√	$4/mmm$	$\mathrm{B1_g}$
N98.13.5 GM3 ⊕ X1	√	1	1	×	-	-
N98.13.6 GM3 ⊕ X2	√	1	1	×	-	-
N98.13.7 GM3 ⊕ X3	√	1	1	×	-	-
N98.13.8 GM3 ⊕ X4	√	1	1	×	-	-
N98.13.9 GM4 ⊕ X1	√	1	1	×	-	-
N98.13.10 GM4 ⊕ X2	√	1	1	×	-	-
N98.13.11 GM4 ⊕ X3	√	1	1	×	-	-
N98.13.12 GM4 ⊕ X4	√	1	1	×	-	-
N98.13.13 M1 ⊕ X1	×	-	-	-	-	-
N98.13.14 M1 ⊕ X2	×	-	-	-	-	-
N98.13.15 M1 ⊕ X3	×	-	-	-	-	-
N98.13.16 M1 ⊕ X4	×	-	-	-	-	-
N98.13.17 M2 ⊕ X1	×	-	-	-	-	-
N98.13.18 M2 ⊕ X2	×	-	-	-	-	-
N98.13.19 M2 ⊕ X3	×	-	-	-	-	-
N98.13.20 M2 ⊕ X4	×	-	-	-	-	-
N98.13.21 M3 ⊕ X1	×	-	-	-	-	-
N98.13.22 M3 ⊕ X2	×	-	-	-	-	-
N98.13.23 M3 ⊕ X3	×	-	-	-	-	-
N98.13.24 M3 ⊕ X4	×	-	-	-	-	-
N98.13.25 M4 ⊕ X1	×	-	-	-	-	-
N98.13.26 M4 ⊕ X2	×	-	-	-	-	-
N98.13.27 M4 ⊕ X3	×	-	-	-	-	-
N98.13.28 M4 ⊕ X4	×	-	-	-	-	-
N98.14.1 GM2 ⊕ LD1	√	1	1	√	$\bar{4}m2$	B1
N98.14.2 GM2 ⊕ LD3	√	1	1	√	$\bar{4}m2$	B1
N98.14.3 GM3 ⊕ LD1	√	1	1	√	422	A2
N98.14.4 GM3 ⊕ LD3	√	1	1	√	422	A2
N98.14.5 GM4 ⊕ LD1	√	1	1	√	$\bar{4}2m$	B2
N98.14.6 GM4 ⊕ LD3	√	1	1	√	$\bar{4}2m$	B2
N98.14.7 M1 ⊕ LD1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N98.14.8 M1 ⊕ LD3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N98.14.9 M2 ⊕ LD1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N98.14.10 M2 ⊕ LD3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N98.14.11 M3 ⊕ LD1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N98.14.12 M3 ⊕ LD3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N98.14.13 M4 ⊕ LD1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N98.14.14 M4 ⊕ LD3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$

TABLE S295: Collinear SSGs with parent space group $P4mm$ (No. 99).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L99.1.1 GM1	1	$4/mmm$	$\mathrm{A1_g}$
L99.2.1 GM2	1	$4/mmm$	$\mathrm{B1_g}$

Collinear SSGs with parent space group $P4mm$ (No. 99)(continued)

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L99.2.2 GM3	1	$4/mmm$	$\mathrm{B2_g}$
L99.2.3 GM4	1	$4/mmm$	$\mathrm{A2_g}$
L99.2.4 A1	0	-	-
L99.2.5 A2	0	-	-
L99.2.6 M1	0	-	-
L99.2.7 M2	0	-	-
L99.2.8 Z1	0	-	-
L99.2.9 Z2	0	-	-
L99.2.10 Z3	0	-	-
L99.2.11 Z4	0	-	-

TABLE S296: Coplanar SSGs with parent space group $P4mm$ (No. 99).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P99.1.1 GM1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A2_u}$
P99.2.1 GM2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B2_u}$
P99.2.2 GM3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_g}$
P99.2.3 GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{A2_g}$
P99.2.4 A1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P99.2.5 A2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P99.2.6 M1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P99.2.7 M2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P99.2.8 Z1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P99.2.9 Z2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P99.2.10 Z3	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P99.2.11 Z4	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P99.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{A2_u}$
P99.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B2_g}$
P99.3.3 GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{A2_g}$
P99.3.4 GM2 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
P99.3.5 GM2 $\oplus$ A2	$\surd$	1	1	$\times$	-	-
P99.3.6 GM2 $\oplus$ M1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
P99.3.7 GM2 $\oplus$ M2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
P99.3.8 GM2 $\oplus$ Z1	$\surd$	1	1	$\times$	-	-
P99.3.9 GM2 $\oplus$ Z2	$\surd$	1	1	$\times$	-	-
P99.3.10 GM2 $\oplus$ Z3	$\surd$	1	1	$\times$	-	-
P99.3.11 GM2 $\oplus$ Z4	$\surd$	1	1	$\times$	-	-
P99.3.12 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
P99.3.13 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
P99.3.14 GM3 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
P99.3.15 GM3 $\oplus$ A2	$\surd$	1	1	$\times$	-	-
P99.3.16 GM3 $\oplus$ M1	$\surd$	1	1	$\times$	-	-
P99.3.17 GM3 $\oplus$ M2	$\surd$	1	1	$\times$	-	-
P99.3.18 GM3 $\oplus$ Z1	$\surd$	1	1	$\times$	-	-
P99.3.19 GM3 $\oplus$ Z2	$\surd$	1	1	$\times$	-	-
P99.3.20 GM3 $\oplus$ Z3	$\surd$	1	1	$\times$	-	-

Coplanar SSGs with parent space group $P4mm$ (No. 99) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P99.3.21 GM3 $\oplus$ Z4	$\surd$	1	1	$\times$	-	-
P99.3.22 GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
P99.3.23 GM4 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
P99.3.24 GM4 $\oplus$ A2	$\surd$	1	1	$\times$	-	-
P99.3.25 GM4 $\oplus$ M1	$\surd$	1	1	$\times$	-	-
P99.3.26 GM4 $\oplus$ M2	$\surd$	1	1	$\times$	-	-
P99.3.27 GM4 $\oplus$ Z1	$\surd$	1	1	$\times$	-	-
P99.3.28 GM4 $\oplus$ Z2	$\surd$	1	1	$\times$	-	-
P99.3.29 GM4 $\oplus$ Z3	$\surd$	1	1	$\times$	-	-
P99.3.30 GM4 $\oplus$ Z4	$\surd$	1	1	$\times$	-	-
P99.3.31 A1 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
P99.3.32 A1 $\oplus$ A3	$\surd$	1	1	$\times$	-	-
P99.3.33 A1 $\oplus$ A2	$\surd$	1	1	$\times$	-	-
P99.3.34 A1 $\oplus$ A4	$\surd$	1	1	$\times$	-	-
P99.3.35 A1 $\oplus$ M1	$\times$	-	-	-	-	-
P99.3.36 A1 $\oplus$ M3	$\times$	-	-	-	-	-
P99.3.37 A1 $\oplus$ M2	$\times$	-	-	-	-	-
P99.3.38 A1 $\oplus$ M4	$\times$	-	-	-	-	-
P99.3.39 A1 $\oplus$ Z1	$\times$	-	-	-	-	-
P99.3.40 A1 $\oplus$ Z2	$\times$	-	-	-	-	-
P99.3.41 A1 $\oplus$ Z3	$\times$	-	-	-	-	-
P99.3.42 A1 $\oplus$ Z4	$\times$	-	-	-	-	-
P99.3.43 A2 $\oplus$ A2	$\surd$	1	1	$\times$	-	-
P99.3.44 A2 $\oplus$ A4	$\surd$	1	1	$\times$	-	-
P99.3.45 A2 $\oplus$ M1	$\times$	-	-	-	-	-
P99.3.46 A2 $\oplus$ M3	$\times$	-	-	-	-	-
P99.3.47 A2 $\oplus$ M2	$\times$	-	-	-	-	-
P99.3.48 A2 $\oplus$ M4	$\times$	-	-	-	-	-
P99.3.49 A2 $\oplus$ Z1	$\times$	-	-	-	-	-
P99.3.50 A2 $\oplus$ Z2	$\times$	-	-	-	-	-
P99.3.51 A2 $\oplus$ Z3	$\times$	-	-	-	-	-
P99.3.52 A2 $\oplus$ Z4	$\times$	-	-	-	-	-
P99.3.53 M1 $\oplus$ M1	$\surd$	1	1	$\times$	-	-
P99.3.54 M1 $\oplus$ M3	$\surd$	1	1	$\times$	-	-
P99.3.55 M1 $\oplus$ M2	$\surd$	1	1	$\times$	-	-
P99.3.56 M1 $\oplus$ M4	$\surd$	1	1	$\times$	-	-
P99.3.57 M1 $\oplus$ Z1	$\times$	-	-	-	-	-
P99.3.58 M1 $\oplus$ Z2	$\times$	-	-	-	-	-
P99.3.59 M1 $\oplus$ Z3	$\times$	-	-	-	-	-
P99.3.60 M1 $\oplus$ Z4	$\times$	-	-	-	-	-
P99.3.61 M2 $\oplus$ M2	$\surd$	1	1	$\times$	-	-
P99.3.62 M2 $\oplus$ M4	$\surd$	1	1	$\times$	-	-
P99.3.63 M2 $\oplus$ Z1	$\times$	-	-	-	-	-
P99.3.64 M2 $\oplus$ Z2	$\times$	-	-	-	-	-
P99.3.65 M2 $\oplus$ Z3	$\times$	-	-	-	-	-
P99.3.66 M2 $\oplus$ Z4	$\times$	-	-	-	-	-

Coplanar SSGs with parent space group $P4mm$ (No. 99) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P99.3.67 Z1 $\oplus$ Z1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P99.3.68 Z1 $\oplus$ Z2	$\surd$	1	1	$\times$	-	-
P99.3.69 Z1 $\oplus$ Z3	$\surd$	1	1	$\times$	-	-
P99.3.70 Z1 $\oplus$ Z4	$\surd$	1	1	$\times$	-	-
P99.3.71 Z2 $\oplus$ Z2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P99.3.72 Z2 $\oplus$ Z3	$\surd$	1	1	$\times$	-	-
P99.3.73 Z2 $\oplus$ Z4	$\surd$	1	1	$\times$	-	-
P99.3.74 Z3 $\oplus$ Z3	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P99.3.75 Z3 $\oplus$ Z4	$\surd$	1	1	$\times$	-	-
P99.3.76 Z4 $\oplus$ Z4	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P99.5.1 LD1LE1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P99.5.2 LD2LE2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P99.5.3 LD3LE3	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P99.5.4 LD4LE4	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P99.5.5 V1VA1	$\surd$	1	1	$\times$	-	-
P99.5.6 V2VA2	$\surd$	1	1	$\times$	-	-
P99.6.1 GM5	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{E_g}$
P99.6.2 A5	$\surd$	1	1	$\times$	-	-
P99.6.3 M5	$\surd$	1	1	$\times$	-	-
P99.6.4 Z5	$\surd$	1	1	$\times$	-	-
P99.7.1 R1	$\times$	-	-	-	-	-
P99.7.2 R2	$\times$	-	-	-	-	-
P99.7.3 X1	$\times$	-	-	-	-	-
P99.7.4 X2	$\times$	-	-	-	-	-

TABLE S297: Non-coplanar SSGs with parent space group $P4mm$ (No. 99).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N99.1.1 GM1	$\surd$	3	3	$\surd$	$4mm$	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{A1}$
N99.2.1 GM2	$\surd$	3	3	$\surd$	$\bar{4}m2$	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{B1}$
N99.2.2 GM3	$\surd$	3	3	$\surd$	$\bar{4}2m$	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{B2}$
N99.2.3 GM4	$\surd$	3	3	$\surd$	422	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{A2}$
N99.2.4 A1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A2_u}$
N99.2.5 A2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A2_u}$
N99.2.6 M1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A2_u}$
N99.2.7 M2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A2_u}$
N99.2.8 Z1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A2_u}$
N99.2.9 Z2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A2_u}$
N99.2.10 Z3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A2_u}$
N99.2.11 Z4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A2_u}$
N99.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$4mm$	$\mathrm{A1} \oplus \mathrm{B1} \oplus \mathrm{B1}$
N99.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	422	$\mathrm{A1} \oplus \mathrm{B1} \oplus \mathrm{B2}$
N99.3.3 GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	$\bar{4}2m$	$\mathrm{A1} \oplus \mathrm{B1} \oplus \mathrm{A2}$
N99.3.4 GM2 $\oplus$ A1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B2_u}$
N99.3.5 GM2 $\oplus$ A2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B2_u}$
N99.3.6 GM2 $\oplus$ M1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B2_u}$

Non-coplanar SSGs with parent space group $P4mm$ (No. 99) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N99.3.7 GM2 $\oplus$ M2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B2_u}$
N99.3.8 GM2 $\oplus$ Z1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B2_u}$
N99.3.9 GM2 $\oplus$ Z2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B2_u}$
N99.3.10 GM2 $\oplus$ Z3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B2_u}$
N99.3.11 GM2 $\oplus$ Z4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B2_u}$
N99.3.12 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	$4mm$	$\mathrm{A1} \oplus \mathrm{B2} \oplus \mathrm{B2}$
N99.3.13 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	$\bar{4}m2$	$\mathrm{A1} \oplus \mathrm{B2} \oplus \mathrm{A2}$
N99.3.14 GM3 $\oplus$ A1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_g}$
N99.3.15 GM3 $\oplus$ A2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_g}$
N99.3.16 GM3 $\oplus$ M1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_g}$
N99.3.17 GM3 $\oplus$ M2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_g}$
N99.3.18 GM3 $\oplus$ Z1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_g}$
N99.3.19 GM3 $\oplus$ Z2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_g}$
N99.3.20 GM3 $\oplus$ Z3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_g}$
N99.3.21 GM3 $\oplus$ Z4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_g}$
N99.3.22 GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4mm$	$\mathrm{A1} \oplus \mathrm{A2} \oplus \mathrm{A2}$
N99.3.23 GM4 $\oplus$ A1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{A2_g}$
N99.3.24 GM4 $\oplus$ A2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{A2_g}$
N99.3.25 GM4 $\oplus$ M1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{A2_g}$
N99.3.26 GM4 $\oplus$ M2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{A2_g}$
N99.3.27 GM4 $\oplus$ Z1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{A2_g}$
N99.3.28 GM4 $\oplus$ Z2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{A2_g}$
N99.3.29 GM4 $\oplus$ Z3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{A2_g}$
N99.3.30 GM4 $\oplus$ Z4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{A2_g}$
N99.3.31 A1 $\oplus$ A1	$\surd$	1	1	$\surd$	$4mm$	A1
N99.3.32 A1 $\oplus$ A3	$\surd$	1	1	$\surd$	$\bar{4}2m$	A1
N99.3.33 A1 $\oplus$ A2	$\surd$	1	1	$\surd$	$\bar{4}m2$	A1
N99.3.34 A1 $\oplus$ A4	$\surd$	1	1	$\surd$	422	A1
N99.3.35 A1 $\oplus$ M1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N99.3.36 A1 $\oplus$ M3	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N99.3.37 A1 $\oplus$ M2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N99.3.38 A1 $\oplus$ M4	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N99.3.39 A1 $\oplus$ Z1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N99.3.40 A1 $\oplus$ Z2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N99.3.41 A1 $\oplus$ Z3	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N99.3.42 A1 $\oplus$ Z4	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N99.3.43 A2 $\oplus$ A2	$\surd$	1	1	$\surd$	$4mm$	A1
N99.3.44 A2 $\oplus$ A4	$\surd$	1	1	$\surd$	$\bar{4}2m$	A1
N99.3.45 A2 $\oplus$ M1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N99.3.46 A2 $\oplus$ M3	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N99.3.47 A2 $\oplus$ M2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N99.3.48 A2 $\oplus$ M4	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N99.3.49 A2 $\oplus$ Z1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N99.3.50 A2 $\oplus$ Z2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N99.3.51 A2 $\oplus$ Z3	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N99.3.52 A2 $\oplus$ Z4	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$

Non-coplanar SSGs with parent space group $P4mm$ (No. 99) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N99.3.53 M1 ⊕ M1	√	1	1	√	$4mm$	A1
N99.3.54 M1 ⊕ M3	√	1	1	√	$\bar{4}2m$	A1
N99.3.55 M1 ⊕ M2	√	1	1	√	$\bar{4}m2$	A1
N99.3.56 M1 ⊕ M4	√	1	1	√	422	A1
N99.3.57 M1 ⊕ Z1	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N99.3.58 M1 ⊕ Z2	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N99.3.59 M1 ⊕ Z3	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N99.3.60 M1 ⊕ Z4	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N99.3.61 M2 ⊕ M2	√	1	1	√	$4mm$	A1
N99.3.62 M2 ⊕ M4	√	1	1	√	$\bar{4}2m$	A1
N99.3.63 M2 ⊕ Z1	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N99.3.64 M2 ⊕ Z2	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N99.3.65 M2 ⊕ Z3	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N99.3.66 M2 ⊕ Z4	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N99.3.67 Z1 ⊕ Z1	√	1	1	√	$4mm$	A1
N99.3.68 Z1 ⊕ Z2	√	1	1	√	$\bar{4}m2$	A1
N99.3.69 Z1 ⊕ Z3	√	1	1	√	$\bar{4}2m$	A1
N99.3.70 Z1 ⊕ Z4	√	1	1	√	422	A1
N99.3.71 Z2 ⊕ Z2	√	1	1	√	$4mm$	A1
N99.3.72 Z2 ⊕ Z3	√	1	1	√	422	A1
N99.3.73 Z2 ⊕ Z4	√	1	1	√	$\bar{4}2m$	A1
N99.3.74 Z3 ⊕ Z3	√	1	1	√	$4mm$	A1
N99.3.75 Z3 ⊕ Z4	√	1	1	√	$\bar{4}m2$	A1
N99.3.76 Z4 ⊕ Z4	√	1	1	√	$4mm$	A1
N99.5.1 LD1LE1	√	1	1	√	$4mm$	A1
N99.5.2 LD2LE2	√	1	1	√	$4mm$	A1
N99.5.3 LD3LE3	√	1	1	√	$4mm$	A1
N99.5.4 LD4LE4	√	1	1	√	$4mm$	A1
N99.5.5 V1VA1	√	1	1	√	$4mm$	A1
N99.5.6 V2VA2	√	1	1	√	$4mm$	A1
N99.6.1 GM5	√	3	3	√	422	A1 ⊕ E
N99.6.2 A5	√	1	1	√	422	A1
N99.6.3 M5	√	1	1	√	422	A1
N99.6.4 Z5	√	1	1	√	422	A1
N99.7.1 R1	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N99.7.2 R2	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N99.7.3 X1	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N99.7.4 X2	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N99.9.1 GM2 ⊕ GM2 ⊕ GM2	√	3	3	√	$\bar{4}m2$	B1 ⊕ B1 ⊕ B1
N99.9.2 GM2 ⊕ GM2 ⊕ GM3	√	3	3	√	$\bar{4}2m$	B1 ⊕ B1 ⊕ B2
N99.9.3 GM2 ⊕ GM2 ⊕ GM4	√	3	3	√	422	B1 ⊕ B1 ⊕ A2
N99.9.4 GM2 ⊕ GM2 ⊕ A1	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{A2_u}$
N99.9.5 GM2 ⊕ GM2 ⊕ A2	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{A2_u}$
N99.9.6 GM2 ⊕ GM2 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{A2_u}$
N99.9.7 GM2 ⊕ GM2 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{A2_u}$
N99.9.8 GM2 ⊕ GM2 ⊕ Z1	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{A2_u}$

Non-coplanar SSGs with parent space group $P4mm$ (No. 99) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N99.9.9 GM2 $\oplus$ GM2 $\oplus$ Z2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{A2_u}$
N99.9.10 GM2 $\oplus$ GM2 $\oplus$ Z3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{A2_u}$
N99.9.11 GM2 $\oplus$ GM2 $\oplus$ Z4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{A2_u}$
N99.9.12 GM2 $\oplus$ GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	$\bar{4}m2$	B1 $\oplus$ A2 $\oplus$ A2
N99.9.13 GM2 $\oplus$ GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4mm$	B1 $\oplus$ B2 $\oplus$ A2
N99.9.14 GM2 $\oplus$ GM3 $\oplus$ A1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B2_g}$
N99.9.15 GM2 $\oplus$ GM3 $\oplus$ A2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B2_g}$
N99.9.16 GM2 $\oplus$ GM3 $\oplus$ M1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B2_g}$
N99.9.17 GM2 $\oplus$ GM3 $\oplus$ M2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B2_g}$
N99.9.18 GM2 $\oplus$ GM3 $\oplus$ Z1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B2_g}$
N99.9.19 GM2 $\oplus$ GM3 $\oplus$ Z2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B2_g}$
N99.9.20 GM2 $\oplus$ GM3 $\oplus$ Z3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B2_g}$
N99.9.21 GM2 $\oplus$ GM3 $\oplus$ Z4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B2_g}$
N99.9.22 GM2 $\oplus$ GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	$\bar{4}m2$	B1 $\oplus$ B2 $\oplus$ B2
N99.9.23 GM2 $\oplus$ GM4 $\oplus$ A1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{A2_g}$
N99.9.24 GM2 $\oplus$ GM4 $\oplus$ A2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{A2_g}$
N99.9.25 GM2 $\oplus$ GM4 $\oplus$ M1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{A2_g}$
N99.9.26 GM2 $\oplus$ GM4 $\oplus$ M2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{A2_g}$
N99.9.27 GM2 $\oplus$ GM4 $\oplus$ Z1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{A2_g}$
N99.9.28 GM2 $\oplus$ GM4 $\oplus$ Z2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{A2_g}$
N99.9.29 GM2 $\oplus$ GM4 $\oplus$ Z3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{A2_g}$
N99.9.30 GM2 $\oplus$ GM4 $\oplus$ Z4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{A2_g}$
N99.9.31 GM2 $\oplus$ A1 $\oplus$ A1	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N99.9.32 GM2 $\oplus$ A1 $\oplus$ A3	$\surd$	1	1	$\times$	-	-
N99.9.33 GM2 $\oplus$ A1 $\oplus$ A2	$\surd$	1	1	$\times$	-	-
N99.9.34 GM2 $\oplus$ A1 $\oplus$ A4	$\surd$	1	1	$\times$	-	-
N99.9.35 GM2 $\oplus$ A1 $\oplus$ M1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N99.9.36 GM2 $\oplus$ A1 $\oplus$ M3	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N99.9.37 GM2 $\oplus$ A1 $\oplus$ M2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N99.9.38 GM2 $\oplus$ A1 $\oplus$ M4	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N99.9.39 GM2 $\oplus$ A1 $\oplus$ Z1	$\surd$	1	1	$\times$	-	-
N99.9.40 GM2 $\oplus$ A1 $\oplus$ Z2	$\surd$	1	1	$\times$	-	-
N99.9.41 GM2 $\oplus$ A1 $\oplus$ Z3	$\surd$	1	1	$\times$	-	-
N99.9.42 GM2 $\oplus$ A1 $\oplus$ Z4	$\surd$	1	1	$\times$	-	-
N99.9.43 GM2 $\oplus$ A2 $\oplus$ A2	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N99.9.44 GM2 $\oplus$ A2 $\oplus$ A4	$\surd$	1	1	$\times$	-	-
N99.9.45 GM2 $\oplus$ A2 $\oplus$ M1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N99.9.46 GM2 $\oplus$ A2 $\oplus$ M3	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N99.9.47 GM2 $\oplus$ A2 $\oplus$ M2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N99.9.48 GM2 $\oplus$ A2 $\oplus$ M4	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N99.9.49 GM2 $\oplus$ A2 $\oplus$ Z1	$\surd$	1	1	$\times$	-	-
N99.9.50 GM2 $\oplus$ A2 $\oplus$ Z2	$\surd$	1	1	$\times$	-	-
N99.9.51 GM2 $\oplus$ A2 $\oplus$ Z3	$\surd$	1	1	$\times$	-	-
N99.9.52 GM2 $\oplus$ A2 $\oplus$ Z4	$\surd$	1	1	$\times$	-	-
N99.9.53 GM2 $\oplus$ M1 $\oplus$ M1	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N99.9.54 GM2 $\oplus$ M1 $\oplus$ M3	$\surd$	1	1	$\surd$	422	B1

Non-coplanar SSGs with parent space group $P4mm$ (No. 99) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N99.9.55 GM2 $\oplus$ M1 $\oplus$ M2	$\surd$	1	1	$\surd$	$4mm$	B1
N99.9.56 GM2 $\oplus$ M1 $\oplus$ M4	$\surd$	1	1	$\surd$	$\bar{4}2m$	B1
N99.9.57 GM2 $\oplus$ M1 $\oplus$ Z1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N99.9.58 GM2 $\oplus$ M1 $\oplus$ Z2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N99.9.59 GM2 $\oplus$ M1 $\oplus$ Z3	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N99.9.60 GM2 $\oplus$ M1 $\oplus$ Z4	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N99.9.61 GM2 $\oplus$ M2 $\oplus$ M2	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N99.9.62 GM2 $\oplus$ M2 $\oplus$ M4	$\surd$	1	1	$\surd$	422	B1
N99.9.63 GM2 $\oplus$ M2 $\oplus$ Z1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N99.9.64 GM2 $\oplus$ M2 $\oplus$ Z2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N99.9.65 GM2 $\oplus$ M2 $\oplus$ Z3	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N99.9.66 GM2 $\oplus$ M2 $\oplus$ Z4	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N99.9.67 GM2 $\oplus$ Z1 $\oplus$ Z1	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N99.9.68 GM2 $\oplus$ Z1 $\oplus$ Z2	$\surd$	1	1	$\times$	-	-
N99.9.69 GM2 $\oplus$ Z1 $\oplus$ Z3	$\surd$	1	1	$\times$	-	-
N99.9.70 GM2 $\oplus$ Z1 $\oplus$ Z4	$\surd$	1	1	$\times$	-	-
N99.9.71 GM2 $\oplus$ Z2 $\oplus$ Z2	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N99.9.72 GM2 $\oplus$ Z2 $\oplus$ Z3	$\surd$	1	1	$\times$	-	-
N99.9.73 GM2 $\oplus$ Z2 $\oplus$ Z4	$\surd$	1	1	$\times$	-	-
N99.9.74 GM2 $\oplus$ Z3 $\oplus$ Z3	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N99.9.75 GM2 $\oplus$ Z3 $\oplus$ Z4	$\surd$	1	1	$\times$	-	-
N99.9.76 GM2 $\oplus$ Z4 $\oplus$ Z4	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N99.9.77 GM3 $\oplus$ GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	$\bar{4}2m$	B2 $\oplus$ B2 $\oplus$ B2
N99.9.78 GM3 $\oplus$ GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	422	A2 $\oplus$ B2 $\oplus$ B2
N99.9.79 GM3 $\oplus$ GM3 $\oplus$ A1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N99.9.80 GM3 $\oplus$ GM3 $\oplus$ A2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N99.9.81 GM3 $\oplus$ GM3 $\oplus$ M1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N99.9.82 GM3 $\oplus$ GM3 $\oplus$ M2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N99.9.83 GM3 $\oplus$ GM3 $\oplus$ Z1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N99.9.84 GM3 $\oplus$ GM3 $\oplus$ Z2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N99.9.85 GM3 $\oplus$ GM3 $\oplus$ Z3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N99.9.86 GM3 $\oplus$ GM3 $\oplus$ Z4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N99.9.87 GM3 $\oplus$ GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	$\bar{4}2m$	B2 $\oplus$ A2 $\oplus$ A2
N99.9.88 GM3 $\oplus$ GM4 $\oplus$ A1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N99.9.89 GM3 $\oplus$ GM4 $\oplus$ A2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N99.9.90 GM3 $\oplus$ GM4 $\oplus$ M1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N99.9.91 GM3 $\oplus$ GM4 $\oplus$ M2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N99.9.92 GM3 $\oplus$ GM4 $\oplus$ Z1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N99.9.93 GM3 $\oplus$ GM4 $\oplus$ Z2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N99.9.94 GM3 $\oplus$ GM4 $\oplus$ Z3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N99.9.95 GM3 $\oplus$ GM4 $\oplus$ Z4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N99.9.96 GM3 $\oplus$ A1 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
N99.9.97 GM3 $\oplus$ A1 $\oplus$ A3	$\surd$	1	1	$\times$	-	-
N99.9.98 GM3 $\oplus$ A1 $\oplus$ A2	$\surd$	1	1	$\times$	-	-
N99.9.99 GM3 $\oplus$ A1 $\oplus$ A4	$\surd$	1	1	$\times$	-	-
N99.9.100 GM3 $\oplus$ A1 $\oplus$ M1	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $P4mm$ (No. 99) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N99.9.101 GM3 ⊕ A1 ⊕ M3	√	1	1	×	-	-
N99.9.102 GM3 ⊕ A1 ⊕ M2	√	1	1	×	-	-
N99.9.103 GM3 ⊕ A1 ⊕ M4	√	1	1	×	-	-
N99.9.104 GM3 ⊕ A1 ⊕ Z1	√	1	1	×	-	-
N99.9.105 GM3 ⊕ A1 ⊕ Z2	√	1	1	×	-	-
N99.9.106 GM3 ⊕ A1 ⊕ Z3	√	1	1	×	-	-
N99.9.107 GM3 ⊕ A1 ⊕ Z4	√	1	1	×	-	-
N99.9.108 GM3 ⊕ A2 ⊕ A2	√	1	1	×	-	-
N99.9.109 GM3 ⊕ A2 ⊕ A4	√	1	1	×	-	-
N99.9.110 GM3 ⊕ A2 ⊕ M1	√	1	1	×	-	-
N99.9.111 GM3 ⊕ A2 ⊕ M3	√	1	1	×	-	-
N99.9.112 GM3 ⊕ A2 ⊕ M2	√	1	1	×	-	-
N99.9.113 GM3 ⊕ A2 ⊕ M4	√	1	1	×	-	-
N99.9.114 GM3 ⊕ A2 ⊕ Z1	√	1	1	×	-	-
N99.9.115 GM3 ⊕ A2 ⊕ Z2	√	1	1	×	-	-
N99.9.116 GM3 ⊕ A2 ⊕ Z3	√	1	1	×	-	-
N99.9.117 GM3 ⊕ A2 ⊕ Z4	√	1	1	×	-	-
N99.9.118 GM3 ⊕ M1 ⊕ M1	√	1	1	×	-	-
N99.9.119 GM3 ⊕ M1 ⊕ M3	√	1	1	×	-	-
N99.9.120 GM3 ⊕ M1 ⊕ M2	√	1	1	×	-	-
N99.9.121 GM3 ⊕ M1 ⊕ M4	√	1	1	×	-	-
N99.9.122 GM3 ⊕ M1 ⊕ Z1	√	1	1	×	-	-
N99.9.123 GM3 ⊕ M1 ⊕ Z2	√	1	1	×	-	-
N99.9.124 GM3 ⊕ M1 ⊕ Z3	√	1	1	×	-	-
N99.9.125 GM3 ⊕ M1 ⊕ Z4	√	1	1	×	-	-
N99.9.126 GM3 ⊕ M2 ⊕ M2	√	1	1	×	-	-
N99.9.127 GM3 ⊕ M2 ⊕ M4	√	1	1	×	-	-
N99.9.128 GM3 ⊕ M2 ⊕ Z1	√	1	1	×	-	-
N99.9.129 GM3 ⊕ M2 ⊕ Z2	√	1	1	×	-	-
N99.9.130 GM3 ⊕ M2 ⊕ Z3	√	1	1	×	-	-
N99.9.131 GM3 ⊕ M2 ⊕ Z4	√	1	1	×	-	-
N99.9.132 GM3 ⊕ Z1 ⊕ Z1	√	1	1	√	$\bar{4}2m$	B2
N99.9.133 GM3 ⊕ Z1 ⊕ Z2	√	1	1	×	-	-
N99.9.134 GM3 ⊕ Z1 ⊕ Z3	√	1	1	×	-	-
N99.9.135 GM3 ⊕ Z1 ⊕ Z4	√	1	1	×	-	-
N99.9.136 GM3 ⊕ Z2 ⊕ Z2	√	1	1	√	$\bar{4}2m$	B2
N99.9.137 GM3 ⊕ Z2 ⊕ Z3	√	1	1	×	-	-
N99.9.138 GM3 ⊕ Z2 ⊕ Z4	√	1	1	×	-	-
N99.9.139 GM3 ⊕ Z3 ⊕ Z3	√	1	1	√	$\bar{4}2m$	B2
N99.9.140 GM3 ⊕ Z3 ⊕ Z4	√	1	1	×	-	-
N99.9.141 GM3 ⊕ Z4 ⊕ Z4	√	1	1	√	$\bar{4}2m$	B2
N99.9.142 GM4 ⊕ GM4 ⊕ GM4	√	3	3	√	422	A2 ⊕ A2 ⊕ A2
N99.9.143 GM4 ⊕ GM4 ⊕ A1	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
N99.9.144 GM4 ⊕ GM4 ⊕ A2	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
N99.9.145 GM4 ⊕ GM4 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
N99.9.146 GM4 ⊕ GM4 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$

Non-coplanar SSGs with parent space group $P4mm$ (No. 99) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N99.9.147 GM4 ⊕ GM4 ⊕ Z1	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
N99.9.148 GM4 ⊕ GM4 ⊕ Z2	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
N99.9.149 GM4 ⊕ GM4 ⊕ Z3	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
N99.9.150 GM4 ⊕ GM4 ⊕ Z4	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
N99.9.151 GM4 ⊕ A1 ⊕ A1	√	1	1	×	-	-
N99.9.152 GM4 ⊕ A1 ⊕ A3	√	1	1	×	-	-
N99.9.153 GM4 ⊕ A1 ⊕ A2	√	1	1	×	-	-
N99.9.154 GM4 ⊕ A1 ⊕ A4	√	1	1	×	-	-
N99.9.155 GM4 ⊕ A1 ⊕ M1	√	1	1	×	-	-
N99.9.156 GM4 ⊕ A1 ⊕ M3	√	1	1	×	-	-
N99.9.157 GM4 ⊕ A1 ⊕ M2	√	1	1	×	-	-
N99.9.158 GM4 ⊕ A1 ⊕ M4	√	1	1	×	-	-
N99.9.159 GM4 ⊕ A1 ⊕ Z1	√	1	1	×	-	-
N99.9.160 GM4 ⊕ A1 ⊕ Z2	√	1	1	×	-	-
N99.9.161 GM4 ⊕ A1 ⊕ Z3	√	1	1	×	-	-
N99.9.162 GM4 ⊕ A1 ⊕ Z4	√	1	1	×	-	-
N99.9.163 GM4 ⊕ A2 ⊕ A2	√	1	1	×	-	-
N99.9.164 GM4 ⊕ A2 ⊕ A4	√	1	1	×	-	-
N99.9.165 GM4 ⊕ A2 ⊕ M1	√	1	1	×	-	-
N99.9.166 GM4 ⊕ A2 ⊕ M3	√	1	1	×	-	-
N99.9.167 GM4 ⊕ A2 ⊕ M2	√	1	1	×	-	-
N99.9.168 GM4 ⊕ A2 ⊕ M4	√	1	1	×	-	-
N99.9.169 GM4 ⊕ A2 ⊕ Z1	√	1	1	×	-	-
N99.9.170 GM4 ⊕ A2 ⊕ Z2	√	1	1	×	-	-
N99.9.171 GM4 ⊕ A2 ⊕ Z3	√	1	1	×	-	-
N99.9.172 GM4 ⊕ A2 ⊕ Z4	√	1	1	×	-	-
N99.9.173 GM4 ⊕ M1 ⊕ M1	√	1	1	×	-	-
N99.9.174 GM4 ⊕ M1 ⊕ M3	√	1	1	×	-	-
N99.9.175 GM4 ⊕ M1 ⊕ M2	√	1	1	×	-	-
N99.9.176 GM4 ⊕ M1 ⊕ M4	√	1	1	×	-	-
N99.9.177 GM4 ⊕ M1 ⊕ Z1	√	1	1	×	-	-
N99.9.178 GM4 ⊕ M1 ⊕ Z2	√	1	1	×	-	-
N99.9.179 GM4 ⊕ M1 ⊕ Z3	√	1	1	×	-	-
N99.9.180 GM4 ⊕ M1 ⊕ Z4	√	1	1	×	-	-
N99.9.181 GM4 ⊕ M2 ⊕ M2	√	1	1	×	-	-
N99.9.182 GM4 ⊕ M2 ⊕ M4	√	1	1	×	-	-
N99.9.183 GM4 ⊕ M2 ⊕ Z1	√	1	1	×	-	-
N99.9.184 GM4 ⊕ M2 ⊕ Z2	√	1	1	×	-	-
N99.9.185 GM4 ⊕ M2 ⊕ Z3	√	1	1	×	-	-
N99.9.186 GM4 ⊕ M2 ⊕ Z4	√	1	1	×	-	-
N99.9.187 GM4 ⊕ Z1 ⊕ Z1	√	1	1	√	422	A2
N99.9.188 GM4 ⊕ Z1 ⊕ Z2	√	1	1	×	-	-
N99.9.189 GM4 ⊕ Z1 ⊕ Z3	√	1	1	×	-	-
N99.9.190 GM4 ⊕ Z1 ⊕ Z4	√	1	1	×	-	-
N99.9.191 GM4 ⊕ Z2 ⊕ Z2	√	1	1	√	422	A2
N99.9.192 GM4 ⊕ Z2 ⊕ Z3	√	1	1	×	-	-

Non-coplanar SSGs with parent space group $P4mm$ (No. 99) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N99.9.193 GM4 ⊕ Z2 ⊕ Z4	√	1	1	×	-	-
N99.9.194 GM4 ⊕ Z3 ⊕ Z3	√	1	1	√	422	A2
N99.9.195 GM4 ⊕ Z3 ⊕ Z4	√	1	1	×	-	-
N99.9.196 GM4 ⊕ Z4 ⊕ Z4	√	1	1	√	422	A2
N99.9.197 A1 ⊕ A1 ⊕ A1	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N99.9.198 A1 ⊕ A1 ⊕ A3	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{A2_u}$
N99.9.199 A1 ⊕ A1 ⊕ A2	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N99.9.200 A1 ⊕ A1 ⊕ A4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A2_u}$
N99.9.201 A1 ⊕ A3 ⊕ A2	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B2_u}$
N99.9.202 A1 ⊕ A1 ⊕ M1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N99.9.203 A1 ⊕ A1 ⊕ M3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N99.9.204 A1 ⊕ A3 ⊕ M1	√	1	1	×	-	-
N99.9.205 A1 ⊕ A1 ⊕ M2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N99.9.206 A1 ⊕ A1 ⊕ M4	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N99.9.207 A1 ⊕ A3 ⊕ M2	√	1	1	×	-	-
N99.9.208 A1 ⊕ A1 ⊕ Z1	√	1	1	×	-	-
N99.9.209 A1 ⊕ A3 ⊕ Z1	√	1	1	×	-	-
N99.9.210 A1 ⊕ A1 ⊕ Z2	√	1	1	×	-	-
N99.9.211 A1 ⊕ A3 ⊕ Z2	√	1	1	×	-	-
N99.9.212 A1 ⊕ A1 ⊕ Z3	√	1	1	×	-	-
N99.9.213 A1 ⊕ A3 ⊕ Z3	√	1	1	×	-	-
N99.9.214 A1 ⊕ A1 ⊕ Z4	√	1	1	×	-	-
N99.9.215 A1 ⊕ A3 ⊕ Z4	√	1	1	×	-	-
N99.9.216 A1 ⊕ A2 ⊕ A2	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N99.9.217 A1 ⊕ A2 ⊕ A4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B2_u}$
N99.9.218 A1 ⊕ A4 ⊕ A4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A2_u}$
N99.9.219 A1 ⊕ A2 ⊕ M1	√	1	1	×	-	-
N99.9.220 A1 ⊕ A2 ⊕ M3	√	1	1	×	-	-
N99.9.221 A1 ⊕ A4 ⊕ M1	√	1	1	×	-	-
N99.9.222 A1 ⊕ A4 ⊕ M3	√	1	1	×	-	-
N99.9.223 A1 ⊕ A2 ⊕ M2	√	1	1	×	-	-
N99.9.224 A1 ⊕ A2 ⊕ M4	√	1	1	×	-	-
N99.9.225 A1 ⊕ A4 ⊕ M2	√	1	1	×	-	-
N99.9.226 A1 ⊕ A4 ⊕ M4	√	1	1	×	-	-
N99.9.227 A1 ⊕ A2 ⊕ Z1	√	1	1	×	-	-
N99.9.228 A1 ⊕ A4 ⊕ Z1	√	1	1	×	-	-
N99.9.229 A1 ⊕ A2 ⊕ Z2	√	1	1	×	-	-
N99.9.230 A1 ⊕ A4 ⊕ Z2	√	1	1	×	-	-
N99.9.231 A1 ⊕ A2 ⊕ Z3	√	1	1	×	-	-
N99.9.232 A1 ⊕ A4 ⊕ Z3	√	1	1	×	-	-
N99.9.233 A1 ⊕ A2 ⊕ Z4	√	1	1	×	-	-
N99.9.234 A1 ⊕ A4 ⊕ Z4	√	1	1	×	-	-
N99.9.235 A1 ⊕ M1 ⊕ M1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N99.9.236 A1 ⊕ M1 ⊕ M3	√	1	1	×	-	-
N99.9.237 A1 ⊕ M3 ⊕ M3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N99.9.238 A1 ⊕ M1 ⊕ M2	√	1	1	√	$4/mmm$	$\mathrm{B2_u}$

Non-coplanar SSGs with parent space group $P4mm$ (No. 99) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N99.9.239 A1 ⊕ M1 ⊕ M4	√	1	1	×	-	-
N99.9.240 A1 ⊕ M3 ⊕ M2	√	1	1	×	-	-
N99.9.241 A1 ⊕ M3 ⊕ M4	√	1	1	√	$4/mmm$	$\mathrm{B2_u}$
N99.9.242 A1 ⊕ M1 ⊕ Z1	×	-	-	-	-	-
N99.9.243 A1 ⊕ M3 ⊕ Z1	×	-	-	-	-	-
N99.9.244 A1 ⊕ M1 ⊕ Z2	×	-	-	-	-	-
N99.9.245 A1 ⊕ M3 ⊕ Z2	×	-	-	-	-	-
N99.9.246 A1 ⊕ M1 ⊕ Z3	×	-	-	-	-	-
N99.9.247 A1 ⊕ M3 ⊕ Z3	×	-	-	-	-	-
N99.9.248 A1 ⊕ M1 ⊕ Z4	×	-	-	-	-	-
N99.9.249 A1 ⊕ M3 ⊕ Z4	×	-	-	-	-	-
N99.9.250 A1 ⊕ M2 ⊕ M2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N99.9.251 A1 ⊕ M2 ⊕ M4	√	1	1	×	-	-
N99.9.252 A1 ⊕ M4 ⊕ M4	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N99.9.253 A1 ⊕ M2 ⊕ Z1	×	-	-	-	-	-
N99.9.254 A1 ⊕ M4 ⊕ Z1	×	-	-	-	-	-
N99.9.255 A1 ⊕ M2 ⊕ Z2	×	-	-	-	-	-
N99.9.256 A1 ⊕ M4 ⊕ Z2	×	-	-	-	-	-
N99.9.257 A1 ⊕ M2 ⊕ Z3	×	-	-	-	-	-
N99.9.258 A1 ⊕ M4 ⊕ Z3	×	-	-	-	-	-
N99.9.259 A1 ⊕ M2 ⊕ Z4	×	-	-	-	-	-
N99.9.260 A1 ⊕ M4 ⊕ Z4	×	-	-	-	-	-
N99.9.261 A1 ⊕ Z1 ⊕ Z1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N99.9.262 A1 ⊕ Z1 ⊕ Z2	√	1	1	√	$4/mmm$	$\mathrm{B2_u}$
N99.9.263 A1 ⊕ Z1 ⊕ Z3	√	1	1	×	-	-
N99.9.264 A1 ⊕ Z1 ⊕ Z4	√	1	1	×	-	-
N99.9.265 A1 ⊕ Z2 ⊕ Z2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N99.9.266 A1 ⊕ Z2 ⊕ Z3	√	1	1	×	-	-
N99.9.267 A1 ⊕ Z2 ⊕ Z4	√	1	1	×	-	-
N99.9.268 A1 ⊕ Z3 ⊕ Z3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N99.9.269 A1 ⊕ Z3 ⊕ Z4	√	1	1	√	$4/mmm$	$\mathrm{B2_u}$
N99.9.270 A1 ⊕ Z4 ⊕ Z4	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N99.9.271 A2 ⊕ A2 ⊕ A2	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N99.9.272 A2 ⊕ A2 ⊕ A4	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{A2_u}$
N99.9.273 A2 ⊕ A2 ⊕ M1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N99.9.274 A2 ⊕ A2 ⊕ M3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N99.9.275 A2 ⊕ A4 ⊕ M1	√	1	1	×	-	-
N99.9.276 A2 ⊕ A2 ⊕ M2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N99.9.277 A2 ⊕ A2 ⊕ M4	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N99.9.278 A2 ⊕ A4 ⊕ M2	√	1	1	×	-	-
N99.9.279 A2 ⊕ A2 ⊕ Z1	√	1	1	×	-	-
N99.9.280 A2 ⊕ A4 ⊕ Z1	√	1	1	×	-	-
N99.9.281 A2 ⊕ A2 ⊕ Z2	√	1	1	×	-	-
N99.9.282 A2 ⊕ A4 ⊕ Z2	√	1	1	×	-	-
N99.9.283 A2 ⊕ A2 ⊕ Z3	√	1	1	×	-	-
N99.9.284 A2 ⊕ A4 ⊕ Z3	√	1	1	×	-	-

Non-coplanar SSGs with parent space group $P4mm$ (No. 99) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N99.9.285 A2 ⊕ A2 ⊕ Z4	√	1	1	×	-	-
N99.9.286 A2 ⊕ A4 ⊕ Z4	√	1	1	×	-	-
N99.9.287 A2 ⊕ M1 ⊕ M1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N99.9.288 A2 ⊕ M1 ⊕ M3	√	1	1	×	-	-
N99.9.289 A2 ⊕ M3 ⊕ M3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N99.9.290 A2 ⊕ M1 ⊕ M2	√	1	1	√	$4/mmm$	$\mathrm{B2_u}$
N99.9.291 A2 ⊕ M1 ⊕ M4	√	1	1	×	-	-
N99.9.292 A2 ⊕ M3 ⊕ M2	√	1	1	×	-	-
N99.9.293 A2 ⊕ M3 ⊕ M4	√	1	1	√	$4/mmm$	$\mathrm{B2_u}$
N99.9.294 A2 ⊕ M1 ⊕ Z1	×	-	-	-	-	-
N99.9.295 A2 ⊕ M3 ⊕ Z1	×	-	-	-	-	-
N99.9.296 A2 ⊕ M1 ⊕ Z2	×	-	-	-	-	-
N99.9.297 A2 ⊕ M3 ⊕ Z2	×	-	-	-	-	-
N99.9.298 A2 ⊕ M1 ⊕ Z3	×	-	-	-	-	-
N99.9.299 A2 ⊕ M3 ⊕ Z3	×	-	-	-	-	-
N99.9.300 A2 ⊕ M1 ⊕ Z4	×	-	-	-	-	-
N99.9.301 A2 ⊕ M3 ⊕ Z4	×	-	-	-	-	-
N99.9.302 A2 ⊕ M2 ⊕ M2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N99.9.303 A2 ⊕ M2 ⊕ M4	√	1	1	×	-	-
N99.9.304 A2 ⊕ M4 ⊕ M4	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N99.9.305 A2 ⊕ M2 ⊕ Z1	×	-	-	-	-	-
N99.9.306 A2 ⊕ M4 ⊕ Z1	×	-	-	-	-	-
N99.9.307 A2 ⊕ M2 ⊕ Z2	×	-	-	-	-	-
N99.9.308 A2 ⊕ M4 ⊕ Z2	×	-	-	-	-	-
N99.9.309 A2 ⊕ M2 ⊕ Z3	×	-	-	-	-	-
N99.9.310 A2 ⊕ M4 ⊕ Z3	×	-	-	-	-	-
N99.9.311 A2 ⊕ M2 ⊕ Z4	×	-	-	-	-	-
N99.9.312 A2 ⊕ M4 ⊕ Z4	×	-	-	-	-	-
N99.9.313 A2 ⊕ Z1 ⊕ Z1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N99.9.314 A2 ⊕ Z1 ⊕ Z2	√	1	1	√	$4/mmm$	$\mathrm{B2_u}$
N99.9.315 A2 ⊕ Z1 ⊕ Z3	√	1	1	×	-	-
N99.9.316 A2 ⊕ Z1 ⊕ Z4	√	1	1	×	-	-
N99.9.317 A2 ⊕ Z2 ⊕ Z2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N99.9.318 A2 ⊕ Z2 ⊕ Z3	√	1	1	×	-	-
N99.9.319 A2 ⊕ Z2 ⊕ Z4	√	1	1	×	-	-
N99.9.320 A2 ⊕ Z3 ⊕ Z3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N99.9.321 A2 ⊕ Z3 ⊕ Z4	√	1	1	√	$4/mmm$	$\mathrm{B2_u}$
N99.9.322 A2 ⊕ Z4 ⊕ Z4	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N99.9.323 M1 ⊕ M1 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N99.9.324 M1 ⊕ M1 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{A2_u}$
N99.9.325 M1 ⊕ M1 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N99.9.326 M1 ⊕ M1 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A2_u}$
N99.9.327 M1 ⊕ M3 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B2_u}$
N99.9.328 M1 ⊕ M1 ⊕ Z1	√	1	1	×	-	-
N99.9.329 M1 ⊕ M3 ⊕ Z1	√	1	1	×	-	-
N99.9.330 M1 ⊕ M1 ⊕ Z2	√	1	1	×	-	-

Non-coplanar SSGs with parent space group $P4mm$ (No. 99) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N99.9.331 M1 ⊕ M3 ⊕ Z2	√	1	1	×	-	-
N99.9.332 M1 ⊕ M1 ⊕ Z3	√	1	1	×	-	-
N99.9.333 M1 ⊕ M3 ⊕ Z3	√	1	1	×	-	-
N99.9.334 M1 ⊕ M1 ⊕ Z4	√	1	1	×	-	-
N99.9.335 M1 ⊕ M3 ⊕ Z4	√	1	1	×	-	-
N99.9.336 M1 ⊕ M2 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N99.9.337 M1 ⊕ M2 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B2_u}$
N99.9.338 M1 ⊕ M4 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A2_u}$
N99.9.339 M1 ⊕ M2 ⊕ Z1	√	1	1	×	-	-
N99.9.340 M1 ⊕ M4 ⊕ Z1	√	1	1	×	-	-
N99.9.341 M1 ⊕ M2 ⊕ Z2	√	1	1	×	-	-
N99.9.342 M1 ⊕ M4 ⊕ Z2	√	1	1	×	-	-
N99.9.343 M1 ⊕ M2 ⊕ Z3	√	1	1	×	-	-
N99.9.344 M1 ⊕ M4 ⊕ Z3	√	1	1	×	-	-
N99.9.345 M1 ⊕ M2 ⊕ Z4	√	1	1	×	-	-
N99.9.346 M1 ⊕ M4 ⊕ Z4	√	1	1	×	-	-
N99.9.347 M1 ⊕ Z1 ⊕ Z1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N99.9.348 M1 ⊕ Z1 ⊕ Z2	√	1	1	×	-	-
N99.9.349 M1 ⊕ Z1 ⊕ Z3	√	1	1	×	-	-
N99.9.350 M1 ⊕ Z1 ⊕ Z4	√	1	1	×	-	-
N99.9.351 M1 ⊕ Z2 ⊕ Z2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N99.9.352 M1 ⊕ Z2 ⊕ Z3	√	1	1	×	-	-
N99.9.353 M1 ⊕ Z2 ⊕ Z4	√	1	1	×	-	-
N99.9.354 M1 ⊕ Z3 ⊕ Z3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N99.9.355 M1 ⊕ Z3 ⊕ Z4	√	1	1	×	-	-
N99.9.356 M1 ⊕ Z4 ⊕ Z4	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N99.9.357 M2 ⊕ M2 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N99.9.358 M2 ⊕ M2 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{A2_u}$
N99.9.359 M2 ⊕ M2 ⊕ Z1	√	1	1	×	-	-
N99.9.360 M2 ⊕ M4 ⊕ Z1	√	1	1	×	-	-
N99.9.361 M2 ⊕ M2 ⊕ Z2	√	1	1	×	-	-
N99.9.362 M2 ⊕ M4 ⊕ Z2	√	1	1	×	-	-
N99.9.363 M2 ⊕ M2 ⊕ Z3	√	1	1	×	-	-
N99.9.364 M2 ⊕ M4 ⊕ Z3	√	1	1	×	-	-
N99.9.365 M2 ⊕ M2 ⊕ Z4	√	1	1	×	-	-
N99.9.366 M2 ⊕ M4 ⊕ Z4	√	1	1	×	-	-
N99.9.367 M2 ⊕ Z1 ⊕ Z1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N99.9.368 M2 ⊕ Z1 ⊕ Z2	√	1	1	×	-	-
N99.9.369 M2 ⊕ Z1 ⊕ Z3	√	1	1	×	-	-
N99.9.370 M2 ⊕ Z1 ⊕ Z4	√	1	1	×	-	-
N99.9.371 M2 ⊕ Z2 ⊕ Z2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N99.9.372 M2 ⊕ Z2 ⊕ Z3	√	1	1	×	-	-
N99.9.373 M2 ⊕ Z2 ⊕ Z4	√	1	1	×	-	-
N99.9.374 M2 ⊕ Z3 ⊕ Z3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N99.9.375 M2 ⊕ Z3 ⊕ Z4	√	1	1	×	-	-
N99.9.376 M2 ⊕ Z4 ⊕ Z4	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$

Non-coplanar SSGs with parent space group $P4mm$ (No. 99) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N99.9.377 Z1 ⊕ Z1 ⊕ Z1	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N99.9.378 Z1 ⊕ Z1 ⊕ Z2	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N99.9.379 Z1 ⊕ Z1 ⊕ Z3	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{A2_u}$
N99.9.380 Z1 ⊕ Z1 ⊕ Z4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A2_u}$
N99.9.381 Z1 ⊕ Z2 ⊕ Z2	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N99.9.382 Z1 ⊕ Z2 ⊕ Z3	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B2_u}$
N99.9.383 Z1 ⊕ Z2 ⊕ Z4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B2_u}$
N99.9.384 Z1 ⊕ Z3 ⊕ Z3	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{A2_u}$
N99.9.385 Z1 ⊕ Z3 ⊕ Z4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B2_u}$
N99.9.386 Z1 ⊕ Z4 ⊕ Z4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A2_u}$
N99.9.387 Z2 ⊕ Z2 ⊕ Z2	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N99.9.388 Z2 ⊕ Z2 ⊕ Z3	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A2_u}$
N99.9.389 Z2 ⊕ Z2 ⊕ Z4	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{A2_u}$
N99.9.390 Z2 ⊕ Z3 ⊕ Z3	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A2_u}$
N99.9.391 Z2 ⊕ Z3 ⊕ Z4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B2_u}$
N99.9.392 Z2 ⊕ Z4 ⊕ Z4	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{A2_u}$
N99.9.393 Z3 ⊕ Z3 ⊕ Z3	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N99.9.394 Z3 ⊕ Z3 ⊕ Z4	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N99.9.395 Z3 ⊕ Z4 ⊕ Z4	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N99.9.396 Z4 ⊕ Z4 ⊕ Z4	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N99.11.1 GM2 ⊕ LD1LE1	√	1	1	√	$\bar{4}m2$	B1
N99.11.2 GM2 ⊕ LD2LE2	√	1	1	√	$\bar{4}m2$	B1
N99.11.3 GM2 ⊕ LD3LE3	√	1	1	√	$\bar{4}m2$	B1
N99.11.4 GM2 ⊕ LD4LE4	√	1	1	√	$\bar{4}m2$	B1
N99.11.5 GM2 ⊕ V1VA1	√	1	1	√	$\bar{4}m2$	B1
N99.11.6 GM2 ⊕ V2VA2	√	1	1	√	$\bar{4}m2$	B1
N99.11.7 GM3 ⊕ LD1LE1	√	1	1	√	$\bar{4}2m$	B2
N99.11.8 GM3 ⊕ LD2LE2	√	1	1	√	$\bar{4}2m$	B2
N99.11.9 GM3 ⊕ LD3LE3	√	1	1	√	$\bar{4}2m$	B2
N99.11.10 GM3 ⊕ LD4LE4	√	1	1	√	$\bar{4}2m$	B2
N99.11.11 GM3 ⊕ V1VA1	√	1	1	×	-	-
N99.11.12 GM3 ⊕ V2VA2	√	1	1	×	-	-
N99.11.13 GM4 ⊕ LD1LE1	√	1	1	√	422	A2
N99.11.14 GM4 ⊕ LD2LE2	√	1	1	√	422	A2
N99.11.15 GM4 ⊕ LD3LE3	√	1	1	√	422	A2
N99.11.16 GM4 ⊕ LD4LE4	√	1	1	√	422	A2
N99.11.17 GM4 ⊕ V1VA1	√	1	1	×	-	-
N99.11.18 GM4 ⊕ V2VA2	√	1	1	×	-	-
N99.11.19 A1 ⊕ LD1LE1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N99.11.20 A1 ⊕ LD2LE2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N99.11.21 A1 ⊕ LD3LE3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N99.11.22 A1 ⊕ LD4LE4	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N99.11.23 A1 ⊕ V1VA1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N99.11.24 A1 ⊕ V3VA3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N99.11.25 A1 ⊕ V2VA2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N99.11.26 A1 ⊕ V4VA4	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$

Non-coplanar SSGs with parent space group $P4mm$ (No. 99) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N99.11.27 A2 $\oplus$ LD1LE1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N99.11.28 A2 $\oplus$ LD2LE2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N99.11.29 A2 $\oplus$ LD3LE3	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N99.11.30 A2 $\oplus$ LD4LE4	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N99.11.31 A2 $\oplus$ V1VA1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N99.11.32 A2 $\oplus$ V3VA3	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N99.11.33 A2 $\oplus$ V2VA2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N99.11.34 A2 $\oplus$ V4VA4	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N99.11.35 M1 $\oplus$ LD1LE1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N99.11.36 M1 $\oplus$ LD2LE2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N99.11.37 M1 $\oplus$ LD3LE3	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N99.11.38 M1 $\oplus$ LD4LE4	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N99.11.39 M1 $\oplus$ V1VA1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N99.11.40 M1 $\oplus$ V3VA3	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N99.11.41 M1 $\oplus$ V2VA2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N99.11.42 M1 $\oplus$ V4VA4	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N99.11.43 M2 $\oplus$ LD1LE1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N99.11.44 M2 $\oplus$ LD2LE2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N99.11.45 M2 $\oplus$ LD3LE3	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N99.11.46 M2 $\oplus$ LD4LE4	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N99.11.47 M2 $\oplus$ V1VA1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N99.11.48 M2 $\oplus$ V3VA3	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N99.11.49 M2 $\oplus$ V2VA2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N99.11.50 M2 $\oplus$ V4VA4	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N99.11.51 Z1 $\oplus$ LD1LE1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N99.11.52 Z1 $\oplus$ LD2LE2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N99.11.53 Z1 $\oplus$ LD3LE3	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N99.11.54 Z1 $\oplus$ LD4LE4	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N99.11.55 Z1 $\oplus$ V1VA1	$\surd$	1	1	$\times$	-	-
N99.11.56 Z1 $\oplus$ V2VA2	$\surd$	1	1	$\times$	-	-
N99.11.57 Z2 $\oplus$ LD1LE1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N99.11.58 Z2 $\oplus$ LD2LE2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N99.11.59 Z2 $\oplus$ LD3LE3	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N99.11.60 Z2 $\oplus$ LD4LE4	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N99.11.61 Z2 $\oplus$ V1VA1	$\surd$	1	1	$\times$	-	-
N99.11.62 Z2 $\oplus$ V2VA2	$\surd$	1	1	$\times$	-	-
N99.11.63 Z3 $\oplus$ LD1LE1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N99.11.64 Z3 $\oplus$ LD2LE2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N99.11.65 Z3 $\oplus$ LD3LE3	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N99.11.66 Z3 $\oplus$ LD4LE4	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N99.11.67 Z3 $\oplus$ V1VA1	$\surd$	1	1	$\times$	-	-
N99.11.68 Z3 $\oplus$ V2VA2	$\surd$	1	1	$\times$	-	-
N99.11.69 Z4 $\oplus$ LD1LE1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N99.11.70 Z4 $\oplus$ LD2LE2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N99.11.71 Z4 $\oplus$ LD3LE3	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N99.11.72 Z4 $\oplus$ LD4LE4	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$

Non-coplanar SSGs with parent space group $P4mm$ (No. 99) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N99.11.73 Z4 $\oplus$ V1VA1	$\surd$	1	1	$\times$	-	-
N99.11.74 Z4 $\oplus$ V2VA2	$\surd$	1	1	$\times$	-	-
N99.12.1 GM2 $\oplus$ GM5	$\surd$	3	3	$\surd$	$\bar{4}2m$	B1 $\oplus$ E
N99.12.2 GM2 $\oplus$ A5	$\surd$	1	1	$\times$	-	-
N99.12.3 GM2 $\oplus$ M5	$\surd$	1	1	$\surd$	$\bar{4}2m$	B1
N99.12.4 GM2 $\oplus$ Z5	$\surd$	1	1	$\times$	-	-
N99.12.5 GM3 $\oplus$ GM5	$\surd$	3	3	$\surd$	$\bar{4}m2$	A2 $\oplus$ E
N99.12.6 GM3 $\oplus$ A5	$\surd$	1	1	$\times$	-	-
N99.12.7 GM3 $\oplus$ M5	$\surd$	1	1	$\times$	-	-
N99.12.8 GM3 $\oplus$ Z5	$\surd$	1	1	$\times$	-	-
N99.12.9 GM4 $\oplus$ GM5	$\surd$	3	3	$\surd$	$4mm$	A2 $\oplus$ E
N99.12.10 GM4 $\oplus$ A5	$\surd$	1	1	$\times$	-	-
N99.12.11 GM4 $\oplus$ M5	$\surd$	1	1	$\times$	-	-
N99.12.12 GM4 $\oplus$ Z5	$\surd$	1	1	$\times$	-	-
N99.12.13 A1 $\oplus$ GM5	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{E_g}$
N99.12.14 A1 $\oplus$ A5	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{E_u}$
N99.12.15 A1 $\oplus$ M5	$\surd$	1	1	$\times$	-	-
N99.12.16 A1 $\oplus$ Z5	$\surd$	1	1	$\times$	-	-
N99.12.17 A2 $\oplus$ GM5	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{E_g}$
N99.12.18 A2 $\oplus$ A5	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{E_u}$
N99.12.19 A2 $\oplus$ M5	$\surd$	1	1	$\times$	-	-
N99.12.20 A2 $\oplus$ Z5	$\surd$	1	1	$\times$	-	-
N99.12.21 M1 $\oplus$ GM5	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{E_g}$
N99.12.22 M1 $\oplus$ A5	$\surd$	1	1	$\times$	-	-
N99.12.23 M1 $\oplus$ M5	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{E_u}$
N99.12.24 M1 $\oplus$ Z5	$\surd$	1	1	$\times$	-	-
N99.12.25 M2 $\oplus$ GM5	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{E_g}$
N99.12.26 M2 $\oplus$ A5	$\surd$	1	1	$\times$	-	-
N99.12.27 M2 $\oplus$ M5	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{E_u}$
N99.12.28 M2 $\oplus$ Z5	$\surd$	1	1	$\times$	-	-
N99.12.29 Z1 $\oplus$ GM5	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{E_g}$
N99.12.30 Z1 $\oplus$ A5	$\surd$	1	1	$\times$	-	-
N99.12.31 Z1 $\oplus$ M5	$\surd$	1	1	$\times$	-	-
N99.12.32 Z1 $\oplus$ Z5	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{E_u}$
N99.12.33 Z2 $\oplus$ GM5	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{E_g}$
N99.12.34 Z2 $\oplus$ A5	$\surd$	1	1	$\times$	-	-
N99.12.35 Z2 $\oplus$ M5	$\surd$	1	1	$\times$	-	-
N99.12.36 Z2 $\oplus$ Z5	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{E_u}$
N99.12.37 Z3 $\oplus$ GM5	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{E_g}$
N99.12.38 Z3 $\oplus$ A5	$\surd$	1	1	$\times$	-	-
N99.12.39 Z3 $\oplus$ M5	$\surd$	1	1	$\times$	-	-
N99.12.40 Z3 $\oplus$ Z5	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{E_u}$
N99.12.41 Z4 $\oplus$ GM5	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{E_g}$
N99.12.42 Z4 $\oplus$ A5	$\surd$	1	1	$\times$	-	-
N99.12.43 Z4 $\oplus$ M5	$\surd$	1	1	$\times$	-	-
N99.12.44 Z4 $\oplus$ Z5	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{E_u}$

Non-coplanar SSGs with parent space group $P4mm$ (No. 99) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N99.13.1 GM2 $\oplus$ R1	$\surd$	1	1	$\times$	-	-
N99.13.2 GM2 $\oplus$ R2	$\surd$	1	1	$\times$	-	-
N99.13.3 GM2 $\oplus$ X1	$\surd$	1	1	$\times$	-	-
N99.13.4 GM2 $\oplus$ X2	$\surd$	1	1	$\times$	-	-
N99.13.5 GM3 $\oplus$ R1	$\surd$	1	1	$\times$	-	-
N99.13.6 GM3 $\oplus$ R2	$\surd$	1	1	$\times$	-	-
N99.13.7 GM3 $\oplus$ X1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_g}$
N99.13.8 GM3 $\oplus$ X2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_g}$
N99.13.9 GM4 $\oplus$ R1	$\surd$	1	1	$\times$	-	-
N99.13.10 GM4 $\oplus$ R2	$\surd$	1	1	$\times$	-	-
N99.13.11 GM4 $\oplus$ X1	$\surd$	1	1	$\times$	-	-
N99.13.12 GM4 $\oplus$ X2	$\surd$	1	1	$\times$	-	-
N99.13.13 A1 $\oplus$ R1	$\times$	-	-	-	-	-
N99.13.14 A1 $\oplus$ R3	$\times$	-	-	-	-	-
N99.13.15 A1 $\oplus$ R2	$\times$	-	-	-	-	-
N99.13.16 A1 $\oplus$ R4	$\times$	-	-	-	-	-
N99.13.17 A1 $\oplus$ X1	$\times$	-	-	-	-	-
N99.13.18 A1 $\oplus$ X3	$\times$	-	-	-	-	-
N99.13.19 A1 $\oplus$ X2	$\times$	-	-	-	-	-
N99.13.20 A1 $\oplus$ X4	$\times$	-	-	-	-	-
N99.13.21 A2 $\oplus$ R1	$\times$	-	-	-	-	-
N99.13.22 A2 $\oplus$ R3	$\times$	-	-	-	-	-
N99.13.23 A2 $\oplus$ R2	$\times$	-	-	-	-	-
N99.13.24 A2 $\oplus$ R4	$\times$	-	-	-	-	-
N99.13.25 A2 $\oplus$ X1	$\times$	-	-	-	-	-
N99.13.26 A2 $\oplus$ X3	$\times$	-	-	-	-	-
N99.13.27 A2 $\oplus$ X2	$\times$	-	-	-	-	-
N99.13.28 A2 $\oplus$ X4	$\times$	-	-	-	-	-
N99.13.29 M1 $\oplus$ R1	$\times$	-	-	-	-	-
N99.13.30 M1 $\oplus$ R3	$\times$	-	-	-	-	-
N99.13.31 M1 $\oplus$ R2	$\times$	-	-	-	-	-
N99.13.32 M1 $\oplus$ R4	$\times$	-	-	-	-	-
N99.13.33 M1 $\oplus$ X1	$\times$	-	-	-	-	-
N99.13.34 M1 $\oplus$ X3	$\times$	-	-	-	-	-
N99.13.35 M1 $\oplus$ X2	$\times$	-	-	-	-	-
N99.13.36 M1 $\oplus$ X4	$\times$	-	-	-	-	-
N99.13.37 M2 $\oplus$ R1	$\times$	-	-	-	-	-
N99.13.38 M2 $\oplus$ R3	$\times$	-	-	-	-	-
N99.13.39 M2 $\oplus$ R2	$\times$	-	-	-	-	-
N99.13.40 M2 $\oplus$ R4	$\times$	-	-	-	-	-
N99.13.41 M2 $\oplus$ X1	$\times$	-	-	-	-	-
N99.13.42 M2 $\oplus$ X3	$\times$	-	-	-	-	-
N99.13.43 M2 $\oplus$ X2	$\times$	-	-	-	-	-
N99.13.44 M2 $\oplus$ X4	$\times$	-	-	-	-	-
N99.13.45 Z1 $\oplus$ R1	$\times$	-	-	-	-	-
N99.13.46 Z1 $\oplus$ R2	$\times$	-	-	-	-	-

Non-coplanar SSGs with parent space group $P4mm$ (No. 99) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N99.13.47 Z1 $\oplus$ X1	$\times$	-	-	-	-	-
N99.13.48 Z1 $\oplus$ X2	$\times$	-	-	-	-	-
N99.13.49 Z2 $\oplus$ R1	$\times$	-	-	-	-	-
N99.13.50 Z2 $\oplus$ R2	$\times$	-	-	-	-	-
N99.13.51 Z2 $\oplus$ X1	$\times$	-	-	-	-	-
N99.13.52 Z2 $\oplus$ X2	$\times$	-	-	-	-	-
N99.13.53 Z3 $\oplus$ R1	$\times$	-	-	-	-	-
N99.13.54 Z3 $\oplus$ R2	$\times$	-	-	-	-	-
N99.13.55 Z3 $\oplus$ X1	$\times$	-	-	-	-	-
N99.13.56 Z3 $\oplus$ X2	$\times$	-	-	-	-	-
N99.13.57 Z4 $\oplus$ R1	$\times$	-	-	-	-	-
N99.13.58 Z4 $\oplus$ R2	$\times$	-	-	-	-	-
N99.13.59 Z4 $\oplus$ X1	$\times$	-	-	-	-	-
N99.13.60 Z4 $\oplus$ X2	$\times$	-	-	-	-	-

TABLE S298: Collinear SSGs with parent space group $P4bm$ (No. 100).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L100.1.1 GM1	1	$4/mmm$	$\mathrm{A1_g}$
L100.2.1 GM2	1	$4/mmm$	$\mathrm{B1_g}$
L100.2.2 GM3	1	$4/mmm$	$\mathrm{B2_g}$
L100.2.3 GM4	1	$4/mmm$	$\mathrm{A2_g}$
L100.2.4 Z1	0	-	-
L100.2.5 Z2	0	-	-
L100.2.6 Z3	0	-	-
L100.2.7 Z4	0	-	-

TABLE S299: Coplanar SSGs with parent space group $P4bm$ (No. 100).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P100.1.1 GM1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A2_u}$
P100.2.1 GM2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B2_u}$
P100.2.2 GM3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_g}$
P100.2.3 GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{A2_g}$
P100.2.4 Z1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P100.2.5 Z2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P100.2.6 Z3	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P100.2.7 Z4	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P100.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{A2_u}$
P100.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B2_g}$
P100.3.3 GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{A2_g}$
P100.3.4 GM2 $\oplus$ Z1	$\surd$	1	1	$\times$	-	-
P100.3.5 GM2 $\oplus$ Z2	$\surd$	1	1	$\times$	-	-
P100.3.6 GM2 $\oplus$ Z3	$\surd$	1	1	$\times$	-	-
P100.3.7 GM2 $\oplus$ Z4	$\surd$	1	1	$\times$	-	-

Coplanar SSGs with parent space group $P4bm$ (No. 100) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P100.3.8 GM3 ⊕ GM3	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
P100.3.9 GM3 ⊕ GM4	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
P100.3.10 GM3 ⊕ Z1	√	1	1	×	-	-
P100.3.11 GM3 ⊕ Z2	√	1	1	×	-	-
P100.3.12 GM3 ⊕ Z3	√	1	1	×	-	-
P100.3.13 GM3 ⊕ Z4	√	1	1	×	-	-
P100.3.14 GM4 ⊕ GM4	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
P100.3.15 GM4 ⊕ Z1	√	1	1	×	-	-
P100.3.16 GM4 ⊕ Z2	√	1	1	×	-	-
P100.3.17 GM4 ⊕ Z3	√	1	1	×	-	-
P100.3.18 GM4 ⊕ Z4	√	1	1	×	-	-
P100.3.19 Z1 ⊕ Z1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
P100.3.20 Z1 ⊕ Z2	√	1	1	×	-	-
P100.3.21 Z1 ⊕ Z3	√	1	1	×	-	-
P100.3.22 Z1 ⊕ Z4	√	1	1	×	-	-
P100.3.23 Z2 ⊕ Z2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
P100.3.24 Z2 ⊕ Z3	√	1	1	×	-	-
P100.3.25 Z2 ⊕ Z4	√	1	1	×	-	-
P100.3.26 Z3 ⊕ Z3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
P100.3.27 Z3 ⊕ Z4	√	1	1	×	-	-
P100.3.28 Z4 ⊕ Z4	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
P100.4.1 M1M3	√	1	1	×	-	-
P100.4.2 M2M4	√	1	1	×	-	-
P100.4.3 A1A3	√	1	1	×	-	-
P100.4.4 A2A4	√	1	1	×	-	-
P100.5.1 LD1LE1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
P100.5.2 LD2LE2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
P100.5.3 LD3LE3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
P100.5.4 LD4LE4	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
P100.5.5 V1VA1	√	1	1	×	-	-
P100.5.6 V2VA2	√	1	1	×	-	-
P100.6.1 GM5	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{E_g}$
P100.6.2 A5	√	1	1	×	-	-
P100.6.3 M5	√	1	1	×	-	-
P100.6.4 Z5	√	1	1	×	-	-

TABLE S300: Non-coplanar SSGs with parent space group $P4bm$ (No. 100).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N100.1.1 GM1	√	3	3	√	$4mm$	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{A1}$
N100.2.1 GM2	√	3	3	√	$\bar{4}m2$	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{B1}$
N100.2.2 GM3	√	3	3	√	$\bar{4}2m$	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{B2}$
N100.2.3 GM4	√	3	3	√	422	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{A2}$
N100.2.4 Z1	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A2_u}$
N100.2.5 Z2	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A2_u}$
N100.2.6 Z3	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A2_u}$

Non-coplanar SSGs with parent space group $P4bm$ (No. 100) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N100.2.7 Z4	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A2_u}$
N100.3.1 GM2 ⊕ GM2	√	3	3	√	$4mm$	A1 ⊕ B1 ⊕ B1
N100.3.2 GM2 ⊕ GM3	√	3	3	√	422	A1 ⊕ B1 ⊕ B2
N100.3.3 GM2 ⊕ GM4	√	3	3	√	$\bar{4}2m$	A1 ⊕ B1 ⊕ A2
N100.3.4 GM2 ⊕ Z1	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B2_u}$
N100.3.5 GM2 ⊕ Z2	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B2_u}$
N100.3.6 GM2 ⊕ Z3	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B2_u}$
N100.3.7 GM2 ⊕ Z4	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B2_u}$
N100.3.8 GM3 ⊕ GM3	√	3	3	√	$4mm$	A1 ⊕ B2 ⊕ B2
N100.3.9 GM3 ⊕ GM4	√	3	3	√	$\bar{4}m2$	A1 ⊕ B2 ⊕ A2
N100.3.10 GM3 ⊕ Z1	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_g}$
N100.3.11 GM3 ⊕ Z2	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_g}$
N100.3.12 GM3 ⊕ Z3	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_g}$
N100.3.13 GM3 ⊕ Z4	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_g}$
N100.3.14 GM4 ⊕ GM4	√	3	3	√	$4mm$	A1 ⊕ A2 ⊕ A2
N100.3.15 GM4 ⊕ Z1	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{A2_g}$
N100.3.16 GM4 ⊕ Z2	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{A2_g}$
N100.3.17 GM4 ⊕ Z3	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{A2_g}$
N100.3.18 GM4 ⊕ Z4	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{A2_g}$
N100.3.19 Z1 ⊕ Z1	√	1	1	√	$4mm$	A1
N100.3.20 Z1 ⊕ Z2	√	1	1	√	$\bar{4}m2$	A1
N100.3.21 Z1 ⊕ Z3	√	1	1	√	$\bar{4}2m$	A1
N100.3.22 Z1 ⊕ Z4	√	1	1	√	422	A1
N100.3.23 Z2 ⊕ Z2	√	1	1	√	$4mm$	A1
N100.3.24 Z2 ⊕ Z3	√	1	1	√	422	A1
N100.3.25 Z2 ⊕ Z4	√	1	1	√	$\bar{4}2m$	A1
N100.3.26 Z3 ⊕ Z3	√	1	1	√	$4mm$	A1
N100.3.27 Z3 ⊕ Z4	√	1	1	√	$\bar{4}m2$	A1
N100.3.28 Z4 ⊕ Z4	√	1	1	√	$4mm$	A1
N100.4.1 M1M3	√	1	1	√	$4mm$	A1
N100.4.2 M2M4	√	1	1	√	$4mm$	A1
N100.4.3 A1A3	√	1	1	√	$4mm$	A1
N100.4.4 A2A4	√	1	1	√	$4mm$	A1
N100.5.1 LD1LE1	√	1	1	√	$4mm$	A1
N100.5.2 LD2LE2	√	1	1	√	$4mm$	A1
N100.5.3 LD3LE3	√	1	1	√	$4mm$	A1
N100.5.4 LD4LE4	√	1	1	√	$4mm$	A1
N100.5.5 V1VA1	√	1	1	√	$4mm$	A1
N100.5.6 V2VA2	√	1	1	√	$4mm$	A1
N100.6.1 GM5	√	3	3	√	422	A1 ⊕ E
N100.6.2 A5	√	1	1	√	$\bar{4}m2$	A1
N100.6.3 M5	√	1	1	√	$\bar{4}m2$	A1
N100.6.4 Z5	√	1	1	√	422	A1
N100.9.1 GM2 ⊕ GM2 ⊕ GM2	√	3	3	√	$\bar{4}m2$	B1 ⊕ B1 ⊕ B1
N100.9.2 GM2 ⊕ GM2 ⊕ GM3	√	3	3	√	$\bar{4}2m$	B1 ⊕ B1 ⊕ B2
N100.9.3 GM2 ⊕ GM2 ⊕ GM4	√	3	3	√	422	B1 ⊕ B1 ⊕ A2

Non-coplanar SSGs with parent space group $P4bm$ (No. 100) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N100.9.4 GM2 ⊕ GM2 ⊕ Z1	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{A2_u}$
N100.9.5 GM2 ⊕ GM2 ⊕ Z2	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{A2_u}$
N100.9.6 GM2 ⊕ GM2 ⊕ Z3	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{A2_u}$
N100.9.7 GM2 ⊕ GM2 ⊕ Z4	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{A2_u}$
N100.9.8 GM2 ⊕ GM3 ⊕ GM3	√	3	3	√	$\bar{4}m2$	B1 ⊕ A2 ⊕ A2
N100.9.9 GM2 ⊕ GM3 ⊕ GM4	√	3	3	√	$4mm$	B1 ⊕ B2 ⊕ A2
N100.9.10 GM2 ⊕ GM3 ⊕ Z1	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B2_g}$
N100.9.11 GM2 ⊕ GM3 ⊕ Z2	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B2_g}$
N100.9.12 GM2 ⊕ GM3 ⊕ Z3	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B2_g}$
N100.9.13 GM2 ⊕ GM3 ⊕ Z4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B2_g}$
N100.9.14 GM2 ⊕ GM4 ⊕ GM4	√	3	3	√	$\bar{4}m2$	B1 ⊕ B2 ⊕ B2
N100.9.15 GM2 ⊕ GM4 ⊕ Z1	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{A2_g}$
N100.9.16 GM2 ⊕ GM4 ⊕ Z2	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{A2_g}$
N100.9.17 GM2 ⊕ GM4 ⊕ Z3	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{A2_g}$
N100.9.18 GM2 ⊕ GM4 ⊕ Z4	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{A2_g}$
N100.9.19 GM2 ⊕ Z1 ⊕ Z1	√	1	1	√	$\bar{4}m2$	B1
N100.9.20 GM2 ⊕ Z1 ⊕ Z2	√	1	1	×	-	-
N100.9.21 GM2 ⊕ Z1 ⊕ Z3	√	1	1	×	-	-
N100.9.22 GM2 ⊕ Z1 ⊕ Z4	√	1	1	×	-	-
N100.9.23 GM2 ⊕ Z2 ⊕ Z2	√	1	1	√	$\bar{4}m2$	B1
N100.9.24 GM2 ⊕ Z2 ⊕ Z3	√	1	1	×	-	-
N100.9.25 GM2 ⊕ Z2 ⊕ Z4	√	1	1	×	-	-
N100.9.26 GM2 ⊕ Z3 ⊕ Z3	√	1	1	√	$\bar{4}m2$	B1
N100.9.27 GM2 ⊕ Z3 ⊕ Z4	√	1	1	×	-	-
N100.9.28 GM2 ⊕ Z4 ⊕ Z4	√	1	1	√	$\bar{4}m2$	B1
N100.9.29 GM3 ⊕ GM3 ⊕ GM3	√	3	3	√	$\bar{4}2m$	B2 ⊕ B2 ⊕ B2
N100.9.30 GM3 ⊕ GM3 ⊕ GM4	√	3	3	√	422	A2 ⊕ B2 ⊕ B2
N100.9.31 GM3 ⊕ GM3 ⊕ Z1	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N100.9.32 GM3 ⊕ GM3 ⊕ Z2	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N100.9.33 GM3 ⊕ GM3 ⊕ Z3	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N100.9.34 GM3 ⊕ GM3 ⊕ Z4	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N100.9.35 GM3 ⊕ GM4 ⊕ GM4	√	3	3	√	$\bar{4}2m$	B2 ⊕ A2 ⊕ A2
N100.9.36 GM3 ⊕ GM4 ⊕ Z1	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N100.9.37 GM3 ⊕ GM4 ⊕ Z2	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N100.9.38 GM3 ⊕ GM4 ⊕ Z3	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N100.9.39 GM3 ⊕ GM4 ⊕ Z4	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N100.9.40 GM3 ⊕ Z1 ⊕ Z1	√	1	1	√	$\bar{4}2m$	B2
N100.9.41 GM3 ⊕ Z1 ⊕ Z2	√	1	1	×	-	-
N100.9.42 GM3 ⊕ Z1 ⊕ Z3	√	1	1	×	-	-
N100.9.43 GM3 ⊕ Z1 ⊕ Z4	√	1	1	×	-	-
N100.9.44 GM3 ⊕ Z2 ⊕ Z2	√	1	1	√	$\bar{4}2m$	B2
N100.9.45 GM3 ⊕ Z2 ⊕ Z3	√	1	1	×	-	-
N100.9.46 GM3 ⊕ Z2 ⊕ Z4	√	1	1	×	-	-
N100.9.47 GM3 ⊕ Z3 ⊕ Z3	√	1	1	√	$\bar{4}2m$	B2
N100.9.48 GM3 ⊕ Z3 ⊕ Z4	√	1	1	×	-	-
N100.9.49 GM3 ⊕ Z4 ⊕ Z4	√	1	1	√	$\bar{4}2m$	B2

Non-coplanar SSGs with parent space group $P4bm$ (No. 100) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N100.9.50 GM4 ⊕ GM4 ⊕ GM4	√	3	3	√	422	A2 ⊕ A2 ⊕ A2
N100.9.51 GM4 ⊕ GM4 ⊕ Z1	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
N100.9.52 GM4 ⊕ GM4 ⊕ Z2	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
N100.9.53 GM4 ⊕ GM4 ⊕ Z3	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
N100.9.54 GM4 ⊕ GM4 ⊕ Z4	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
N100.9.55 GM4 ⊕ Z1 ⊕ Z1	√	1	1	√	422	A2
N100.9.56 GM4 ⊕ Z1 ⊕ Z2	√	1	1	×	-	-
N100.9.57 GM4 ⊕ Z1 ⊕ Z3	√	1	1	×	-	-
N100.9.58 GM4 ⊕ Z1 ⊕ Z4	√	1	1	×	-	-
N100.9.59 GM4 ⊕ Z2 ⊕ Z2	√	1	1	√	422	A2
N100.9.60 GM4 ⊕ Z2 ⊕ Z3	√	1	1	×	-	-
N100.9.61 GM4 ⊕ Z2 ⊕ Z4	√	1	1	×	-	-
N100.9.62 GM4 ⊕ Z3 ⊕ Z3	√	1	1	√	422	A2
N100.9.63 GM4 ⊕ Z3 ⊕ Z4	√	1	1	×	-	-
N100.9.64 GM4 ⊕ Z4 ⊕ Z4	√	1	1	√	422	A2
N100.9.65 Z1 ⊕ Z1 ⊕ Z1	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N100.9.66 Z1 ⊕ Z1 ⊕ Z2	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N100.9.67 Z1 ⊕ Z1 ⊕ Z3	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{A2_u}$
N100.9.68 Z1 ⊕ Z1 ⊕ Z4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A2_u}$
N100.9.69 Z1 ⊕ Z2 ⊕ Z2	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N100.9.70 Z1 ⊕ Z2 ⊕ Z3	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B2_u}$
N100.9.71 Z1 ⊕ Z2 ⊕ Z4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B2_u}$
N100.9.72 Z1 ⊕ Z3 ⊕ Z3	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{A2_u}$
N100.9.73 Z1 ⊕ Z3 ⊕ Z4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B2_u}$
N100.9.74 Z1 ⊕ Z4 ⊕ Z4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A2_u}$
N100.9.75 Z2 ⊕ Z2 ⊕ Z2	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N100.9.76 Z2 ⊕ Z2 ⊕ Z3	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A2_u}$
N100.9.77 Z2 ⊕ Z2 ⊕ Z4	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{A2_u}$
N100.9.78 Z2 ⊕ Z3 ⊕ Z3	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A2_u}$
N100.9.79 Z2 ⊕ Z3 ⊕ Z4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B2_u}$
N100.9.80 Z2 ⊕ Z4 ⊕ Z4	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{A2_u}$
N100.9.81 Z3 ⊕ Z3 ⊕ Z3	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N100.9.82 Z3 ⊕ Z3 ⊕ Z4	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N100.9.83 Z3 ⊕ Z4 ⊕ Z4	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N100.9.84 Z4 ⊕ Z4 ⊕ Z4	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N100.10.1 GM2 ⊕ M1M3	√	1	1	√	$\bar{4}m2$	B1
N100.10.2 GM2 ⊕ M2M4	√	1	1	√	$\bar{4}m2$	B1
N100.10.3 GM2 ⊕ A1A3	√	1	1	√	$\bar{4}m2$	B1
N100.10.4 GM2 ⊕ A2A4	√	1	1	√	$\bar{4}m2$	B1
N100.10.5 GM3 ⊕ M1M3	√	1	1	×	-	-
N100.10.6 GM3 ⊕ M2M4	√	1	1	×	-	-
N100.10.7 GM3 ⊕ A1A3	√	1	1	×	-	-
N100.10.8 GM3 ⊕ A2A4	√	1	1	×	-	-
N100.10.9 GM4 ⊕ M1M3	√	1	1	×	-	-
N100.10.10 GM4 ⊕ M2M4	√	1	1	×	-	-
N100.10.11 GM4 ⊕ A1A3	√	1	1	×	-	-

Non-coplanar SSGs with parent space group $P4bm$ (No. 100) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N100.10.12 GM4 $\oplus$ A2A4	$\surd$	1	1	$\times$	-	-
N100.10.13 Z1 $\oplus$ M1M3	$\surd$	1	1	$\times$	-	-
N100.10.14 Z1 $\oplus$ M2M4	$\surd$	1	1	$\times$	-	-
N100.10.15 Z1 $\oplus$ A1A3	$\surd$	1	1	$\times$	-	-
N100.10.16 Z1 $\oplus$ A2A4	$\surd$	1	1	$\times$	-	-
N100.10.17 Z2 $\oplus$ M1M3	$\surd$	1	1	$\times$	-	-
N100.10.18 Z2 $\oplus$ M2M4	$\surd$	1	1	$\times$	-	-
N100.10.19 Z2 $\oplus$ A1A3	$\surd$	1	1	$\times$	-	-
N100.10.20 Z2 $\oplus$ A2A4	$\surd$	1	1	$\times$	-	-
N100.10.21 Z3 $\oplus$ M1M3	$\surd$	1	1	$\times$	-	-
N100.10.22 Z3 $\oplus$ M2M4	$\surd$	1	1	$\times$	-	-
N100.10.23 Z3 $\oplus$ A1A3	$\surd$	1	1	$\times$	-	-
N100.10.24 Z3 $\oplus$ A2A4	$\surd$	1	1	$\times$	-	-
N100.10.25 Z4 $\oplus$ M1M3	$\surd$	1	1	$\times$	-	-
N100.10.26 Z4 $\oplus$ M2M4	$\surd$	1	1	$\times$	-	-
N100.10.27 Z4 $\oplus$ A1A3	$\surd$	1	1	$\times$	-	-
N100.10.28 Z4 $\oplus$ A2A4	$\surd$	1	1	$\times$	-	-
N100.11.1 GM2 $\oplus$ LD1LE1	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N100.11.2 GM2 $\oplus$ LD2LE2	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N100.11.3 GM2 $\oplus$ LD3LE3	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N100.11.4 GM2 $\oplus$ LD4LE4	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N100.11.5 GM2 $\oplus$ V1VA1	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N100.11.6 GM2 $\oplus$ V2VA2	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N100.11.7 GM3 $\oplus$ LD1LE1	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N100.11.8 GM3 $\oplus$ LD2LE2	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N100.11.9 GM3 $\oplus$ LD3LE3	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N100.11.10 GM3 $\oplus$ LD4LE4	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N100.11.11 GM3 $\oplus$ V1VA1	$\surd$	1	1	$\times$	-	-
N100.11.12 GM3 $\oplus$ V2VA2	$\surd$	1	1	$\times$	-	-
N100.11.13 GM4 $\oplus$ LD1LE1	$\surd$	1	1	$\surd$	422	A2
N100.11.14 GM4 $\oplus$ LD2LE2	$\surd$	1	1	$\surd$	422	A2
N100.11.15 GM4 $\oplus$ LD3LE3	$\surd$	1	1	$\surd$	422	A2
N100.11.16 GM4 $\oplus$ LD4LE4	$\surd$	1	1	$\surd$	422	A2
N100.11.17 GM4 $\oplus$ V1VA1	$\surd$	1	1	$\times$	-	-
N100.11.18 GM4 $\oplus$ V2VA2	$\surd$	1	1	$\times$	-	-
N100.11.19 Z1 $\oplus$ LD1LE1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N100.11.20 Z1 $\oplus$ LD2LE2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N100.11.21 Z1 $\oplus$ LD3LE3	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N100.11.22 Z1 $\oplus$ LD4LE4	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N100.11.23 Z1 $\oplus$ V1VA1	$\surd$	1	1	$\times$	-	-
N100.11.24 Z1 $\oplus$ V2VA2	$\surd$	1	1	$\times$	-	-
N100.11.25 Z2 $\oplus$ LD1LE1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N100.11.26 Z2 $\oplus$ LD2LE2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N100.11.27 Z2 $\oplus$ LD3LE3	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N100.11.28 Z2 $\oplus$ LD4LE4	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N100.11.29 Z2 $\oplus$ V1VA1	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $P4bm$ (No. 100) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N100.11.30 Z2 $\oplus$ V2VA2	$\surd$	1	1	$\times$	-	-
N100.11.31 Z3 $\oplus$ LD1LE1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N100.11.32 Z3 $\oplus$ LD2LE2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N100.11.33 Z3 $\oplus$ LD3LE3	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N100.11.34 Z3 $\oplus$ LD4LE4	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N100.11.35 Z3 $\oplus$ V1VA1	$\surd$	1	1	$\times$	-	-
N100.11.36 Z3 $\oplus$ V2VA2	$\surd$	1	1	$\times$	-	-
N100.11.37 Z4 $\oplus$ LD1LE1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N100.11.38 Z4 $\oplus$ LD2LE2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N100.11.39 Z4 $\oplus$ LD3LE3	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N100.11.40 Z4 $\oplus$ LD4LE4	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N100.11.41 Z4 $\oplus$ V1VA1	$\surd$	1	1	$\times$	-	-
N100.11.42 Z4 $\oplus$ V2VA2	$\surd$	1	1	$\times$	-	-
N100.12.1 GM2 $\oplus$ GM5	$\surd$	3	3	$\surd$	$\bar{4}2m$	$\mathrm{B1} \oplus \mathrm{E}$
N100.12.2 GM2 $\oplus$ A5	$\surd$	1	1	$\times$	-	-
N100.12.3 GM2 $\oplus$ M5	$\surd$	1	1	$\surd$	$4mm$	B1
N100.12.4 GM2 $\oplus$ Z5	$\surd$	1	1	$\times$	-	-
N100.12.5 GM3 $\oplus$ GM5	$\surd$	3	3	$\surd$	$\bar{4}m2$	$\mathrm{A2} \oplus \mathrm{E}$
N100.12.6 GM3 $\oplus$ A5	$\surd$	1	1	$\times$	-	-
N100.12.7 GM3 $\oplus$ M5	$\surd$	1	1	$\times$	-	-
N100.12.8 GM3 $\oplus$ Z5	$\surd$	1	1	$\times$	-	-
N100.12.9 GM4 $\oplus$ GM5	$\surd$	3	3	$\surd$	$4mm$	$\mathrm{A2} \oplus \mathrm{E}$
N100.12.10 GM4 $\oplus$ A5	$\surd$	1	1	$\times$	-	-
N100.12.11 GM4 $\oplus$ M5	$\surd$	1	1	$\times$	-	-
N100.12.12 GM4 $\oplus$ Z5	$\surd$	1	1	$\times$	-	-
N100.12.13 Z1 $\oplus$ GM5	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{E_g}$
N100.12.14 Z1 $\oplus$ A5	$\surd$	1	1	$\times$	-	-
N100.12.15 Z1 $\oplus$ M5	$\surd$	1	1	$\times$	-	-
N100.12.16 Z1 $\oplus$ Z5	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{E_u}$
N100.12.17 Z2 $\oplus$ GM5	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{E_g}$
N100.12.18 Z2 $\oplus$ A5	$\surd$	1	1	$\times$	-	-
N100.12.19 Z2 $\oplus$ M5	$\surd$	1	1	$\times$	-	-
N100.12.20 Z2 $\oplus$ Z5	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{E_u}$
N100.12.21 Z3 $\oplus$ GM5	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{E_g}$
N100.12.22 Z3 $\oplus$ A5	$\surd$	1	1	$\times$	-	-
N100.12.23 Z3 $\oplus$ M5	$\surd$	1	1	$\times$	-	-
N100.12.24 Z3 $\oplus$ Z5	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{E_u}$
N100.12.25 Z4 $\oplus$ GM5	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{E_g}$
N100.12.26 Z4 $\oplus$ A5	$\surd$	1	1	$\times$	-	-
N100.12.27 Z4 $\oplus$ M5	$\surd$	1	1	$\times$	-	-
N100.12.28 Z4 $\oplus$ Z5	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{E_u}$

TABLE S301: Collinear SSGs with parent space group $P4_2cm$ (No. 101).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L101.1.1 GM1	1	$4/mmm$	$\mathrm{A1_g}$

Collinear SSGs with parent space group $P4_2cm$ (No. 101)(continued)

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L101.2.1 GM2	1	$4/mmm$	$\mathrm{B1_g}$
L101.2.2 GM3	1	$4/mmm$	$\mathrm{B2_g}$
L101.2.3 GM4	1	$4/mmm$	$\mathrm{A2_g}$
L101.2.4 M1	0	-	-
L101.2.5 M2	0	-	-

TABLE S302: Coplanar SSGs with parent space group $P4_2cm$ (No. 101).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P101.1.1 GM1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A2_u}$
P101.2.1 GM2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B2_u}$
P101.2.2 GM3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_g}$
P101.2.3 GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{A2_g}$
P101.2.4 M1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P101.2.5 M2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P101.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{A2_u}$
P101.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B2_g}$
P101.3.3 GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{A2_g}$
P101.3.4 GM2 $\oplus$ M1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
P101.3.5 GM2 $\oplus$ M2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
P101.3.6 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
P101.3.7 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
P101.3.8 GM3 $\oplus$ M1	$\surd$	1	1	$\times$	-	-
P101.3.9 GM3 $\oplus$ M2	$\surd$	1	1	$\times$	-	-
P101.3.10 GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
P101.3.11 GM4 $\oplus$ M1	$\surd$	1	1	$\times$	-	-
P101.3.12 GM4 $\oplus$ M2	$\surd$	1	1	$\times$	-	-
P101.3.13 M1 $\oplus$ M1	$\surd$	1	1	$\times$	-	-
P101.3.14 M1 $\oplus$ M3	$\surd$	1	1	$\times$	-	-
P101.3.15 M1 $\oplus$ M2	$\surd$	1	1	$\times$	-	-
P101.3.16 M1 $\oplus$ M4	$\surd$	1	1	$\times$	-	-
P101.3.17 M2 $\oplus$ M2	$\surd$	1	1	$\times$	-	-
P101.3.18 M2 $\oplus$ M4	$\surd$	1	1	$\times$	-	-
P101.4.1 Z1Z3	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P101.4.2 Z2Z4	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P101.4.3 A1A3	$\surd$	1	1	$\times$	-	-
P101.4.4 A2A4	$\surd$	1	1	$\times$	-	-
P101.5.1 LD1LE1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P101.5.2 LD2LE2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P101.5.3 V1VA1	$\surd$	1	1	$\times$	-	-
P101.5.4 V2VA2	$\surd$	1	1	$\times$	-	-
P101.6.1 GM5	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{E_g}$
P101.6.2 A5	$\surd$	1	1	$\times$	-	-
P101.6.3 M5	$\surd$	1	1	$\times$	-	-
P101.6.4 Z5	$\surd$	1	1	$\times$	-	-
P101.7.1 X1	$\times$	-	-	-	-	-

Coplanar SSGs with parent space group $P4_2cm$ (No. 101) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P101.7.2 X2	×	-	-	-	-	-

TABLE S303: Non-coplanar SSGs with parent space group $P4_2cm$ (No. 101).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N101.1.1 GM1	√	3	3	√	$4mm$	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{A1}$
N101.2.1 GM2	√	3	3	√	$\bar{4}m2$	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{B1}$
N101.2.2 GM3	√	3	3	√	$\bar{4}2m$	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{B2}$
N101.2.3 GM4	√	3	3	√	422	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{A2}$
N101.2.4 M1	√	3	3	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A2_u}$
N101.2.5 M2	√	3	3	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A2_u}$
N101.3.1 GM2 ⊕ GM2	√	3	3	√	$4mm$	$\mathrm{A1}\oplus\mathrm{B1}\oplus\mathrm{B1}$
N101.3.2 GM2 ⊕ GM3	√	3	3	√	422	$\mathrm{A1}\oplus\mathrm{B1}\oplus\mathrm{B2}$
N101.3.3 GM2 ⊕ GM4	√	3	3	√	$\bar{4}2m$	$\mathrm{A1}\oplus\mathrm{B1}\oplus\mathrm{A2}$
N101.3.4 GM2 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B2_u}$
N101.3.5 GM2 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B2_u}$
N101.3.6 GM3 ⊕ GM3	√	3	3	√	$4mm$	$\mathrm{A1}\oplus\mathrm{B2}\oplus\mathrm{B2}$
N101.3.7 GM3 ⊕ GM4	√	3	3	√	$\bar{4}m2$	$\mathrm{A1}\oplus\mathrm{B2}\oplus\mathrm{A2}$
N101.3.8 GM3 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}\oplus\mathrm{B2_g}$
N101.3.9 GM3 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}\oplus\mathrm{B2_g}$
N101.3.10 GM4 ⊕ GM4	√	3	3	√	$4mm$	$\mathrm{A1}\oplus\mathrm{A2}\oplus\mathrm{A2}$
N101.3.11 GM4 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{A2_g}$
N101.3.12 GM4 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{A2_g}$
N101.3.13 M1 ⊕ M1	√	1	1	√	$4mm$	A1
N101.3.14 M1 ⊕ M3	√	1	1	√	$\bar{4}2m$	A1
N101.3.15 M1 ⊕ M2	√	1	1	√	$\bar{4}m2$	A1
N101.3.16 M1 ⊕ M4	√	1	1	√	422	A1
N101.3.17 M2 ⊕ M2	√	1	1	√	$4mm$	A1
N101.3.18 M2 ⊕ M4	√	1	1	√	$\bar{4}2m$	A1
N101.4.1 Z1Z3	√	1	1	√	$4mm$	A1
N101.4.2 Z2Z4	√	1	1	√	$4mm$	A1
N101.4.3 A1A3	√	1	1	√	$4mm$	A1
N101.4.4 A2A4	√	1	1	√	$4mm$	A1
N101.5.1 LD1LE1	√	1	1	√	$4mm$	A1
N101.5.2 LD2LE2	√	1	1	√	$4mm$	A1
N101.5.3 V1VA1	√	1	1	√	$4mm$	A1
N101.5.4 V2VA2	√	1	1	√	$4mm$	A1
N101.6.1 GM5	√	3	3	√	422	$\mathrm{A1}\oplus\mathrm{E}$
N101.6.2 A5	√	1	1	√	$\bar{4}m2$	A1
N101.6.3 M5	√	1	1	√	422	A1
N101.6.4 Z5	√	1	1	√	$\bar{4}m2$	A1
N101.7.1 X1	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N101.7.2 X2	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N101.9.1 GM2 ⊕ GM2 ⊕ GM2	√	3	3	√	$\bar{4}m2$	$\mathrm{B1}\oplus\mathrm{B1}\oplus\mathrm{B1}$
N101.9.2 GM2 ⊕ GM2 ⊕ GM3	√	3	3	√	$\bar{4}2m$	$\mathrm{B1}\oplus\mathrm{B1}\oplus\mathrm{B2}$
N101.9.3 GM2 ⊕ GM2 ⊕ GM4	√	3	3	√	422	$\mathrm{B1}\oplus\mathrm{B1}\oplus\mathrm{A2}$

Non-coplanar SSGs with parent space group $P4_2cm$ (No. 101) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N101.9.4 GM2 ⊕ GM2 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{A2_u}$
N101.9.5 GM2 ⊕ GM2 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{A2_u}$
N101.9.6 GM2 ⊕ GM3 ⊕ GM3	√	3	3	√	$\bar{4}m2$	$\mathrm{B1} \oplus \mathrm{A2} \oplus \mathrm{A2}$
N101.9.7 GM2 ⊕ GM3 ⊕ GM4	√	3	3	√	$4mm$	$\mathrm{B1} \oplus \mathrm{B2} \oplus \mathrm{A2}$
N101.9.8 GM2 ⊕ GM3 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B2_g}$
N101.9.9 GM2 ⊕ GM3 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B2_g}$
N101.9.10 GM2 ⊕ GM4 ⊕ GM4	√	3	3	√	$\bar{4}m2$	$\mathrm{B1} \oplus \mathrm{B2} \oplus \mathrm{B2}$
N101.9.11 GM2 ⊕ GM4 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{A2_g}$
N101.9.12 GM2 ⊕ GM4 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{A2_g}$
N101.9.13 GM2 ⊕ M1 ⊕ M1	√	1	1	√	$\bar{4}m2$	B1
N101.9.14 GM2 ⊕ M1 ⊕ M3	√	1	1	√	422	B1
N101.9.15 GM2 ⊕ M1 ⊕ M2	√	1	1	√	$4mm$	B1
N101.9.16 GM2 ⊕ M1 ⊕ M4	√	1	1	√	$\bar{4}2m$	B1
N101.9.17 GM2 ⊕ M2 ⊕ M2	√	1	1	√	$\bar{4}m2$	B1
N101.9.18 GM2 ⊕ M2 ⊕ M4	√	1	1	√	422	B1
N101.9.19 GM3 ⊕ GM3 ⊕ GM3	√	3	3	√	$\bar{4}2m$	$\mathrm{B2} \oplus \mathrm{B2} \oplus \mathrm{B2}$
N101.9.20 GM3 ⊕ GM3 ⊕ GM4	√	3	3	√	422	$\mathrm{A2} \oplus \mathrm{B2} \oplus \mathrm{B2}$
N101.9.21 GM3 ⊕ GM3 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N101.9.22 GM3 ⊕ GM3 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N101.9.23 GM3 ⊕ GM4 ⊕ GM4	√	3	3	√	$\bar{4}2m$	$\mathrm{B2} \oplus \mathrm{A2} \oplus \mathrm{A2}$
N101.9.24 GM3 ⊕ GM4 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N101.9.25 GM3 ⊕ GM4 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N101.9.26 GM3 ⊕ M1 ⊕ M1	√	1	1	×	-	-
N101.9.27 GM3 ⊕ M1 ⊕ M3	√	1	1	×	-	-
N101.9.28 GM3 ⊕ M1 ⊕ M2	√	1	1	×	-	-
N101.9.29 GM3 ⊕ M1 ⊕ M4	√	1	1	×	-	-
N101.9.30 GM3 ⊕ M2 ⊕ M2	√	1	1	×	-	-
N101.9.31 GM3 ⊕ M2 ⊕ M4	√	1	1	×	-	-
N101.9.32 GM4 ⊕ GM4 ⊕ GM4	√	3	3	√	422	$\mathrm{A2} \oplus \mathrm{A2} \oplus \mathrm{A2}$
N101.9.33 GM4 ⊕ GM4 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
N101.9.34 GM4 ⊕ GM4 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
N101.9.35 GM4 ⊕ M1 ⊕ M1	√	1	1	×	-	-
N101.9.36 GM4 ⊕ M1 ⊕ M3	√	1	1	×	-	-
N101.9.37 GM4 ⊕ M1 ⊕ M2	√	1	1	×	-	-
N101.9.38 GM4 ⊕ M1 ⊕ M4	√	1	1	×	-	-
N101.9.39 GM4 ⊕ M2 ⊕ M2	√	1	1	×	-	-
N101.9.40 GM4 ⊕ M2 ⊕ M4	√	1	1	×	-	-
N101.9.41 M1 ⊕ M1 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N101.9.42 M1 ⊕ M1 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{A2_u}$
N101.9.43 M1 ⊕ M1 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N101.9.44 M1 ⊕ M1 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A2_u}$
N101.9.45 M1 ⊕ M3 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B2_u}$
N101.9.46 M1 ⊕ M2 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N101.9.47 M1 ⊕ M2 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B2_u}$
N101.9.48 M1 ⊕ M4 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A2_u}$
N101.9.49 M2 ⊕ M2 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$

Non-coplanar SSGs with parent space group $P4_2cm$ (No. 101) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N101.9.50 M2 ⊕ M2 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{A2_u}$
N101.10.1 GM2 ⊕ Z1Z3	√	1	1	√	$\bar{4}m2$	B1
N101.10.2 GM2 ⊕ Z2Z4	√	1	1	√	$\bar{4}m2$	B1
N101.10.3 GM2 ⊕ A1A3	√	1	1	√	$\bar{4}m2$	B1
N101.10.4 GM2 ⊕ A2A4	√	1	1	√	$\bar{4}m2$	B1
N101.10.5 GM3 ⊕ Z1Z3	√	1	1	√	$\bar{4}2m$	B2
N101.10.6 GM3 ⊕ Z2Z4	√	1	1	√	$\bar{4}2m$	B2
N101.10.7 GM3 ⊕ A1A3	√	1	1	×	-	-
N101.10.8 GM3 ⊕ A2A4	√	1	1	×	-	-
N101.10.9 GM4 ⊕ Z1Z3	√	1	1	√	422	A2
N101.10.10 GM4 ⊕ Z2Z4	√	1	1	√	422	A2
N101.10.11 GM4 ⊕ A1A3	√	1	1	×	-	-
N101.10.12 GM4 ⊕ A2A4	√	1	1	×	-	-
N101.10.13 M1 ⊕ Z1Z3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N101.10.14 M1 ⊕ Z2Z4	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N101.10.15 M1 ⊕ A1A3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N101.10.16 M1 ⊕ A2A4	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N101.10.17 M2 ⊕ Z1Z3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N101.10.18 M2 ⊕ Z2Z4	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N101.10.19 M2 ⊕ A1A3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N101.10.20 M2 ⊕ A2A4	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N101.11.1 GM2 ⊕ LD1LE1	√	1	1	√	$\bar{4}m2$	B1
N101.11.2 GM2 ⊕ LD2LE2	√	1	1	√	$\bar{4}m2$	B1
N101.11.3 GM2 ⊕ V1VA1	√	1	1	√	$\bar{4}m2$	B1
N101.11.4 GM2 ⊕ V2VA2	√	1	1	√	$\bar{4}m2$	B1
N101.11.5 GM3 ⊕ LD1LE1	√	1	1	√	$\bar{4}2m$	B2
N101.11.6 GM3 ⊕ LD2LE2	√	1	1	√	$\bar{4}2m$	B2
N101.11.7 GM3 ⊕ V1VA1	√	1	1	×	-	-
N101.11.8 GM3 ⊕ V2VA2	√	1	1	×	-	-
N101.11.9 GM4 ⊕ LD1LE1	√	1	1	√	422	A2
N101.11.10 GM4 ⊕ LD2LE2	√	1	1	√	422	A2
N101.11.11 GM4 ⊕ V1VA1	√	1	1	×	-	-
N101.11.12 GM4 ⊕ V2VA2	√	1	1	×	-	-
N101.11.13 M1 ⊕ LD1LE1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N101.11.14 M1 ⊕ LD2LE2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N101.11.15 M1 ⊕ V1VA1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N101.11.16 M1 ⊕ V2VA2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N101.11.17 M2 ⊕ LD1LE1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N101.11.18 M2 ⊕ LD2LE2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N101.11.19 M2 ⊕ V1VA1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N101.11.20 M2 ⊕ V2VA2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N101.12.1 GM2 ⊕ GM5	√	3	3	√	$\bar{4}2m$	B1 ⊕ E
N101.12.2 GM2 ⊕ A5	√	1	1	×	-	-
N101.12.3 GM2 ⊕ M5	√	1	1	√	$\bar{4}2m$	B1
N101.12.4 GM2 ⊕ Z5	√	1	1	×	-	-
N101.12.5 GM3 ⊕ GM5	√	3	3	√	$\bar{4}m2$	A2 ⊕ E

Non-coplanar SSGs with parent space group $P4_2cm$ (No. 101) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N101.12.6 GM3 $\oplus$ A5	$\surd$	1	1	$\times$	-	-
N101.12.7 GM3 $\oplus$ M5	$\surd$	1	1	$\times$	-	-
N101.12.8 GM3 $\oplus$ Z5	$\surd$	1	1	$\times$	-	-
N101.12.9 GM4 $\oplus$ GM5	$\surd$	3	3	$\surd$	$4mm$	A2 $\oplus$ E
N101.12.10 GM4 $\oplus$ A5	$\surd$	1	1	$\times$	-	-
N101.12.11 GM4 $\oplus$ M5	$\surd$	1	1	$\times$	-	-
N101.12.12 GM4 $\oplus$ Z5	$\surd$	1	1	$\times$	-	-
N101.12.13 M1 $\oplus$ GM5	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{E_g}$
N101.12.14 M1 $\oplus$ A5	$\surd$	1	1	$\times$	-	-
N101.12.15 M1 $\oplus$ M5	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{E_u}$
N101.12.16 M1 $\oplus$ Z5	$\surd$	1	1	$\times$	-	-
N101.12.17 M2 $\oplus$ GM5	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{E_g}$
N101.12.18 M2 $\oplus$ A5	$\surd$	1	1	$\times$	-	-
N101.12.19 M2 $\oplus$ M5	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{E_u}$
N101.12.20 M2 $\oplus$ Z5	$\surd$	1	1	$\times$	-	-
N101.13.1 GM2 $\oplus$ X1	$\surd$	1	1	$\times$	-	-
N101.13.2 GM2 $\oplus$ X2	$\surd$	1	1	$\times$	-	-
N101.13.3 GM3 $\oplus$ X1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_g}$
N101.13.4 GM3 $\oplus$ X2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_g}$
N101.13.5 GM4 $\oplus$ X1	$\surd$	1	1	$\times$	-	-
N101.13.6 GM4 $\oplus$ X2	$\surd$	1	1	$\times$	-	-
N101.13.7 M1 $\oplus$ X1	$\times$	-	-	-	-	-
N101.13.8 M1 $\oplus$ X3	$\times$	-	-	-	-	-
N101.13.9 M1 $\oplus$ X2	$\times$	-	-	-	-	-
N101.13.10 M1 $\oplus$ X4	$\times$	-	-	-	-	-
N101.13.11 M2 $\oplus$ X1	$\times$	-	-	-	-	-
N101.13.12 M2 $\oplus$ X3	$\times$	-	-	-	-	-
N101.13.13 M2 $\oplus$ X2	$\times$	-	-	-	-	-
N101.13.14 M2 $\oplus$ X4	$\times$	-	-	-	-	-

TABLE S304: Collinear SSGs with parent space group $P4_2cm$ (No. 102).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L102.1.1 GM1	1	$4/mmm$	$\mathrm{A1_g}$
L102.2.1 GM2	1	$4/mmm$	$\mathrm{B1_g}$
L102.2.2 GM3	1	$4/mmm$	$\mathrm{B2_g}$
L102.2.3 GM4	1	$4/mmm$	$\mathrm{A2_g}$
L102.2.4 A1	0	-	-
L102.2.5 A2	0	-	-

TABLE S305: Coplanar SSGs with parent space group $P4_2cm$ (No. 102).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P102.1.1 GM1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A2_u}$

Coplanar SSGs with parent space group $P4_2cm$ (No. 102) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P102.2.1 GM2	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B2_u}$
P102.2.2 GM3	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_g}$
P102.2.3 GM4	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{A2_g}$
P102.2.4 A1	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
P102.2.5 A2	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
P102.3.1 GM2 ⊕ GM2	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{A2_u}$
P102.3.2 GM2 ⊕ GM3	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B2_g}$
P102.3.3 GM2 ⊕ GM4	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{A2_g}$
P102.3.4 GM2 ⊕ A1	√	1	1	×	-	-
P102.3.5 GM2 ⊕ A2	√	1	1	×	-	-
P102.3.6 GM3 ⊕ GM3	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
P102.3.7 GM3 ⊕ GM4	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
P102.3.8 GM3 ⊕ A1	√	1	1	×	-	-
P102.3.9 GM3 ⊕ A2	√	1	1	×	-	-
P102.3.10 GM4 ⊕ GM4	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
P102.3.11 GM4 ⊕ A1	√	1	1	×	-	-
P102.3.12 GM4 ⊕ A2	√	1	1	×	-	-
P102.3.13 A1 ⊕ A1	√	1	1	×	-	-
P102.3.14 A1 ⊕ A3	√	1	1	×	-	-
P102.3.15 A1 ⊕ A2	√	1	1	×	-	-
P102.3.16 A1 ⊕ A4	√	1	1	×	-	-
P102.3.17 A2 ⊕ A2	√	1	1	×	-	-
P102.3.18 A2 ⊕ A4	√	1	1	×	-	-
P102.4.1 Z1Z3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
P102.4.2 Z2Z4	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
P102.4.3 M1M3	√	1	1	×	-	-
P102.4.4 M2M4	√	1	1	×	-	-
P102.5.1 LD1LE1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
P102.5.2 LD2LE2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
P102.5.3 V1VA1	√	1	1	×	-	-
P102.5.4 V2VA2	√	1	1	×	-	-
P102.6.1 GM5	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{E_g}$
P102.6.2 A5	√	1	1	×	-	-
P102.6.3 M5	√	1	1	×	-	-
P102.6.4 Z5	√	1	1	×	-	-

TABLE S306: Non-coplanar SSGs with parent space group $P4_2cm$ (No. 102).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N102.1.1 GM1	√	3	3	√	$4mm$	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{A1}$
N102.2.1 GM2	√	3	3	√	$\bar{4}m2$	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{B1}$
N102.2.2 GM3	√	3	3	√	$\bar{4}2m$	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{B2}$
N102.2.3 GM4	√	3	3	√	422	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{A2}$
N102.2.4 A1	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A2_u}$
N102.2.5 A2	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A2_u}$

Non-coplanar SSGs with parent space group $P4_2cm$ (No. 102) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N102.3.1 GM2 ⊕ GM2	√	3	3	√	$4mm$	A1 ⊕ B1 ⊕ B1
N102.3.2 GM2 ⊕ GM3	√	3	3	√	422	A1 ⊕ B1 ⊕ B2
N102.3.3 GM2 ⊕ GM4	√	3	3	√	$\bar{4}2m$	A1 ⊕ B1 ⊕ A2
N102.3.4 GM2 ⊕ A1	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B2_u}$
N102.3.5 GM2 ⊕ A2	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B2_u}$
N102.3.6 GM3 ⊕ GM3	√	3	3	√	$4mm$	A1 ⊕ B2 ⊕ B2
N102.3.7 GM3 ⊕ GM4	√	3	3	√	$\bar{4}m2$	A1 ⊕ B2 ⊕ A2
N102.3.8 GM3 ⊕ A1	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_g}$
N102.3.9 GM3 ⊕ A2	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_g}$
N102.3.10 GM4 ⊕ GM4	√	3	3	√	$4mm$	A1 ⊕ A2 ⊕ A2
N102.3.11 GM4 ⊕ A1	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{A2_g}$
N102.3.12 GM4 ⊕ A2	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{A2_g}$
N102.3.13 A1 ⊕ A1	√	1	1	√	$4mm$	A1
N102.3.14 A1 ⊕ A3	√	1	1	√	$\bar{4}2m$	A1
N102.3.15 A1 ⊕ A2	√	1	1	√	$\bar{4}m2$	A1
N102.3.16 A1 ⊕ A4	√	1	1	√	422	A1
N102.3.17 A2 ⊕ A2	√	1	1	√	$4mm$	A1
N102.3.18 A2 ⊕ A4	√	1	1	√	$\bar{4}2m$	A1
N102.4.1 Z1Z3	√	1	1	√	$4mm$	A1
N102.4.2 Z2Z4	√	1	1	√	$4mm$	A1
N102.4.3 M1M3	√	1	1	√	$4mm$	A1
N102.4.4 M2M4	√	1	1	√	$4mm$	A1
N102.5.1 LD1LE1	√	1	1	√	$4mm$	A1
N102.5.2 LD2LE2	√	1	1	√	$4mm$	A1
N102.5.3 V1VA1	√	1	1	√	$4mm$	A1
N102.5.4 V2VA2	√	1	1	√	$4mm$	A1
N102.6.1 GM5	√	3	3	√	422	A1 ⊕ E
N102.6.2 A5	√	1	1	√	422	A1
N102.6.3 M5	√	1	1	√	$\bar{4}m2$	A1
N102.6.4 Z5	√	1	1	√	$\bar{4}m2$	A1
N102.9.1 GM2 ⊕ GM2 ⊕ GM2	√	3	3	√	$\bar{4}m2$	B1 ⊕ B1 ⊕ B1
N102.9.2 GM2 ⊕ GM2 ⊕ GM3	√	3	3	√	$\bar{4}2m$	B1 ⊕ B1 ⊕ B2
N102.9.3 GM2 ⊕ GM2 ⊕ GM4	√	3	3	√	422	B1 ⊕ B1 ⊕ A2
N102.9.4 GM2 ⊕ GM2 ⊕ A1	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{A2_u}$
N102.9.5 GM2 ⊕ GM2 ⊕ A2	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{A2_u}$
N102.9.6 GM2 ⊕ GM3 ⊕ GM3	√	3	3	√	$\bar{4}m2$	B1 ⊕ A2 ⊕ A2
N102.9.7 GM2 ⊕ GM3 ⊕ GM4	√	3	3	√	$4mm$	B1 ⊕ B2 ⊕ A2
N102.9.8 GM2 ⊕ GM3 ⊕ A1	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B2_g}$
N102.9.9 GM2 ⊕ GM3 ⊕ A2	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B2_g}$
N102.9.10 GM2 ⊕ GM4 ⊕ GM4	√	3	3	√	$\bar{4}m2$	B1 ⊕ B2 ⊕ B2
N102.9.11 GM2 ⊕ GM4 ⊕ A1	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{A2_g}$
N102.9.12 GM2 ⊕ GM4 ⊕ A2	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{A2_g}$
N102.9.13 GM2 ⊕ A1 ⊕ A1	√	1	1	√	$\bar{4}m2$	B1
N102.9.14 GM2 ⊕ A1 ⊕ A3	√	1	1	×	-	-
N102.9.15 GM2 ⊕ A1 ⊕ A2	√	1	1	×	-	-
N102.9.16 GM2 ⊕ A1 ⊕ A4	√	1	1	×	-	-

Non-coplanar SSGs with parent space group $P4_2cm$ (No. 102) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N102.9.17 GM2 ⊕ A2 ⊕ A2	√	1	1	√	$\bar{4}m2$	B1
N102.9.18 GM2 ⊕ A2 ⊕ A4	√	1	1	×	-	-
N102.9.19 GM3 ⊕ GM3 ⊕ GM3	√	3	3	√	$\bar{4}2m$	B2 ⊕ B2 ⊕ B2
N102.9.20 GM3 ⊕ GM3 ⊕ GM4	√	3	3	√	422	A2 ⊕ B2 ⊕ B2
N102.9.21 GM3 ⊕ GM3 ⊕ A1	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N102.9.22 GM3 ⊕ GM3 ⊕ A2	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N102.9.23 GM3 ⊕ GM4 ⊕ GM4	√	3	3	√	$\bar{4}2m$	B2 ⊕ A2 ⊕ A2
N102.9.24 GM3 ⊕ GM4 ⊕ A1	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N102.9.25 GM3 ⊕ GM4 ⊕ A2	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N102.9.26 GM3 ⊕ A1 ⊕ A1	√	1	1	×	-	-
N102.9.27 GM3 ⊕ A1 ⊕ A3	√	1	1	×	-	-
N102.9.28 GM3 ⊕ A1 ⊕ A2	√	1	1	×	-	-
N102.9.29 GM3 ⊕ A1 ⊕ A4	√	1	1	×	-	-
N102.9.30 GM3 ⊕ A2 ⊕ A2	√	1	1	×	-	-
N102.9.31 GM3 ⊕ A2 ⊕ A4	√	1	1	×	-	-
N102.9.32 GM4 ⊕ GM4 ⊕ GM4	√	3	3	√	422	A2 ⊕ A2 ⊕ A2
N102.9.33 GM4 ⊕ GM4 ⊕ A1	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
N102.9.34 GM4 ⊕ GM4 ⊕ A2	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
N102.9.35 GM4 ⊕ A1 ⊕ A1	√	1	1	×	-	-
N102.9.36 GM4 ⊕ A1 ⊕ A3	√	1	1	×	-	-
N102.9.37 GM4 ⊕ A1 ⊕ A2	√	1	1	×	-	-
N102.9.38 GM4 ⊕ A1 ⊕ A4	√	1	1	×	-	-
N102.9.39 GM4 ⊕ A2 ⊕ A2	√	1	1	×	-	-
N102.9.40 GM4 ⊕ A2 ⊕ A4	√	1	1	×	-	-
N102.9.41 A1 ⊕ A1 ⊕ A1	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N102.9.42 A1 ⊕ A1 ⊕ A3	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{A2_u}$
N102.9.43 A1 ⊕ A1 ⊕ A2	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N102.9.44 A1 ⊕ A1 ⊕ A4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A2_u}$
N102.9.45 A1 ⊕ A3 ⊕ A2	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B2_u}$
N102.9.46 A1 ⊕ A2 ⊕ A2	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N102.9.47 A1 ⊕ A2 ⊕ A4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B2_u}$
N102.9.48 A1 ⊕ A4 ⊕ A4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A2_u}$
N102.9.49 A2 ⊕ A2 ⊕ A2	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N102.9.50 A2 ⊕ A2 ⊕ A4	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{A2_u}$
N102.10.1 GM2 ⊕ Z1Z3	√	1	1	√	$\bar{4}m2$	B1
N102.10.2 GM2 ⊕ Z2Z4	√	1	1	√	$\bar{4}m2$	B1
N102.10.3 GM2 ⊕ M1M3	√	1	1	√	$\bar{4}m2$	B1
N102.10.4 GM2 ⊕ M2M4	√	1	1	√	$\bar{4}m2$	B1
N102.10.5 GM3 ⊕ Z1Z3	√	1	1	√	$\bar{4}2m$	B2
N102.10.6 GM3 ⊕ Z2Z4	√	1	1	√	$\bar{4}2m$	B2
N102.10.7 GM3 ⊕ M1M3	√	1	1	×	-	-
N102.10.8 GM3 ⊕ M2M4	√	1	1	×	-	-
N102.10.9 GM4 ⊕ Z1Z3	√	1	1	√	422	A2
N102.10.10 GM4 ⊕ Z2Z4	√	1	1	√	422	A2
N102.10.11 GM4 ⊕ M1M3	√	1	1	×	-	-
N102.10.12 GM4 ⊕ M2M4	√	1	1	×	-	-

Non-coplanar SSGs with parent space group $P4_2cm$ (No. 102) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N102.10.13 A1 $\oplus$ Z1Z3	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N102.10.14 A1 $\oplus$ Z2Z4	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N102.10.15 A1 $\oplus$ M1M3	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N102.10.16 A1 $\oplus$ M2M4	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N102.10.17 A2 $\oplus$ Z1Z3	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N102.10.18 A2 $\oplus$ Z2Z4	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N102.10.19 A2 $\oplus$ M1M3	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N102.10.20 A2 $\oplus$ M2M4	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N102.11.1 GM2 $\oplus$ LD1LE1	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N102.11.2 GM2 $\oplus$ LD2LE2	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N102.11.3 GM2 $\oplus$ V1VA1	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N102.11.4 GM2 $\oplus$ V2VA2	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N102.11.5 GM3 $\oplus$ LD1LE1	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N102.11.6 GM3 $\oplus$ LD2LE2	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N102.11.7 GM3 $\oplus$ V1VA1	$\surd$	1	1	$\times$	-	-
N102.11.8 GM3 $\oplus$ V2VA2	$\surd$	1	1	$\times$	-	-
N102.11.9 GM4 $\oplus$ LD1LE1	$\surd$	1	1	$\surd$	422	A2
N102.11.10 GM4 $\oplus$ LD2LE2	$\surd$	1	1	$\surd$	422	A2
N102.11.11 GM4 $\oplus$ V1VA1	$\surd$	1	1	$\times$	-	-
N102.11.12 GM4 $\oplus$ V2VA2	$\surd$	1	1	$\times$	-	-
N102.11.13 A1 $\oplus$ LD1LE1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N102.11.14 A1 $\oplus$ LD2LE2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N102.11.15 A1 $\oplus$ V1VA1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N102.11.16 A1 $\oplus$ V2VA2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N102.11.17 A2 $\oplus$ LD1LE1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N102.11.18 A2 $\oplus$ LD2LE2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N102.11.19 A2 $\oplus$ V1VA1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N102.11.20 A2 $\oplus$ V2VA2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N102.12.1 GM2 $\oplus$ GM5	$\surd$	3	3	$\surd$	$\bar{4}2m$	B1 $\oplus$ E
N102.12.2 GM2 $\oplus$ A5	$\surd$	1	1	$\times$	-	-
N102.12.3 GM2 $\oplus$ M5	$\surd$	1	1	$\surd$	$4mm$	B1
N102.12.4 GM2 $\oplus$ Z5	$\surd$	1	1	$\times$	-	-
N102.12.5 GM3 $\oplus$ GM5	$\surd$	3	3	$\surd$	$\bar{4}m2$	A2 $\oplus$ E
N102.12.6 GM3 $\oplus$ A5	$\surd$	1	1	$\times$	-	-
N102.12.7 GM3 $\oplus$ M5	$\surd$	1	1	$\times$	-	-
N102.12.8 GM3 $\oplus$ Z5	$\surd$	1	1	$\times$	-	-
N102.12.9 GM4 $\oplus$ GM5	$\surd$	3	3	$\surd$	$4mm$	A2 $\oplus$ E
N102.12.10 GM4 $\oplus$ A5	$\surd$	1	1	$\times$	-	-
N102.12.11 GM4 $\oplus$ M5	$\surd$	1	1	$\times$	-	-
N102.12.12 GM4 $\oplus$ Z5	$\surd$	1	1	$\times$	-	-
N102.12.13 A1 $\oplus$ GM5	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{E_g}$
N102.12.14 A1 $\oplus$ A5	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{E_u}$
N102.12.15 A1 $\oplus$ M5	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_u}$
N102.12.16 A1 $\oplus$ Z5	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_u}$
N102.12.17 A2 $\oplus$ GM5	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{E_g}$
N102.12.18 A2 $\oplus$ A5	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{E_u}$

Non-coplanar SSGs with parent space group $P4_2cm$ (No. 102) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N102.12.19 A2 $\oplus$ M5	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_u}$
N102.12.20 A2 $\oplus$ Z5	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_u}$

TABLE S307: Collinear SSGs with parent space group $P4cc$ (No. 103).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L103.1.1 GM1	1	$4/mmm$	$\mathrm{A1_g}$
L103.2.1 GM2	1	$4/mmm$	$\mathrm{B1_g}$
L103.2.2 GM3	1	$4/mmm$	$\mathrm{B2_g}$
L103.2.3 GM4	1	$4/mmm$	$\mathrm{A2_g}$
L103.2.4 M1	0	-	-
L103.2.5 M2	0	-	-

TABLE S308: Coplanar SSGs with parent space group $P4cc$ (No. 103).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P103.1.1 GM1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A2_u}$
P103.2.1 GM2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B2_u}$
P103.2.2 GM3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_g}$
P103.2.3 GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{A2_g}$
P103.2.4 M1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P103.2.5 M2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P103.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{A2_u}$
P103.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B2_g}$
P103.3.3 GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{A2_g}$
P103.3.4 GM2 $\oplus$ M1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
P103.3.5 GM2 $\oplus$ M2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
P103.3.6 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
P103.3.7 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
P103.3.8 GM3 $\oplus$ M1	$\surd$	1	1	$\times$	-	-
P103.3.9 GM3 $\oplus$ M2	$\surd$	1	1	$\times$	-	-
P103.3.10 GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
P103.3.11 GM4 $\oplus$ M1	$\surd$	1	1	$\times$	-	-
P103.3.12 GM4 $\oplus$ M2	$\surd$	1	1	$\times$	-	-
P103.3.13 M1 $\oplus$ M1	$\surd$	1	1	$\times$	-	-
P103.3.14 M1 $\oplus$ M3	$\surd$	1	1	$\times$	-	-
P103.3.15 M1 $\oplus$ M2	$\surd$	1	1	$\times$	-	-
P103.3.16 M1 $\oplus$ M4	$\surd$	1	1	$\times$	-	-
P103.3.17 M2 $\oplus$ M2	$\surd$	1	1	$\times$	-	-
P103.3.18 M2 $\oplus$ M4	$\surd$	1	1	$\times$	-	-
P103.4.1 Z1Z4	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P103.4.2 Z2Z3	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P103.4.3 A1A4	$\surd$	1	1	$\times$	-	-
P103.5.1 LD1LE1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P103.5.2 LD2LE2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P103.5.3 V1VA1	$\surd$	1	1	$\times$	-	-

Coplanar SSGs with parent space group $P4cc$ (No. 103) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P103.6.1 GM5	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{E_g}$
P103.6.2 M5	$\surd$	1	1	$\times$	-	-
P103.7.1 X1	$\times$	-	-	-	-	-
P103.7.2 X2	$\times$	-	-	-	-	-

TABLE S309: Non-coplanar SSGs with parent space group $P4cc$ (No. 103).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N103.1.1 GM1	$\surd$	3	3	$\surd$	$4mm$	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{A1}$
N103.2.1 GM2	$\surd$	3	3	$\surd$	$\bar{4}m2$	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{B1}$
N103.2.2 GM3	$\surd$	3	3	$\surd$	$\bar{4}2m$	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{B2}$
N103.2.3 GM4	$\surd$	3	3	$\surd$	422	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{A2}$
N103.2.4 M1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A2_u}$
N103.2.5 M2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A2_u}$
N103.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$4mm$	$\mathrm{A1} \oplus \mathrm{B1} \oplus \mathrm{B1}$
N103.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	422	$\mathrm{A1} \oplus \mathrm{B1} \oplus \mathrm{B2}$
N103.3.3 GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	$\bar{4}2m$	$\mathrm{A1} \oplus \mathrm{B1} \oplus \mathrm{A2}$
N103.3.4 GM2 $\oplus$ M1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B2_u}$
N103.3.5 GM2 $\oplus$ M2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B2_u}$
N103.3.6 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	$4mm$	$\mathrm{A1} \oplus \mathrm{B2} \oplus \mathrm{B2}$
N103.3.7 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	$\bar{4}m2$	$\mathrm{A1} \oplus \mathrm{B2} \oplus \mathrm{A2}$
N103.3.8 GM3 $\oplus$ M1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_g}$
N103.3.9 GM3 $\oplus$ M2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_g}$
N103.3.10 GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4mm$	$\mathrm{A1} \oplus \mathrm{A2} \oplus \mathrm{A2}$
N103.3.11 GM4 $\oplus$ M1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{A2_g}$
N103.3.12 GM4 $\oplus$ M2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{A2_g}$
N103.3.13 M1 $\oplus$ M1	$\surd$	1	1	$\surd$	$4mm$	A1
N103.3.14 M1 $\oplus$ M3	$\surd$	1	1	$\surd$	$\bar{4}2m$	A1
N103.3.15 M1 $\oplus$ M2	$\surd$	1	1	$\surd$	$\bar{4}m2$	A1
N103.3.16 M1 $\oplus$ M4	$\surd$	1	1	$\surd$	422	A1
N103.3.17 M2 $\oplus$ M2	$\surd$	1	1	$\surd$	$4mm$	A1
N103.3.18 M2 $\oplus$ M4	$\surd$	1	1	$\surd$	$\bar{4}2m$	A1
N103.4.1 Z1Z4	$\surd$	1	1	$\surd$	$4mm$	A1
N103.4.2 Z2Z3	$\surd$	1	1	$\surd$	$4mm$	A1
N103.4.3 A1A4	$\surd$	1	1	$\surd$	$4mm$	A1
N103.5.1 LD1LE1	$\surd$	1	1	$\surd$	$4mm$	A1
N103.5.2 LD2LE2	$\surd$	1	1	$\surd$	$4mm$	A1
N103.5.3 V1VA1	$\surd$	1	1	$\surd$	$4mm$	A1
N103.6.1 GM5	$\surd$	3	3	$\surd$	422	$\mathrm{A1} \oplus \mathrm{E}$
N103.6.2 M5	$\surd$	1	1	$\surd$	422	A1
N103.7.1 X1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N103.7.2 X2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N103.9.1 GM2 $\oplus$ GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$\bar{4}m2$	$\mathrm{B1} \oplus \mathrm{B1} \oplus \mathrm{B1}$
N103.9.2 GM2 $\oplus$ GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$\bar{4}2m$	$\mathrm{B1} \oplus \mathrm{B1} \oplus \mathrm{B2}$
N103.9.3 GM2 $\oplus$ GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	422	$\mathrm{B1} \oplus \mathrm{B1} \oplus \mathrm{A2}$
N103.9.4 GM2 $\oplus$ GM2 $\oplus$ M1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{A2_u}$

Non-coplanar SSGs with parent space group $P4cc$ (No. 103) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N103.9.5 GM2 ⊕ GM2 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{A2_u}$
N103.9.6 GM2 ⊕ GM3 ⊕ GM3	√	3	3	√	$\bar{4}m2$	$\mathrm{B1} \oplus \mathrm{A2} \oplus \mathrm{A2}$
N103.9.7 GM2 ⊕ GM3 ⊕ GM4	√	3	3	√	$4mm$	$\mathrm{B1} \oplus \mathrm{B2} \oplus \mathrm{A2}$
N103.9.8 GM2 ⊕ GM3 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B2_g}$
N103.9.9 GM2 ⊕ GM3 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B2_g}$
N103.9.10 GM2 ⊕ GM4 ⊕ GM4	√	3	3	√	$\bar{4}m2$	$\mathrm{B1} \oplus \mathrm{B2} \oplus \mathrm{B2}$
N103.9.11 GM2 ⊕ GM4 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{A2_g}$
N103.9.12 GM2 ⊕ GM4 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{A2_g}$
N103.9.13 GM2 ⊕ M1 ⊕ M1	√	1	1	√	$\bar{4}m2$	B1
N103.9.14 GM2 ⊕ M1 ⊕ M3	√	1	1	√	422	B1
N103.9.15 GM2 ⊕ M1 ⊕ M2	√	1	1	√	$4mm$	B1
N103.9.16 GM2 ⊕ M1 ⊕ M4	√	1	1	√	$\bar{4}2m$	B1
N103.9.17 GM2 ⊕ M2 ⊕ M2	√	1	1	√	$\bar{4}m2$	B1
N103.9.18 GM2 ⊕ M2 ⊕ M4	√	1	1	√	422	B1
N103.9.19 GM3 ⊕ GM3 ⊕ GM3	√	3	3	√	$\bar{4}2m$	$\mathrm{B2} \oplus \mathrm{B2} \oplus \mathrm{B2}$
N103.9.20 GM3 ⊕ GM3 ⊕ GM4	√	3	3	√	422	$\mathrm{A2} \oplus \mathrm{B2} \oplus \mathrm{B2}$
N103.9.21 GM3 ⊕ GM3 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N103.9.22 GM3 ⊕ GM3 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N103.9.23 GM3 ⊕ GM4 ⊕ GM4	√	3	3	√	$\bar{4}2m$	$\mathrm{B2} \oplus \mathrm{A2} \oplus \mathrm{A2}$
N103.9.24 GM3 ⊕ GM4 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N103.9.25 GM3 ⊕ GM4 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N103.9.26 GM3 ⊕ M1 ⊕ M1	√	1	1	×	-	-
N103.9.27 GM3 ⊕ M1 ⊕ M3	√	1	1	×	-	-
N103.9.28 GM3 ⊕ M1 ⊕ M2	√	1	1	×	-	-
N103.9.29 GM3 ⊕ M1 ⊕ M4	√	1	1	×	-	-
N103.9.30 GM3 ⊕ M2 ⊕ M2	√	1	1	×	-	-
N103.9.31 GM3 ⊕ M2 ⊕ M4	√	1	1	×	-	-
N103.9.32 GM4 ⊕ GM4 ⊕ GM4	√	3	3	√	422	$\mathrm{A2} \oplus \mathrm{A2} \oplus \mathrm{A2}$
N103.9.33 GM4 ⊕ GM4 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
N103.9.34 GM4 ⊕ GM4 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
N103.9.35 GM4 ⊕ M1 ⊕ M1	√	1	1	×	-	-
N103.9.36 GM4 ⊕ M1 ⊕ M3	√	1	1	×	-	-
N103.9.37 GM4 ⊕ M1 ⊕ M2	√	1	1	×	-	-
N103.9.38 GM4 ⊕ M1 ⊕ M4	√	1	1	×	-	-
N103.9.39 GM4 ⊕ M2 ⊕ M2	√	1	1	×	-	-
N103.9.40 GM4 ⊕ M2 ⊕ M4	√	1	1	×	-	-
N103.9.41 M1 ⊕ M1 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N103.9.42 M1 ⊕ M1 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{A2_u}$
N103.9.43 M1 ⊕ M1 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N103.9.44 M1 ⊕ M1 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A2_u}$
N103.9.45 M1 ⊕ M3 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B2_u}$
N103.9.46 M1 ⊕ M2 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N103.9.47 M1 ⊕ M2 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B2_u}$
N103.9.48 M1 ⊕ M4 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A2_u}$
N103.9.49 M2 ⊕ M2 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N103.9.50 M2 ⊕ M2 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{A2_u}$

Non-coplanar SSGs with parent space group $P4cc$ (No. 103) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N103.10.1 GM2 ⊕ Z1Z4	√	1	1	√	$\bar{4}m2$	B1
N103.10.2 GM2 ⊕ Z2Z3	√	1	1	√	$\bar{4}m2$	B1
N103.10.3 GM2 ⊕ A1A4	√	1	1	√	$\bar{4}m2$	B1
N103.10.4 GM3 ⊕ Z1Z4	√	1	1	√	$\bar{4}2m$	B2
N103.10.5 GM3 ⊕ Z2Z3	√	1	1	√	$\bar{4}2m$	B2
N103.10.6 GM3 ⊕ A1A4	√	1	1	×	-	-
N103.10.7 GM4 ⊕ Z1Z4	√	1	1	√	422	A2
N103.10.8 GM4 ⊕ Z2Z3	√	1	1	√	422	A2
N103.10.9 GM4 ⊕ A1A4	√	1	1	×	-	-
N103.10.10 M1 ⊕ Z1Z4	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N103.10.11 M1 ⊕ Z2Z3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N103.10.12 M1 ⊕ A1A4	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N103.10.13 M1 ⊕ A2A3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N103.10.14 M2 ⊕ Z1Z4	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N103.10.15 M2 ⊕ Z2Z3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N103.10.16 M2 ⊕ A1A4	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N103.10.17 M2 ⊕ A2A3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N103.11.1 GM2 ⊕ LD1LE1	√	1	1	√	$\bar{4}m2$	B1
N103.11.2 GM2 ⊕ LD2LE2	√	1	1	√	$\bar{4}m2$	B1
N103.11.3 GM2 ⊕ V1VA1	√	1	1	√	$\bar{4}m2$	B1
N103.11.4 GM3 ⊕ LD1LE1	√	1	1	√	$\bar{4}2m$	B2
N103.11.5 GM3 ⊕ LD2LE2	√	1	1	√	$\bar{4}2m$	B2
N103.11.6 GM3 ⊕ V1VA1	√	1	1	×	-	-
N103.11.7 GM4 ⊕ LD1LE1	√	1	1	√	422	A2
N103.11.8 GM4 ⊕ LD2LE2	√	1	1	√	422	A2
N103.11.9 GM4 ⊕ V1VA1	√	1	1	×	-	-
N103.11.10 M1 ⊕ LD1LE1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N103.11.11 M1 ⊕ LD2LE2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N103.11.12 M1 ⊕ V1VA1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N103.11.13 M1 ⊕ V2VA2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N103.11.14 M2 ⊕ LD1LE1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N103.11.15 M2 ⊕ LD2LE2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N103.11.16 M2 ⊕ V1VA1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N103.11.17 M2 ⊕ V2VA2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N103.12.1 GM2 ⊕ GM5	√	3	3	√	$\bar{4}2m$	B1 ⊕ E
N103.12.2 GM2 ⊕ M5	√	1	1	√	$\bar{4}2m$	B1
N103.12.3 GM3 ⊕ GM5	√	3	3	√	$\bar{4}m2$	A2 ⊕ E
N103.12.4 GM3 ⊕ M5	√	1	1	×	-	-
N103.12.5 GM4 ⊕ GM5	√	3	3	√	$4mm$	A2 ⊕ E
N103.12.6 GM4 ⊕ M5	√	1	1	×	-	-
N103.12.7 M1 ⊕ GM5	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{E_g}$
N103.12.8 M1 ⊕ M5	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{E_u}$
N103.12.9 M2 ⊕ GM5	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{E_g}$
N103.12.10 M2 ⊕ M5	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{E_u}$
N103.13.1 GM2 ⊕ X1	√	1	1	×	-	-
N103.13.2 GM2 ⊕ X2	√	1	1	×	-	-

Non-coplanar SSGs with parent space group $P4cc$ (No. 103) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N103.13.3 GM3 $\oplus$ X1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_g}$
N103.13.4 GM3 $\oplus$ X2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_g}$
N103.13.5 GM4 $\oplus$ X1	$\surd$	1	1	$\times$	-	-
N103.13.6 GM4 $\oplus$ X2	$\surd$	1	1	$\times$	-	-
N103.13.7 M1 $\oplus$ X1	$\times$	-	-	-	-	-
N103.13.8 M1 $\oplus$ X3	$\times$	-	-	-	-	-
N103.13.9 M1 $\oplus$ X2	$\times$	-	-	-	-	-
N103.13.10 M1 $\oplus$ X4	$\times$	-	-	-	-	-
N103.13.11 M2 $\oplus$ X1	$\times$	-	-	-	-	-
N103.13.12 M2 $\oplus$ X3	$\times$	-	-	-	-	-
N103.13.13 M2 $\oplus$ X2	$\times$	-	-	-	-	-
N103.13.14 M2 $\oplus$ X4	$\times$	-	-	-	-	-

TABLE S310: Collinear SSGs with parent space group $P4nc$ (No. 104).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L104.1.1 GM1	1	$4/mmm$	$\mathrm{A1_g}$
L104.2.1 GM2	1	$4/mmm$	$\mathrm{B1_g}$
L104.2.2 GM3	1	$4/mmm$	$\mathrm{B2_g}$
L104.2.3 GM4	1	$4/mmm$	$\mathrm{A2_g}$

TABLE S311: Coplanar SSGs with parent space group $P4nc$ (No. 104).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P104.1.1 GM1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A2_u}$
P104.2.1 GM2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B2_u}$
P104.2.2 GM3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_g}$
P104.2.3 GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{A2_g}$
P104.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{A2_u}$
P104.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B2_g}$
P104.3.3 GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{A2_g}$
P104.3.4 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
P104.3.5 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
P104.3.6 GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
P104.4.1 Z1Z4	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P104.4.2 Z2Z3	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P104.4.3 M1M3	$\surd$	1	1	$\times$	-	-
P104.4.4 M2M4	$\surd$	1	1	$\times$	-	-
P104.4.5 A1A2	$\surd$	1	1	$\times$	-	-
P104.5.1 LD1LE1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P104.5.2 LD2LE2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P104.5.3 V1VA1	$\surd$	1	1	$\times$	-	-
P104.6.1 GM5	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{E_g}$
P104.6.2 A5	$\surd$	1	1	$\times$	-	-
P104.6.3 M5	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $P4nc$ (No. 104) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation

TABLE S312: Non-coplanar SSGs with parent space group $P4nc$ (No. 104).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N104.1.1 GM1	$\surd$	3	3	$\surd$	$4mm$	A1 $\oplus$ A1 $\oplus$ A1
N104.2.1 GM2	$\surd$	3	3	$\surd$	$\bar{4}m2$	A1 $\oplus$ A1 $\oplus$ B1
N104.2.2 GM3	$\surd$	3	3	$\surd$	$\bar{4}2m$	A1 $\oplus$ A1 $\oplus$ B2
N104.2.3 GM4	$\surd$	3	3	$\surd$	422	A1 $\oplus$ A1 $\oplus$ A2
N104.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$4mm$	A1 $\oplus$ B1 $\oplus$ B1
N104.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	422	A1 $\oplus$ B1 $\oplus$ B2
N104.3.3 GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	$\bar{4}2m$	A1 $\oplus$ B1 $\oplus$ A2
N104.3.4 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	$4mm$	A1 $\oplus$ B2 $\oplus$ B2
N104.3.5 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	$\bar{4}m2$	A1 $\oplus$ B2 $\oplus$ A2
N104.3.6 GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4mm$	A1 $\oplus$ A2 $\oplus$ A2
N104.4.1 Z1Z4	$\surd$	1	1	$\surd$	$4mm$	A1
N104.4.2 Z2Z3	$\surd$	1	1	$\surd$	$4mm$	A1
N104.4.3 M1M3	$\surd$	1	1	$\surd$	$4mm$	A1
N104.4.4 M2M4	$\surd$	1	1	$\surd$	$4mm$	A1
N104.4.5 A1A2	$\surd$	1	1	$\surd$	$4mm$	A1
N104.5.1 LD1LE1	$\surd$	1	1	$\surd$	$4mm$	A1
N104.5.2 LD2LE2	$\surd$	1	1	$\surd$	$4mm$	A1
N104.5.3 V1VA1	$\surd$	1	1	$\surd$	$4mm$	A1
N104.6.1 GM5	$\surd$	3	3	$\surd$	422	A1 $\oplus$ E
N104.6.2 A5	$\surd$	1	1	$\surd$	$\bar{4}2m$	A1
N104.6.3 M5	$\surd$	1	1	$\surd$	$\bar{4}m2$	A1
N104.9.1 GM2 $\oplus$ GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$\bar{4}m2$	B1 $\oplus$ B1 $\oplus$ B1
N104.9.2 GM2 $\oplus$ GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$\bar{4}2m$	B1 $\oplus$ B1 $\oplus$ B2
N104.9.3 GM2 $\oplus$ GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	422	B1 $\oplus$ B1 $\oplus$ A2
N104.9.4 GM2 $\oplus$ GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	$\bar{4}m2$	B1 $\oplus$ A2 $\oplus$ A2
N104.9.5 GM2 $\oplus$ GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4mm$	B1 $\oplus$ B2 $\oplus$ A2
N104.9.6 GM2 $\oplus$ GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	$\bar{4}m2$	B1 $\oplus$ B2 $\oplus$ B2
N104.9.7 GM3 $\oplus$ GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	$\bar{4}2m$	B2 $\oplus$ B2 $\oplus$ B2
N104.9.8 GM3 $\oplus$ GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	422	A2 $\oplus$ B2 $\oplus$ B2
N104.9.9 GM3 $\oplus$ GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	$\bar{4}2m$	B2 $\oplus$ A2 $\oplus$ A2
N104.9.10 GM4 $\oplus$ GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	422	A2 $\oplus$ A2 $\oplus$ A2
N104.10.1 GM2 $\oplus$ Z1Z4	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N104.10.2 GM2 $\oplus$ Z2Z3	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N104.10.3 GM2 $\oplus$ M1M3	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N104.10.4 GM2 $\oplus$ M2M4	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N104.10.5 GM2 $\oplus$ A1A2	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N104.10.6 GM3 $\oplus$ Z1Z4	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N104.10.7 GM3 $\oplus$ Z2Z3	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N104.10.8 GM3 $\oplus$ M1M3	$\surd$	1	1	$\times$	-	-
N104.10.9 GM3 $\oplus$ M2M4	$\surd$	1	1	$\times$	-	-
N104.10.10 GM3 $\oplus$ A1A2	$\surd$	1	1	$\times$	-	-
N104.10.11 GM4 $\oplus$ Z1Z4	$\surd$	1	1	$\surd$	422	A2

Non-coplanar SSGs with parent space group $P4nc$ (No. 104) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N104.10.12 GM4 $\oplus$ Z2Z3	$\surd$	1	1	$\surd$	422	A2
N104.10.13 GM4 $\oplus$ M1M3	$\surd$	1	1	$\times$	-	-
N104.10.14 GM4 $\oplus$ M2M4	$\surd$	1	1	$\times$	-	-
N104.10.15 GM4 $\oplus$ A1A2	$\surd$	1	1	$\times$	-	-
N104.11.1 GM2 $\oplus$ LD1LE1	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N104.11.2 GM2 $\oplus$ LD2LE2	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N104.11.3 GM2 $\oplus$ V1VA1	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N104.11.4 GM3 $\oplus$ LD1LE1	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N104.11.5 GM3 $\oplus$ LD2LE2	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N104.11.6 GM3 $\oplus$ V1VA1	$\surd$	1	1	$\times$	-	-
N104.11.7 GM4 $\oplus$ LD1LE1	$\surd$	1	1	$\surd$	422	A2
N104.11.8 GM4 $\oplus$ LD2LE2	$\surd$	1	1	$\surd$	422	A2
N104.11.9 GM4 $\oplus$ V1VA1	$\surd$	1	1	$\times$	-	-
N104.12.1 GM2 $\oplus$ GM5	$\surd$	3	3	$\surd$	$\bar{4}2m$	B1 $\oplus$ E
N104.12.2 GM2 $\oplus$ A5	$\surd$	1	1	$\times$	-	-
N104.12.3 GM2 $\oplus$ M5	$\surd$	1	1	$\surd$	$4mm$	B1
N104.12.4 GM3 $\oplus$ GM5	$\surd$	3	3	$\surd$	$\bar{4}m2$	A2 $\oplus$ E
N104.12.5 GM3 $\oplus$ A5	$\surd$	1	1	$\times$	-	-
N104.12.6 GM3 $\oplus$ M5	$\surd$	1	1	$\times$	-	-
N104.12.7 GM4 $\oplus$ GM5	$\surd$	3	3	$\surd$	$4mm$	A2 $\oplus$ E
N104.12.8 GM4 $\oplus$ A5	$\surd$	1	1	$\times$	-	-
N104.12.9 GM4 $\oplus$ M5	$\surd$	1	1	$\times$	-	-

TABLE S313: Collinear SSGs with parent space group $P4_2mc$ (No. 105).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L105.1.1 GM1	1	$4/mmm$	$\mathrm{A1_g}$
L105.2.1 GM2	1	$4/mmm$	$\mathrm{B1_g}$
L105.2.2 GM3	1	$4/mmm$	$\mathrm{B2_g}$
L105.2.3 GM4	1	$4/mmm$	$\mathrm{A2_g}$
L105.2.4 M1	0	-	-
L105.2.5 M2	0	-	-

TABLE S314: Coplanar SSGs with parent space group $P4_2mc$ (No. 105).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P105.1.1 GM1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A2_u}$
P105.2.1 GM2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B2_u}$
P105.2.2 GM3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_g}$
P105.2.3 GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{A2_g}$
P105.2.4 M1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P105.2.5 M2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P105.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{A2_u}$
P105.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B2_g}$
P105.3.3 GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{A2_g}$

Coplanar SSGs with parent space group $P4_2mc$ (No. 105) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P105.3.4 GM2 $\oplus$ M1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
P105.3.5 GM2 $\oplus$ M2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
P105.3.6 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
P105.3.7 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
P105.3.8 GM3 $\oplus$ M1	$\surd$	1	1	$\times$	-	-
P105.3.9 GM3 $\oplus$ M2	$\surd$	1	1	$\times$	-	-
P105.3.10 GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
P105.3.11 GM4 $\oplus$ M1	$\surd$	1	1	$\times$	-	-
P105.3.12 GM4 $\oplus$ M2	$\surd$	1	1	$\times$	-	-
P105.3.13 M1 $\oplus$ M1	$\surd$	1	1	$\times$	-	-
P105.3.14 M1 $\oplus$ M3	$\surd$	1	1	$\times$	-	-
P105.3.15 M1 $\oplus$ M2	$\surd$	1	1	$\times$	-	-
P105.3.16 M1 $\oplus$ M4	$\surd$	1	1	$\times$	-	-
P105.3.17 M2 $\oplus$ M2	$\surd$	1	1	$\times$	-	-
P105.3.18 M2 $\oplus$ M4	$\surd$	1	1	$\times$	-	-
P105.4.1 Z1Z2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P105.4.2 Z3Z4	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P105.4.3 A1A2	$\surd$	1	1	$\times$	-	-
P105.5.1 LD1LE1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P105.5.2 LD3LE3	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P105.5.3 V1VA1	$\surd$	1	1	$\times$	-	-
P105.6.1 GM5	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{E_g}$
P105.6.2 A5	$\surd$	1	1	$\times$	-	-
P105.6.3 M5	$\surd$	1	1	$\times$	-	-
P105.6.4 Z5	$\surd$	1	1	$\times$	-	-
P105.7.1 R1	$\times$	-	-	-	-	-
P105.7.2 R2	$\times$	-	-	-	-	-
P105.7.3 X1	$\times$	-	-	-	-	-
P105.7.4 X2	$\times$	-	-	-	-	-

TABLE S315: Non-coplanar SSGs with parent space group $P4_2mc$ (No. 105).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N105.1.1 GM1	$\surd$	3	3	$\surd$	$4mm$	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{A1}$
N105.2.1 GM2	$\surd$	3	3	$\surd$	$\bar{4}m2$	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{B1}$
N105.2.2 GM3	$\surd$	3	3	$\surd$	$\bar{4}2m$	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{B2}$
N105.2.3 GM4	$\surd$	3	3	$\surd$	422	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{A2}$
N105.2.4 M1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A2_u}$
N105.2.5 M2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A2_u}$
N105.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$4mm$	$\mathrm{A1} \oplus \mathrm{B1} \oplus \mathrm{B1}$
N105.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	422	$\mathrm{A1} \oplus \mathrm{B1} \oplus \mathrm{B2}$
N105.3.3 GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	$\bar{4}2m$	$\mathrm{A1} \oplus \mathrm{B1} \oplus \mathrm{A2}$
N105.3.4 GM2 $\oplus$ M1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B2_u}$
N105.3.5 GM2 $\oplus$ M2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B2_u}$
N105.3.6 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	$4mm$	$\mathrm{A1} \oplus \mathrm{B2} \oplus \mathrm{B2}$
N105.3.7 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	$\bar{4}m2$	$\mathrm{A1} \oplus \mathrm{B2} \oplus \mathrm{A2}$

Non-coplanar SSGs with parent space group $P4_2mc$ (No. 105) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N105.3.8 GM3 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_g}$
N105.3.9 GM3 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_g}$
N105.3.10 GM4 ⊕ GM4	√	3	3	√	$4mm$	A1 ⊕ A2 ⊕ A2
N105.3.11 GM4 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{A2_g}$
N105.3.12 GM4 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{A2_g}$
N105.3.13 M1 ⊕ M1	√	1	1	√	$4mm$	A1
N105.3.14 M1 ⊕ M3	√	1	1	√	$\bar{4}2m$	A1
N105.3.15 M1 ⊕ M2	√	1	1	√	$\bar{4}m2$	A1
N105.3.16 M1 ⊕ M4	√	1	1	√	422	A1
N105.3.17 M2 ⊕ M2	√	1	1	√	$4mm$	A1
N105.3.18 M2 ⊕ M4	√	1	1	√	$\bar{4}2m$	A1
N105.4.1 Z1Z2	√	1	1	√	$4mm$	A1
N105.4.2 Z3Z4	√	1	1	√	$4mm$	A1
N105.4.3 A1A2	√	1	1	√	$4mm$	A1
N105.5.1 LD1LE1	√	1	1	√	$4mm$	A1
N105.5.2 LD3LE3	√	1	1	√	$4mm$	A1
N105.5.3 V1VA1	√	1	1	√	$4mm$	A1
N105.6.1 GM5	√	3	3	√	422	A1 ⊕ E
N105.6.2 A5	√	1	1	√	$\bar{4}2m$	A1
N105.6.3 M5	√	1	1	√	422	A1
N105.6.4 Z5	√	1	1	√	$\bar{4}2m$	A1
N105.7.1 R1	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N105.7.2 R2	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N105.7.3 X1	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N105.7.4 X2	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N105.9.1 GM2 ⊕ GM2 ⊕ GM2	√	3	3	√	$\bar{4}m2$	B1 ⊕ B1 ⊕ B1
N105.9.2 GM2 ⊕ GM2 ⊕ GM3	√	3	3	√	$\bar{4}2m$	B1 ⊕ B1 ⊕ B2
N105.9.3 GM2 ⊕ GM2 ⊕ GM4	√	3	3	√	422	B1 ⊕ B1 ⊕ A2
N105.9.4 GM2 ⊕ GM2 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{A2_u}$
N105.9.5 GM2 ⊕ GM2 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{A2_u}$
N105.9.6 GM2 ⊕ GM3 ⊕ GM3	√	3	3	√	$\bar{4}m2$	B1 ⊕ A2 ⊕ A2
N105.9.7 GM2 ⊕ GM3 ⊕ GM4	√	3	3	√	$4mm$	B1 ⊕ B2 ⊕ A2
N105.9.8 GM2 ⊕ GM3 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B2_g}$
N105.9.9 GM2 ⊕ GM3 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B2_g}$
N105.9.10 GM2 ⊕ GM4 ⊕ GM4	√	3	3	√	$\bar{4}m2$	B1 ⊕ B2 ⊕ B2
N105.9.11 GM2 ⊕ GM4 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{A2_g}$
N105.9.12 GM2 ⊕ GM4 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{A2_g}$
N105.9.13 GM2 ⊕ M1 ⊕ M1	√	1	1	√	$\bar{4}m2$	B1
N105.9.14 GM2 ⊕ M1 ⊕ M3	√	1	1	√	422	B1
N105.9.15 GM2 ⊕ M1 ⊕ M2	√	1	1	√	$4mm$	B1
N105.9.16 GM2 ⊕ M1 ⊕ M4	√	1	1	√	$\bar{4}2m$	B1
N105.9.17 GM2 ⊕ M2 ⊕ M2	√	1	1	√	$\bar{4}m2$	B1
N105.9.18 GM2 ⊕ M2 ⊕ M4	√	1	1	√	422	B1
N105.9.19 GM3 ⊕ GM3 ⊕ GM3	√	3	3	√	$\bar{4}2m$	B2 ⊕ B2 ⊕ B2
N105.9.20 GM3 ⊕ GM3 ⊕ GM4	√	3	3	√	422	A2 ⊕ B2 ⊕ B2
N105.9.21 GM3 ⊕ GM3 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$

Non-coplanar SSGs with parent space group $P4_2mc$ (No. 105) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N105.9.22 GM3 ⊕ GM3 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N105.9.23 GM3 ⊕ GM4 ⊕ GM4	√	3	3	√	$\bar{4}2m$	$\mathrm{B2} \oplus \mathrm{A2} \oplus \mathrm{A2}$
N105.9.24 GM3 ⊕ GM4 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N105.9.25 GM3 ⊕ GM4 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N105.9.26 GM3 ⊕ M1 ⊕ M1	√	1	1	×	-	-
N105.9.27 GM3 ⊕ M1 ⊕ M3	√	1	1	×	-	-
N105.9.28 GM3 ⊕ M1 ⊕ M2	√	1	1	×	-	-
N105.9.29 GM3 ⊕ M1 ⊕ M4	√	1	1	×	-	-
N105.9.30 GM3 ⊕ M2 ⊕ M2	√	1	1	×	-	-
N105.9.31 GM3 ⊕ M2 ⊕ M4	√	1	1	×	-	-
N105.9.32 GM4 ⊕ GM4 ⊕ GM4	√	3	3	√	422	$\mathrm{A2} \oplus \mathrm{A2} \oplus \mathrm{A2}$
N105.9.33 GM4 ⊕ GM4 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
N105.9.34 GM4 ⊕ GM4 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
N105.9.35 GM4 ⊕ M1 ⊕ M1	√	1	1	×	-	-
N105.9.36 GM4 ⊕ M1 ⊕ M3	√	1	1	×	-	-
N105.9.37 GM4 ⊕ M1 ⊕ M2	√	1	1	×	-	-
N105.9.38 GM4 ⊕ M1 ⊕ M4	√	1	1	×	-	-
N105.9.39 GM4 ⊕ M2 ⊕ M2	√	1	1	×	-	-
N105.9.40 GM4 ⊕ M2 ⊕ M4	√	1	1	×	-	-
N105.9.41 M1 ⊕ M1 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N105.9.42 M1 ⊕ M1 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{A2_u}$
N105.9.43 M1 ⊕ M1 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N105.9.44 M1 ⊕ M1 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A2_u}$
N105.9.45 M1 ⊕ M3 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B2_u}$
N105.9.46 M1 ⊕ M2 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N105.9.47 M1 ⊕ M2 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B2_u}$
N105.9.48 M1 ⊕ M4 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A2_u}$
N105.9.49 M2 ⊕ M2 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N105.9.50 M2 ⊕ M2 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{A2_u}$
N105.10.1 GM2 ⊕ Z1Z2	√	1	1	√	$\bar{4}m2$	B1
N105.10.2 GM2 ⊕ Z3Z4	√	1	1	√	$\bar{4}m2$	B1
N105.10.3 GM2 ⊕ A1A2	√	1	1	√	$\bar{4}m2$	B1
N105.10.4 GM3 ⊕ Z1Z2	√	1	1	√	$\bar{4}2m$	B2
N105.10.5 GM3 ⊕ Z3Z4	√	1	1	√	$\bar{4}2m$	B2
N105.10.6 GM3 ⊕ A1A2	√	1	1	×	-	-
N105.10.7 GM4 ⊕ Z1Z2	√	1	1	√	422	A2
N105.10.8 GM4 ⊕ Z3Z4	√	1	1	√	422	A2
N105.10.9 GM4 ⊕ A1A2	√	1	1	×	-	-
N105.10.10 M1 ⊕ Z1Z2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N105.10.11 M1 ⊕ Z3Z4	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N105.10.12 M1 ⊕ A1A2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N105.10.13 M1 ⊕ A3A4	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N105.10.14 M2 ⊕ Z1Z2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N105.10.15 M2 ⊕ Z3Z4	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N105.10.16 M2 ⊕ A1A2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N105.10.17 M2 ⊕ A3A4	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$

Non-coplanar SSGs with parent space group $P4_2mc$ (No. 105) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N105.11.1 GM2 ⊕ LD1LE1	√	1	1	√	$\bar{4}m2$	B1
N105.11.2 GM2 ⊕ LD3LE3	√	1	1	√	$\bar{4}m2$	B1
N105.11.3 GM2 ⊕ V1VA1	√	1	1	√	$\bar{4}m2$	B1
N105.11.4 GM3 ⊕ LD1LE1	√	1	1	√	$\bar{4}2m$	B2
N105.11.5 GM3 ⊕ LD3LE3	√	1	1	√	$\bar{4}2m$	B2
N105.11.6 GM3 ⊕ V1VA1	√	1	1	×	-	-
N105.11.7 GM4 ⊕ LD1LE1	√	1	1	√	422	A2
N105.11.8 GM4 ⊕ LD3LE3	√	1	1	√	422	A2
N105.11.9 GM4 ⊕ V1VA1	√	1	1	×	-	-
N105.11.10 M1 ⊕ LD1LE1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N105.11.11 M1 ⊕ LD3LE3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N105.11.12 M1 ⊕ V1VA1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N105.11.13 M1 ⊕ V3VA3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N105.11.14 M2 ⊕ LD1LE1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N105.11.15 M2 ⊕ LD3LE3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N105.11.16 M2 ⊕ V1VA1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N105.11.17 M2 ⊕ V3VA3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N105.12.1 GM2 ⊕ GM5	√	3	3	√	$\bar{4}2m$	B1 ⊕ E
N105.12.2 GM2 ⊕ A5	√	1	1	×	-	-
N105.12.3 GM2 ⊕ M5	√	1	1	√	$\bar{4}2m$	B1
N105.12.4 GM2 ⊕ Z5	√	1	1	×	-	-
N105.12.5 GM3 ⊕ GM5	√	3	3	√	$\bar{4}m2$	A2 ⊕ E
N105.12.6 GM3 ⊕ A5	√	1	1	×	-	-
N105.12.7 GM3 ⊕ M5	√	1	1	×	-	-
N105.12.8 GM3 ⊕ Z5	√	1	1	×	-	-
N105.12.9 GM4 ⊕ GM5	√	3	3	√	$4mm$	A2 ⊕ E
N105.12.10 GM4 ⊕ A5	√	1	1	×	-	-
N105.12.11 GM4 ⊕ M5	√	1	1	×	-	-
N105.12.12 GM4 ⊕ Z5	√	1	1	×	-	-
N105.12.13 M1 ⊕ GM5	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{E_g}$
N105.12.14 M1 ⊕ A5	√	1	1	×	-	-
N105.12.15 M1 ⊕ M5	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{E_u}$
N105.12.16 M1 ⊕ Z5	√	1	1	×	-	-
N105.12.17 M2 ⊕ GM5	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{E_g}$
N105.12.18 M2 ⊕ A5	√	1	1	×	-	-
N105.12.19 M2 ⊕ M5	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{E_u}$
N105.12.20 M2 ⊕ Z5	√	1	1	×	-	-
N105.13.1 GM2 ⊕ R1	√	1	1	×	-	-
N105.13.2 GM2 ⊕ R2	√	1	1	×	-	-
N105.13.3 GM2 ⊕ X1	√	1	1	×	-	-
N105.13.4 GM2 ⊕ X2	√	1	1	×	-	-
N105.13.5 GM3 ⊕ R1	√	1	1	×	-	-
N105.13.6 GM3 ⊕ R2	√	1	1	×	-	-
N105.13.7 GM3 ⊕ X1	√	1	1	√	$4/mmm$	$\mathrm{B2_g}$
N105.13.8 GM3 ⊕ X2	√	1	1	√	$4/mmm$	$\mathrm{B2_g}$
N105.13.9 GM4 ⊕ R1	√	1	1	×	-	-

Non-coplanar SSGs with parent space group $P4_2mc$ (No. 105) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N105.13.10 GM4 $\oplus$ R2	$\surd$	1	1	$\times$	-	-
N105.13.11 GM4 $\oplus$ X1	$\surd$	1	1	$\times$	-	-
N105.13.12 GM4 $\oplus$ X2	$\surd$	1	1	$\times$	-	-
N105.13.13 M1 $\oplus$ R1	$\times$	-	-	-	-	-
N105.13.14 M1 $\oplus$ R3	$\times$	-	-	-	-	-
N105.13.15 M1 $\oplus$ R2	$\times$	-	-	-	-	-
N105.13.16 M1 $\oplus$ R4	$\times$	-	-	-	-	-
N105.13.17 M1 $\oplus$ X1	$\times$	-	-	-	-	-
N105.13.18 M1 $\oplus$ X3	$\times$	-	-	-	-	-
N105.13.19 M1 $\oplus$ X2	$\times$	-	-	-	-	-
N105.13.20 M1 $\oplus$ X4	$\times$	-	-	-	-	-
N105.13.21 M2 $\oplus$ R1	$\times$	-	-	-	-	-
N105.13.22 M2 $\oplus$ R3	$\times$	-	-	-	-	-
N105.13.23 M2 $\oplus$ R2	$\times$	-	-	-	-	-
N105.13.24 M2 $\oplus$ R4	$\times$	-	-	-	-	-
N105.13.25 M2 $\oplus$ X1	$\times$	-	-	-	-	-
N105.13.26 M2 $\oplus$ X3	$\times$	-	-	-	-	-
N105.13.27 M2 $\oplus$ X2	$\times$	-	-	-	-	-
N105.13.28 M2 $\oplus$ X4	$\times$	-	-	-	-	-

TABLE S316: Collinear SSGs with parent space group $P4_2bc$ (No. 106).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L106.1.1 GM1	1	$4/mmm$	$\mathrm{A1_g}$
L106.2.1 GM2	1	$4/mmm$	$\mathrm{B1_g}$
L106.2.2 GM3	1	$4/mmm$	$\mathrm{B2_g}$
L106.2.3 GM4	1	$4/mmm$	$\mathrm{A2_g}$

TABLE S317: Coplanar SSGs with parent space group $P4_2bc$ (No. 106).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P106.1.1 GM1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A2_u}$
P106.2.1 GM2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B2_u}$
P106.2.2 GM3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_g}$
P106.2.3 GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{A2_g}$
P106.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{A2_u}$
P106.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B2_g}$
P106.3.3 GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{A2_g}$
P106.3.4 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
P106.3.5 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
P106.3.6 GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
P106.4.1 Z1Z2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P106.4.2 Z3Z4	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P106.4.3 M1M3	$\surd$	1	1	$\times$	-	-
P106.4.4 M2M4	$\surd$	1	1	$\times$	-	-
P106.4.5 A1A4	$\surd$	1	1	$\times$	-	-

Coplanar SSGs with parent space group $P4_2bc$ (No. 106) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P106.5.1 LD1LE1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P106.5.2 LD3LE3	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P106.5.3 V1VA1	$\surd$	1	1	$\times$	-	-
P106.6.1 GM5	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{E_g}$
P106.6.2 M5	$\surd$	1	1	$\times$	-	-
P106.6.3 Z5	$\surd$	1	1	$\times$	-	-

TABLE S318: Non-coplanar SSGs with parent space group $P4_2bc$ (No. 106).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N106.1.1 GM1	$\surd$	3	3	$\surd$	$4mm$	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{A1}$
N106.2.1 GM2	$\surd$	3	3	$\surd$	$\bar{4}m2$	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{B1}$
N106.2.2 GM3	$\surd$	3	3	$\surd$	$\bar{4}2m$	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{B2}$
N106.2.3 GM4	$\surd$	3	3	$\surd$	422	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{A2}$
N106.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$4mm$	$\mathrm{A1} \oplus \mathrm{B1} \oplus \mathrm{B1}$
N106.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	422	$\mathrm{A1} \oplus \mathrm{B1} \oplus \mathrm{B2}$
N106.3.3 GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	$\bar{4}2m$	$\mathrm{A1} \oplus \mathrm{B1} \oplus \mathrm{A2}$
N106.3.4 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	$4mm$	$\mathrm{A1} \oplus \mathrm{B2} \oplus \mathrm{B2}$
N106.3.5 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	$\bar{4}m2$	$\mathrm{A1} \oplus \mathrm{B2} \oplus \mathrm{A2}$
N106.3.6 GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4mm$	$\mathrm{A1} \oplus \mathrm{A2} \oplus \mathrm{A2}$
N106.4.1 Z1Z2	$\surd$	1	1	$\surd$	$4mm$	A1
N106.4.2 Z3Z4	$\surd$	1	1	$\surd$	$4mm$	A1
N106.4.3 M1M3	$\surd$	1	1	$\surd$	$4mm$	A1
N106.4.4 M2M4	$\surd$	1	1	$\surd$	$4mm$	A1
N106.4.5 A1A4	$\surd$	1	1	$\surd$	$4mm$	A1
N106.5.1 LD1LE1	$\surd$	1	1	$\surd$	$4mm$	A1
N106.5.2 LD3LE3	$\surd$	1	1	$\surd$	$4mm$	A1
N106.5.3 V1VA1	$\surd$	1	1	$\surd$	$4mm$	A1
N106.6.1 GM5	$\surd$	3	3	$\surd$	422	$\mathrm{A1} \oplus \mathrm{E}$
N106.6.2 M5	$\surd$	1	1	$\surd$	$\bar{4}m2$	A1
N106.6.3 Z5	$\surd$	1	1	$\surd$	$\bar{4}2m$	A1
N106.9.1 GM2 $\oplus$ GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$\bar{4}m2$	$\mathrm{B1} \oplus \mathrm{B1} \oplus \mathrm{B1}$
N106.9.2 GM2 $\oplus$ GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$\bar{4}2m$	$\mathrm{B1} \oplus \mathrm{B1} \oplus \mathrm{B2}$
N106.9.3 GM2 $\oplus$ GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	422	$\mathrm{B1} \oplus \mathrm{B1} \oplus \mathrm{A2}$
N106.9.4 GM2 $\oplus$ GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	$\bar{4}m2$	$\mathrm{B1} \oplus \mathrm{A2} \oplus \mathrm{A2}$
N106.9.5 GM2 $\oplus$ GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4mm$	$\mathrm{B1} \oplus \mathrm{B2} \oplus \mathrm{A2}$
N106.9.6 GM2 $\oplus$ GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	$\bar{4}m2$	$\mathrm{B1} \oplus \mathrm{B2} \oplus \mathrm{B2}$
N106.9.7 GM3 $\oplus$ GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	$\bar{4}2m$	$\mathrm{B2} \oplus \mathrm{B2} \oplus \mathrm{B2}$
N106.9.8 GM3 $\oplus$ GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	422	$\mathrm{A2} \oplus \mathrm{B2} \oplus \mathrm{B2}$
N106.9.9 GM3 $\oplus$ GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	$\bar{4}2m$	$\mathrm{B2} \oplus \mathrm{A2} \oplus \mathrm{A2}$
N106.9.10 GM4 $\oplus$ GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	422	$\mathrm{A2} \oplus \mathrm{A2} \oplus \mathrm{A2}$
N106.10.1 GM2 $\oplus$ Z1Z2	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N106.10.2 GM2 $\oplus$ Z3Z4	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N106.10.3 GM2 $\oplus$ M1M3	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N106.10.4 GM2 $\oplus$ M2M4	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N106.10.5 GM2 $\oplus$ A1A4	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1

Non-coplanar SSGs with parent space group $P4_2bc$ (No. 106) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N106.10.6 GM3 $\oplus$ Z1Z2	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N106.10.7 GM3 $\oplus$ Z3Z4	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N106.10.8 GM3 $\oplus$ M1M3	$\surd$	1	1	$\times$	-	-
N106.10.9 GM3 $\oplus$ M2M4	$\surd$	1	1	$\times$	-	-
N106.10.10 GM3 $\oplus$ A1A4	$\surd$	1	1	$\times$	-	-
N106.10.11 GM4 $\oplus$ Z1Z2	$\surd$	1	1	$\surd$	422	A2
N106.10.12 GM4 $\oplus$ Z3Z4	$\surd$	1	1	$\surd$	422	A2
N106.10.13 GM4 $\oplus$ M1M3	$\surd$	1	1	$\times$	-	-
N106.10.14 GM4 $\oplus$ M2M4	$\surd$	1	1	$\times$	-	-
N106.10.15 GM4 $\oplus$ A1A4	$\surd$	1	1	$\times$	-	-
N106.11.1 GM2 $\oplus$ LD1LE1	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N106.11.2 GM2 $\oplus$ LD3LE3	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N106.11.3 GM2 $\oplus$ V1VA1	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N106.11.4 GM3 $\oplus$ LD1LE1	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N106.11.5 GM3 $\oplus$ LD3LE3	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N106.11.6 GM3 $\oplus$ V1VA1	$\surd$	1	1	$\times$	-	-
N106.11.7 GM4 $\oplus$ LD1LE1	$\surd$	1	1	$\surd$	422	A2
N106.11.8 GM4 $\oplus$ LD3LE3	$\surd$	1	1	$\surd$	422	A2
N106.11.9 GM4 $\oplus$ V1VA1	$\surd$	1	1	$\times$	-	-
N106.12.1 GM2 $\oplus$ GM5	$\surd$	3	3	$\surd$	$\bar{4}2m$	B1 $\oplus$ E
N106.12.2 GM2 $\oplus$ M5	$\surd$	1	1	$\surd$	$4mm$	B1
N106.12.3 GM2 $\oplus$ Z5	$\surd$	1	1	$\times$	-	-
N106.12.4 GM3 $\oplus$ GM5	$\surd$	3	3	$\surd$	$\bar{4}m2$	A2 $\oplus$ E
N106.12.5 GM3 $\oplus$ M5	$\surd$	1	1	$\times$	-	-
N106.12.6 GM3 $\oplus$ Z5	$\surd$	1	1	$\times$	-	-
N106.12.7 GM4 $\oplus$ GM5	$\surd$	3	3	$\surd$	$4mm$	A2 $\oplus$ E
N106.12.8 GM4 $\oplus$ M5	$\surd$	1	1	$\times$	-	-
N106.12.9 GM4 $\oplus$ Z5	$\surd$	1	1	$\times$	-	-

TABLE S319: Collinear SSGs with parent space group $I4mm$ (No. 107).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L107.1.1 GM1	1	$4/mmm$	$\mathrm{A1_g}$
L107.2.1 GM2	1	$4/mmm$	$\mathrm{B1_g}$
L107.2.2 GM3	1	$4/mmm$	$\mathrm{B2_g}$
L107.2.3 GM4	1	$4/mmm$	$\mathrm{A2_g}$
L107.2.4 M1	0	-	-
L107.2.5 M2	0	-	-
L107.2.6 M3	0	-	-
L107.2.7 M4	0	-	-

TABLE S320: Coplanar SSGs with parent space group $I4mm$ (No. 107).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P107.1.1 GM1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A2_u}$

Coplanar SSGs with parent space group $I4mm$ (No. 107) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P107.2.1 GM2	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B2_u}$
P107.2.2 GM3	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_g}$
P107.2.3 GM4	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{A2_g}$
P107.2.4 M1	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
P107.2.5 M2	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
P107.2.6 M3	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
P107.2.7 M4	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
P107.3.1 GM2 ⊕ GM2	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{A2_u}$
P107.3.2 GM2 ⊕ GM3	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B2_g}$
P107.3.3 GM2 ⊕ GM4	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{A2_g}$
P107.3.4 GM2 ⊕ M1	√	1	1	×	-	-
P107.3.5 GM2 ⊕ M2	√	1	1	×	-	-
P107.3.6 GM2 ⊕ M3	√	1	1	×	-	-
P107.3.7 GM2 ⊕ M4	√	1	1	×	-	-
P107.3.8 GM3 ⊕ GM3	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
P107.3.9 GM3 ⊕ GM4	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
P107.3.10 GM3 ⊕ M1	√	1	1	√	$4/mmm$	$\mathrm{B2_g}$
P107.3.11 GM3 ⊕ M2	√	1	1	√	$4/mmm$	$\mathrm{B2_g}$
P107.3.12 GM3 ⊕ M3	√	1	1	√	$4/mmm$	$\mathrm{B2_g}$
P107.3.13 GM3 ⊕ M4	√	1	1	√	$4/mmm$	$\mathrm{B2_g}$
P107.3.14 GM4 ⊕ GM4	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
P107.3.15 GM4 ⊕ M1	√	1	1	×	-	-
P107.3.16 GM4 ⊕ M2	√	1	1	×	-	-
P107.3.17 GM4 ⊕ M3	√	1	1	×	-	-
P107.3.18 GM4 ⊕ M4	√	1	1	×	-	-
P107.3.19 M1 ⊕ M1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
P107.3.20 M1 ⊕ M2	√	1	1	×	-	-
P107.3.21 M1 ⊕ M3	√	1	1	√	$4/mmm$	$\mathrm{B1_u}$
P107.3.22 M1 ⊕ M4	√	1	1	×	-	-
P107.3.23 M2 ⊕ M2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
P107.3.24 M2 ⊕ M3	√	1	1	×	-	-
P107.3.25 M2 ⊕ M4	√	1	1	√	$4/mmm$	$\mathrm{B1_u}$
P107.3.26 M3 ⊕ M3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
P107.3.27 M3 ⊕ M4	√	1	1	×	-	-
P107.3.28 M4 ⊕ M4	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
P107.5.1 LD1LE1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
P107.5.2 LD2LE2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
P107.5.3 LD3LE3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
P107.5.4 LD4LE4	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
P107.6.1 GM5	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{E_g}$
P107.6.2 M5	√	1	1	×	-	-
P107.7.1 X1	×	-	-	-	-	-
P107.7.2 X2	×	-	-	-	-	-
P107.7.3 X3	×	-	-	-	-	-
P107.7.4 X4	×	-	-	-	-	-
P107.7.5 P1	√	1	1	×	-	-

Coplanar SSGs with parent space group $I4mm$ (No. 107) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P107.7.6 P2	$\surd$	1	1	$\times$	-	-

TABLE S321: Non-coplanar SSGs with parent space group $I4mm$ (No. 107).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N107.1.1 GM1	$\surd$	3	3	$\surd$	$4mm$	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{A1}$
N107.2.1 GM2	$\surd$	3	3	$\surd$	$\bar{4}m2$	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{B1}$
N107.2.2 GM3	$\surd$	3	3	$\surd$	$\bar{4}2m$	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{B2}$
N107.2.3 GM4	$\surd$	3	3	$\surd$	422	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{A2}$
N107.2.4 M1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A2_u}$
N107.2.5 M2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A2_u}$
N107.2.6 M3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A2_u}$
N107.2.7 M4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A2_u}$
N107.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$4mm$	$\mathrm{A1}\oplus\mathrm{B1}\oplus\mathrm{B1}$
N107.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	422	$\mathrm{A1}\oplus\mathrm{B1}\oplus\mathrm{B2}$
N107.3.3 GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	$\bar{4}2m$	$\mathrm{A1}\oplus\mathrm{B1}\oplus\mathrm{A2}$
N107.3.4 GM2 $\oplus$ M1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B2_u}$
N107.3.5 GM2 $\oplus$ M2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B2_u}$
N107.3.6 GM2 $\oplus$ M3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B2_u}$
N107.3.7 GM2 $\oplus$ M4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B2_u}$
N107.3.8 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	$4mm$	$\mathrm{A1}\oplus\mathrm{B2}\oplus\mathrm{B2}$
N107.3.9 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	$\bar{4}m2$	$\mathrm{A1}\oplus\mathrm{B2}\oplus\mathrm{A2}$
N107.3.10 GM3 $\oplus$ M1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}\oplus\mathrm{B2_g}$
N107.3.11 GM3 $\oplus$ M2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}\oplus\mathrm{B2_g}$
N107.3.12 GM3 $\oplus$ M3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}\oplus\mathrm{B2_g}$
N107.3.13 GM3 $\oplus$ M4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}\oplus\mathrm{B2_g}$
N107.3.14 GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4mm$	$\mathrm{A1}\oplus\mathrm{A2}\oplus\mathrm{A2}$
N107.3.15 GM4 $\oplus$ M1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{A2_g}$
N107.3.16 GM4 $\oplus$ M2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{A2_g}$
N107.3.17 GM4 $\oplus$ M3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{A2_g}$
N107.3.18 GM4 $\oplus$ M4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{A2_g}$
N107.3.19 M1 $\oplus$ M1	$\surd$	1	1	$\surd$	$4mm$	A1
N107.3.20 M1 $\oplus$ M2	$\surd$	1	1	$\surd$	$\bar{4}m2$	A1
N107.3.21 M1 $\oplus$ M3	$\surd$	1	1	$\surd$	$\bar{4}2m$	A1
N107.3.22 M1 $\oplus$ M4	$\surd$	1	1	$\surd$	422	A1
N107.3.23 M2 $\oplus$ M2	$\surd$	1	1	$\surd$	$4mm$	A1
N107.3.24 M2 $\oplus$ M3	$\surd$	1	1	$\surd$	422	A1
N107.3.25 M2 $\oplus$ M4	$\surd$	1	1	$\surd$	$\bar{4}2m$	A1
N107.3.26 M3 $\oplus$ M3	$\surd$	1	1	$\surd$	$4mm$	A1
N107.3.27 M3 $\oplus$ M4	$\surd$	1	1	$\surd$	$\bar{4}m2$	A1
N107.3.28 M4 $\oplus$ M4	$\surd$	1	1	$\surd$	$4mm$	A1
N107.5.1 LD1LE1	$\surd$	1	1	$\surd$	$4mm$	A1
N107.5.2 LD2LE2	$\surd$	1	1	$\surd$	$4mm$	A1
N107.5.3 LD3LE3	$\surd$	1	1	$\surd$	$4mm$	A1
N107.5.4 LD4LE4	$\surd$	1	1	$\surd$	$4mm$	A1

Non-coplanar SSGs with parent space group $I4mm$ (No. 107) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N107.6.1 GM5	√	3	3	√	422	$\mathrm{A1}\oplus\mathrm{E}$
N107.6.2 M5	√	1	1	√	422	A1
N107.7.1 X1	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N107.7.2 X2	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N107.7.3 X3	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N107.7.4 X4	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N107.7.5 P1	√	1	1	√	$\bar{4}2m$	A1
N107.7.6 P2	√	1	1	√	$\bar{4}2m$	A1
N107.9.1 $\mathrm{GM2}\oplus\mathrm{GM2}\oplus\mathrm{GM2}$	√	3	3	√	$\bar{4}m2$	$\mathrm{B1}\oplus\mathrm{B1}\oplus\mathrm{B1}$
N107.9.2 $\mathrm{GM2}\oplus\mathrm{GM2}\oplus\mathrm{GM3}$	√	3	3	√	$\bar{4}2m$	$\mathrm{B1}\oplus\mathrm{B1}\oplus\mathrm{B2}$
N107.9.3 $\mathrm{GM2}\oplus\mathrm{GM2}\oplus\mathrm{GM4}$	√	3	3	√	422	$\mathrm{B1}\oplus\mathrm{B1}\oplus\mathrm{A2}$
N107.9.4 $\mathrm{GM2}\oplus\mathrm{GM2}\oplus\mathrm{M1}$	√	3	3	√	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_g}\oplus\mathrm{A2_u}$
N107.9.5 $\mathrm{GM2}\oplus\mathrm{GM2}\oplus\mathrm{M2}$	√	3	3	√	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_g}\oplus\mathrm{A2_u}$
N107.9.6 $\mathrm{GM2}\oplus\mathrm{GM2}\oplus\mathrm{M3}$	√	3	3	√	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_g}\oplus\mathrm{A2_u}$
N107.9.7 $\mathrm{GM2}\oplus\mathrm{GM2}\oplus\mathrm{M4}$	√	3	3	√	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_g}\oplus\mathrm{A2_u}$
N107.9.8 $\mathrm{GM2}\oplus\mathrm{GM3}\oplus\mathrm{GM3}$	√	3	3	√	$\bar{4}m2$	$\mathrm{B1}\oplus\mathrm{A2}\oplus\mathrm{A2}$
N107.9.9 $\mathrm{GM2}\oplus\mathrm{GM3}\oplus\mathrm{GM4}$	√	3	3	√	$4mm$	$\mathrm{B1}\oplus\mathrm{B2}\oplus\mathrm{A2}$
N107.9.10 $\mathrm{GM2}\oplus\mathrm{GM3}\oplus\mathrm{M1}$	√	3	3	√	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B1_g}\oplus\mathrm{B2_g}$
N107.9.11 $\mathrm{GM2}\oplus\mathrm{GM3}\oplus\mathrm{M2}$	√	3	3	√	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B1_g}\oplus\mathrm{B2_g}$
N107.9.12 $\mathrm{GM2}\oplus\mathrm{GM3}\oplus\mathrm{M3}$	√	3	3	√	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B1_g}\oplus\mathrm{B2_g}$
N107.9.13 $\mathrm{GM2}\oplus\mathrm{GM3}\oplus\mathrm{M4}$	√	3	3	√	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B1_g}\oplus\mathrm{B2_g}$
N107.9.14 $\mathrm{GM2}\oplus\mathrm{GM4}\oplus\mathrm{GM4}$	√	3	3	√	$\bar{4}m2$	$\mathrm{B1}\oplus\mathrm{B2}\oplus\mathrm{B2}$
N107.9.15 $\mathrm{GM2}\oplus\mathrm{GM4}\oplus\mathrm{M1}$	√	3	3	√	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_u}\oplus\mathrm{A2_g}$
N107.9.16 $\mathrm{GM2}\oplus\mathrm{GM4}\oplus\mathrm{M2}$	√	3	3	√	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_u}\oplus\mathrm{A2_g}$
N107.9.17 $\mathrm{GM2}\oplus\mathrm{GM4}\oplus\mathrm{M3}$	√	3	3	√	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_u}\oplus\mathrm{A2_g}$
N107.9.18 $\mathrm{GM2}\oplus\mathrm{GM4}\oplus\mathrm{M4}$	√	3	3	√	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_u}\oplus\mathrm{A2_g}$
N107.9.19 $\mathrm{GM2}\oplus\mathrm{M1}\oplus\mathrm{M1}$	√	1	1	√	$\bar{4}m2$	B1
N107.9.20 $\mathrm{GM2}\oplus\mathrm{M1}\oplus\mathrm{M2}$	√	1	1	×	-	-
N107.9.21 $\mathrm{GM2}\oplus\mathrm{M1}\oplus\mathrm{M3}$	√	1	1	√	422	B1
N107.9.22 $\mathrm{GM2}\oplus\mathrm{M1}\oplus\mathrm{M4}$	√	1	1	×	-	-
N107.9.23 $\mathrm{GM2}\oplus\mathrm{M2}\oplus\mathrm{M2}$	√	1	1	√	$\bar{4}m2$	B1
N107.9.24 $\mathrm{GM2}\oplus\mathrm{M2}\oplus\mathrm{M3}$	√	1	1	×	-	-
N107.9.25 $\mathrm{GM2}\oplus\mathrm{M2}\oplus\mathrm{M4}$	√	1	1	√	422	B1
N107.9.26 $\mathrm{GM2}\oplus\mathrm{M3}\oplus\mathrm{M3}$	√	1	1	√	$\bar{4}m2$	B1
N107.9.27 $\mathrm{GM2}\oplus\mathrm{M3}\oplus\mathrm{M4}$	√	1	1	×	-	-
N107.9.28 $\mathrm{GM2}\oplus\mathrm{M4}\oplus\mathrm{M4}$	√	1	1	√	$\bar{4}m2$	B1
N107.9.29 $\mathrm{GM3}\oplus\mathrm{GM3}\oplus\mathrm{GM3}$	√	3	3	√	$\bar{4}2m$	$\mathrm{B2}\oplus\mathrm{B2}\oplus\mathrm{B2}$
N107.9.30 $\mathrm{GM3}\oplus\mathrm{GM3}\oplus\mathrm{GM4}$	√	3	3	√	422	$\mathrm{A2}\oplus\mathrm{B2}\oplus\mathrm{B2}$
N107.9.31 $\mathrm{GM3}\oplus\mathrm{GM3}\oplus\mathrm{M1}$	√	3	3	√	$4/mmm$	$\mathrm{A2_u}\oplus\mathrm{B2_g}\oplus\mathrm{B2_g}$
N107.9.32 $\mathrm{GM3}\oplus\mathrm{GM3}\oplus\mathrm{M2}$	√	3	3	√	$4/mmm$	$\mathrm{A2_u}\oplus\mathrm{B2_g}\oplus\mathrm{B2_g}$
N107.9.33 $\mathrm{GM3}\oplus\mathrm{GM3}\oplus\mathrm{M3}$	√	3	3	√	$4/mmm$	$\mathrm{A2_u}\oplus\mathrm{B2_g}\oplus\mathrm{B2_g}$
N107.9.34 $\mathrm{GM3}\oplus\mathrm{GM3}\oplus\mathrm{M4}$	√	3	3	√	$4/mmm$	$\mathrm{A2_u}\oplus\mathrm{B2_g}\oplus\mathrm{B2_g}$
N107.9.35 $\mathrm{GM3}\oplus\mathrm{GM4}\oplus\mathrm{GM4}$	√	3	3	√	$\bar{4}2m$	$\mathrm{B2}\oplus\mathrm{A2}\oplus\mathrm{A2}$
N107.9.36 $\mathrm{GM3}\oplus\mathrm{GM4}\oplus\mathrm{M1}$	√	3	3	√	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{B2_g}\oplus\mathrm{B2_u}$
N107.9.37 $\mathrm{GM3}\oplus\mathrm{GM4}\oplus\mathrm{M2}$	√	3	3	√	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{B2_g}\oplus\mathrm{B2_u}$
N107.9.38 $\mathrm{GM3}\oplus\mathrm{GM4}\oplus\mathrm{M3}$	√	3	3	√	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{B2_g}\oplus\mathrm{B2_u}$

Non-coplanar SSGs with parent space group $I4mm$ (No. 107) (continued).

SSG		Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N107.9.39	GM3 ⊕ GM4 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N107.9.40	GM3 ⊕ M1 ⊕ M1	√	1	1	√	$\bar{4}2m$	B2
N107.9.41	GM3 ⊕ M1 ⊕ M2	√	1	1	√	422	B2
N107.9.42	GM3 ⊕ M1 ⊕ M3	√	1	1	√	$4mm$	B2
N107.9.43	GM3 ⊕ M1 ⊕ M4	√	1	1	√	$\bar{4}m2$	A2
N107.9.44	GM3 ⊕ M2 ⊕ M2	√	1	1	√	$\bar{4}2m$	B2
N107.9.45	GM3 ⊕ M2 ⊕ M3	√	1	1	√	$\bar{4}m2$	A2
N107.9.46	GM3 ⊕ M2 ⊕ M4	√	1	1	√	$4mm$	B2
N107.9.47	GM3 ⊕ M3 ⊕ M3	√	1	1	√	$\bar{4}2m$	B2
N107.9.48	GM3 ⊕ M3 ⊕ M4	√	1	1	√	422	B2
N107.9.49	GM3 ⊕ M4 ⊕ M4	√	1	1	√	$\bar{4}2m$	B2
N107.9.50	GM4 ⊕ GM4 ⊕ GM4	√	3	3	√	422	A2 ⊕ A2 ⊕ A2
N107.9.51	GM4 ⊕ GM4 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
N107.9.52	GM4 ⊕ GM4 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
N107.9.53	GM4 ⊕ GM4 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
N107.9.54	GM4 ⊕ GM4 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
N107.9.55	GM4 ⊕ M1 ⊕ M1	√	1	1	√	422	A2
N107.9.56	GM4 ⊕ M1 ⊕ M2	√	1	1	×	-	-
N107.9.57	GM4 ⊕ M1 ⊕ M3	√	1	1	√	$\bar{4}m2$	B2
N107.9.58	GM4 ⊕ M1 ⊕ M4	√	1	1	×	-	-
N107.9.59	GM4 ⊕ M2 ⊕ M2	√	1	1	√	422	A2
N107.9.60	GM4 ⊕ M2 ⊕ M3	√	1	1	×	-	-
N107.9.61	GM4 ⊕ M2 ⊕ M4	√	1	1	√	$\bar{4}m2$	B2
N107.9.62	GM4 ⊕ M3 ⊕ M3	√	1	1	√	422	A2
N107.9.63	GM4 ⊕ M3 ⊕ M4	√	1	1	×	-	-
N107.9.64	GM4 ⊕ M4 ⊕ M4	√	1	1	√	422	A2
N107.9.65	M1 ⊕ M1 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N107.9.66	M1 ⊕ M1 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N107.9.67	M1 ⊕ M1 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{A2_u}$
N107.9.68	M1 ⊕ M1 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A2_u}$
N107.9.69	M1 ⊕ M2 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N107.9.70	M1 ⊕ M2 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B2_u}$
N107.9.71	M1 ⊕ M2 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B2_u}$
N107.9.72	M1 ⊕ M3 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{A2_u}$
N107.9.73	M1 ⊕ M3 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B2_u}$
N107.9.74	M1 ⊕ M4 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A2_u}$
N107.9.75	M2 ⊕ M2 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N107.9.76	M2 ⊕ M2 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A2_u}$
N107.9.77	M2 ⊕ M2 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{A2_u}$
N107.9.78	M2 ⊕ M3 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A2_u}$
N107.9.79	M2 ⊕ M3 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B2_u}$
N107.9.80	M2 ⊕ M4 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{A2_u}$
N107.9.81	M3 ⊕ M3 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N107.9.82	M3 ⊕ M3 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N107.9.83	M3 ⊕ M4 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N107.9.84	M4 ⊕ M4 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$

Non-coplanar SSGs with parent space group $I4mm$ (No. 107) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N107.11.1 GM2 ⊕ LD1LE1	√	1	1	√	$\bar{4}m2$	B1
N107.11.2 GM2 ⊕ LD2LE2	√	1	1	√	$\bar{4}m2$	B1
N107.11.3 GM2 ⊕ LD3LE3	√	1	1	√	$\bar{4}m2$	B1
N107.11.4 GM2 ⊕ LD4LE4	√	1	1	√	$\bar{4}m2$	B1
N107.11.5 GM3 ⊕ LD1LE1	√	1	1	√	$\bar{4}2m$	B2
N107.11.6 GM3 ⊕ LD2LE2	√	1	1	√	$\bar{4}2m$	B2
N107.11.7 GM3 ⊕ LD3LE3	√	1	1	√	$\bar{4}2m$	B2
N107.11.8 GM3 ⊕ LD4LE4	√	1	1	√	$\bar{4}2m$	B2
N107.11.9 GM4 ⊕ LD1LE1	√	1	1	√	422	A2
N107.11.10 GM4 ⊕ LD2LE2	√	1	1	√	422	A2
N107.11.11 GM4 ⊕ LD3LE3	√	1	1	√	422	A2
N107.11.12 GM4 ⊕ LD4LE4	√	1	1	√	422	A2
N107.11.13 M1 ⊕ LD1LE1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N107.11.14 M1 ⊕ LD2LE2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N107.11.15 M1 ⊕ LD3LE3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N107.11.16 M1 ⊕ LD4LE4	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N107.11.17 M2 ⊕ LD1LE1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N107.11.18 M2 ⊕ LD2LE2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N107.11.19 M2 ⊕ LD3LE3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N107.11.20 M2 ⊕ LD4LE4	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N107.11.21 M3 ⊕ LD1LE1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N107.11.22 M3 ⊕ LD2LE2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N107.11.23 M3 ⊕ LD3LE3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N107.11.24 M3 ⊕ LD4LE4	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N107.11.25 M4 ⊕ LD1LE1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N107.11.26 M4 ⊕ LD2LE2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N107.11.27 M4 ⊕ LD3LE3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N107.11.28 M4 ⊕ LD4LE4	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N107.12.1 GM2 ⊕ GM5	√	3	3	√	$\bar{4}2m$	$\mathrm{B1 \oplus E}$
N107.12.2 GM2 ⊕ M5	√	1	1	×	-	-
N107.12.3 GM3 ⊕ GM5	√	3	3	√	$\bar{4}m2$	$\mathrm{A2 \oplus E}$
N107.12.4 GM3 ⊕ M5	√	1	1	√	$\bar{4}m2$	A2
N107.12.5 GM4 ⊕ GM5	√	3	3	√	$4mm$	$\mathrm{A2 \oplus E}$
N107.12.6 GM4 ⊕ M5	√	1	1	×	-	-
N107.12.7 M1 ⊕ GM5	√	3	3	√	$4/mmm$	$\mathrm{A1_u \oplus E_g}$
N107.12.8 M1 ⊕ M5	√	3	3	√	$4/mmm$	$\mathrm{A1_u \oplus E_u}$
N107.12.9 M2 ⊕ GM5	√	3	3	√	$4/mmm$	$\mathrm{A1_u \oplus E_g}$
N107.12.10 M2 ⊕ M5	√	3	3	√	$4/mmm$	$\mathrm{A1_u \oplus E_u}$
N107.12.11 M3 ⊕ GM5	√	3	3	√	$4/mmm$	$\mathrm{A1_u \oplus E_g}$
N107.12.12 M3 ⊕ M5	√	3	3	√	$4/mmm$	$\mathrm{A1_u \oplus E_u}$
N107.12.13 M4 ⊕ GM5	√	3	3	√	$4/mmm$	$\mathrm{A1_u \oplus E_g}$
N107.12.14 M4 ⊕ M5	√	3	3	√	$4/mmm$	$\mathrm{A1_u \oplus E_u}$
N107.13.1 GM2 ⊕ X1	√	1	1	√	$4/mmm$	$\mathrm{B1_g}$
N107.13.2 GM2 ⊕ X2	√	1	1	√	$4/mmm$	$\mathrm{B1_g}$
N107.13.3 GM2 ⊕ X3	√	1	1	√	$4/mmm$	$\mathrm{B1_g}$
N107.13.4 GM2 ⊕ X4	√	1	1	√	$4/mmm$	$\mathrm{B1_g}$

Non-coplanar SSGs with parent space group $I4mm$ (No. 107) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N107.13.5 GM2 $\oplus$ P1	$\surd$	1	1	$\times$	-	-
N107.13.6 GM2 $\oplus$ P2	$\surd$	1	1	$\times$	-	-
N107.13.7 GM3 $\oplus$ X1	$\surd$	1	1	$\times$	-	-
N107.13.8 GM3 $\oplus$ X2	$\surd$	1	1	$\times$	-	-
N107.13.9 GM3 $\oplus$ X3	$\surd$	1	1	$\times$	-	-
N107.13.10 GM3 $\oplus$ X4	$\surd$	1	1	$\times$	-	-
N107.13.11 GM3 $\oplus$ P1	$\surd$	1	1	$\times$	-	-
N107.13.12 GM3 $\oplus$ P2	$\surd$	1	1	$\times$	-	-
N107.13.13 GM4 $\oplus$ X1	$\surd$	1	1	$\times$	-	-
N107.13.14 GM4 $\oplus$ X2	$\surd$	1	1	$\times$	-	-
N107.13.15 GM4 $\oplus$ X3	$\surd$	1	1	$\times$	-	-
N107.13.16 GM4 $\oplus$ X4	$\surd$	1	1	$\times$	-	-
N107.13.17 GM4 $\oplus$ P1	$\surd$	1	1	$\times$	-	-
N107.13.18 GM4 $\oplus$ P2	$\surd$	1	1	$\times$	-	-
N107.13.19 M1 $\oplus$ X1	$\times$	-	-	-	-	-
N107.13.20 M1 $\oplus$ X2	$\times$	-	-	-	-	-
N107.13.21 M1 $\oplus$ X3	$\times$	-	-	-	-	-
N107.13.22 M1 $\oplus$ X4	$\times$	-	-	-	-	-
N107.13.23 M1 $\oplus$ P1	$\surd$	1	1	$\times$	-	-
N107.13.24 M1 $\oplus$ P2	$\surd$	1	1	$\times$	-	-
N107.13.25 M2 $\oplus$ X1	$\times$	-	-	-	-	-
N107.13.26 M2 $\oplus$ X2	$\times$	-	-	-	-	-
N107.13.27 M2 $\oplus$ X3	$\times$	-	-	-	-	-
N107.13.28 M2 $\oplus$ X4	$\times$	-	-	-	-	-
N107.13.29 M2 $\oplus$ P1	$\surd$	1	1	$\times$	-	-
N107.13.30 M2 $\oplus$ P2	$\surd$	1	1	$\times$	-	-
N107.13.31 M3 $\oplus$ X1	$\times$	-	-	-	-	-
N107.13.32 M3 $\oplus$ X2	$\times$	-	-	-	-	-
N107.13.33 M3 $\oplus$ X3	$\times$	-	-	-	-	-
N107.13.34 M3 $\oplus$ X4	$\times$	-	-	-	-	-
N107.13.35 M3 $\oplus$ P1	$\surd$	1	1	$\times$	-	-
N107.13.36 M3 $\oplus$ P2	$\surd$	1	1	$\times$	-	-
N107.13.37 M4 $\oplus$ X1	$\times$	-	-	-	-	-
N107.13.38 M4 $\oplus$ X2	$\times$	-	-	-	-	-
N107.13.39 M4 $\oplus$ X3	$\times$	-	-	-	-	-
N107.13.40 M4 $\oplus$ X4	$\times$	-	-	-	-	-
N107.13.41 M4 $\oplus$ P1	$\surd$	1	1	$\times$	-	-
N107.13.42 M4 $\oplus$ P2	$\surd$	1	1	$\times$	-	-

TABLE S322: Collinear SSGs with parent space group $I4cm$ (No. 108).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L108.1.1 GM1	1	$4/mmm$	$\mathrm{A1_g}$
L108.2.1 GM2	1	$4/mmm$	$\mathrm{B1_g}$
L108.2.2 GM3	1	$4/mmm$	$\mathrm{B2_g}$
L108.2.3 GM4	1	$4/mmm$	$\mathrm{A2_g}$

Collinear SSGs with parent space group $I4cm$ (No. 108)(continued)

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L108.2.4 M1	0	-	-
L108.2.5 M2	0	-	-
L108.2.6 M3	0	-	-
L108.2.7 M4	0	-	-

TABLE S323: Coplanar SSGs with parent space group $I4cm$ (No. 108).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P108.1.1 GM1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A2_u}$
P108.2.1 GM2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B2_u}$
P108.2.2 GM3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}\oplus\mathrm{B2_g}$
P108.2.3 GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{A2_g}$
P108.2.4 M1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P108.2.5 M2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P108.2.6 M3	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P108.2.7 M4	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P108.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_g}\oplus\mathrm{A2_u}$
P108.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B1_g}\oplus\mathrm{B2_g}$
P108.3.3 GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_u}\oplus\mathrm{A2_g}$
P108.3.4 GM2 $\oplus$ M1	$\surd$	1	1	$\times$	-	-
P108.3.5 GM2 $\oplus$ M2	$\surd$	1	1	$\times$	-	-
P108.3.6 GM2 $\oplus$ M3	$\surd$	1	1	$\times$	-	-
P108.3.7 GM2 $\oplus$ M4	$\surd$	1	1	$\times$	-	-
P108.3.8 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_u}\oplus\mathrm{B2_g}\oplus\mathrm{B2_g}$
P108.3.9 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{B2_g}\oplus\mathrm{B2_u}$
P108.3.10 GM3 $\oplus$ M1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_g}$
P108.3.11 GM3 $\oplus$ M2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_g}$
P108.3.12 GM3 $\oplus$ M3	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_g}$
P108.3.13 GM3 $\oplus$ M4	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_g}$
P108.3.14 GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_u}$
P108.3.15 GM4 $\oplus$ M1	$\surd$	1	1	$\times$	-	-
P108.3.16 GM4 $\oplus$ M2	$\surd$	1	1	$\times$	-	-
P108.3.17 GM4 $\oplus$ M3	$\surd$	1	1	$\times$	-	-
P108.3.18 GM4 $\oplus$ M4	$\surd$	1	1	$\times$	-	-
P108.3.19 M1 $\oplus$ M1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P108.3.20 M1 $\oplus$ M2	$\surd$	1	1	$\times$	-	-
P108.3.21 M1 $\oplus$ M3	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_u}$
P108.3.22 M1 $\oplus$ M4	$\surd$	1	1	$\times$	-	-
P108.3.23 M2 $\oplus$ M2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P108.3.24 M2 $\oplus$ M3	$\surd$	1	1	$\times$	-	-
P108.3.25 M2 $\oplus$ M4	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_u}$
P108.3.26 M3 $\oplus$ M3	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P108.3.27 M3 $\oplus$ M4	$\surd$	1	1	$\times$	-	-
P108.3.28 M4 $\oplus$ M4	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P108.5.1 LD1LE1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P108.5.2 LD2LE2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$

Coplanar SSGs with parent space group $I4cm$ (No. 108) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P108.5.3 LD3LE3	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P108.5.4 LD4LE4	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P108.6.1 GM5	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{E_g}$
P108.6.2 M5	$\surd$	1	1	$\times$	-	-
P108.7.1 X1	$\times$	-	-	-	-	-
P108.7.2 X2	$\times$	-	-	-	-	-
P108.7.3 X3	$\times$	-	-	-	-	-
P108.7.4 X4	$\times$	-	-	-	-	-

TABLE S324: Non-coplanar SSGs with parent space group $I4cm$ (No. 108).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N108.1.1 GM1	$\surd$	3	3	$\surd$	$4mm$	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{A1}$
N108.2.1 GM2	$\surd$	3	3	$\surd$	$\bar{4}m2$	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{B1}$
N108.2.2 GM3	$\surd$	3	3	$\surd$	$\bar{4}2m$	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{B2}$
N108.2.3 GM4	$\surd$	3	3	$\surd$	422	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{A2}$
N108.2.4 M1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A2_u}$
N108.2.5 M2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A2_u}$
N108.2.6 M3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A2_u}$
N108.2.7 M4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A2_u}$
N108.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$4mm$	$\mathrm{A1} \oplus \mathrm{B1} \oplus \mathrm{B1}$
N108.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	422	$\mathrm{A1} \oplus \mathrm{B1} \oplus \mathrm{B2}$
N108.3.3 GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	$\bar{4}2m$	$\mathrm{A1} \oplus \mathrm{B1} \oplus \mathrm{A2}$
N108.3.4 GM2 $\oplus$ M1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B2_u}$
N108.3.5 GM2 $\oplus$ M2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B2_u}$
N108.3.6 GM2 $\oplus$ M3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B2_u}$
N108.3.7 GM2 $\oplus$ M4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B2_u}$
N108.3.8 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	$4mm$	$\mathrm{A1} \oplus \mathrm{B2} \oplus \mathrm{B2}$
N108.3.9 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	$\bar{4}m2$	$\mathrm{A1} \oplus \mathrm{B2} \oplus \mathrm{A2}$
N108.3.10 GM3 $\oplus$ M1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_g}$
N108.3.11 GM3 $\oplus$ M2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_g}$
N108.3.12 GM3 $\oplus$ M3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_g}$
N108.3.13 GM3 $\oplus$ M4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_g}$
N108.3.14 GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4mm$	$\mathrm{A1} \oplus \mathrm{A2} \oplus \mathrm{A2}$
N108.3.15 GM4 $\oplus$ M1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{A2_g}$
N108.3.16 GM4 $\oplus$ M2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{A2_g}$
N108.3.17 GM4 $\oplus$ M3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{A2_g}$
N108.3.18 GM4 $\oplus$ M4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{A2_g}$
N108.3.19 M1 $\oplus$ M1	$\surd$	1	1	$\surd$	$4mm$	A1
N108.3.20 M1 $\oplus$ M2	$\surd$	1	1	$\surd$	$\bar{4}m2$	A1
N108.3.21 M1 $\oplus$ M3	$\surd$	1	1	$\surd$	$\bar{4}2m$	A1
N108.3.22 M1 $\oplus$ M4	$\surd$	1	1	$\surd$	422	A1
N108.3.23 M2 $\oplus$ M2	$\surd$	1	1	$\surd$	$4mm$	A1
N108.3.24 M2 $\oplus$ M3	$\surd$	1	1	$\surd$	422	A1
N108.3.25 M2 $\oplus$ M4	$\surd$	1	1	$\surd$	$\bar{4}2m$	A1
N108.3.26 M3 $\oplus$ M3	$\surd$	1	1	$\surd$	$4mm$	A1

Non-coplanar SSGs with parent space group $I4cm$ (No. 108) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N108.3.27 M3 ⊕ M4	√	1	1	√	$\bar{4}m2$	A1
N108.3.28 M4 ⊕ M4	√	1	1	√	$4mm$	A1
N108.5.1 LD1LE1	√	1	1	√	$4mm$	A1
N108.5.2 LD2LE2	√	1	1	√	$4mm$	A1
N108.5.3 LD3LE3	√	1	1	√	$4mm$	A1
N108.5.4 LD4LE4	√	1	1	√	$4mm$	A1
N108.6.1 GM5	√	3	3	√	422	A1 ⊕ E
N108.6.2 M5	√	1	1	√	422	A1
N108.7.1 X1	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N108.7.2 X2	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N108.7.3 X3	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N108.7.4 X4	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N108.9.1 GM2 ⊕ GM2 ⊕ GM2	√	3	3	√	$\bar{4}m2$	B1 ⊕ B1 ⊕ B1
N108.9.2 GM2 ⊕ GM2 ⊕ GM3	√	3	3	√	$\bar{4}2m$	B1 ⊕ B1 ⊕ B2
N108.9.3 GM2 ⊕ GM2 ⊕ GM4	√	3	3	√	422	B1 ⊕ B1 ⊕ A2
N108.9.4 GM2 ⊕ GM2 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{A2_u}$
N108.9.5 GM2 ⊕ GM2 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{A2_u}$
N108.9.6 GM2 ⊕ GM2 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{A2_u}$
N108.9.7 GM2 ⊕ GM2 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{A2_u}$
N108.9.8 GM2 ⊕ GM3 ⊕ GM3	√	3	3	√	$\bar{4}m2$	B1 ⊕ A2 ⊕ A2
N108.9.9 GM2 ⊕ GM3 ⊕ GM4	√	3	3	√	$4mm$	B1 ⊕ B2 ⊕ A2
N108.9.10 GM2 ⊕ GM3 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B2_g}$
N108.9.11 GM2 ⊕ GM3 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B2_g}$
N108.9.12 GM2 ⊕ GM3 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B2_g}$
N108.9.13 GM2 ⊕ GM3 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B2_g}$
N108.9.14 GM2 ⊕ GM4 ⊕ GM4	√	3	3	√	$\bar{4}m2$	B1 ⊕ B2 ⊕ B2
N108.9.15 GM2 ⊕ GM4 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{A2_g}$
N108.9.16 GM2 ⊕ GM4 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{A2_g}$
N108.9.17 GM2 ⊕ GM4 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{A2_g}$
N108.9.18 GM2 ⊕ GM4 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{A2_g}$
N108.9.19 GM2 ⊕ M1 ⊕ M1	√	1	1	√	$\bar{4}m2$	B1
N108.9.20 GM2 ⊕ M1 ⊕ M2	√	1	1	×	-	-
N108.9.21 GM2 ⊕ M1 ⊕ M3	√	1	1	√	422	B1
N108.9.22 GM2 ⊕ M1 ⊕ M4	√	1	1	×	-	-
N108.9.23 GM2 ⊕ M2 ⊕ M2	√	1	1	√	$\bar{4}m2$	B1
N108.9.24 GM2 ⊕ M2 ⊕ M3	√	1	1	×	-	-
N108.9.25 GM2 ⊕ M2 ⊕ M4	√	1	1	√	422	B1
N108.9.26 GM2 ⊕ M3 ⊕ M3	√	1	1	√	$\bar{4}m2$	B1
N108.9.27 GM2 ⊕ M3 ⊕ M4	√	1	1	×	-	-
N108.9.28 GM2 ⊕ M4 ⊕ M4	√	1	1	√	$\bar{4}m2$	B1
N108.9.29 GM3 ⊕ GM3 ⊕ GM3	√	3	3	√	$\bar{4}2m$	B2 ⊕ B2 ⊕ B2
N108.9.30 GM3 ⊕ GM3 ⊕ GM4	√	3	3	√	422	A2 ⊕ B2 ⊕ B2
N108.9.31 GM3 ⊕ GM3 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N108.9.32 GM3 ⊕ GM3 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N108.9.33 GM3 ⊕ GM3 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N108.9.34 GM3 ⊕ GM3 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$

Non-coplanar SSGs with parent space group $I4cm$ (No. 108) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N108.9.35 GM3 ⊕ GM4 ⊕ GM4	√	3	3	√	$\bar{4}2m$	B2 ⊕ A2 ⊕ A2
N108.9.36 GM3 ⊕ GM4 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N108.9.37 GM3 ⊕ GM4 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N108.9.38 GM3 ⊕ GM4 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N108.9.39 GM3 ⊕ GM4 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N108.9.40 GM3 ⊕ M1 ⊕ M1	√	1	1	√	$\bar{4}2m$	B2
N108.9.41 GM3 ⊕ M1 ⊕ M2	√	1	1	√	422	B2
N108.9.42 GM3 ⊕ M1 ⊕ M3	√	1	1	√	$4mm$	B2
N108.9.43 GM3 ⊕ M1 ⊕ M4	√	1	1	√	$\bar{4}m2$	A2
N108.9.44 GM3 ⊕ M2 ⊕ M2	√	1	1	√	$\bar{4}2m$	B2
N108.9.45 GM3 ⊕ M2 ⊕ M3	√	1	1	√	$\bar{4}m2$	A2
N108.9.46 GM3 ⊕ M2 ⊕ M4	√	1	1	√	$4mm$	B2
N108.9.47 GM3 ⊕ M3 ⊕ M3	√	1	1	√	$\bar{4}2m$	B2
N108.9.48 GM3 ⊕ M3 ⊕ M4	√	1	1	√	422	B2
N108.9.49 GM3 ⊕ M4 ⊕ M4	√	1	1	√	$\bar{4}2m$	B2
N108.9.50 GM4 ⊕ GM4 ⊕ GM4	√	3	3	√	422	A2 ⊕ A2 ⊕ A2
N108.9.51 GM4 ⊕ GM4 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
N108.9.52 GM4 ⊕ GM4 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
N108.9.53 GM4 ⊕ GM4 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
N108.9.54 GM4 ⊕ GM4 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
N108.9.55 GM4 ⊕ M1 ⊕ M1	√	1	1	√	422	A2
N108.9.56 GM4 ⊕ M1 ⊕ M2	√	1	1	×	-	-
N108.9.57 GM4 ⊕ M1 ⊕ M3	√	1	1	√	$\bar{4}m2$	B2
N108.9.58 GM4 ⊕ M1 ⊕ M4	√	1	1	×	-	-
N108.9.59 GM4 ⊕ M2 ⊕ M2	√	1	1	√	422	A2
N108.9.60 GM4 ⊕ M2 ⊕ M3	√	1	1	×	-	-
N108.9.61 GM4 ⊕ M2 ⊕ M4	√	1	1	√	$\bar{4}m2$	B2
N108.9.62 GM4 ⊕ M3 ⊕ M3	√	1	1	√	422	A2
N108.9.63 GM4 ⊕ M3 ⊕ M4	√	1	1	×	-	-
N108.9.64 GM4 ⊕ M4 ⊕ M4	√	1	1	√	422	A2
N108.9.65 M1 ⊕ M1 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N108.9.66 M1 ⊕ M1 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N108.9.67 M1 ⊕ M1 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{A2_u}$
N108.9.68 M1 ⊕ M1 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A2_u}$
N108.9.69 M1 ⊕ M2 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N108.9.70 M1 ⊕ M2 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B2_u}$
N108.9.71 M1 ⊕ M2 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B2_u}$
N108.9.72 M1 ⊕ M3 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{A2_u}$
N108.9.73 M1 ⊕ M3 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B2_u}$
N108.9.74 M1 ⊕ M4 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A2_u}$
N108.9.75 M2 ⊕ M2 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N108.9.76 M2 ⊕ M2 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A2_u}$
N108.9.77 M2 ⊕ M2 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{A2_u}$
N108.9.78 M2 ⊕ M3 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A2_u}$
N108.9.79 M2 ⊕ M3 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B2_u}$
N108.9.80 M2 ⊕ M4 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{A2_u}$

Non-coplanar SSGs with parent space group $I4cm$ (No. 108) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N108.9.81 M3 ⊕ M3 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N108.9.82 M3 ⊕ M3 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N108.9.83 M3 ⊕ M4 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N108.9.84 M4 ⊕ M4 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N108.11.1 GM2 ⊕ LD1LE1	√	1	1	√	$\bar{4}m2$	B1
N108.11.2 GM2 ⊕ LD2LE2	√	1	1	√	$\bar{4}m2$	B1
N108.11.3 GM2 ⊕ LD3LE3	√	1	1	√	$\bar{4}m2$	B1
N108.11.4 GM2 ⊕ LD4LE4	√	1	1	√	$\bar{4}m2$	B1
N108.11.5 GM3 ⊕ LD1LE1	√	1	1	√	$\bar{4}2m$	B2
N108.11.6 GM3 ⊕ LD2LE2	√	1	1	√	$\bar{4}2m$	B2
N108.11.7 GM3 ⊕ LD3LE3	√	1	1	√	$\bar{4}2m$	B2
N108.11.8 GM3 ⊕ LD4LE4	√	1	1	√	$\bar{4}2m$	B2
N108.11.9 GM4 ⊕ LD1LE1	√	1	1	√	422	A2
N108.11.10 GM4 ⊕ LD2LE2	√	1	1	√	422	A2
N108.11.11 GM4 ⊕ LD3LE3	√	1	1	√	422	A2
N108.11.12 GM4 ⊕ LD4LE4	√	1	1	√	422	A2
N108.11.13 M1 ⊕ LD1LE1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N108.11.14 M1 ⊕ LD2LE2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N108.11.15 M1 ⊕ LD3LE3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N108.11.16 M1 ⊕ LD4LE4	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N108.11.17 M2 ⊕ LD1LE1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N108.11.18 M2 ⊕ LD2LE2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N108.11.19 M2 ⊕ LD3LE3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N108.11.20 M2 ⊕ LD4LE4	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N108.11.21 M3 ⊕ LD1LE1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N108.11.22 M3 ⊕ LD2LE2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N108.11.23 M3 ⊕ LD3LE3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N108.11.24 M3 ⊕ LD4LE4	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N108.11.25 M4 ⊕ LD1LE1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N108.11.26 M4 ⊕ LD2LE2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N108.11.27 M4 ⊕ LD3LE3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N108.11.28 M4 ⊕ LD4LE4	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N108.12.1 GM2 ⊕ GM5	√	3	3	√	$\bar{4}2m$	$\mathrm{B1} \oplus \mathrm{E}$
N108.12.2 GM2 ⊕ M5	√	1	1	×	-	-
N108.12.3 GM3 ⊕ GM5	√	3	3	√	$\bar{4}m2$	$\mathrm{A2} \oplus \mathrm{E}$
N108.12.4 GM3 ⊕ M5	√	1	1	√	$\bar{4}m2$	A2
N108.12.5 GM4 ⊕ GM5	√	3	3	√	$4mm$	$\mathrm{A2} \oplus \mathrm{E}$
N108.12.6 GM4 ⊕ M5	√	1	1	×	-	-
N108.12.7 M1 ⊕ GM5	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{E_g}$
N108.12.8 M1 ⊕ M5	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{E_u}$
N108.12.9 M2 ⊕ GM5	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{E_g}$
N108.12.10 M2 ⊕ M5	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{E_u}$
N108.12.11 M3 ⊕ GM5	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{E_g}$
N108.12.12 M3 ⊕ M5	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{E_u}$
N108.12.13 M4 ⊕ GM5	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{E_g}$
N108.12.14 M4 ⊕ M5	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{E_u}$

Non-coplanar SSGs with parent space group $I4cm$ (No. 108) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N108.13.1 GM2 $\oplus$ X1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N108.13.2 GM2 $\oplus$ X2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N108.13.3 GM2 $\oplus$ X3	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N108.13.4 GM2 $\oplus$ X4	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N108.13.5 GM3 $\oplus$ X1	$\surd$	1	1	$\times$	-	-
N108.13.6 GM3 $\oplus$ X2	$\surd$	1	1	$\times$	-	-
N108.13.7 GM3 $\oplus$ X3	$\surd$	1	1	$\times$	-	-
N108.13.8 GM3 $\oplus$ X4	$\surd$	1	1	$\times$	-	-
N108.13.9 GM4 $\oplus$ X1	$\surd$	1	1	$\times$	-	-
N108.13.10 GM4 $\oplus$ X2	$\surd$	1	1	$\times$	-	-
N108.13.11 GM4 $\oplus$ X3	$\surd$	1	1	$\times$	-	-
N108.13.12 GM4 $\oplus$ X4	$\surd$	1	1	$\times$	-	-
N108.13.13 M1 $\oplus$ X1	$\times$	-	-	-	-	-
N108.13.14 M1 $\oplus$ X2	$\times$	-	-	-	-	-
N108.13.15 M1 $\oplus$ X3	$\times$	-	-	-	-	-
N108.13.16 M1 $\oplus$ X4	$\times$	-	-	-	-	-
N108.13.17 M2 $\oplus$ X1	$\times$	-	-	-	-	-
N108.13.18 M2 $\oplus$ X2	$\times$	-	-	-	-	-
N108.13.19 M2 $\oplus$ X3	$\times$	-	-	-	-	-
N108.13.20 M2 $\oplus$ X4	$\times$	-	-	-	-	-
N108.13.21 M3 $\oplus$ X1	$\times$	-	-	-	-	-
N108.13.22 M3 $\oplus$ X2	$\times$	-	-	-	-	-
N108.13.23 M3 $\oplus$ X3	$\times$	-	-	-	-	-
N108.13.24 M3 $\oplus$ X4	$\times$	-	-	-	-	-
N108.13.25 M4 $\oplus$ X1	$\times$	-	-	-	-	-
N108.13.26 M4 $\oplus$ X2	$\times$	-	-	-	-	-
N108.13.27 M4 $\oplus$ X3	$\times$	-	-	-	-	-
N108.13.28 M4 $\oplus$ X4	$\times$	-	-	-	-	-

TABLE S325: Collinear SSGs with parent space group $I4_1md$ (No. 109).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L109.1.1 GM1	1	$4/mmm$	$\mathrm{A1_g}$
L109.2.1 GM2	1	$4/mmm$	$\mathrm{B1_g}$
L109.2.2 GM3	1	$4/mmm$	$\mathrm{B2_g}$
L109.2.3 GM4	1	$4/mmm$	$\mathrm{A2_g}$

TABLE S326: Coplanar SSGs with parent space group $I4_1md$ (No. 109).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P109.1.1 GM1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A2_u}$
P109.2.1 GM2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B2_u}$
P109.2.2 GM3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_g}$
P109.2.3 GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{A2_g}$

Coplanar SSGs with parent space group $I4_1md$ (No. 109) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P109.3.1 GM2 ⊕ GM2	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{A2_u}$
P109.3.2 GM2 ⊕ GM3	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B2_g}$
P109.3.3 GM2 ⊕ GM4	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{A2_g}$
P109.3.4 GM3 ⊕ GM3	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
P109.3.5 GM3 ⊕ GM4	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
P109.3.6 GM4 ⊕ GM4	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
P109.4.1 M1M2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
P109.4.2 M3M4	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
P109.5.1 LD1LE1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
P109.5.2 LD3LE3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
P109.6.1 GM5	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{E_g}$
P109.6.2 M5	√	1	1	√	$4/mmm$	$\mathrm{B1_u}$

TABLE S327: Non-coplanar SSGs with parent space group $I4_1md$ (No. 109).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N109.1.1 GM1	√	3	3	√	$4mm$	A1 ⊕ A1 ⊕ A1
N109.2.1 GM2	√	3	3	√	$\bar{4}m2$	A1 ⊕ A1 ⊕ B1
N109.2.2 GM3	√	3	3	√	$\bar{4}2m$	A1 ⊕ A1 ⊕ B2
N109.2.3 GM4	√	3	3	√	422	A1 ⊕ A1 ⊕ A2
N109.3.1 GM2 ⊕ GM2	√	3	3	√	$4mm$	A1 ⊕ B1 ⊕ B1
N109.3.2 GM2 ⊕ GM3	√	3	3	√	422	A1 ⊕ B1 ⊕ B2
N109.3.3 GM2 ⊕ GM4	√	3	3	√	$\bar{4}2m$	A1 ⊕ B1 ⊕ A2
N109.3.4 GM3 ⊕ GM3	√	3	3	√	$4mm$	A1 ⊕ B2 ⊕ B2
N109.3.5 GM3 ⊕ GM4	√	3	3	√	$\bar{4}m2$	A1 ⊕ B2 ⊕ A2
N109.3.6 GM4 ⊕ GM4	√	3	3	√	$4mm$	A1 ⊕ A2 ⊕ A2
N109.4.1 M1M2	√	1	1	√	$4mm$	A1
N109.4.2 M3M4	√	1	1	√	$4mm$	A1
N109.5.1 LD1LE1	√	1	1	√	$4mm$	A1
N109.5.2 LD3LE3	√	1	1	√	$4mm$	A1
N109.6.1 GM5	√	3	3	√	422	A1 ⊕ E
N109.6.2 M5	√	1	1	√	$\bar{4}2m$	A1
N109.9.1 GM2 ⊕ GM2 ⊕ GM2	√	3	3	√	$\bar{4}m2$	B1 ⊕ B1 ⊕ B1
N109.9.2 GM2 ⊕ GM2 ⊕ GM3	√	3	3	√	$\bar{4}2m$	B1 ⊕ B1 ⊕ B2
N109.9.3 GM2 ⊕ GM2 ⊕ GM4	√	3	3	√	422	B1 ⊕ B1 ⊕ A2
N109.9.4 GM2 ⊕ GM3 ⊕ GM3	√	3	3	√	$\bar{4}m2$	B1 ⊕ A2 ⊕ A2
N109.9.5 GM2 ⊕ GM3 ⊕ GM4	√	3	3	√	$4mm$	B1 ⊕ B2 ⊕ A2
N109.9.6 GM2 ⊕ GM4 ⊕ GM4	√	3	3	√	$\bar{4}m2$	B1 ⊕ B2 ⊕ B2
N109.9.7 GM3 ⊕ GM3 ⊕ GM3	√	3	3	√	$\bar{4}2m$	B2 ⊕ B2 ⊕ B2
N109.9.8 GM3 ⊕ GM3 ⊕ GM4	√	3	3	√	422	A2 ⊕ B2 ⊕ B2
N109.9.9 GM3 ⊕ GM4 ⊕ GM4	√	3	3	√	$\bar{4}2m$	B2 ⊕ A2 ⊕ A2
N109.9.10 GM4 ⊕ GM4 ⊕ GM4	√	3	3	√	422	A2 ⊕ A2 ⊕ A2
N109.10.1 GM2 ⊕ M1M2	√	1	1	√	$\bar{4}m2$	B1
N109.10.2 GM2 ⊕ M3M4	√	1	1	√	$\bar{4}m2$	B1
N109.10.3 GM3 ⊕ M1M2	√	1	1	√	$\bar{4}2m$	B2
N109.10.4 GM3 ⊕ M3M4	√	1	1	√	$\bar{4}2m$	B2

Non-coplanar SSGs with parent space group $I4_1md$ (No. 109) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N109.10.5 GM4 $\oplus$ M1M2	$\surd$	1	1	$\surd$	422	A2
N109.10.6 GM4 $\oplus$ M3M4	$\surd$	1	1	$\surd$	422	A2
N109.11.1 GM2 $\oplus$ LD1LE1	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N109.11.2 GM2 $\oplus$ LD3LE3	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N109.11.3 GM3 $\oplus$ LD1LE1	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N109.11.4 GM3 $\oplus$ LD3LE3	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N109.11.5 GM4 $\oplus$ LD1LE1	$\surd$	1	1	$\surd$	422	A2
N109.11.6 GM4 $\oplus$ LD3LE3	$\surd$	1	1	$\surd$	422	A2
N109.12.1 GM2 $\oplus$ GM5	$\surd$	3	3	$\surd$	$\bar{4}2m$	B1 $\oplus$ E
N109.12.2 GM2 $\oplus$ M5	$\surd$	1	1	$\surd$	422	B1
N109.12.3 GM3 $\oplus$ GM5	$\surd$	3	3	$\surd$	$\bar{4}m2$	A2 $\oplus$ E
N109.12.4 GM3 $\oplus$ M5	$\surd$	1	1	$\surd$	$4mm$	B2
N109.12.5 GM4 $\oplus$ GM5	$\surd$	3	3	$\surd$	$4mm$	A2 $\oplus$ E
N109.12.6 GM4 $\oplus$ M5	$\surd$	1	1	$\surd$	$\bar{4}m2$	B2

TABLE S328: Collinear SSGs with parent space group $I4_1cd$ (No. 110).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L110.1.1 GM1	1	$4/mmm$	$\mathrm{A1_g}$
L110.2.1 GM2	1	$4/mmm$	$\mathrm{B1_g}$
L110.2.2 GM3	1	$4/mmm$	$\mathrm{B2_g}$
L110.2.3 GM4	1	$4/mmm$	$\mathrm{A2_g}$

TABLE S329: Coplanar SSGs with parent space group $I4_1cd$ (No. 110).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P110.1.1 GM1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A2_u}$
P110.2.1 GM2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B2_u}$
P110.2.2 GM3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_g}$
P110.2.3 GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{A2_g}$
P110.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{A2_u}$
P110.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B2_g}$
P110.3.3 GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{A2_g}$
P110.3.4 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
P110.3.5 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
P110.3.6 GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
P110.4.1 M1M2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P110.4.2 M3M4	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P110.5.1 LD1LE1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P110.5.2 LD3LE3	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P110.6.1 GM5	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{E_g}$
P110.6.2 M5	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_u}$

TABLE S330: Non-coplanar SSGs with parent space group $I4_1cd$ (No. 110).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N110.1.1 GM1	√	3	3	√	$4mm$	A1 ⊕ A1 ⊕ A1
N110.2.1 GM2	√	3	3	√	$\bar{4}m2$	A1 ⊕ A1 ⊕ B1
N110.2.2 GM3	√	3	3	√	$\bar{4}2m$	A1 ⊕ A1 ⊕ B2
N110.2.3 GM4	√	3	3	√	422	A1 ⊕ A1 ⊕ A2
N110.3.1 GM2 ⊕ GM2	√	3	3	√	$4mm$	A1 ⊕ B1 ⊕ B1
N110.3.2 GM2 ⊕ GM3	√	3	3	√	422	A1 ⊕ B1 ⊕ B2
N110.3.3 GM2 ⊕ GM4	√	3	3	√	$\bar{4}2m$	A1 ⊕ B1 ⊕ A2
N110.3.4 GM3 ⊕ GM3	√	3	3	√	$4mm$	A1 ⊕ B2 ⊕ B2
N110.3.5 GM3 ⊕ GM4	√	3	3	√	$\bar{4}m2$	A1 ⊕ B2 ⊕ A2
N110.3.6 GM4 ⊕ GM4	√	3	3	√	$4mm$	A1 ⊕ A2 ⊕ A2
N110.4.1 M1M2	√	1	1	√	$4mm$	A1
N110.4.2 M3M4	√	1	1	√	$4mm$	A1
N110.5.1 LD1LE1	√	1	1	√	$4mm$	A1
N110.5.2 LD3LE3	√	1	1	√	$4mm$	A1
N110.6.1 GM5	√	3	3	√	422	A1 ⊕ E
N110.6.2 M5	√	1	1	√	$\bar{4}2m$	A1
N110.9.1 GM2 ⊕ GM2 ⊕ GM2	√	3	3	√	$\bar{4}m2$	B1 ⊕ B1 ⊕ B1
N110.9.2 GM2 ⊕ GM2 ⊕ GM3	√	3	3	√	$\bar{4}2m$	B1 ⊕ B1 ⊕ B2
N110.9.3 GM2 ⊕ GM2 ⊕ GM4	√	3	3	√	422	B1 ⊕ B1 ⊕ A2
N110.9.4 GM2 ⊕ GM3 ⊕ GM3	√	3	3	√	$\bar{4}m2$	B1 ⊕ A2 ⊕ A2
N110.9.5 GM2 ⊕ GM3 ⊕ GM4	√	3	3	√	$4mm$	B1 ⊕ B2 ⊕ A2
N110.9.6 GM2 ⊕ GM4 ⊕ GM4	√	3	3	√	$\bar{4}m2$	B1 ⊕ B2 ⊕ B2
N110.9.7 GM3 ⊕ GM3 ⊕ GM3	√	3	3	√	$\bar{4}2m$	B2 ⊕ B2 ⊕ B2
N110.9.8 GM3 ⊕ GM3 ⊕ GM4	√	3	3	√	422	A2 ⊕ B2 ⊕ B2
N110.9.9 GM3 ⊕ GM4 ⊕ GM4	√	3	3	√	$\bar{4}2m$	B2 ⊕ A2 ⊕ A2
N110.9.10 GM4 ⊕ GM4 ⊕ GM4	√	3	3	√	422	A2 ⊕ A2 ⊕ A2
N110.10.1 GM2 ⊕ M1M2	√	1	1	√	$\bar{4}m2$	B1
N110.10.2 GM2 ⊕ M3M4	√	1	1	√	$\bar{4}m2$	B1
N110.10.3 GM3 ⊕ M1M2	√	1	1	√	$\bar{4}2m$	B2
N110.10.4 GM3 ⊕ M3M4	√	1	1	√	$\bar{4}2m$	B2
N110.10.5 GM4 ⊕ M1M2	√	1	1	√	422	A2
N110.10.6 GM4 ⊕ M3M4	√	1	1	√	422	A2
N110.11.1 GM2 ⊕ LD1LE1	√	1	1	√	$\bar{4}m2$	B1
N110.11.2 GM2 ⊕ LD3LE3	√	1	1	√	$\bar{4}m2$	B1
N110.11.3 GM3 ⊕ LD1LE1	√	1	1	√	$\bar{4}2m$	B2
N110.11.4 GM3 ⊕ LD3LE3	√	1	1	√	$\bar{4}2m$	B2
N110.11.5 GM4 ⊕ LD1LE1	√	1	1	√	422	A2
N110.11.6 GM4 ⊕ LD3LE3	√	1	1	√	422	A2
N110.12.1 GM2 ⊕ GM5	√	3	3	√	$\bar{4}2m$	B1 ⊕ E
N110.12.2 GM2 ⊕ M5	√	1	1	√	422	B1
N110.12.3 GM3 ⊕ GM5	√	3	3	√	$\bar{4}m2$	A2 ⊕ E
N110.12.4 GM3 ⊕ M5	√	1	1	√	$4mm$	B2
N110.12.5 GM4 ⊕ GM5	√	3	3	√	$4mm$	A2 ⊕ E
N110.12.6 GM4 ⊕ M5	√	1	1	√	$\bar{4}m2$	B2

TABLE S331: Collinear SSGs with parent space group $P\bar{4}2m$ (No. 111).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L111.1.1 GM1	1	$4/mmm$	$\mathrm{A1_g}$
L111.2.1 GM2	1	$4/mmm$	$\mathrm{B1_g}$
L111.2.2 GM3	1	$4/mmm$	$\mathrm{B2_g}$
L111.2.3 GM4	1	$4/mmm$	$\mathrm{A2_g}$
L111.2.4 A1	0	-	-
L111.2.5 A2	0	-	-
L111.2.6 M1	0	-	-
L111.2.7 M2	0	-	-
L111.2.8 Z1	0	-	-
L111.2.9 Z2	0	-	-

TABLE S332: Coplanar SSGs with parent space group $P\bar{4}2m$ (No. 111).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P111.1.1 GM1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{B1_u}$
P111.2.1 GM2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{B1_g}$
P111.2.2 GM3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$
P111.2.3 GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g} \oplus \mathrm{B2_u}$
P111.2.4 A1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P111.2.5 A2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P111.2.6 M1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P111.2.7 M2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P111.2.8 Z1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P111.2.9 Z2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P111.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
P111.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
P111.3.3 GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
P111.3.4 GM2 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
P111.3.5 GM2 $\oplus$ A2	$\surd$	1	1	$\times$	-	-
P111.3.6 GM2 $\oplus$ M1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
P111.3.7 GM2 $\oplus$ M2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
P111.3.8 GM2 $\oplus$ Z1	$\surd$	1	1	$\times$	-	-
P111.3.9 GM2 $\oplus$ Z2	$\surd$	1	1	$\times$	-	-
P111.3.10 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
P111.3.11 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{B2_g}$
P111.3.12 GM3 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
P111.3.13 GM3 $\oplus$ A2	$\surd$	1	1	$\times$	-	-
P111.3.14 GM3 $\oplus$ M1	$\surd$	1	1	$\times$	-	-
P111.3.15 GM3 $\oplus$ M2	$\surd$	1	1	$\times$	-	-
P111.3.16 GM3 $\oplus$ Z1	$\surd$	1	1	$\times$	-	-
P111.3.17 GM3 $\oplus$ Z2	$\surd$	1	1	$\times$	-	-
P111.3.18 GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
P111.3.19 GM4 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
P111.3.20 GM4 $\oplus$ A2	$\surd$	1	1	$\times$	-	-
P111.3.21 GM4 $\oplus$ M1	$\surd$	1	1	$\times$	-	-
P111.3.22 GM4 $\oplus$ M2	$\surd$	1	1	$\times$	-	-

Coplanar SSGs with parent space group $P\bar{4}2m$ (No. 111) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P111.3.23 GM4 $\oplus$ Z1	$\surd$	1	1	$\times$	-	-
P111.3.24 GM4 $\oplus$ Z2	$\surd$	1	1	$\times$	-	-
P111.3.25 A1 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
P111.3.26 A1 $\oplus$ A3	$\surd$	1	1	$\times$	-	-
P111.3.27 A1 $\oplus$ A2	$\surd$	1	1	$\times$	-	-
P111.3.28 A1 $\oplus$ A4	$\surd$	1	1	$\times$	-	-
P111.3.29 A1 $\oplus$ M1	$\times$	-	-	-	-	-
P111.3.30 A1 $\oplus$ M2	$\times$	-	-	-	-	-
P111.3.31 A1 $\oplus$ Z1	$\times$	-	-	-	-	-
P111.3.32 A1 $\oplus$ Z2	$\times$	-	-	-	-	-
P111.3.33 A2 $\oplus$ A2	$\surd$	1	1	$\times$	-	-
P111.3.34 A2 $\oplus$ A4	$\surd$	1	1	$\times$	-	-
P111.3.35 A2 $\oplus$ M1	$\times$	-	-	-	-	-
P111.3.36 A2 $\oplus$ M2	$\times$	-	-	-	-	-
P111.3.37 A2 $\oplus$ Z1	$\times$	-	-	-	-	-
P111.3.38 A2 $\oplus$ Z2	$\times$	-	-	-	-	-
P111.3.39 M1 $\oplus$ M1	$\surd$	1	1	$\times$	-	-
P111.3.40 M1 $\oplus$ M3	$\surd$	1	1	$\times$	-	-
P111.3.41 M1 $\oplus$ M2	$\surd$	1	1	$\times$	-	-
P111.3.42 M1 $\oplus$ M4	$\surd$	1	1	$\times$	-	-
P111.3.43 M1 $\oplus$ Z1	$\times$	-	-	-	-	-
P111.3.44 M1 $\oplus$ Z2	$\times$	-	-	-	-	-
P111.3.45 M2 $\oplus$ M2	$\surd$	1	1	$\times$	-	-
P111.3.46 M2 $\oplus$ M4	$\surd$	1	1	$\times$	-	-
P111.3.47 M2 $\oplus$ Z1	$\times$	-	-	-	-	-
P111.3.48 M2 $\oplus$ Z2	$\times$	-	-	-	-	-
P111.3.49 Z1 $\oplus$ Z1	$\surd$	1	1	$\times$	-	-
P111.3.50 Z1 $\oplus$ Z3	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P111.3.51 Z1 $\oplus$ Z2	$\surd$	1	1	$\times$	-	-
P111.3.52 Z1 $\oplus$ Z4	$\surd$	1	1	$\times$	-	-
P111.3.53 Z2 $\oplus$ Z2	$\surd$	1	1	$\times$	-	-
P111.3.54 Z2 $\oplus$ Z4	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P111.6.1 GM5	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B2_u} \oplus \mathrm{E_g}$
P111.6.2 A5	$\surd$	1	1	$\times$	-	-
P111.6.3 M5	$\surd$	1	1	$\times$	-	-
P111.6.4 Z5	$\surd$	1	1	$\times$	-	-
P111.7.1 R1	$\times$	-	-	-	-	-
P111.7.2 X1	$\times$	-	-	-	-	-
P111.7.3 X2	$\times$	-	-	-	-	-
P111.8.1 LD1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P111.8.2 LD2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P111.8.3 V1	$\surd$	1	1	$\times$	-	-
P111.8.4 V2	$\surd$	1	1	$\times$	-	-

TABLE S333: Non-coplanar SSGs with parent space group $P\bar{4}2m$ (No. 111).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N111.1.1 GM1	$\surd$	3	3	$\surd$	$\bar{4}2m$	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{A1}$
N111.2.1 GM2	$\surd$	3	3	$\surd$	422	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{B1}$
N111.2.2 GM3	$\surd$	3	3	$\surd$	$4mm$	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{B2}$
N111.2.3 GM4	$\surd$	3	3	$\surd$	$\bar{4}m2$	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{B2}$
N111.2.4 A1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{B1_u}$
N111.2.5 A2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{B1_u}$
N111.2.6 M1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{B1_u}$
N111.2.7 M2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{B1_u}$
N111.2.8 Z1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{B1_u}$
N111.2.9 Z2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{B1_u}$
N111.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$\bar{4}2m$	$\mathrm{A1}\oplus\mathrm{B1}\oplus\mathrm{B1}$
N111.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$\bar{4}m2$	$\mathrm{A1}\oplus\mathrm{B1}\oplus\mathrm{A2}$
N111.3.3 GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4mm$	$\mathrm{A1}\oplus\mathrm{B1}\oplus\mathrm{A2}$
N111.3.4 GM2 $\oplus$ A1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{B1_g}$
N111.3.5 GM2 $\oplus$ A2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{B1_g}$
N111.3.6 GM2 $\oplus$ M1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{B1_g}$
N111.3.7 GM2 $\oplus$ M2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{B1_g}$
N111.3.8 GM2 $\oplus$ Z1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{B1_g}$
N111.3.9 GM2 $\oplus$ Z2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{B1_g}$
N111.3.10 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	$\bar{4}2m$	$\mathrm{A1}\oplus\mathrm{B2}\oplus\mathrm{B2}$
N111.3.11 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	422	$\mathrm{A1}\oplus\mathrm{A2}\oplus\mathrm{B2}$
N111.3.12 GM3 $\oplus$ A1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_u}\oplus\mathrm{B2_g}$
N111.3.13 GM3 $\oplus$ A2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_u}\oplus\mathrm{B2_g}$
N111.3.14 GM3 $\oplus$ M1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_u}\oplus\mathrm{B2_g}$
N111.3.15 GM3 $\oplus$ M2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_u}\oplus\mathrm{B2_g}$
N111.3.16 GM3 $\oplus$ Z1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_u}\oplus\mathrm{B2_g}$
N111.3.17 GM3 $\oplus$ Z2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_u}\oplus\mathrm{B2_g}$
N111.3.18 GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	$\bar{4}2m$	$\mathrm{A1}\oplus\mathrm{A2}\oplus\mathrm{A2}$
N111.3.19 GM4 $\oplus$ A1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_g}\oplus\mathrm{B2_u}$
N111.3.20 GM4 $\oplus$ A2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_g}\oplus\mathrm{B2_u}$
N111.3.21 GM4 $\oplus$ M1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_g}\oplus\mathrm{B2_u}$
N111.3.22 GM4 $\oplus$ M2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_g}\oplus\mathrm{B2_u}$
N111.3.23 GM4 $\oplus$ Z1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_g}\oplus\mathrm{B2_u}$
N111.3.24 GM4 $\oplus$ Z2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_g}\oplus\mathrm{B2_u}$
N111.3.25 A1 $\oplus$ A1	$\surd$	1	1	$\surd$	$\bar{4}2m$	A1
N111.3.26 A1 $\oplus$ A3	$\surd$	1	1	$\surd$	$4mm$	A1
N111.3.27 A1 $\oplus$ A2	$\surd$	1	1	$\surd$	422	A1
N111.3.28 A1 $\oplus$ A4	$\surd$	1	1	$\surd$	$\bar{4}m2$	A1
N111.3.29 A1 $\oplus$ M1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N111.3.30 A1 $\oplus$ M2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N111.3.31 A1 $\oplus$ Z1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N111.3.32 A1 $\oplus$ Z2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N111.3.33 A2 $\oplus$ A2	$\surd$	1	1	$\surd$	$\bar{4}2m$	A1
N111.3.34 A2 $\oplus$ A4	$\surd$	1	1	$\surd$	$4mm$	A1
N111.3.35 A2 $\oplus$ M1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N111.3.36 A2 $\oplus$ M2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$

Non-coplanar SSGs with parent space group $P\bar{4}2m$ (No. 111) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N111.3.37 A2 ⊕ Z1	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N111.3.38 A2 ⊕ Z2	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N111.3.39 M1 ⊕ M1	√	1	1	√	$\bar{4}2m$	A1
N111.3.40 M1 ⊕ M3	√	1	1	√	$4mm$	A1
N111.3.41 M1 ⊕ M2	√	1	1	√	422	A1
N111.3.42 M1 ⊕ M4	√	1	1	√	$\bar{4}m2$	A1
N111.3.43 M1 ⊕ Z1	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N111.3.44 M1 ⊕ Z2	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N111.3.45 M2 ⊕ M2	√	1	1	√	$\bar{4}2m$	A1
N111.3.46 M2 ⊕ M4	√	1	1	√	$4mm$	A1
N111.3.47 M2 ⊕ Z1	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N111.3.48 M2 ⊕ Z2	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N111.3.49 Z1 ⊕ Z1	√	1	1	√	$\bar{4}2m$	A1
N111.3.50 Z1 ⊕ Z3	√	1	1	√	$4mm$	A1
N111.3.51 Z1 ⊕ Z2	√	1	1	√	422	A1
N111.3.52 Z1 ⊕ Z4	√	1	1	√	$\bar{4}m2$	A1
N111.3.53 Z2 ⊕ Z2	√	1	1	√	$\bar{4}2m$	A1
N111.3.54 Z2 ⊕ Z4	√	1	1	√	$4mm$	A1
N111.6.1 GM5	√	3	3	√	$\bar{4}m2$	A1 ⊕ E
N111.6.2 A5	√	1	1	√	$\bar{4}m2$	A1
N111.6.3 M5	√	1	1	√	$\bar{4}m2$	A1
N111.6.4 Z5	√	1	1	√	$\bar{4}m2$	A1
N111.7.1 R1	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N111.7.2 X1	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N111.7.3 X2	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N111.8.1 LD1	√	1	1	√	$4mm$	A1
N111.8.2 LD2	√	1	1	√	$4mm$	A1
N111.8.3 V1	√	1	1	√	$4mm$	A1
N111.8.4 V2	√	1	1	√	$4mm$	A1
N111.9.1 GM2 ⊕ GM2 ⊕ GM2	√	3	3	√	422	B1 ⊕ B1 ⊕ B1
N111.9.2 GM2 ⊕ GM2 ⊕ GM3	√	3	3	√	$4mm$	B1 ⊕ B1 ⊕ B2
N111.9.3 GM2 ⊕ GM2 ⊕ GM4	√	3	3	√	$\bar{4}m2$	B1 ⊕ B1 ⊕ B2
N111.9.4 GM2 ⊕ GM2 ⊕ A1	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N111.9.5 GM2 ⊕ GM2 ⊕ A2	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N111.9.6 GM2 ⊕ GM2 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N111.9.7 GM2 ⊕ GM2 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N111.9.8 GM2 ⊕ GM2 ⊕ Z1	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N111.9.9 GM2 ⊕ GM2 ⊕ Z2	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N111.9.10 GM2 ⊕ GM3 ⊕ GM3	√	3	3	√	422	B1 ⊕ B2 ⊕ B2
N111.9.11 GM2 ⊕ GM3 ⊕ GM4	√	3	3	√	$\bar{4}2m$	B1 ⊕ B2 ⊕ A2
N111.9.12 GM2 ⊕ GM3 ⊕ A1	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N111.9.13 GM2 ⊕ GM3 ⊕ A2	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N111.9.14 GM2 ⊕ GM3 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N111.9.15 GM2 ⊕ GM3 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N111.9.16 GM2 ⊕ GM3 ⊕ Z1	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N111.9.17 GM2 ⊕ GM3 ⊕ Z2	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$

Non-coplanar SSGs with parent space group $P\bar{4}2m$ (No. 111) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N111.9.18 GM2 ⊕ GM4 ⊕ GM4	√	3	3	√	422	$\mathrm{B1}\oplus\mathrm{A2}\oplus\mathrm{A2}$
N111.9.19 GM2 ⊕ GM4 ⊕ A1	√	3	3	√	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_u}$
N111.9.20 GM2 ⊕ GM4 ⊕ A2	√	3	3	√	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_u}$
N111.9.21 GM2 ⊕ GM4 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_u}$
N111.9.22 GM2 ⊕ GM4 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_u}$
N111.9.23 GM2 ⊕ GM4 ⊕ Z1	√	3	3	√	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_u}$
N111.9.24 GM2 ⊕ GM4 ⊕ Z2	√	3	3	√	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_u}$
N111.9.25 GM2 ⊕ A1 ⊕ A1	√	1	1	×	-	-
N111.9.26 GM2 ⊕ A1 ⊕ A3	√	1	1	√	$\bar{4}m2$	B1
N111.9.27 GM2 ⊕ A1 ⊕ A2	√	1	1	×	-	-
N111.9.28 GM2 ⊕ A1 ⊕ A4	√	1	1	×	-	-
N111.9.29 GM2 ⊕ A1 ⊕ M1	√	1	1	√	$4/mmm$	$\mathrm{B1_g}$
N111.9.30 GM2 ⊕ A1 ⊕ M2	√	1	1	√	$4/mmm$	$\mathrm{B1_g}$
N111.9.31 GM2 ⊕ A1 ⊕ Z1	√	1	1	×	-	-
N111.9.32 GM2 ⊕ A1 ⊕ Z2	√	1	1	×	-	-
N111.9.33 GM2 ⊕ A2 ⊕ A2	√	1	1	×	-	-
N111.9.34 GM2 ⊕ A2 ⊕ A4	√	1	1	√	$\bar{4}m2$	B1
N111.9.35 GM2 ⊕ A2 ⊕ M1	√	1	1	√	$4/mmm$	$\mathrm{B1_g}$
N111.9.36 GM2 ⊕ A2 ⊕ M2	√	1	1	√	$4/mmm$	$\mathrm{B1_g}$
N111.9.37 GM2 ⊕ A2 ⊕ Z1	√	1	1	×	-	-
N111.9.38 GM2 ⊕ A2 ⊕ Z2	√	1	1	×	-	-
N111.9.39 GM2 ⊕ M1 ⊕ M1	√	1	1	√	422	B1
N111.9.40 GM2 ⊕ M1 ⊕ M3	√	1	1	√	$\bar{4}m2$	B1
N111.9.41 GM2 ⊕ M1 ⊕ M2	√	1	1	√	$\bar{4}2m$	B1
N111.9.42 GM2 ⊕ M1 ⊕ M4	√	1	1	√	$4mm$	B1
N111.9.43 GM2 ⊕ M1 ⊕ Z1	√	1	1	√	$4/mmm$	$\mathrm{B1_g}$
N111.9.44 GM2 ⊕ M1 ⊕ Z2	√	1	1	√	$4/mmm$	$\mathrm{B1_g}$
N111.9.45 GM2 ⊕ M2 ⊕ M2	√	1	1	√	422	B1
N111.9.46 GM2 ⊕ M2 ⊕ M4	√	1	1	√	$\bar{4}m2$	B1
N111.9.47 GM2 ⊕ M2 ⊕ Z1	√	1	1	√	$4/mmm$	$\mathrm{B1_g}$
N111.9.48 GM2 ⊕ M2 ⊕ Z2	√	1	1	√	$4/mmm$	$\mathrm{B1_g}$
N111.9.49 GM2 ⊕ Z1 ⊕ Z1	√	1	1	×	-	-
N111.9.50 GM2 ⊕ Z1 ⊕ Z3	√	1	1	√	$\bar{4}m2$	B1
N111.9.51 GM2 ⊕ Z1 ⊕ Z2	√	1	1	×	-	-
N111.9.52 GM2 ⊕ Z1 ⊕ Z4	√	1	1	×	-	-
N111.9.53 GM2 ⊕ Z2 ⊕ Z2	√	1	1	×	-	-
N111.9.54 GM2 ⊕ Z2 ⊕ Z4	√	1	1	√	$\bar{4}m2$	B1
N111.9.55 GM3 ⊕ GM3 ⊕ GM3	√	3	3	√	$4mm$	$\mathrm{B2}\oplus\mathrm{B2}\oplus\mathrm{B2}$
N111.9.56 GM3 ⊕ GM3 ⊕ GM4	√	3	3	√	$\bar{4}m2$	$\mathrm{B2}\oplus\mathrm{A2}\oplus\mathrm{A2}$
N111.9.57 GM3 ⊕ GM3 ⊕ A1	√	3	3	√	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{B2_g}\oplus\mathrm{B2_g}$
N111.9.58 GM3 ⊕ GM3 ⊕ A2	√	3	3	√	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{B2_g}\oplus\mathrm{B2_g}$
N111.9.59 GM3 ⊕ GM3 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{B2_g}\oplus\mathrm{B2_g}$
N111.9.60 GM3 ⊕ GM3 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{B2_g}\oplus\mathrm{B2_g}$
N111.9.61 GM3 ⊕ GM3 ⊕ Z1	√	3	3	√	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{B2_g}\oplus\mathrm{B2_g}$
N111.9.62 GM3 ⊕ GM3 ⊕ Z2	√	3	3	√	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{B2_g}\oplus\mathrm{B2_g}$
N111.9.63 GM3 ⊕ GM4 ⊕ GM4	√	3	3	√	$4mm$	$\mathrm{B2}\oplus\mathrm{A2}\oplus\mathrm{A2}$

Non-coplanar SSGs with parent space group $P\bar{4}2m$ (No. 111) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N111.9.64 GM3 ⊕ GM4 ⊕ A1	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{B2_g}$
N111.9.65 GM3 ⊕ GM4 ⊕ A2	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{B2_g}$
N111.9.66 GM3 ⊕ GM4 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{B2_g}$
N111.9.67 GM3 ⊕ GM4 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{B2_g}$
N111.9.68 GM3 ⊕ GM4 ⊕ Z1	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{B2_g}$
N111.9.69 GM3 ⊕ GM4 ⊕ Z2	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{B2_g}$
N111.9.70 GM3 ⊕ A1 ⊕ A1	√	1	1	×	-	-
N111.9.71 GM3 ⊕ A1 ⊕ A3	√	1	1	×	-	-
N111.9.72 GM3 ⊕ A1 ⊕ A2	√	1	1	×	-	-
N111.9.73 GM3 ⊕ A1 ⊕ A4	√	1	1	×	-	-
N111.9.74 GM3 ⊕ A1 ⊕ M1	√	1	1	×	-	-
N111.9.75 GM3 ⊕ A1 ⊕ M2	√	1	1	×	-	-
N111.9.76 GM3 ⊕ A1 ⊕ Z1	√	1	1	×	-	-
N111.9.77 GM3 ⊕ A1 ⊕ Z2	√	1	1	×	-	-
N111.9.78 GM3 ⊕ A2 ⊕ A2	√	1	1	×	-	-
N111.9.79 GM3 ⊕ A2 ⊕ A4	√	1	1	×	-	-
N111.9.80 GM3 ⊕ A2 ⊕ M1	√	1	1	×	-	-
N111.9.81 GM3 ⊕ A2 ⊕ M2	√	1	1	×	-	-
N111.9.82 GM3 ⊕ A2 ⊕ Z1	√	1	1	×	-	-
N111.9.83 GM3 ⊕ A2 ⊕ Z2	√	1	1	×	-	-
N111.9.84 GM3 ⊕ M1 ⊕ M1	√	1	1	×	-	-
N111.9.85 GM3 ⊕ M1 ⊕ M3	√	1	1	×	-	-
N111.9.86 GM3 ⊕ M1 ⊕ M2	√	1	1	×	-	-
N111.9.87 GM3 ⊕ M1 ⊕ M4	√	1	1	×	-	-
N111.9.88 GM3 ⊕ M1 ⊕ Z1	√	1	1	×	-	-
N111.9.89 GM3 ⊕ M1 ⊕ Z2	√	1	1	×	-	-
N111.9.90 GM3 ⊕ M2 ⊕ M2	√	1	1	×	-	-
N111.9.91 GM3 ⊕ M2 ⊕ M4	√	1	1	×	-	-
N111.9.92 GM3 ⊕ M2 ⊕ Z1	√	1	1	×	-	-
N111.9.93 GM3 ⊕ M2 ⊕ Z2	√	1	1	×	-	-
N111.9.94 GM3 ⊕ Z1 ⊕ Z1	√	1	1	×	-	-
N111.9.95 GM3 ⊕ Z1 ⊕ Z3	√	1	1	√	$\bar{4}2m$	B2
N111.9.96 GM3 ⊕ Z1 ⊕ Z2	√	1	1	×	-	-
N111.9.97 GM3 ⊕ Z1 ⊕ Z4	√	1	1	×	-	-
N111.9.98 GM3 ⊕ Z2 ⊕ Z2	√	1	1	×	-	-
N111.9.99 GM3 ⊕ Z2 ⊕ Z4	√	1	1	√	$\bar{4}2m$	B2
N111.9.100 GM4 ⊕ GM4 ⊕ GM4	√	3	3	√	$\bar{4}m2$	B2 ⊕ B2 ⊕ B2
N111.9.101 GM4 ⊕ GM4 ⊕ A1	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
N111.9.102 GM4 ⊕ GM4 ⊕ A2	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
N111.9.103 GM4 ⊕ GM4 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
N111.9.104 GM4 ⊕ GM4 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
N111.9.105 GM4 ⊕ GM4 ⊕ Z1	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
N111.9.106 GM4 ⊕ GM4 ⊕ Z2	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
N111.9.107 GM4 ⊕ A1 ⊕ A1	√	1	1	×	-	-
N111.9.108 GM4 ⊕ A1 ⊕ A3	√	1	1	×	-	-
N111.9.109 GM4 ⊕ A1 ⊕ A2	√	1	1	×	-	-

Non-coplanar SSGs with parent space group $P\bar{4}2m$ (No. 111) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N111.9.110 GM4 $\oplus$ A1 $\oplus$ A4	$\surd$	1	1	$\times$	-	-
N111.9.111 GM4 $\oplus$ A1 $\oplus$ M1	$\surd$	1	1	$\times$	-	-
N111.9.112 GM4 $\oplus$ A1 $\oplus$ M2	$\surd$	1	1	$\times$	-	-
N111.9.113 GM4 $\oplus$ A1 $\oplus$ Z1	$\surd$	1	1	$\times$	-	-
N111.9.114 GM4 $\oplus$ A1 $\oplus$ Z2	$\surd$	1	1	$\times$	-	-
N111.9.115 GM4 $\oplus$ A2 $\oplus$ A2	$\surd$	1	1	$\times$	-	-
N111.9.116 GM4 $\oplus$ A2 $\oplus$ A4	$\surd$	1	1	$\times$	-	-
N111.9.117 GM4 $\oplus$ A2 $\oplus$ M1	$\surd$	1	1	$\times$	-	-
N111.9.118 GM4 $\oplus$ A2 $\oplus$ M2	$\surd$	1	1	$\times$	-	-
N111.9.119 GM4 $\oplus$ A2 $\oplus$ Z1	$\surd$	1	1	$\times$	-	-
N111.9.120 GM4 $\oplus$ A2 $\oplus$ Z2	$\surd$	1	1	$\times$	-	-
N111.9.121 GM4 $\oplus$ M1 $\oplus$ M1	$\surd$	1	1	$\times$	-	-
N111.9.122 GM4 $\oplus$ M1 $\oplus$ M3	$\surd$	1	1	$\times$	-	-
N111.9.123 GM4 $\oplus$ M1 $\oplus$ M2	$\surd$	1	1	$\times$	-	-
N111.9.124 GM4 $\oplus$ M1 $\oplus$ M4	$\surd$	1	1	$\times$	-	-
N111.9.125 GM4 $\oplus$ M1 $\oplus$ Z1	$\surd$	1	1	$\times$	-	-
N111.9.126 GM4 $\oplus$ M1 $\oplus$ Z2	$\surd$	1	1	$\times$	-	-
N111.9.127 GM4 $\oplus$ M2 $\oplus$ M2	$\surd$	1	1	$\times$	-	-
N111.9.128 GM4 $\oplus$ M2 $\oplus$ M4	$\surd$	1	1	$\times$	-	-
N111.9.129 GM4 $\oplus$ M2 $\oplus$ Z1	$\surd$	1	1	$\times$	-	-
N111.9.130 GM4 $\oplus$ M2 $\oplus$ Z2	$\surd$	1	1	$\times$	-	-
N111.9.131 GM4 $\oplus$ Z1 $\oplus$ Z1	$\surd$	1	1	$\times$	-	-
N111.9.132 GM4 $\oplus$ Z1 $\oplus$ Z3	$\surd$	1	1	$\surd$	422	A2
N111.9.133 GM4 $\oplus$ Z1 $\oplus$ Z2	$\surd$	1	1	$\times$	-	-
N111.9.134 GM4 $\oplus$ Z1 $\oplus$ Z4	$\surd$	1	1	$\times$	-	-
N111.9.135 GM4 $\oplus$ Z2 $\oplus$ Z2	$\surd$	1	1	$\times$	-	-
N111.9.136 GM4 $\oplus$ Z2 $\oplus$ Z4	$\surd$	1	1	$\surd$	422	A2
N111.9.137 A1 $\oplus$ A1 $\oplus$ A1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N111.9.138 A1 $\oplus$ A1 $\oplus$ A3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N111.9.139 A1 $\oplus$ A1 $\oplus$ A2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{B1_u}$
N111.9.140 A1 $\oplus$ A1 $\oplus$ A4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N111.9.141 A1 $\oplus$ A3 $\oplus$ A2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N111.9.142 A1 $\oplus$ A1 $\oplus$ M1	$\surd$	1	1	$\times$	-	-
N111.9.143 A1 $\oplus$ A3 $\oplus$ M1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N111.9.144 A1 $\oplus$ A1 $\oplus$ M2	$\surd$	1	1	$\times$	-	-
N111.9.145 A1 $\oplus$ A3 $\oplus$ M2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N111.9.146 A1 $\oplus$ A1 $\oplus$ Z1	$\surd$	1	1	$\times$	-	-
N111.9.147 A1 $\oplus$ A3 $\oplus$ Z1	$\surd$	1	1	$\times$	-	-
N111.9.148 A1 $\oplus$ A1 $\oplus$ Z2	$\surd$	1	1	$\times$	-	-
N111.9.149 A1 $\oplus$ A3 $\oplus$ Z2	$\surd$	1	1	$\times$	-	-
N111.9.150 A1 $\oplus$ A2 $\oplus$ A2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{B1_u}$
N111.9.151 A1 $\oplus$ A2 $\oplus$ A4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N111.9.152 A1 $\oplus$ A4 $\oplus$ A4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N111.9.153 A1 $\oplus$ A2 $\oplus$ M1	$\surd$	1	1	$\times$	-	-
N111.9.154 A1 $\oplus$ A4 $\oplus$ M1	$\surd$	1	1	$\times$	-	-
N111.9.155 A1 $\oplus$ A2 $\oplus$ M2	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $P\bar{4}2m$ (No. 111) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N111.9.156 A1 ⊕ A4 ⊕ M2	√	1	1	×	-	-
N111.9.157 A1 ⊕ A2 ⊕ Z1	√	1	1	×	-	-
N111.9.158 A1 ⊕ A4 ⊕ Z1	√	1	1	×	-	-
N111.9.159 A1 ⊕ A2 ⊕ Z2	√	1	1	×	-	-
N111.9.160 A1 ⊕ A4 ⊕ Z2	√	1	1	×	-	-
N111.9.161 A1 ⊕ M1 ⊕ M1	√	1	1	×	-	-
N111.9.162 A1 ⊕ M1 ⊕ M3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N111.9.163 A1 ⊕ M1 ⊕ M2	√	1	1	×	-	-
N111.9.164 A1 ⊕ M1 ⊕ M4	√	1	1	√	$4/mmm$	$\mathrm{B2_u}$
N111.9.165 A1 ⊕ M1 ⊕ Z1	×	-	-	-	-	-
N111.9.166 A1 ⊕ M1 ⊕ Z3	×	-	-	-	-	-
N111.9.167 A1 ⊕ M1 ⊕ Z2	×	-	-	-	-	-
N111.9.168 A1 ⊕ M1 ⊕ Z4	×	-	-	-	-	-
N111.9.169 A1 ⊕ M2 ⊕ M2	√	1	1	×	-	-
N111.9.170 A1 ⊕ M2 ⊕ M4	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N111.9.171 A1 ⊕ M2 ⊕ Z1	×	-	-	-	-	-
N111.9.172 A1 ⊕ M2 ⊕ Z3	×	-	-	-	-	-
N111.9.173 A1 ⊕ M2 ⊕ Z2	×	-	-	-	-	-
N111.9.174 A1 ⊕ M2 ⊕ Z4	×	-	-	-	-	-
N111.9.175 A1 ⊕ Z1 ⊕ Z1	√	1	1	×	-	-
N111.9.176 A1 ⊕ Z1 ⊕ Z3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N111.9.177 A1 ⊕ Z1 ⊕ Z2	√	1	1	×	-	-
N111.9.178 A1 ⊕ Z1 ⊕ Z4	√	1	1	√	$4/mmm$	$\mathrm{B2_u}$
N111.9.179 A1 ⊕ Z2 ⊕ Z2	√	1	1	×	-	-
N111.9.180 A1 ⊕ Z2 ⊕ Z4	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N111.9.181 A2 ⊕ A2 ⊕ A2	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N111.9.182 A2 ⊕ A2 ⊕ A4	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N111.9.183 A2 ⊕ A2 ⊕ M1	√	1	1	×	-	-
N111.9.184 A2 ⊕ A4 ⊕ M1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N111.9.185 A2 ⊕ A2 ⊕ M2	√	1	1	×	-	-
N111.9.186 A2 ⊕ A4 ⊕ M2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N111.9.187 A2 ⊕ A2 ⊕ Z1	√	1	1	×	-	-
N111.9.188 A2 ⊕ A4 ⊕ Z1	√	1	1	×	-	-
N111.9.189 A2 ⊕ A2 ⊕ Z2	√	1	1	×	-	-
N111.9.190 A2 ⊕ A4 ⊕ Z2	√	1	1	×	-	-
N111.9.191 A2 ⊕ M1 ⊕ M1	√	1	1	×	-	-
N111.9.192 A2 ⊕ M1 ⊕ M3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N111.9.193 A2 ⊕ M1 ⊕ M2	√	1	1	×	-	-
N111.9.194 A2 ⊕ M1 ⊕ M4	√	1	1	√	$4/mmm$	$\mathrm{B2_u}$
N111.9.195 A2 ⊕ M1 ⊕ Z1	×	-	-	-	-	-
N111.9.196 A2 ⊕ M1 ⊕ Z3	×	-	-	-	-	-
N111.9.197 A2 ⊕ M1 ⊕ Z2	×	-	-	-	-	-
N111.9.198 A2 ⊕ M1 ⊕ Z4	×	-	-	-	-	-
N111.9.199 A2 ⊕ M2 ⊕ M2	√	1	1	×	-	-
N111.9.200 A2 ⊕ M2 ⊕ M4	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N111.9.201 A2 ⊕ M2 ⊕ Z1	×	-	-	-	-	-

Non-coplanar SSGs with parent space group $P\bar{4}2m$ (No. 111) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N111.9.202 A2 ⊕ M2 ⊕ Z3	×	-	-	-	-	-
N111.9.203 A2 ⊕ M2 ⊕ Z2	×	-	-	-	-	-
N111.9.204 A2 ⊕ M2 ⊕ Z4	×	-	-	-	-	-
N111.9.205 A2 ⊕ Z1 ⊕ Z1	√	1	1	×	-	-
N111.9.206 A2 ⊕ Z1 ⊕ Z3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N111.9.207 A2 ⊕ Z1 ⊕ Z2	√	1	1	×	-	-
N111.9.208 A2 ⊕ Z1 ⊕ Z4	√	1	1	√	$4/mmm$	$\mathrm{B2_u}$
N111.9.209 A2 ⊕ Z2 ⊕ Z2	√	1	1	×	-	-
N111.9.210 A2 ⊕ Z2 ⊕ Z4	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N111.9.211 M1 ⊕ M1 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N111.9.212 M1 ⊕ M1 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N111.9.213 M1 ⊕ M1 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{B1_u}$
N111.9.214 M1 ⊕ M1 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N111.9.215 M1 ⊕ M3 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N111.9.216 M1 ⊕ M1 ⊕ Z1	√	1	1	×	-	-
N111.9.217 M1 ⊕ M3 ⊕ Z1	√	1	1	×	-	-
N111.9.218 M1 ⊕ M1 ⊕ Z2	√	1	1	×	-	-
N111.9.219 M1 ⊕ M3 ⊕ Z2	√	1	1	×	-	-
N111.9.220 M1 ⊕ M2 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{B1_u}$
N111.9.221 M1 ⊕ M2 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N111.9.222 M1 ⊕ M4 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N111.9.223 M1 ⊕ M2 ⊕ Z1	√	1	1	×	-	-
N111.9.224 M1 ⊕ M4 ⊕ Z1	√	1	1	×	-	-
N111.9.225 M1 ⊕ M2 ⊕ Z2	√	1	1	×	-	-
N111.9.226 M1 ⊕ M4 ⊕ Z2	√	1	1	×	-	-
N111.9.227 M1 ⊕ Z1 ⊕ Z1	√	1	1	×	-	-
N111.9.228 M1 ⊕ Z1 ⊕ Z3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N111.9.229 M1 ⊕ Z1 ⊕ Z2	√	1	1	×	-	-
N111.9.230 M1 ⊕ Z1 ⊕ Z4	√	1	1	×	-	-
N111.9.231 M1 ⊕ Z2 ⊕ Z2	√	1	1	×	-	-
N111.9.232 M1 ⊕ Z2 ⊕ Z4	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N111.9.233 M2 ⊕ M2 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N111.9.234 M2 ⊕ M2 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N111.9.235 M2 ⊕ M2 ⊕ Z1	√	1	1	×	-	-
N111.9.236 M2 ⊕ M4 ⊕ Z1	√	1	1	×	-	-
N111.9.237 M2 ⊕ M2 ⊕ Z2	√	1	1	×	-	-
N111.9.238 M2 ⊕ M4 ⊕ Z2	√	1	1	×	-	-
N111.9.239 M2 ⊕ Z1 ⊕ Z1	√	1	1	×	-	-
N111.9.240 M2 ⊕ Z1 ⊕ Z3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N111.9.241 M2 ⊕ Z1 ⊕ Z2	√	1	1	×	-	-
N111.9.242 M2 ⊕ Z1 ⊕ Z4	√	1	1	×	-	-
N111.9.243 M2 ⊕ Z2 ⊕ Z2	√	1	1	×	-	-
N111.9.244 M2 ⊕ Z2 ⊕ Z4	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N111.9.245 Z1 ⊕ Z1 ⊕ Z1	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N111.9.246 Z1 ⊕ Z1 ⊕ Z3	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N111.9.247 Z1 ⊕ Z1 ⊕ Z2	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{B1_u}$

Non-coplanar SSGs with parent space group $P\bar{4}2m$ (No. 111) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N111.9.248 Z1 ⊕ Z1 ⊕ Z4	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N111.9.249 Z1 ⊕ Z3 ⊕ Z2	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N111.9.250 Z1 ⊕ Z2 ⊕ Z2	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{B1_u}$
N111.9.251 Z1 ⊕ Z2 ⊕ Z4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N111.9.252 Z1 ⊕ Z4 ⊕ Z4	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N111.9.253 Z2 ⊕ Z2 ⊕ Z2	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N111.9.254 Z2 ⊕ Z2 ⊕ Z4	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N111.12.1 GM2 ⊕ GM5	√	3	3	√	$4mm$	B1 ⊕ E
N111.12.2 GM2 ⊕ A5	√	1	1	×	-	-
N111.12.3 GM2 ⊕ M5	√	1	1	√	$4mm$	B1
N111.12.4 GM2 ⊕ Z5	√	1	1	×	-	-
N111.12.5 GM3 ⊕ GM5	√	3	3	√	422	B2 ⊕ E
N111.12.6 GM3 ⊕ A5	√	1	1	×	-	-
N111.12.7 GM3 ⊕ M5	√	1	1	×	-	-
N111.12.8 GM3 ⊕ Z5	√	1	1	×	-	-
N111.12.9 GM4 ⊕ GM5	√	3	3	√	$\bar{4}2m$	A2 ⊕ E
N111.12.10 GM4 ⊕ A5	√	1	1	×	-	-
N111.12.11 GM4 ⊕ M5	√	1	1	×	-	-
N111.12.12 GM4 ⊕ Z5	√	1	1	×	-	-
N111.12.13 A1 ⊕ GM5	√	3	3	√	$4/mmm$	$\mathrm{B2_u} \oplus \mathrm{E_g}$
N111.12.14 A1 ⊕ A5	√	3	3	√	$4/mmm$	$\mathrm{B2_u} \oplus \mathrm{E_u}$
N111.12.15 A1 ⊕ M5	√	1	1	√	$4/mmm$	$\mathrm{B2_u}$
N111.12.16 A1 ⊕ Z5	√	1	1	√	$4/mmm$	$\mathrm{B2_u}$
N111.12.17 A2 ⊕ GM5	√	3	3	√	$4/mmm$	$\mathrm{B2_u} \oplus \mathrm{E_g}$
N111.12.18 A2 ⊕ A5	√	3	3	√	$4/mmm$	$\mathrm{B2_u} \oplus \mathrm{E_u}$
N111.12.19 A2 ⊕ M5	√	1	1	√	$4/mmm$	$\mathrm{B2_u}$
N111.12.20 A2 ⊕ Z5	√	1	1	√	$4/mmm$	$\mathrm{B2_u}$
N111.12.21 M1 ⊕ GM5	√	3	3	√	$4/mmm$	$\mathrm{B2_u} \oplus \mathrm{E_g}$
N111.12.22 M1 ⊕ A5	√	1	1	×	-	-
N111.12.23 M1 ⊕ M5	√	3	3	√	$4/mmm$	$\mathrm{B2_u} \oplus \mathrm{E_u}$
N111.12.24 M1 ⊕ Z5	√	1	1	×	-	-
N111.12.25 M2 ⊕ GM5	√	3	3	√	$4/mmm$	$\mathrm{B2_u} \oplus \mathrm{E_g}$
N111.12.26 M2 ⊕ A5	√	1	1	×	-	-
N111.12.27 M2 ⊕ M5	√	3	3	√	$4/mmm$	$\mathrm{B2_u} \oplus \mathrm{E_u}$
N111.12.28 M2 ⊕ Z5	√	1	1	×	-	-
N111.12.29 Z1 ⊕ GM5	√	3	3	√	$4/mmm$	$\mathrm{B2_u} \oplus \mathrm{E_g}$
N111.12.30 Z1 ⊕ A5	√	1	1	×	-	-
N111.12.31 Z1 ⊕ M5	√	1	1	×	-	-
N111.12.32 Z1 ⊕ Z5	√	3	3	√	$4/mmm$	$\mathrm{B2_u} \oplus \mathrm{E_u}$
N111.12.33 Z2 ⊕ GM5	√	3	3	√	$4/mmm$	$\mathrm{B2_u} \oplus \mathrm{E_g}$
N111.12.34 Z2 ⊕ A5	√	1	1	×	-	-
N111.12.35 Z2 ⊕ M5	√	1	1	×	-	-
N111.12.36 Z2 ⊕ Z5	√	3	3	√	$4/mmm$	$\mathrm{B2_u} \oplus \mathrm{E_u}$
N111.13.1 GM2 ⊕ R1	√	1	1	×	-	-
N111.13.2 GM2 ⊕ X1	√	1	1	×	-	-
N111.13.3 GM2 ⊕ X2	√	1	1	×	-	-

Non-coplanar SSGs with parent space group $P\bar{4}2m$ (No. 111) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N111.13.4 GM3 ⊕ R1	√	1	1	×	-	-
N111.13.5 GM3 ⊕ X1	√	1	1	√	$4/mmm$	$\mathrm{B2_g}$
N111.13.6 GM3 ⊕ X2	√	1	1	√	$4/mmm$	$\mathrm{B2_g}$
N111.13.7 GM4 ⊕ R1	√	1	1	×	-	-
N111.13.8 GM4 ⊕ X1	√	1	1	×	-	-
N111.13.9 GM4 ⊕ X2	√	1	1	×	-	-
N111.13.10 A1 ⊕ R1	×	-	-	-	-	-
N111.13.11 A1 ⊕ R2	×	-	-	-	-	-
N111.13.12 A1 ⊕ X1	×	-	-	-	-	-
N111.13.13 A1 ⊕ X2	×	-	-	-	-	-
N111.13.14 A2 ⊕ R1	×	-	-	-	-	-
N111.13.15 A2 ⊕ R2	×	-	-	-	-	-
N111.13.16 A2 ⊕ X1	×	-	-	-	-	-
N111.13.17 A2 ⊕ X2	×	-	-	-	-	-
N111.13.18 M1 ⊕ R1	×	-	-	-	-	-
N111.13.19 M1 ⊕ R3	×	-	-	-	-	-
N111.13.20 M1 ⊕ X1	×	-	-	-	-	-
N111.13.21 M1 ⊕ X4	×	-	-	-	-	-
N111.13.22 M1 ⊕ X2	×	-	-	-	-	-
N111.13.23 M1 ⊕ X3	×	-	-	-	-	-
N111.13.24 M2 ⊕ R1	×	-	-	-	-	-
N111.13.25 M2 ⊕ R3	×	-	-	-	-	-
N111.13.26 M2 ⊕ X1	×	-	-	-	-	-
N111.13.27 M2 ⊕ X4	×	-	-	-	-	-
N111.13.28 M2 ⊕ X2	×	-	-	-	-	-
N111.13.29 M2 ⊕ X3	×	-	-	-	-	-
N111.13.30 Z1 ⊕ R1	×	-	-	-	-	-
N111.13.31 Z1 ⊕ R2	×	-	-	-	-	-
N111.13.32 Z1 ⊕ X1	×	-	-	-	-	-
N111.13.33 Z1 ⊕ X2	×	-	-	-	-	-
N111.13.34 Z2 ⊕ R1	×	-	-	-	-	-
N111.13.35 Z2 ⊕ R2	×	-	-	-	-	-
N111.13.36 Z2 ⊕ X1	×	-	-	-	-	-
N111.13.37 Z2 ⊕ X2	×	-	-	-	-	-
N111.14.1 GM2 ⊕ LD1	√	1	1	√	$\bar{4}m2$	B1
N111.14.2 GM2 ⊕ LD2	√	1	1	√	$\bar{4}m2$	B1
N111.14.3 GM2 ⊕ V1	√	1	1	√	$\bar{4}m2$	B1
N111.14.4 GM2 ⊕ V2	√	1	1	√	$\bar{4}m2$	B1
N111.14.5 GM3 ⊕ LD1	√	1	1	√	$\bar{4}2m$	B2
N111.14.6 GM3 ⊕ LD2	√	1	1	√	$\bar{4}2m$	B2
N111.14.7 GM3 ⊕ V1	√	1	1	×	-	-
N111.14.8 GM3 ⊕ V2	√	1	1	×	-	-
N111.14.9 GM4 ⊕ LD1	√	1	1	√	422	A2
N111.14.10 GM4 ⊕ LD2	√	1	1	√	422	A2
N111.14.11 GM4 ⊕ V1	√	1	1	×	-	-
N111.14.12 GM4 ⊕ V2	√	1	1	×	-	-

Non-coplanar SSGs with parent space group $P\bar{4}2m$ (No. 111) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N111.14.13 A1 ⊕ LD1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N111.14.14 A1 ⊕ LD2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N111.14.15 A1 ⊕ V1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N111.14.16 A1 ⊕ V2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N111.14.17 A2 ⊕ LD1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N111.14.18 A2 ⊕ LD2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N111.14.19 A2 ⊕ V1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N111.14.20 A2 ⊕ V2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N111.14.21 M1 ⊕ LD1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N111.14.22 M1 ⊕ LD2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N111.14.23 M1 ⊕ V1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N111.14.24 M1 ⊕ V2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N111.14.25 M2 ⊕ LD1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N111.14.26 M2 ⊕ LD2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N111.14.27 M2 ⊕ V1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N111.14.28 M2 ⊕ V2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N111.14.29 Z1 ⊕ LD1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N111.14.30 Z1 ⊕ LD2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N111.14.31 Z1 ⊕ V1	√	1	1	×	-	-
N111.14.32 Z1 ⊕ V2	√	1	1	×	-	-
N111.14.33 Z2 ⊕ LD1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N111.14.34 Z2 ⊕ LD2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N111.14.35 Z2 ⊕ V1	√	1	1	×	-	-
N111.14.36 Z2 ⊕ V2	√	1	1	×	-	-

TABLE S334: Collinear SSGs with parent space group $P\bar{4}2c$ (No. 112).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L112.1.1 GM1	1	$4/mmm$	$\mathrm{A1_g}$
L112.2.1 GM2	1	$4/mmm$	$\mathrm{B1_g}$
L112.2.2 GM3	1	$4/mmm$	$\mathrm{B2_g}$
L112.2.3 GM4	1	$4/mmm$	$\mathrm{A2_g}$
L112.2.4 M1	0	-	-
L112.2.5 M2	0	-	-

TABLE S335: Coplanar SSGs with parent space group $P\bar{4}2c$ (No. 112).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P112.1.1 GM1	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{B1_u}$
P112.2.1 GM2	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{B1_g}$
P112.2.2 GM3	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$
P112.2.3 GM4	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g} \oplus \mathrm{B2_u}$
P112.2.4 M1	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
P112.2.5 M2	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$

Coplanar SSGs with parent space group $P\bar{4}2c$ (No. 112) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P112.3.1 GM2 ⊕ GM2	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
P112.3.2 GM2 ⊕ GM3	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
P112.3.3 GM2 ⊕ GM4	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
P112.3.4 GM2 ⊕ M1	√	1	1	√	$4/mmm$	$\mathrm{B1_g}$
P112.3.5 GM2 ⊕ M2	√	1	1	√	$4/mmm$	$\mathrm{B1_g}$
P112.3.6 GM3 ⊕ GM3	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
P112.3.7 GM3 ⊕ GM4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{B2_g}$
P112.3.8 GM3 ⊕ M1	√	1	1	×	-	-
P112.3.9 GM3 ⊕ M2	√	1	1	×	-	-
P112.3.10 GM4 ⊕ GM4	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
P112.3.11 GM4 ⊕ M1	√	1	1	×	-	-
P112.3.12 GM4 ⊕ M2	√	1	1	×	-	-
P112.3.13 M1 ⊕ M1	√	1	1	×	-	-
P112.3.14 M1 ⊕ M3	√	1	1	×	-	-
P112.3.15 M1 ⊕ M2	√	1	1	×	-	-
P112.3.16 M1 ⊕ M4	√	1	1	×	-	-
P112.3.17 M2 ⊕ M2	√	1	1	×	-	-
P112.3.18 M2 ⊕ M4	√	1	1	×	-	-
P112.4.1 Z1Z2	√	1	1	×	-	-
P112.4.2 A1A2	√	1	1	×	-	-
P112.6.1 GM5	√	3	3	√	$4/mmm$	$\mathrm{B2_u} \oplus \mathrm{E_g}$
P112.6.2 A5	√	1	1	×	-	-
P112.6.3 M5	√	1	1	×	-	-
P112.6.4 Z5	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
P112.7.1 R1	×	-	-	-	-	-
P112.7.2 X1	×	-	-	-	-	-
P112.7.3 X2	×	-	-	-	-	-
P112.8.1 LD1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
P112.8.2 V1	√	1	1	×	-	-

TABLE S336: Non-coplanar SSGs with parent space group $P\bar{4}2c$ (No. 112).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N112.1.1 GM1	√	3	3	√	$\bar{4}2m$	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{A1}$
N112.2.1 GM2	√	3	3	√	422	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{B1}$
N112.2.2 GM3	√	3	3	√	$4mm$	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{B2}$
N112.2.3 GM4	√	3	3	√	$\bar{4}m2$	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{B2}$
N112.2.4 M1	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{B1_u}$
N112.2.5 M2	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{B1_u}$
N112.3.1 GM2 ⊕ GM2	√	3	3	√	$\bar{4}2m$	$\mathrm{A1} \oplus \mathrm{B1} \oplus \mathrm{B1}$
N112.3.2 GM2 ⊕ GM3	√	3	3	√	$\bar{4}m2$	$\mathrm{A1} \oplus \mathrm{B1} \oplus \mathrm{A2}$
N112.3.3 GM2 ⊕ GM4	√	3	3	√	$4mm$	$\mathrm{A1} \oplus \mathrm{B1} \oplus \mathrm{A2}$
N112.3.4 GM2 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{B1_g}$
N112.3.5 GM2 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{B1_g}$
N112.3.6 GM3 ⊕ GM3	√	3	3	√	$\bar{4}2m$	$\mathrm{A1} \oplus \mathrm{B2} \oplus \mathrm{B2}$
N112.3.7 GM3 ⊕ GM4	√	3	3	√	422	$\mathrm{A1} \oplus \mathrm{A2} \oplus \mathrm{B2}$

Non-coplanar SSGs with parent space group $P\bar{4}2c$ (No. 112) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N112.3.8 GM3 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$
N112.3.9 GM3 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$
N112.3.10 GM4 ⊕ GM4	√	3	3	√	$\bar{4}2m$	$\mathrm{A1} \oplus \mathrm{A2} \oplus \mathrm{A2}$
N112.3.11 GM4 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g} \oplus \mathrm{B2_u}$
N112.3.12 GM4 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g} \oplus \mathrm{B2_u}$
N112.3.13 M1 ⊕ M1	√	1	1	√	$\bar{4}2m$	A1
N112.3.14 M1 ⊕ M3	√	1	1	√	$4mm$	A1
N112.3.15 M1 ⊕ M2	√	1	1	√	422	A1
N112.3.16 M1 ⊕ M4	√	1	1	√	$\bar{4}m2$	A1
N112.3.17 M2 ⊕ M2	√	1	1	√	$\bar{4}2m$	A1
N112.3.18 M2 ⊕ M4	√	1	1	√	$4mm$	A1
N112.4.1 Z1Z2	√	1	1	√	$\bar{4}2m$	A1
N112.4.2 A1A2	√	1	1	√	$\bar{4}2m$	A1
N112.6.1 GM5	√	3	3	√	$\bar{4}m2$	$\mathrm{A1} \oplus \mathrm{E}$
N112.6.2 A5	√	1	1	√	$4mm$	A1
N112.6.3 M5	√	1	1	√	$\bar{4}m2$	A1
N112.6.4 Z5	√	1	1	√	$4mm$	A1
N112.7.1 R1	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N112.7.2 X1	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N112.7.3 X2	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N112.8.1 LD1	√	1	1	√	$4mm$	A1
N112.8.2 V1	√	1	1	√	$4mm$	A1
N112.9.1 GM2 ⊕ GM2 ⊕ GM2	√	3	3	√	422	$\mathrm{B1} \oplus \mathrm{B1} \oplus \mathrm{B1}$
N112.9.2 GM2 ⊕ GM2 ⊕ GM3	√	3	3	√	$4mm$	$\mathrm{B1} \oplus \mathrm{B1} \oplus \mathrm{B2}$
N112.9.3 GM2 ⊕ GM2 ⊕ GM4	√	3	3	√	$\bar{4}m2$	$\mathrm{B1} \oplus \mathrm{B1} \oplus \mathrm{B2}$
N112.9.4 GM2 ⊕ GM2 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N112.9.5 GM2 ⊕ GM2 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N112.9.6 GM2 ⊕ GM3 ⊕ GM3	√	3	3	√	422	$\mathrm{B1} \oplus \mathrm{B2} \oplus \mathrm{B2}$
N112.9.7 GM2 ⊕ GM3 ⊕ GM4	√	3	3	√	$\bar{4}2m$	$\mathrm{B1} \oplus \mathrm{B2} \oplus \mathrm{A2}$
N112.9.8 GM2 ⊕ GM3 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N112.9.9 GM2 ⊕ GM3 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N112.9.10 GM2 ⊕ GM4 ⊕ GM4	√	3	3	√	422	$\mathrm{B1} \oplus \mathrm{A2} \oplus \mathrm{A2}$
N112.9.11 GM2 ⊕ GM4 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
N112.9.12 GM2 ⊕ GM4 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
N112.9.13 GM2 ⊕ M1 ⊕ M1	√	1	1	√	422	B1
N112.9.14 GM2 ⊕ M1 ⊕ M3	√	1	1	√	$\bar{4}m2$	B1
N112.9.15 GM2 ⊕ M1 ⊕ M2	√	1	1	√	$\bar{4}2m$	B1
N112.9.16 GM2 ⊕ M1 ⊕ M4	√	1	1	√	$4mm$	B1
N112.9.17 GM2 ⊕ M2 ⊕ M2	√	1	1	√	422	B1
N112.9.18 GM2 ⊕ M2 ⊕ M4	√	1	1	√	$\bar{4}m2$	B1
N112.9.19 GM3 ⊕ GM3 ⊕ GM3	√	3	3	√	$4mm$	$\mathrm{B2} \oplus \mathrm{B2} \oplus \mathrm{B2}$
N112.9.20 GM3 ⊕ GM3 ⊕ GM4	√	3	3	√	$\bar{4}m2$	$\mathrm{B2} \oplus \mathrm{A2} \oplus \mathrm{A2}$
N112.9.21 GM3 ⊕ GM3 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N112.9.22 GM3 ⊕ GM3 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N112.9.23 GM3 ⊕ GM4 ⊕ GM4	√	3	3	√	$4mm$	$\mathrm{B2} \oplus \mathrm{A2} \oplus \mathrm{A2}$
N112.9.24 GM3 ⊕ GM4 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{B2_g}$

Non-coplanar SSGs with parent space group $P\bar{4}2c$ (No. 112) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N112.9.25 GM3 ⊕ GM4 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{B2_g}$
N112.9.26 GM3 ⊕ M1 ⊕ M1	√	1	1	×	-	-
N112.9.27 GM3 ⊕ M1 ⊕ M3	√	1	1	×	-	-
N112.9.28 GM3 ⊕ M1 ⊕ M2	√	1	1	×	-	-
N112.9.29 GM3 ⊕ M1 ⊕ M4	√	1	1	×	-	-
N112.9.30 GM3 ⊕ M2 ⊕ M2	√	1	1	×	-	-
N112.9.31 GM3 ⊕ M2 ⊕ M4	√	1	1	×	-	-
N112.9.32 GM4 ⊕ GM4 ⊕ GM4	√	3	3	√	$\bar{4}m2$	$\mathrm{B2} \oplus \mathrm{B2} \oplus \mathrm{B2}$
N112.9.33 GM4 ⊕ GM4 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
N112.9.34 GM4 ⊕ GM4 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
N112.9.35 GM4 ⊕ M1 ⊕ M1	√	1	1	×	-	-
N112.9.36 GM4 ⊕ M1 ⊕ M3	√	1	1	×	-	-
N112.9.37 GM4 ⊕ M1 ⊕ M2	√	1	1	×	-	-
N112.9.38 GM4 ⊕ M1 ⊕ M4	√	1	1	×	-	-
N112.9.39 GM4 ⊕ M2 ⊕ M2	√	1	1	×	-	-
N112.9.40 GM4 ⊕ M2 ⊕ M4	√	1	1	×	-	-
N112.9.41 M1 ⊕ M1 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N112.9.42 M1 ⊕ M1 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N112.9.43 M1 ⊕ M1 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{B1_u}$
N112.9.44 M1 ⊕ M1 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N112.9.45 M1 ⊕ M3 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N112.9.46 M1 ⊕ M2 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{B1_u}$
N112.9.47 M1 ⊕ M2 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N112.9.48 M1 ⊕ M4 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N112.9.49 M2 ⊕ M2 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N112.9.50 M2 ⊕ M2 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N112.10.1 GM2 ⊕ Z1Z2	√	1	1	×	-	-
N112.10.2 GM2 ⊕ A1A2	√	1	1	×	-	-
N112.10.3 GM3 ⊕ Z1Z2	√	1	1	×	-	-
N112.10.4 GM3 ⊕ A1A2	√	1	1	×	-	-
N112.10.5 GM4 ⊕ Z1Z2	√	1	1	×	-	-
N112.10.6 GM4 ⊕ A1A2	√	1	1	×	-	-
N112.10.7 M1 ⊕ Z1Z2	√	1	1	×	-	-
N112.10.8 M1 ⊕ A1A2	√	1	1	×	-	-
N112.10.9 M2 ⊕ Z1Z2	√	1	1	×	-	-
N112.10.10 M2 ⊕ A1A2	√	1	1	×	-	-
N112.12.1 GM2 ⊕ GM5	√	3	3	√	$4mm$	$\mathrm{B1} \oplus \mathrm{E}$
N112.12.2 GM2 ⊕ A5	√	1	1	√	$\bar{4}m2$	B1
N112.12.3 GM2 ⊕ M5	√	1	1	√	$4mm$	B1
N112.12.4 GM2 ⊕ Z5	√	1	1	√	$\bar{4}m2$	B1
N112.12.5 GM3 ⊕ GM5	√	3	3	√	422	$\mathrm{B2} \oplus \mathrm{E}$
N112.12.6 GM3 ⊕ A5	√	1	1	×	-	-
N112.12.7 GM3 ⊕ M5	√	1	1	×	-	-
N112.12.8 GM3 ⊕ Z5	√	1	1	√	$\bar{4}2m$	B2
N112.12.9 GM4 ⊕ GM5	√	3	3	√	$\bar{4}2m$	$\mathrm{A2} \oplus \mathrm{E}$
N112.12.10 GM4 ⊕ A5	√	1	1	×	-	-

Non-coplanar SSGs with parent space group $P\bar{4}2c$ (No. 112) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N112.12.11 GM4 ⊕ M5	√	1	1	×	-	-
N112.12.12 GM4 ⊕ Z5	√	1	1	√	422	A2
N112.12.13 M1 ⊕ GM5	√	3	3	√	$4/mmm$	$\mathrm{B2_u} \oplus \mathrm{E_g}$
N112.12.14 M1 ⊕ A5	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N112.12.15 M1 ⊕ M5	√	3	3	√	$4/mmm$	$\mathrm{B2_u} \oplus \mathrm{E_u}$
N112.12.16 M1 ⊕ Z5	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N112.12.17 M2 ⊕ GM5	√	3	3	√	$4/mmm$	$\mathrm{B2_u} \oplus \mathrm{E_g}$
N112.12.18 M2 ⊕ A5	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N112.12.19 M2 ⊕ M5	√	3	3	√	$4/mmm$	$\mathrm{B2_u} \oplus \mathrm{E_u}$
N112.12.20 M2 ⊕ Z5	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N112.13.1 GM2 ⊕ R1	√	1	1	×	-	-
N112.13.2 GM2 ⊕ X1	√	1	1	×	-	-
N112.13.3 GM2 ⊕ X2	√	1	1	×	-	-
N112.13.4 GM3 ⊕ R1	√	1	1	×	-	-
N112.13.5 GM3 ⊕ X1	√	1	1	√	$4/mmm$	$\mathrm{B2_g}$
N112.13.6 GM3 ⊕ X2	√	1	1	√	$4/mmm$	$\mathrm{B2_g}$
N112.13.7 GM4 ⊕ R1	√	1	1	×	-	-
N112.13.8 GM4 ⊕ X1	√	1	1	×	-	-
N112.13.9 GM4 ⊕ X2	√	1	1	×	-	-
N112.13.10 M1 ⊕ R1	×	-	-	-	-	-
N112.13.11 M1 ⊕ R3	×	-	-	-	-	-
N112.13.12 M1 ⊕ X1	×	-	-	-	-	-
N112.13.13 M1 ⊕ X4	×	-	-	-	-	-
N112.13.14 M1 ⊕ X2	×	-	-	-	-	-
N112.13.15 M1 ⊕ X3	×	-	-	-	-	-
N112.13.16 M2 ⊕ R1	×	-	-	-	-	-
N112.13.17 M2 ⊕ R3	×	-	-	-	-	-
N112.13.18 M2 ⊕ X1	×	-	-	-	-	-
N112.13.19 M2 ⊕ X4	×	-	-	-	-	-
N112.13.20 M2 ⊕ X2	×	-	-	-	-	-
N112.13.21 M2 ⊕ X3	×	-	-	-	-	-
N112.14.1 GM2 ⊕ LD1	√	1	1	√	$\bar{4}m2$	B1
N112.14.2 GM2 ⊕ V1	√	1	1	√	$\bar{4}m2$	B1
N112.14.3 GM3 ⊕ LD1	√	1	1	√	$\bar{4}2m$	B2
N112.14.4 GM3 ⊕ V1	√	1	1	×	-	-
N112.14.5 GM4 ⊕ LD1	√	1	1	√	422	A2
N112.14.6 GM4 ⊕ V1	√	1	1	×	-	-
N112.14.7 M1 ⊕ LD1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N112.14.8 M1 ⊕ V1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N112.14.9 M2 ⊕ LD1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N112.14.10 M2 ⊕ V1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$

TABLE S337: Collinear SSGs with parent space group $P\bar{4}2_1m$ (No. 113).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L113.1.1 GM1	1	$4/mmm$	$\mathrm{A1_g}$

Collinear SSGs with parent space group $P\bar{4}2_1m$ (No. 113)(continued)

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L113.2.1 GM2	1	$4/mmm$	$\mathrm{B1_g}$
L113.2.2 GM3	1	$4/mmm$	$\mathrm{B2_g}$
L113.2.3 GM4	1	$4/mmm$	$\mathrm{A2_g}$
L113.2.4 Z1	0	-	-
L113.2.5 Z2	0	-	-

TABLE S338: Coplanar SSGs with parent space group $P\bar{4}2_1m$ (No. 113).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P113.1.1 GM1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{B1_u}$
P113.2.1 GM2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{B1_g}$
P113.2.2 GM3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_u}\oplus\mathrm{B2_g}$
P113.2.3 GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_g}\oplus\mathrm{B2_u}$
P113.2.4 Z1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P113.2.5 Z2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P113.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B1_u}$
P113.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B2_g}\oplus\mathrm{B2_u}$
P113.3.3 GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_u}$
P113.3.4 GM2 $\oplus$ Z1	$\surd$	1	1	$\times$	-	-
P113.3.5 GM2 $\oplus$ Z2	$\surd$	1	1	$\times$	-	-
P113.3.6 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{B2_g}\oplus\mathrm{B2_g}$
P113.3.7 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A2_g}\oplus\mathrm{B2_g}$
P113.3.8 GM3 $\oplus$ Z1	$\surd$	1	1	$\times$	-	-
P113.3.9 GM3 $\oplus$ Z2	$\surd$	1	1	$\times$	-	-
P113.3.10 GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{A2_g}\oplus\mathrm{A2_g}$
P113.3.11 GM4 $\oplus$ Z1	$\surd$	1	1	$\times$	-	-
P113.3.12 GM4 $\oplus$ Z2	$\surd$	1	1	$\times$	-	-
P113.3.13 Z1 $\oplus$ Z1	$\surd$	1	1	$\times$	-	-
P113.3.14 Z1 $\oplus$ Z3	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P113.3.15 Z1 $\oplus$ Z2	$\surd$	1	1	$\times$	-	-
P113.3.16 Z1 $\oplus$ Z4	$\surd$	1	1	$\times$	-	-
P113.3.17 Z2 $\oplus$ Z2	$\surd$	1	1	$\times$	-	-
P113.3.18 Z2 $\oplus$ Z4	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P113.4.1 M1M3	$\surd$	1	1	$\times$	-	-
P113.4.2 M2M4	$\surd$	1	1	$\times$	-	-
P113.4.3 A1A3	$\surd$	1	1	$\times$	-	-
P113.4.4 A2A4	$\surd$	1	1	$\times$	-	-
P113.6.1 GM5	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B2_u}\oplus\mathrm{E_g}$
P113.6.2 A5	$\surd$	1	1	$\times$	-	-
P113.6.3 M5	$\surd$	1	1	$\times$	-	-
P113.6.4 Z5	$\surd$	1	1	$\times$	-	-
P113.8.1 LD1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P113.8.2 LD2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$

TABLE S339: Non-coplanar SSGs with parent space group $P\bar{4}2_1m$ (No. 113).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N113.1.1 GM1	√	3	3	√	$\bar{4}2m$	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{A1}$
N113.2.1 GM2	√	3	3	√	422	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{B1}$
N113.2.2 GM3	√	3	3	√	$4mm$	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{B2}$
N113.2.3 GM4	√	3	3	√	$\bar{4}m2$	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{B2}$
N113.2.4 Z1	√	3	3	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{B1_u}$
N113.2.5 Z2	√	3	3	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{B1_u}$
N113.3.1 GM2 ⊕ GM2	√	3	3	√	$\bar{4}2m$	$\mathrm{A1}\oplus\mathrm{B1}\oplus\mathrm{B1}$
N113.3.2 GM2 ⊕ GM3	√	3	3	√	$\bar{4}m2$	$\mathrm{A1}\oplus\mathrm{B1}\oplus\mathrm{A2}$
N113.3.3 GM2 ⊕ GM4	√	3	3	√	$4mm$	$\mathrm{A1}\oplus\mathrm{B1}\oplus\mathrm{A2}$
N113.3.4 GM2 ⊕ Z1	√	3	3	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{B1_g}$
N113.3.5 GM2 ⊕ Z2	√	3	3	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{B1_g}$
N113.3.6 GM3 ⊕ GM3	√	3	3	√	$\bar{4}2m$	$\mathrm{A1}\oplus\mathrm{B2}\oplus\mathrm{B2}$
N113.3.7 GM3 ⊕ GM4	√	3	3	√	422	$\mathrm{A1}\oplus\mathrm{A2}\oplus\mathrm{B2}$
N113.3.8 GM3 ⊕ Z1	√	3	3	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_u}\oplus\mathrm{B2_g}$
N113.3.9 GM3 ⊕ Z2	√	3	3	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_u}\oplus\mathrm{B2_g}$
N113.3.10 GM4 ⊕ GM4	√	3	3	√	$\bar{4}2m$	$\mathrm{A1}\oplus\mathrm{A2}\oplus\mathrm{A2}$
N113.3.11 GM4 ⊕ Z1	√	3	3	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_g}\oplus\mathrm{B2_u}$
N113.3.12 GM4 ⊕ Z2	√	3	3	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_g}\oplus\mathrm{B2_u}$
N113.3.13 Z1 ⊕ Z1	√	1	1	√	$\bar{4}2m$	A1
N113.3.14 Z1 ⊕ Z3	√	1	1	√	$4mm$	A1
N113.3.15 Z1 ⊕ Z2	√	1	1	√	422	A1
N113.3.16 Z1 ⊕ Z4	√	1	1	√	$\bar{4}m2$	A1
N113.3.17 Z2 ⊕ Z2	√	1	1	√	$\bar{4}2m$	A1
N113.3.18 Z2 ⊕ Z4	√	1	1	√	$4mm$	A1
N113.4.1 M1M3	√	1	1	√	$\bar{4}2m$	A1
N113.4.2 M2M4	√	1	1	√	$\bar{4}2m$	A1
N113.4.3 A1A3	√	1	1	√	$\bar{4}2m$	A1
N113.4.4 A2A4	√	1	1	√	$\bar{4}2m$	A1
N113.6.1 GM5	√	3	3	√	$\bar{4}m2$	$\mathrm{A1}\oplus\mathrm{E}$
N113.6.2 A5	√	1	1	√	422	A1
N113.6.3 M5	√	1	1	√	422	A1
N113.6.4 Z5	√	1	1	√	$\bar{4}m2$	A1
N113.8.1 LD1	√	1	1	√	$4mm$	A1
N113.8.2 LD2	√	1	1	√	$4mm$	A1
N113.9.1 GM2 ⊕ GM2 ⊕ GM2	√	3	3	√	422	$\mathrm{B1}\oplus\mathrm{B1}\oplus\mathrm{B1}$
N113.9.2 GM2 ⊕ GM2 ⊕ GM3	√	3	3	√	$4mm$	$\mathrm{B1}\oplus\mathrm{B1}\oplus\mathrm{B2}$
N113.9.3 GM2 ⊕ GM2 ⊕ GM4	√	3	3	√	$\bar{4}m2$	$\mathrm{B1}\oplus\mathrm{B1}\oplus\mathrm{B2}$
N113.9.4 GM2 ⊕ GM2 ⊕ Z1	√	3	3	√	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B1_u}$
N113.9.5 GM2 ⊕ GM2 ⊕ Z2	√	3	3	√	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B1_u}$
N113.9.6 GM2 ⊕ GM3 ⊕ GM3	√	3	3	√	422	$\mathrm{B1}\oplus\mathrm{B2}\oplus\mathrm{B2}$
N113.9.7 GM2 ⊕ GM3 ⊕ GM4	√	3	3	√	$\bar{4}2m$	$\mathrm{B1}\oplus\mathrm{B2}\oplus\mathrm{A2}$
N113.9.8 GM2 ⊕ GM3 ⊕ Z1	√	3	3	√	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B2_g}\oplus\mathrm{B2_u}$
N113.9.9 GM2 ⊕ GM3 ⊕ Z2	√	3	3	√	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B2_g}\oplus\mathrm{B2_u}$
N113.9.10 GM2 ⊕ GM4 ⊕ GM4	√	3	3	√	422	$\mathrm{B1}\oplus\mathrm{A2}\oplus\mathrm{A2}$
N113.9.11 GM2 ⊕ GM4 ⊕ Z1	√	3	3	√	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_u}$
N113.9.12 GM2 ⊕ GM4 ⊕ Z2	√	3	3	√	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_u}$

Non-coplanar SSGs with parent space group $P\bar{4}2_1m$ (No. 113) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N113.9.13 GM2 ⊕ Z1 ⊕ Z1	√	1	1	×	-	-
N113.9.14 GM2 ⊕ Z1 ⊕ Z3	√	1	1	√	$\bar{4}m2$	B1
N113.9.15 GM2 ⊕ Z1 ⊕ Z2	√	1	1	×	-	-
N113.9.16 GM2 ⊕ Z1 ⊕ Z4	√	1	1	×	-	-
N113.9.17 GM2 ⊕ Z2 ⊕ Z2	√	1	1	×	-	-
N113.9.18 GM2 ⊕ Z2 ⊕ Z4	√	1	1	√	$\bar{4}m2$	B1
N113.9.19 GM3 ⊕ GM3 ⊕ GM3	√	3	3	√	$4mm$	B2 ⊕ B2 ⊕ B2
N113.9.20 GM3 ⊕ GM3 ⊕ GM4	√	3	3	√	$\bar{4}m2$	B2 ⊕ A2 ⊕ A2
N113.9.21 GM3 ⊕ GM3 ⊕ Z1	√	3	3	√	$4/mmm$	$\mathrm{B1_u}$ ⊕ $\mathrm{B2_g}$ ⊕ $\mathrm{B2_g}$
N113.9.22 GM3 ⊕ GM3 ⊕ Z2	√	3	3	√	$4/mmm$	$\mathrm{B1_u}$ ⊕ $\mathrm{B2_g}$ ⊕ $\mathrm{B2_g}$
N113.9.23 GM3 ⊕ GM4 ⊕ GM4	√	3	3	√	$4mm$	B2 ⊕ A2 ⊕ A2
N113.9.24 GM3 ⊕ GM4 ⊕ Z1	√	3	3	√	$4/mmm$	$\mathrm{A1_u}$ ⊕ $\mathrm{A2_g}$ ⊕ $\mathrm{B2_g}$
N113.9.25 GM3 ⊕ GM4 ⊕ Z2	√	3	3	√	$4/mmm$	$\mathrm{A1_u}$ ⊕ $\mathrm{A2_g}$ ⊕ $\mathrm{B2_g}$
N113.9.26 GM3 ⊕ Z1 ⊕ Z1	√	1	1	×	-	-
N113.9.27 GM3 ⊕ Z1 ⊕ Z3	√	1	1	√	$\bar{4}2m$	B2
N113.9.28 GM3 ⊕ Z1 ⊕ Z2	√	1	1	×	-	-
N113.9.29 GM3 ⊕ Z1 ⊕ Z4	√	1	1	×	-	-
N113.9.30 GM3 ⊕ Z2 ⊕ Z2	√	1	1	×	-	-
N113.9.31 GM3 ⊕ Z2 ⊕ Z4	√	1	1	√	$\bar{4}2m$	B2
N113.9.32 GM4 ⊕ GM4 ⊕ GM4	√	3	3	√	$\bar{4}m2$	B2 ⊕ B2 ⊕ B2
N113.9.33 GM4 ⊕ GM4 ⊕ Z1	√	3	3	√	$4/mmm$	$\mathrm{B1_u}$ ⊕ $\mathrm{A2_g}$ ⊕ $\mathrm{A2_g}$
N113.9.34 GM4 ⊕ GM4 ⊕ Z2	√	3	3	√	$4/mmm$	$\mathrm{B1_u}$ ⊕ $\mathrm{A2_g}$ ⊕ $\mathrm{A2_g}$
N113.9.35 GM4 ⊕ Z1 ⊕ Z1	√	1	1	×	-	-
N113.9.36 GM4 ⊕ Z1 ⊕ Z3	√	1	1	√	422	A2
N113.9.37 GM4 ⊕ Z1 ⊕ Z2	√	1	1	×	-	-
N113.9.38 GM4 ⊕ Z1 ⊕ Z4	√	1	1	×	-	-
N113.9.39 GM4 ⊕ Z2 ⊕ Z2	√	1	1	×	-	-
N113.9.40 GM4 ⊕ Z2 ⊕ Z4	√	1	1	√	422	A2
N113.9.41 Z1 ⊕ Z1 ⊕ Z1	√	3	3	√	$4/mmm$	$\mathrm{B1_u}$ ⊕ $\mathrm{B1_u}$ ⊕ $\mathrm{B1_u}$
N113.9.42 Z1 ⊕ Z1 ⊕ Z3	√	3	3	√	$4/mmm$	$\mathrm{B1_u}$ ⊕ $\mathrm{A2_u}$ ⊕ $\mathrm{A2_u}$
N113.9.43 Z1 ⊕ Z1 ⊕ Z2	√	3	3	√	$4/mmm$	$\mathrm{A1_u}$ ⊕ $\mathrm{A1_u}$ ⊕ $\mathrm{B1_u}$
N113.9.44 Z1 ⊕ Z1 ⊕ Z4	√	3	3	√	$4/mmm$	$\mathrm{B1_u}$ ⊕ $\mathrm{B2_u}$ ⊕ $\mathrm{B2_u}$
N113.9.45 Z1 ⊕ Z3 ⊕ Z2	√	3	3	√	$4/mmm$	$\mathrm{A1_u}$ ⊕ $\mathrm{A2_u}$ ⊕ $\mathrm{B2_u}$
N113.9.46 Z1 ⊕ Z2 ⊕ Z2	√	3	3	√	$4/mmm$	$\mathrm{A1_u}$ ⊕ $\mathrm{A1_u}$ ⊕ $\mathrm{B1_u}$
N113.9.47 Z1 ⊕ Z2 ⊕ Z4	√	3	3	√	$4/mmm$	$\mathrm{A1_u}$ ⊕ $\mathrm{A2_u}$ ⊕ $\mathrm{B2_u}$
N113.9.48 Z1 ⊕ Z4 ⊕ Z4	√	3	3	√	$4/mmm$	$\mathrm{B1_u}$ ⊕ $\mathrm{B2_u}$ ⊕ $\mathrm{B2_u}$
N113.9.49 Z2 ⊕ Z2 ⊕ Z2	√	3	3	√	$4/mmm$	$\mathrm{B1_u}$ ⊕ $\mathrm{B1_u}$ ⊕ $\mathrm{B1_u}$
N113.9.50 Z2 ⊕ Z2 ⊕ Z4	√	3	3	√	$4/mmm$	$\mathrm{B1_u}$ ⊕ $\mathrm{A2_u}$ ⊕ $\mathrm{A2_u}$
N113.10.1 GM2 ⊕ M1M3	√	1	1	√	422	B1
N113.10.2 GM2 ⊕ M2M4	√	1	1	√	422	B1
N113.10.3 GM2 ⊕ A1A3	√	1	1	×	-	-
N113.10.4 GM2 ⊕ A2A4	√	1	1	×	-	-
N113.10.5 GM3 ⊕ M1M3	√	1	1	×	-	-
N113.10.6 GM3 ⊕ M2M4	√	1	1	×	-	-
N113.10.7 GM3 ⊕ A1A3	√	1	1	×	-	-
N113.10.8 GM3 ⊕ A2A4	√	1	1	×	-	-

Non-coplanar SSGs with parent space group $P\bar{4}2_1m$ (No. 113) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N113.10.9 GM4 ⊕ M1M3	√	1	1	×	-	-
N113.10.10 GM4 ⊕ M2M4	√	1	1	×	-	-
N113.10.11 GM4 ⊕ A1A3	√	1	1	×	-	-
N113.10.12 GM4 ⊕ A2A4	√	1	1	×	-	-
N113.10.13 Z1 ⊕ M1M3	√	1	1	×	-	-
N113.10.14 Z1 ⊕ M2M4	√	1	1	×	-	-
N113.10.15 Z1 ⊕ A1A3	√	1	1	×	-	-
N113.10.16 Z1 ⊕ A2A4	√	1	1	×	-	-
N113.10.17 Z2 ⊕ M1M3	√	1	1	×	-	-
N113.10.18 Z2 ⊕ M2M4	√	1	1	×	-	-
N113.10.19 Z2 ⊕ A1A3	√	1	1	×	-	-
N113.10.20 Z2 ⊕ A2A4	√	1	1	×	-	-
N113.12.1 GM2 ⊕ GM5	√	3	3	√	$4mm$	B1 ⊕ E
N113.12.2 GM2 ⊕ A5	√	1	1	×	-	-
N113.12.3 GM2 ⊕ M5	√	1	1	√	$\bar{4}2m$	B1
N113.12.4 GM2 ⊕ Z5	√	1	1	×	-	-
N113.12.5 GM3 ⊕ GM5	√	3	3	√	422	B2 ⊕ E
N113.12.6 GM3 ⊕ A5	√	1	1	×	-	-
N113.12.7 GM3 ⊕ M5	√	1	1	×	-	-
N113.12.8 GM3 ⊕ Z5	√	1	1	×	-	-
N113.12.9 GM4 ⊕ GM5	√	3	3	√	$\bar{4}2m$	A2 ⊕ E
N113.12.10 GM4 ⊕ A5	√	1	1	×	-	-
N113.12.11 GM4 ⊕ M5	√	1	1	×	-	-
N113.12.12 GM4 ⊕ Z5	√	1	1	×	-	-
N113.12.13 Z1 ⊕ GM5	√	3	3	√	$4/mmm$	$\mathrm{B2_u} \oplus \mathrm{E_g}$
N113.12.14 Z1 ⊕ A5	√	1	1	×	-	-
N113.12.15 Z1 ⊕ M5	√	1	1	×	-	-
N113.12.16 Z1 ⊕ Z5	√	3	3	√	$4/mmm$	$\mathrm{B2_u} \oplus \mathrm{E_u}$
N113.12.17 Z2 ⊕ GM5	√	3	3	√	$4/mmm$	$\mathrm{B2_u} \oplus \mathrm{E_g}$
N113.12.18 Z2 ⊕ A5	√	1	1	×	-	-
N113.12.19 Z2 ⊕ M5	√	1	1	×	-	-
N113.12.20 Z2 ⊕ Z5	√	3	3	√	$4/mmm$	$\mathrm{B2_u} \oplus \mathrm{E_u}$
N113.14.1 GM2 ⊕ LD1	√	1	1	√	$\bar{4}m2$	B1
N113.14.2 GM2 ⊕ LD2	√	1	1	√	$\bar{4}m2$	B1
N113.14.3 GM3 ⊕ LD1	√	1	1	√	$\bar{4}2m$	B2
N113.14.4 GM3 ⊕ LD2	√	1	1	√	$\bar{4}2m$	B2
N113.14.5 GM4 ⊕ LD1	√	1	1	√	422	A2
N113.14.6 GM4 ⊕ LD2	√	1	1	√	422	A2
N113.14.7 Z1 ⊕ LD1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N113.14.8 Z1 ⊕ LD2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N113.14.9 Z2 ⊕ LD1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N113.14.10 Z2 ⊕ LD2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$

TABLE S340: Collinear SSGs with parent space group $P\bar{4}2_1c$ (No. 114).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L114.1.1 GM1	1	$4/mmm$	$\mathrm{A1_g}$
L114.2.1 GM2	1	$4/mmm$	$\mathrm{B1_g}$
L114.2.2 GM3	1	$4/mmm$	$\mathrm{B2_g}$
L114.2.3 GM4	1	$4/mmm$	$\mathrm{A2_g}$

TABLE S341: Coplanar SSGs with parent space group $P\bar{4}2_1c$ (No. 114).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P114.1.1 GM1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{B1_u}$
P114.2.1 GM2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{B1_g}$
P114.2.2 GM3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_u}\oplus\mathrm{B2_g}$
P114.2.3 GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_g}\oplus\mathrm{B2_u}$
P114.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B1_u}$
P114.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B2_g}\oplus\mathrm{B2_u}$
P114.3.3 GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_u}$
P114.3.4 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{B2_g}\oplus\mathrm{B2_g}$
P114.3.5 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A2_g}\oplus\mathrm{B2_g}$
P114.3.6 GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{A2_g}\oplus\mathrm{A2_g}$
P114.4.1 Z1Z2	$\surd$	1	1	$\times$	-	-
P114.4.2 M1M3	$\surd$	1	1	$\times$	-	-
P114.4.3 M2M4	$\surd$	1	1	$\times$	-	-
P114.4.4 A1A4	$\surd$	1	1	$\times$	-	-
P114.6.1 GM5	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B2_u}\oplus\mathrm{E_g}$
P114.6.2 M5	$\surd$	1	1	$\times$	-	-
P114.6.3 Z5	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P114.8.1 LD1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$

TABLE S342: Non-coplanar SSGs with parent space group $P\bar{4}2_1c$ (No. 114).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N114.1.1 GM1	$\surd$	3	3	$\surd$	$\bar{4}2m$	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{A1}$
N114.2.1 GM2	$\surd$	3	3	$\surd$	422	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{B1}$
N114.2.2 GM3	$\surd$	3	3	$\surd$	$4mm$	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{B2}$
N114.2.3 GM4	$\surd$	3	3	$\surd$	$\bar{4}m2$	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{B2}$
N114.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$\bar{4}2m$	$\mathrm{A1}\oplus\mathrm{B1}\oplus\mathrm{B1}$
N114.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$\bar{4}m2$	$\mathrm{A1}\oplus\mathrm{B1}\oplus\mathrm{A2}$
N114.3.3 GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4mm$	$\mathrm{A1}\oplus\mathrm{B1}\oplus\mathrm{A2}$
N114.3.4 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	$\bar{4}2m$	$\mathrm{A1}\oplus\mathrm{B2}\oplus\mathrm{B2}$
N114.3.5 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	422	$\mathrm{A1}\oplus\mathrm{A2}\oplus\mathrm{B2}$
N114.3.6 GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	$\bar{4}2m$	$\mathrm{A1}\oplus\mathrm{A2}\oplus\mathrm{A2}$
N114.4.1 Z1Z2	$\surd$	1	1	$\surd$	$\bar{4}2m$	A1
N114.4.2 M1M3	$\surd$	1	1	$\surd$	$\bar{4}2m$	A1
N114.4.3 M2M4	$\surd$	1	1	$\surd$	$\bar{4}2m$	A1
N114.4.4 A1A4	$\surd$	1	1	$\surd$	$\bar{4}2m$	A1

Non-coplanar SSGs with parent space group $P\bar{4}2_1c$ (No. 114) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N114.6.1 GM5	√	3	3	√	$\bar{4}m2$	A1 ⊕ E
N114.6.2 M5	√	1	1	√	422	A1
N114.6.3 Z5	√	1	1	√	$4mm$	A1
N114.8.1 LD1	√	1	1	√	$4mm$	A1
N114.9.1 GM2 ⊕ GM2 ⊕ GM2	√	3	3	√	422	B1 ⊕ B1 ⊕ B1
N114.9.2 GM2 ⊕ GM2 ⊕ GM3	√	3	3	√	$4mm$	B1 ⊕ B1 ⊕ B2
N114.9.3 GM2 ⊕ GM2 ⊕ GM4	√	3	3	√	$\bar{4}m2$	B1 ⊕ B1 ⊕ B2
N114.9.4 GM2 ⊕ GM3 ⊕ GM3	√	3	3	√	422	B1 ⊕ B2 ⊕ B2
N114.9.5 GM2 ⊕ GM3 ⊕ GM4	√	3	3	√	$\bar{4}2m$	B1 ⊕ B2 ⊕ A2
N114.9.6 GM2 ⊕ GM4 ⊕ GM4	√	3	3	√	422	B1 ⊕ A2 ⊕ A2
N114.9.7 GM3 ⊕ GM3 ⊕ GM3	√	3	3	√	$4mm$	B2 ⊕ B2 ⊕ B2
N114.9.8 GM3 ⊕ GM3 ⊕ GM4	√	3	3	√	$\bar{4}m2$	B2 ⊕ A2 ⊕ A2
N114.9.9 GM3 ⊕ GM4 ⊕ GM4	√	3	3	√	$4mm$	B2 ⊕ A2 ⊕ A2
N114.9.10 GM4 ⊕ GM4 ⊕ GM4	√	3	3	√	$\bar{4}m2$	B2 ⊕ B2 ⊕ B2
N114.10.1 GM2 ⊕ Z1Z2	√	1	1	×	-	-
N114.10.2 GM2 ⊕ M1M3	√	1	1	√	422	B1
N114.10.3 GM2 ⊕ M2M4	√	1	1	√	422	B1
N114.10.4 GM2 ⊕ A1A4	√	1	1	×	-	-
N114.10.5 GM3 ⊕ Z1Z2	√	1	1	×	-	-
N114.10.6 GM3 ⊕ M1M3	√	1	1	×	-	-
N114.10.7 GM3 ⊕ M2M4	√	1	1	×	-	-
N114.10.8 GM3 ⊕ A1A4	√	1	1	×	-	-
N114.10.9 GM4 ⊕ Z1Z2	√	1	1	×	-	-
N114.10.10 GM4 ⊕ M1M3	√	1	1	×	-	-
N114.10.11 GM4 ⊕ M2M4	√	1	1	×	-	-
N114.10.12 GM4 ⊕ A1A4	√	1	1	×	-	-
N114.12.1 GM2 ⊕ GM5	√	3	3	√	$4mm$	B1 ⊕ E
N114.12.2 GM2 ⊕ M5	√	1	1	√	$\bar{4}2m$	B1
N114.12.3 GM2 ⊕ Z5	√	1	1	√	$\bar{4}m2$	B1
N114.12.4 GM3 ⊕ GM5	√	3	3	√	422	B2 ⊕ E
N114.12.5 GM3 ⊕ M5	√	1	1	×	-	-
N114.12.6 GM3 ⊕ Z5	√	1	1	√	$\bar{4}2m$	B2
N114.12.7 GM4 ⊕ GM5	√	3	3	√	$\bar{4}2m$	A2 ⊕ E
N114.12.8 GM4 ⊕ M5	√	1	1	×	-	-
N114.12.9 GM4 ⊕ Z5	√	1	1	√	422	A2
N114.14.1 GM2 ⊕ LD1	√	1	1	√	$\bar{4}m2$	B1
N114.14.2 GM3 ⊕ LD1	√	1	1	√	$\bar{4}2m$	B2
N114.14.3 GM4 ⊕ LD1	√	1	1	√	422	A2

TABLE S343: Collinear SSGs with parent space group $P\bar{4}m2$ (No. 115).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L115.1.1 GM1	1	$4/mmm$	$\mathrm{A1_g}$
L115.2.1 GM2	1	$4/mmm$	$\mathrm{B1_g}$
L115.2.2 GM3	1	$4/mmm$	$\mathrm{A2_g}$
L115.2.3 GM4	1	$4/mmm$	$\mathrm{B2_g}$

Collinear SSGs with parent space group $P\bar{4}m2$ (No. 115)(continued)

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L115.2.4 A1	0	-	-
L115.2.5 M1	0	-	-
L115.2.6 M2	0	-	-
L115.2.7 Z1	0	-	-
L115.2.8 Z3	0	-	-

TABLE S344: Coplanar SSGs with parent space group $P\bar{4}m2$ (No. 115).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P115.1.1 GM1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{B2_u}$
P115.2.1 GM2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g} \oplus \mathrm{A2_u}$
P115.2.2 GM3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u} \oplus \mathrm{A2_g}$
P115.2.3 GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{B2_g}$
P115.2.4 A1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P115.2.5 M1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P115.2.6 M2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P115.2.7 Z1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P115.2.8 Z3	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P115.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B2_u}$
P115.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{A2_g}$
P115.3.3 GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_g}$
P115.3.4 GM2 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
P115.3.5 GM2 $\oplus$ M1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
P115.3.6 GM2 $\oplus$ M2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
P115.3.7 GM2 $\oplus$ Z1	$\surd$	1	1	$\times$	-	-
P115.3.8 GM2 $\oplus$ Z3	$\surd$	1	1	$\times$	-	-
P115.3.9 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{B2_u}$
P115.3.10 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$
P115.3.11 GM3 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
P115.3.12 GM3 $\oplus$ M1	$\surd$	1	1	$\times$	-	-
P115.3.13 GM3 $\oplus$ M2	$\surd$	1	1	$\times$	-	-
P115.3.14 GM3 $\oplus$ Z1	$\surd$	1	1	$\times$	-	-
P115.3.15 GM3 $\oplus$ Z3	$\surd$	1	1	$\times$	-	-
P115.3.16 GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
P115.3.17 GM4 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
P115.3.18 GM4 $\oplus$ M1	$\surd$	1	1	$\times$	-	-
P115.3.19 GM4 $\oplus$ M2	$\surd$	1	1	$\times$	-	-
P115.3.20 GM4 $\oplus$ Z1	$\surd$	1	1	$\times$	-	-
P115.3.21 GM4 $\oplus$ Z3	$\surd$	1	1	$\times$	-	-
P115.3.22 A1 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
P115.3.23 A1 $\oplus$ A2	$\surd$	1	1	$\times$	-	-
P115.3.24 A1 $\oplus$ A3	$\surd$	1	1	$\times$	-	-
P115.3.25 A1 $\oplus$ A4	$\surd$	1	1	$\times$	-	-
P115.3.26 A1 $\oplus$ M1	$\times$	-	-	-	-	-
P115.3.27 A1 $\oplus$ M4	$\times$	-	-	-	-	-
P115.3.28 A1 $\oplus$ M2	$\times$	-	-	-	-	-

Coplanar SSGs with parent space group $P\bar{4}m2$ (No. 115) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P115.3.29 A1 $\oplus$ M3	$\times$	-	-	-	-	-
P115.3.30 A1 $\oplus$ Z1	$\times$	-	-	-	-	-
P115.3.31 A1 $\oplus$ Z2	$\times$	-	-	-	-	-
P115.3.32 A1 $\oplus$ Z3	$\times$	-	-	-	-	-
P115.3.33 A1 $\oplus$ Z4	$\times$	-	-	-	-	-
P115.3.34 M1 $\oplus$ M1	$\surd$	1	1	$\times$	-	-
P115.3.35 M1 $\oplus$ M4	$\surd$	1	1	$\times$	-	-
P115.3.36 M1 $\oplus$ M2	$\surd$	1	1	$\times$	-	-
P115.3.37 M1 $\oplus$ M3	$\surd$	1	1	$\times$	-	-
P115.3.38 M1 $\oplus$ Z1	$\times$	-	-	-	-	-
P115.3.39 M1 $\oplus$ Z3	$\times$	-	-	-	-	-
P115.3.40 M2 $\oplus$ M2	$\surd$	1	1	$\times$	-	-
P115.3.41 M2 $\oplus$ M3	$\surd$	1	1	$\times$	-	-
P115.3.42 M2 $\oplus$ Z1	$\times$	-	-	-	-	-
P115.3.43 M2 $\oplus$ Z3	$\times$	-	-	-	-	-
P115.3.44 Z1 $\oplus$ Z1	$\surd$	1	1	$\times$	-	-
P115.3.45 Z1 $\oplus$ Z2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P115.3.46 Z1 $\oplus$ Z3	$\surd$	1	1	$\times$	-	-
P115.3.47 Z1 $\oplus$ Z4	$\surd$	1	1	$\times$	-	-
P115.3.48 Z3 $\oplus$ Z3	$\surd$	1	1	$\times$	-	-
P115.3.49 Z3 $\oplus$ Z4	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P115.6.1 GM5	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{E_g}$
P115.6.2 A5	$\surd$	1	1	$\times$	-	-
P115.6.3 M5	$\surd$	1	1	$\times$	-	-
P115.6.4 Z5	$\surd$	1	1	$\times$	-	-
P115.7.1 R1	$\times$	-	-	-	-	-
P115.7.2 R2	$\times$	-	-	-	-	-
P115.7.3 X1	$\times$	-	-	-	-	-
P115.7.4 X2	$\times$	-	-	-	-	-
P115.8.1 LD1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P115.8.2 LD2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P115.8.3 V1	$\surd$	1	1	$\times$	-	-

TABLE S345: Non-coplanar SSGs with parent space group $P\bar{4}m2$ (No. 115).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N115.1.1 GM1	$\surd$	3	3	$\surd$	$\bar{4}m2$	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{A1}$
N115.2.1 GM2	$\surd$	3	3	$\surd$	$4mm$	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{B1}$
N115.2.2 GM3	$\surd$	3	3	$\surd$	$\bar{4}2m$	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{A2}$
N115.2.3 GM4	$\surd$	3	3	$\surd$	422	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{B2}$
N115.2.4 A1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{B2_u}$
N115.2.5 M1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{B2_u}$
N115.2.6 M2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{B2_u}$
N115.2.7 Z1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{B2_u}$
N115.2.8 Z3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{B2_u}$

Non-coplanar SSGs with parent space group $P\bar{4}m2$ (No. 115) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N115.3.1 GM2 ⊕ GM2	√	3	3	√	$\bar{4}m2$	$\mathrm{A1}\oplus\mathrm{B1}\oplus\mathrm{B1}$
N115.3.2 GM2 ⊕ GM3	√	3	3	√	422	$\mathrm{A1}\oplus\mathrm{B1}\oplus\mathrm{A2}$
N115.3.3 GM2 ⊕ GM4	√	3	3	√	$\bar{4}2m$	$\mathrm{A1}\oplus\mathrm{B1}\oplus\mathrm{B2}$
N115.3.4 GM2 ⊕ A1	√	3	3	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}\oplus\mathrm{A2_u}$
N115.3.5 GM2 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}\oplus\mathrm{A2_u}$
N115.3.6 GM2 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}\oplus\mathrm{A2_u}$
N115.3.7 GM2 ⊕ Z1	√	3	3	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}\oplus\mathrm{A2_u}$
N115.3.8 GM2 ⊕ Z3	√	3	3	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}\oplus\mathrm{A2_u}$
N115.3.9 GM3 ⊕ GM3	√	3	3	√	$\bar{4}m2$	$\mathrm{A1}\oplus\mathrm{B2}\oplus\mathrm{B2}$
N115.3.10 GM3 ⊕ GM4	√	3	3	√	$4mm$	$\mathrm{A1}\oplus\mathrm{B2}\oplus\mathrm{A2}$
N115.3.11 GM3 ⊕ A1	√	3	3	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}\oplus\mathrm{A2_g}$
N115.3.12 GM3 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}\oplus\mathrm{A2_g}$
N115.3.13 GM3 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}\oplus\mathrm{A2_g}$
N115.3.14 GM3 ⊕ Z1	√	3	3	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}\oplus\mathrm{A2_g}$
N115.3.15 GM3 ⊕ Z3	√	3	3	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}\oplus\mathrm{A2_g}$
N115.3.16 GM4 ⊕ GM4	√	3	3	√	$\bar{4}m2$	$\mathrm{A1}\oplus\mathrm{A2}\oplus\mathrm{A2}$
N115.3.17 GM4 ⊕ A1	√	3	3	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{B2_g}$
N115.3.18 GM4 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{B2_g}$
N115.3.19 GM4 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{B2_g}$
N115.3.20 GM4 ⊕ Z1	√	3	3	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{B2_g}$
N115.3.21 GM4 ⊕ Z3	√	3	3	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{B2_g}$
N115.3.22 A1 ⊕ A1	√	1	1	√	$\bar{4}m2$	A1
N115.3.23 A1 ⊕ A2	√	1	1	√	$4mm$	A1
N115.3.24 A1 ⊕ A3	√	1	1	√	$\bar{4}2m$	A1
N115.3.25 A1 ⊕ A4	√	1	1	√	422	A1
N115.3.26 A1 ⊕ M1	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N115.3.27 A1 ⊕ M4	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N115.3.28 A1 ⊕ M2	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N115.3.29 A1 ⊕ M3	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N115.3.30 A1 ⊕ Z1	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N115.3.31 A1 ⊕ Z2	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N115.3.32 A1 ⊕ Z3	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N115.3.33 A1 ⊕ Z4	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N115.3.34 M1 ⊕ M1	√	1	1	√	$\bar{4}m2$	A1
N115.3.35 M1 ⊕ M4	√	1	1	√	422	A1
N115.3.36 M1 ⊕ M2	√	1	1	√	$4mm$	A1
N115.3.37 M1 ⊕ M3	√	1	1	√	$\bar{4}2m$	A1
N115.3.38 M1 ⊕ Z1	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N115.3.39 M1 ⊕ Z3	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N115.3.40 M2 ⊕ M2	√	1	1	√	$\bar{4}m2$	A1
N115.3.41 M2 ⊕ M3	√	1	1	√	422	A1
N115.3.42 M2 ⊕ Z1	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N115.3.43 M2 ⊕ Z3	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N115.3.44 Z1 ⊕ Z1	√	1	1	√	$\bar{4}m2$	A1
N115.3.45 Z1 ⊕ Z2	√	1	1	√	$4mm$	A1
N115.3.46 Z1 ⊕ Z3	√	1	1	√	$\bar{4}2m$	A1

Non-coplanar SSGs with parent space group $P\bar{4}m2$ (No. 115) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N115.3.47 Z1 ⊕ Z4	√	1	1	√	422	A1
N115.3.48 Z3 ⊕ Z3	√	1	1	√	$\bar{4}m2$	A1
N115.3.49 Z3 ⊕ Z4	√	1	1	√	$4mm$	A1
N115.6.1 GM5	√	3	3	√	$\bar{4}2m$	A1 ⊕ E
N115.6.2 A5	√	1	1	√	$\bar{4}2m$	A1
N115.6.3 M5	√	1	1	√	$\bar{4}2m$	A1
N115.6.4 Z5	√	1	1	√	$\bar{4}2m$	A1
N115.7.1 R1	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N115.7.2 R2	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N115.7.3 X1	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N115.7.4 X2	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N115.8.1 LD1	√	1	1	√	$4mm$	A1
N115.8.2 LD2	√	1	1	√	$4mm$	A1
N115.8.3 V1	√	1	1	√	$4mm$	A1
N115.9.1 GM2 ⊕ GM2 ⊕ GM2	√	3	3	√	$4mm$	B1 ⊕ B1 ⊕ B1
N115.9.2 GM2 ⊕ GM2 ⊕ GM3	√	3	3	√	$\bar{4}2m$	B1 ⊕ B1 ⊕ A2
N115.9.3 GM2 ⊕ GM2 ⊕ GM4	√	3	3	√	422	B1 ⊕ B1 ⊕ B2
N115.9.4 GM2 ⊕ GM2 ⊕ A1	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B2_u}$
N115.9.5 GM2 ⊕ GM2 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B2_u}$
N115.9.6 GM2 ⊕ GM2 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B2_u}$
N115.9.7 GM2 ⊕ GM2 ⊕ Z1	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B2_u}$
N115.9.8 GM2 ⊕ GM2 ⊕ Z3	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B2_u}$
N115.9.9 GM2 ⊕ GM3 ⊕ GM3	√	3	3	√	$4mm$	B1 ⊕ A2 ⊕ A2
N115.9.10 GM2 ⊕ GM3 ⊕ GM4	√	3	3	√	$\bar{4}m2$	B1 ⊕ B2 ⊕ A2
N115.9.11 GM2 ⊕ GM3 ⊕ A1	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{A2_g}$
N115.9.12 GM2 ⊕ GM3 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{A2_g}$
N115.9.13 GM2 ⊕ GM3 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{A2_g}$
N115.9.14 GM2 ⊕ GM3 ⊕ Z1	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{A2_g}$
N115.9.15 GM2 ⊕ GM3 ⊕ Z3	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{A2_g}$
N115.9.16 GM2 ⊕ GM4 ⊕ GM4	√	3	3	√	$4mm$	B1 ⊕ B2 ⊕ B2
N115.9.17 GM2 ⊕ GM4 ⊕ A1	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_g}$
N115.9.18 GM2 ⊕ GM4 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_g}$
N115.9.19 GM2 ⊕ GM4 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_g}$
N115.9.20 GM2 ⊕ GM4 ⊕ Z1	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_g}$
N115.9.21 GM2 ⊕ GM4 ⊕ Z3	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_g}$
N115.9.22 GM2 ⊕ A1 ⊕ A1	√	1	1	×	-	-
N115.9.23 GM2 ⊕ A1 ⊕ A2	√	1	1	√	$\bar{4}m2$	B1
N115.9.24 GM2 ⊕ A1 ⊕ A3	√	1	1	×	-	-
N115.9.25 GM2 ⊕ A1 ⊕ A4	√	1	1	×	-	-
N115.9.26 GM2 ⊕ A1 ⊕ M1	√	1	1	√	$4/mmm$	$\mathrm{B1_g}$
N115.9.27 GM2 ⊕ A1 ⊕ M4	√	1	1	√	$4/mmm$	$\mathrm{B1_g}$
N115.9.28 GM2 ⊕ A1 ⊕ M2	√	1	1	√	$4/mmm$	$\mathrm{B1_g}$
N115.9.29 GM2 ⊕ A1 ⊕ M3	√	1	1	√	$4/mmm$	$\mathrm{B1_g}$
N115.9.30 GM2 ⊕ A1 ⊕ Z1	√	1	1	×	-	-
N115.9.31 GM2 ⊕ A1 ⊕ Z2	√	1	1	×	-	-
N115.9.32 GM2 ⊕ A1 ⊕ Z3	√	1	1	×	-	-

Non-coplanar SSGs with parent space group $P\bar{4}m2$ (No. 115) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N115.9.33 GM2 ⊕ A1 ⊕ Z4	√	1	1	×	-	-
N115.9.34 GM2 ⊕ M1 ⊕ M1	√	1	1	√	$4mm$	B1
N115.9.35 GM2 ⊕ M1 ⊕ M4	√	1	1	√	$\bar{4}2m$	B1
N115.9.36 GM2 ⊕ M1 ⊕ M2	√	1	1	√	$\bar{4}m2$	B1
N115.9.37 GM2 ⊕ M1 ⊕ M3	√	1	1	√	422	B1
N115.9.38 GM2 ⊕ M1 ⊕ Z1	√	1	1	√	$4/mmm$	$\mathrm{B1_g}$
N115.9.39 GM2 ⊕ M1 ⊕ Z3	√	1	1	√	$4/mmm$	$\mathrm{B1_g}$
N115.9.40 GM2 ⊕ M2 ⊕ M2	√	1	1	√	$4mm$	B1
N115.9.41 GM2 ⊕ M2 ⊕ M3	√	1	1	√	$\bar{4}2m$	B1
N115.9.42 GM2 ⊕ M2 ⊕ Z1	√	1	1	√	$4/mmm$	$\mathrm{B1_g}$
N115.9.43 GM2 ⊕ M2 ⊕ Z3	√	1	1	√	$4/mmm$	$\mathrm{B1_g}$
N115.9.44 GM2 ⊕ Z1 ⊕ Z1	√	1	1	×	-	-
N115.9.45 GM2 ⊕ Z1 ⊕ Z2	√	1	1	√	$\bar{4}m2$	B1
N115.9.46 GM2 ⊕ Z1 ⊕ Z3	√	1	1	×	-	-
N115.9.47 GM2 ⊕ Z1 ⊕ Z4	√	1	1	×	-	-
N115.9.48 GM2 ⊕ Z3 ⊕ Z3	√	1	1	×	-	-
N115.9.49 GM2 ⊕ Z3 ⊕ Z4	√	1	1	√	$\bar{4}m2$	B1
N115.9.50 GM3 ⊕ GM3 ⊕ GM3	√	3	3	√	$\bar{4}2m$	A2 ⊕ A2 ⊕ A2
N115.9.51 GM3 ⊕ GM3 ⊕ GM4	√	3	3	√	422	A2 ⊕ A2 ⊕ B2
N115.9.52 GM3 ⊕ GM3 ⊕ A1	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{B2_u}$
N115.9.53 GM3 ⊕ GM3 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{B2_u}$
N115.9.54 GM3 ⊕ GM3 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{B2_u}$
N115.9.55 GM3 ⊕ GM3 ⊕ Z1	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{B2_u}$
N115.9.56 GM3 ⊕ GM3 ⊕ Z3	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{B2_u}$
N115.9.57 GM3 ⊕ GM4 ⊕ GM4	√	3	3	√	$\bar{4}2m$	B2 ⊕ B2 ⊕ A2
N115.9.58 GM3 ⊕ GM4 ⊕ A1	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$
N115.9.59 GM3 ⊕ GM4 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$
N115.9.60 GM3 ⊕ GM4 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$
N115.9.61 GM3 ⊕ GM4 ⊕ Z1	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$
N115.9.62 GM3 ⊕ GM4 ⊕ Z3	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$
N115.9.63 GM3 ⊕ A1 ⊕ A1	√	1	1	×	-	-
N115.9.64 GM3 ⊕ A1 ⊕ A2	√	1	1	×	-	-
N115.9.65 GM3 ⊕ A1 ⊕ A3	√	1	1	×	-	-
N115.9.66 GM3 ⊕ A1 ⊕ A4	√	1	1	×	-	-
N115.9.67 GM3 ⊕ A1 ⊕ M1	√	1	1	×	-	-
N115.9.68 GM3 ⊕ A1 ⊕ M4	√	1	1	×	-	-
N115.9.69 GM3 ⊕ A1 ⊕ M2	√	1	1	×	-	-
N115.9.70 GM3 ⊕ A1 ⊕ M3	√	1	1	×	-	-
N115.9.71 GM3 ⊕ A1 ⊕ Z1	√	1	1	×	-	-
N115.9.72 GM3 ⊕ A1 ⊕ Z2	√	1	1	×	-	-
N115.9.73 GM3 ⊕ A1 ⊕ Z3	√	1	1	×	-	-
N115.9.74 GM3 ⊕ A1 ⊕ Z4	√	1	1	×	-	-
N115.9.75 GM3 ⊕ M1 ⊕ M1	√	1	1	×	-	-
N115.9.76 GM3 ⊕ M1 ⊕ M4	√	1	1	×	-	-
N115.9.77 GM3 ⊕ M1 ⊕ M2	√	1	1	×	-	-
N115.9.78 GM3 ⊕ M1 ⊕ M3	√	1	1	×	-	-

Non-coplanar SSGs with parent space group $P\bar{4}m2$ (No. 115) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N115.9.79 GM3 ⊕ M1 ⊕ Z1	√	1	1	×	-	-
N115.9.80 GM3 ⊕ M1 ⊕ Z3	√	1	1	×	-	-
N115.9.81 GM3 ⊕ M2 ⊕ M2	√	1	1	×	-	-
N115.9.82 GM3 ⊕ M2 ⊕ M3	√	1	1	×	-	-
N115.9.83 GM3 ⊕ M2 ⊕ Z1	√	1	1	×	-	-
N115.9.84 GM3 ⊕ M2 ⊕ Z3	√	1	1	×	-	-
N115.9.85 GM3 ⊕ Z1 ⊕ Z1	√	1	1	×	-	-
N115.9.86 GM3 ⊕ Z1 ⊕ Z2	√	1	1	√	422	A2
N115.9.87 GM3 ⊕ Z1 ⊕ Z3	√	1	1	×	-	-
N115.9.88 GM3 ⊕ Z1 ⊕ Z4	√	1	1	×	-	-
N115.9.89 GM3 ⊕ Z3 ⊕ Z3	√	1	1	×	-	-
N115.9.90 GM3 ⊕ Z3 ⊕ Z4	√	1	1	√	422	A2
N115.9.91 GM4 ⊕ GM4 ⊕ GM4	√	3	3	√	422	B2 ⊕ B2 ⊕ B2
N115.9.92 GM4 ⊕ GM4 ⊕ A1	√	3	3	√	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N115.9.93 GM4 ⊕ GM4 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N115.9.94 GM4 ⊕ GM4 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N115.9.95 GM4 ⊕ GM4 ⊕ Z1	√	3	3	√	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N115.9.96 GM4 ⊕ GM4 ⊕ Z3	√	3	3	√	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N115.9.97 GM4 ⊕ A1 ⊕ A1	√	1	1	×	-	-
N115.9.98 GM4 ⊕ A1 ⊕ A2	√	1	1	×	-	-
N115.9.99 GM4 ⊕ A1 ⊕ A3	√	1	1	×	-	-
N115.9.100 GM4 ⊕ A1 ⊕ A4	√	1	1	×	-	-
N115.9.101 GM4 ⊕ A1 ⊕ M1	√	1	1	×	-	-
N115.9.102 GM4 ⊕ A1 ⊕ M4	√	1	1	×	-	-
N115.9.103 GM4 ⊕ A1 ⊕ M2	√	1	1	×	-	-
N115.9.104 GM4 ⊕ A1 ⊕ M3	√	1	1	×	-	-
N115.9.105 GM4 ⊕ A1 ⊕ Z1	√	1	1	×	-	-
N115.9.106 GM4 ⊕ A1 ⊕ Z2	√	1	1	×	-	-
N115.9.107 GM4 ⊕ A1 ⊕ Z3	√	1	1	×	-	-
N115.9.108 GM4 ⊕ A1 ⊕ Z4	√	1	1	×	-	-
N115.9.109 GM4 ⊕ M1 ⊕ M1	√	1	1	×	-	-
N115.9.110 GM4 ⊕ M1 ⊕ M4	√	1	1	×	-	-
N115.9.111 GM4 ⊕ M1 ⊕ M2	√	1	1	×	-	-
N115.9.112 GM4 ⊕ M1 ⊕ M3	√	1	1	×	-	-
N115.9.113 GM4 ⊕ M1 ⊕ Z1	√	1	1	×	-	-
N115.9.114 GM4 ⊕ M1 ⊕ Z3	√	1	1	×	-	-
N115.9.115 GM4 ⊕ M2 ⊕ M2	√	1	1	×	-	-
N115.9.116 GM4 ⊕ M2 ⊕ M3	√	1	1	×	-	-
N115.9.117 GM4 ⊕ M2 ⊕ Z1	√	1	1	×	-	-
N115.9.118 GM4 ⊕ M2 ⊕ Z3	√	1	1	×	-	-
N115.9.119 GM4 ⊕ Z1 ⊕ Z1	√	1	1	×	-	-
N115.9.120 GM4 ⊕ Z1 ⊕ Z2	√	1	1	√	$\bar{4}2m$	B2
N115.9.121 GM4 ⊕ Z1 ⊕ Z3	√	1	1	×	-	-
N115.9.122 GM4 ⊕ Z1 ⊕ Z4	√	1	1	×	-	-
N115.9.123 GM4 ⊕ Z3 ⊕ Z3	√	1	1	×	-	-
N115.9.124 GM4 ⊕ Z3 ⊕ Z4	√	1	1	√	$\bar{4}2m$	B2

Non-coplanar SSGs with parent space group $P\bar{4}m2$ (No. 115) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N115.9.125 A1 ⊕ A1 ⊕ A1	√	3	3	√	$4/mmm$	$\mathrm{B2_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N115.9.126 A1 ⊕ A1 ⊕ A2	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N115.9.127 A1 ⊕ A1 ⊕ A3	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B2_u}$
N115.9.128 A1 ⊕ A1 ⊕ A4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{B2_u}$
N115.9.129 A1 ⊕ A2 ⊕ A3	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{A2_u}$
N115.9.130 A1 ⊕ A1 ⊕ M1	√	1	1	×	-	-
N115.9.131 A1 ⊕ A1 ⊕ M4	√	1	1	×	-	-
N115.9.132 A1 ⊕ A2 ⊕ M1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N115.9.133 A1 ⊕ A2 ⊕ M4	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N115.9.134 A1 ⊕ A3 ⊕ M1	√	1	1	×	-	-
N115.9.135 A1 ⊕ A4 ⊕ M1	√	1	1	×	-	-
N115.9.136 A1 ⊕ A1 ⊕ M2	√	1	1	×	-	-
N115.9.137 A1 ⊕ A1 ⊕ M3	√	1	1	×	-	-
N115.9.138 A1 ⊕ A2 ⊕ M2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N115.9.139 A1 ⊕ A2 ⊕ M3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N115.9.140 A1 ⊕ A3 ⊕ M2	√	1	1	×	-	-
N115.9.141 A1 ⊕ A4 ⊕ M2	√	1	1	×	-	-
N115.9.142 A1 ⊕ A1 ⊕ Z1	√	1	1	×	-	-
N115.9.143 A1 ⊕ A1 ⊕ Z2	√	1	1	×	-	-
N115.9.144 A1 ⊕ A2 ⊕ Z1	√	1	1	×	-	-
N115.9.145 A1 ⊕ A3 ⊕ Z1	√	1	1	×	-	-
N115.9.146 A1 ⊕ A4 ⊕ Z1	√	1	1	×	-	-
N115.9.147 A1 ⊕ A4 ⊕ Z2	√	1	1	×	-	-
N115.9.148 A1 ⊕ A1 ⊕ Z3	√	1	1	×	-	-
N115.9.149 A1 ⊕ A1 ⊕ Z4	√	1	1	×	-	-
N115.9.150 A1 ⊕ A2 ⊕ Z3	√	1	1	×	-	-
N115.9.151 A1 ⊕ A3 ⊕ Z3	√	1	1	×	-	-
N115.9.152 A1 ⊕ A4 ⊕ Z3	√	1	1	×	-	-
N115.9.153 A1 ⊕ A4 ⊕ Z4	√	1	1	×	-	-
N115.9.154 A1 ⊕ M1 ⊕ M1	√	1	1	√	$4/mmm$	$\mathrm{B2_u}$
N115.9.155 A1 ⊕ M1 ⊕ M4	√	1	1	×	-	-
N115.9.156 A1 ⊕ M4 ⊕ M4	√	1	1	√	$4/mmm$	$\mathrm{B2_u}$
N115.9.157 A1 ⊕ M1 ⊕ M2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N115.9.158 A1 ⊕ M1 ⊕ M3	√	1	1	×	-	-
N115.9.159 A1 ⊕ M4 ⊕ M2	√	1	1	×	-	-
N115.9.160 A1 ⊕ M4 ⊕ M3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N115.9.161 A1 ⊕ M1 ⊕ Z1	×	-	-	-	-	-
N115.9.162 A1 ⊕ M1 ⊕ Z2	×	-	-	-	-	-
N115.9.163 A1 ⊕ M4 ⊕ Z1	×	-	-	-	-	-
N115.9.164 A1 ⊕ M4 ⊕ Z2	×	-	-	-	-	-
N115.9.165 A1 ⊕ M1 ⊕ Z3	×	-	-	-	-	-
N115.9.166 A1 ⊕ M1 ⊕ Z4	×	-	-	-	-	-
N115.9.167 A1 ⊕ M4 ⊕ Z3	×	-	-	-	-	-
N115.9.168 A1 ⊕ M4 ⊕ Z4	×	-	-	-	-	-
N115.9.169 A1 ⊕ M2 ⊕ M2	√	1	1	√	$4/mmm$	$\mathrm{B2_u}$
N115.9.170 A1 ⊕ M2 ⊕ M3	√	1	1	×	-	-

Non-coplanar SSGs with parent space group $P\bar{4}m2$ (No. 115) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N115.9.171 A1 ⊕ M3 ⊕ M3	√	1	1	√	$4/mmm$	$\mathrm{B2_u}$
N115.9.172 A1 ⊕ M2 ⊕ Z1	×	-	-	-	-	-
N115.9.173 A1 ⊕ M2 ⊕ Z2	×	-	-	-	-	-
N115.9.174 A1 ⊕ M3 ⊕ Z1	×	-	-	-	-	-
N115.9.175 A1 ⊕ M3 ⊕ Z2	×	-	-	-	-	-
N115.9.176 A1 ⊕ M2 ⊕ Z3	×	-	-	-	-	-
N115.9.177 A1 ⊕ M2 ⊕ Z4	×	-	-	-	-	-
N115.9.178 A1 ⊕ M3 ⊕ Z3	×	-	-	-	-	-
N115.9.179 A1 ⊕ M3 ⊕ Z4	×	-	-	-	-	-
N115.9.180 A1 ⊕ Z1 ⊕ Z1	√	1	1	√	$4/mmm$	$\mathrm{B2_u}$
N115.9.181 A1 ⊕ Z1 ⊕ Z2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N115.9.182 A1 ⊕ Z2 ⊕ Z2	√	1	1	√	$4/mmm$	$\mathrm{B2_u}$
N115.9.183 A1 ⊕ Z1 ⊕ Z3	√	1	1	×	-	-
N115.9.184 A1 ⊕ Z1 ⊕ Z4	√	1	1	×	-	-
N115.9.185 A1 ⊕ Z2 ⊕ Z3	√	1	1	×	-	-
N115.9.186 A1 ⊕ Z2 ⊕ Z4	√	1	1	×	-	-
N115.9.187 A1 ⊕ Z3 ⊕ Z3	√	1	1	√	$4/mmm$	$\mathrm{B2_u}$
N115.9.188 A1 ⊕ Z3 ⊕ Z4	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N115.9.189 A1 ⊕ Z4 ⊕ Z4	√	1	1	√	$4/mmm$	$\mathrm{B2_u}$
N115.9.190 M1 ⊕ M1 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{B2_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N115.9.191 M1 ⊕ M1 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{B2_u}$
N115.9.192 M1 ⊕ M1 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N115.9.193 M1 ⊕ M1 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B2_u}$
N115.9.194 M1 ⊕ M4 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{A2_u}$
N115.9.195 M1 ⊕ M1 ⊕ Z1	√	1	1	×	-	-
N115.9.196 M1 ⊕ M4 ⊕ Z1	√	1	1	×	-	-
N115.9.197 M1 ⊕ M1 ⊕ Z3	√	1	1	×	-	-
N115.9.198 M1 ⊕ M4 ⊕ Z3	√	1	1	×	-	-
N115.9.199 M1 ⊕ M2 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N115.9.200 M1 ⊕ M2 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{A2_u}$
N115.9.201 M1 ⊕ M3 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B2_u}$
N115.9.202 M1 ⊕ M2 ⊕ Z1	√	1	1	×	-	-
N115.9.203 M1 ⊕ M3 ⊕ Z1	√	1	1	×	-	-
N115.9.204 M1 ⊕ M2 ⊕ Z3	√	1	1	×	-	-
N115.9.205 M1 ⊕ M3 ⊕ Z3	√	1	1	×	-	-
N115.9.206 M1 ⊕ Z1 ⊕ Z1	√	1	1	×	-	-
N115.9.207 M1 ⊕ Z1 ⊕ Z2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N115.9.208 M1 ⊕ Z1 ⊕ Z3	√	1	1	×	-	-
N115.9.209 M1 ⊕ Z1 ⊕ Z4	√	1	1	×	-	-
N115.9.210 M1 ⊕ Z3 ⊕ Z3	√	1	1	×	-	-
N115.9.211 M1 ⊕ Z3 ⊕ Z4	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N115.9.212 M2 ⊕ M2 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{B2_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N115.9.213 M2 ⊕ M2 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{B2_u}$
N115.9.214 M2 ⊕ M2 ⊕ Z1	√	1	1	×	-	-
N115.9.215 M2 ⊕ M3 ⊕ Z1	√	1	1	×	-	-
N115.9.216 M2 ⊕ M2 ⊕ Z3	√	1	1	×	-	-

Non-coplanar SSGs with parent space group $P\bar{4}m2$ (No. 115) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N115.9.217 M2 ⊕ M3 ⊕ Z3	√	1	1	×	-	-
N115.9.218 M2 ⊕ Z1 ⊕ Z1	√	1	1	×	-	-
N115.9.219 M2 ⊕ Z1 ⊕ Z2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N115.9.220 M2 ⊕ Z1 ⊕ Z3	√	1	1	×	-	-
N115.9.221 M2 ⊕ Z1 ⊕ Z4	√	1	1	×	-	-
N115.9.222 M2 ⊕ Z3 ⊕ Z3	√	1	1	×	-	-
N115.9.223 M2 ⊕ Z3 ⊕ Z4	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N115.9.224 Z1 ⊕ Z1 ⊕ Z1	√	3	3	√	$4/mmm$	$\mathrm{B2_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N115.9.225 Z1 ⊕ Z1 ⊕ Z2	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N115.9.226 Z1 ⊕ Z1 ⊕ Z3	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B2_u}$
N115.9.227 Z1 ⊕ Z1 ⊕ Z4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{B2_u}$
N115.9.228 Z1 ⊕ Z2 ⊕ Z3	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{A2_u}$
N115.9.229 Z1 ⊕ Z3 ⊕ Z3	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B2_u}$
N115.9.230 Z1 ⊕ Z3 ⊕ Z4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{A2_u}$
N115.9.231 Z1 ⊕ Z4 ⊕ Z4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{B2_u}$
N115.9.232 Z3 ⊕ Z3 ⊕ Z3	√	3	3	√	$4/mmm$	$\mathrm{B2_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N115.9.233 Z3 ⊕ Z3 ⊕ Z4	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N115.12.1 GM2 ⊕ GM5	√	3	3	√	422	B1 ⊕ E
N115.12.2 GM2 ⊕ A5	√	1	1	×	-	-
N115.12.3 GM2 ⊕ M5	√	1	1	√	422	B1
N115.12.4 GM2 ⊕ Z5	√	1	1	×	-	-
N115.12.5 GM3 ⊕ GM5	√	3	3	√	$\bar{4}m2$	B2 ⊕ E
N115.12.6 GM3 ⊕ A5	√	1	1	×	-	-
N115.12.7 GM3 ⊕ M5	√	1	1	×	-	-
N115.12.8 GM3 ⊕ Z5	√	1	1	×	-	-
N115.12.9 GM4 ⊕ GM5	√	3	3	√	$4mm$	B2 ⊕ E
N115.12.10 GM4 ⊕ A5	√	1	1	×	-	-
N115.12.11 GM4 ⊕ M5	√	1	1	×	-	-
N115.12.12 GM4 ⊕ Z5	√	1	1	×	-	-
N115.12.13 A1 ⊕ GM5	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{E_g}$
N115.12.14 A1 ⊕ A5	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{E_u}$
N115.12.15 A1 ⊕ M5	√	1	1	×	-	-
N115.12.16 A1 ⊕ Z5	√	1	1	×	-	-
N115.12.17 M1 ⊕ GM5	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{E_g}$
N115.12.18 M1 ⊕ A5	√	1	1	×	-	-
N115.12.19 M1 ⊕ M5	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{E_u}$
N115.12.20 M1 ⊕ Z5	√	1	1	×	-	-
N115.12.21 M2 ⊕ GM5	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{E_g}$
N115.12.22 M2 ⊕ A5	√	1	1	×	-	-
N115.12.23 M2 ⊕ M5	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{E_u}$
N115.12.24 M2 ⊕ Z5	√	1	1	×	-	-
N115.12.25 Z1 ⊕ GM5	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{E_g}$
N115.12.26 Z1 ⊕ A5	√	1	1	×	-	-
N115.12.27 Z1 ⊕ M5	√	1	1	×	-	-
N115.12.28 Z1 ⊕ Z5	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{E_u}$
N115.12.29 Z3 ⊕ GM5	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{E_g}$

Non-coplanar SSGs with parent space group $P\bar{4}m2$ (No. 115) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N115.12.30 Z3 $\oplus$ A5	$\surd$	1	1	$\times$	-	-
N115.12.31 Z3 $\oplus$ M5	$\surd$	1	1	$\times$	-	-
N115.12.32 Z3 $\oplus$ Z5	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{E_u}$
N115.13.1 GM2 $\oplus$ R1	$\surd$	1	1	$\times$	-	-
N115.13.2 GM2 $\oplus$ R2	$\surd$	1	1	$\times$	-	-
N115.13.3 GM2 $\oplus$ X1	$\surd$	1	1	$\times$	-	-
N115.13.4 GM2 $\oplus$ X2	$\surd$	1	1	$\times$	-	-
N115.13.5 GM3 $\oplus$ R1	$\surd$	1	1	$\times$	-	-
N115.13.6 GM3 $\oplus$ R2	$\surd$	1	1	$\times$	-	-
N115.13.7 GM3 $\oplus$ X1	$\surd$	1	1	$\times$	-	-
N115.13.8 GM3 $\oplus$ X2	$\surd$	1	1	$\times$	-	-
N115.13.9 GM4 $\oplus$ R1	$\surd$	1	1	$\times$	-	-
N115.13.10 GM4 $\oplus$ R2	$\surd$	1	1	$\times$	-	-
N115.13.11 GM4 $\oplus$ X1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_g}$
N115.13.12 GM4 $\oplus$ X2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_g}$
N115.13.13 A1 $\oplus$ R1	$\times$	-	-	-	-	-
N115.13.14 A1 $\oplus$ R3	$\times$	-	-	-	-	-
N115.13.15 A1 $\oplus$ R2	$\times$	-	-	-	-	-
N115.13.16 A1 $\oplus$ R4	$\times$	-	-	-	-	-
N115.13.17 A1 $\oplus$ X1	$\times$	-	-	-	-	-
N115.13.18 A1 $\oplus$ X3	$\times$	-	-	-	-	-
N115.13.19 A1 $\oplus$ X2	$\times$	-	-	-	-	-
N115.13.20 A1 $\oplus$ X4	$\times$	-	-	-	-	-
N115.13.21 M1 $\oplus$ R1	$\times$	-	-	-	-	-
N115.13.22 M1 $\oplus$ R3	$\times$	-	-	-	-	-
N115.13.23 M1 $\oplus$ R2	$\times$	-	-	-	-	-
N115.13.24 M1 $\oplus$ R4	$\times$	-	-	-	-	-
N115.13.25 M1 $\oplus$ X1	$\times$	-	-	-	-	-
N115.13.26 M1 $\oplus$ X3	$\times$	-	-	-	-	-
N115.13.27 M1 $\oplus$ X2	$\times$	-	-	-	-	-
N115.13.28 M1 $\oplus$ X4	$\times$	-	-	-	-	-
N115.13.29 M2 $\oplus$ R1	$\times$	-	-	-	-	-
N115.13.30 M2 $\oplus$ R3	$\times$	-	-	-	-	-
N115.13.31 M2 $\oplus$ R2	$\times$	-	-	-	-	-
N115.13.32 M2 $\oplus$ R4	$\times$	-	-	-	-	-
N115.13.33 M2 $\oplus$ X1	$\times$	-	-	-	-	-
N115.13.34 M2 $\oplus$ X3	$\times$	-	-	-	-	-
N115.13.35 M2 $\oplus$ X2	$\times$	-	-	-	-	-
N115.13.36 M2 $\oplus$ X4	$\times$	-	-	-	-	-
N115.13.37 Z1 $\oplus$ R1	$\times$	-	-	-	-	-
N115.13.38 Z1 $\oplus$ R2	$\times$	-	-	-	-	-
N115.13.39 Z1 $\oplus$ X1	$\times$	-	-	-	-	-
N115.13.40 Z1 $\oplus$ X2	$\times$	-	-	-	-	-
N115.13.41 Z3 $\oplus$ R1	$\times$	-	-	-	-	-
N115.13.42 Z3 $\oplus$ R2	$\times$	-	-	-	-	-
N115.13.43 Z3 $\oplus$ X1	$\times$	-	-	-	-	-

Non-coplanar SSGs with parent space group $P\bar{4}m2$ (No. 115) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N115.13.44 Z3 $\oplus$ X2	$\times$	-	-	-	-	-
N115.14.1 GM2 $\oplus$ LD1	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N115.14.2 GM2 $\oplus$ LD2	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N115.14.3 GM2 $\oplus$ V1	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N115.14.4 GM3 $\oplus$ LD1	$\surd$	1	1	$\surd$	422	A2
N115.14.5 GM3 $\oplus$ LD2	$\surd$	1	1	$\surd$	422	A2
N115.14.6 GM3 $\oplus$ V1	$\surd$	1	1	$\times$	-	-
N115.14.7 GM4 $\oplus$ LD1	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N115.14.8 GM4 $\oplus$ LD2	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N115.14.9 GM4 $\oplus$ V1	$\surd$	1	1	$\times$	-	-
N115.14.10 A1 $\oplus$ LD1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N115.14.11 A1 $\oplus$ LD2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N115.14.12 A1 $\oplus$ V1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N115.14.13 A1 $\oplus$ V2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N115.14.14 M1 $\oplus$ LD1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N115.14.15 M1 $\oplus$ LD2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N115.14.16 M1 $\oplus$ V1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N115.14.17 M1 $\oplus$ V2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N115.14.18 M2 $\oplus$ LD1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N115.14.19 M2 $\oplus$ LD2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N115.14.20 M2 $\oplus$ V1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N115.14.21 M2 $\oplus$ V2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N115.14.22 Z1 $\oplus$ LD1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N115.14.23 Z1 $\oplus$ LD2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N115.14.24 Z1 $\oplus$ V1	$\surd$	1	1	$\times$	-	-
N115.14.25 Z3 $\oplus$ LD1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N115.14.26 Z3 $\oplus$ LD2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N115.14.27 Z3 $\oplus$ V1	$\surd$	1	1	$\times$	-	-

TABLE S346: Collinear SSGs with parent space group $P\bar{4}c2$ (No. 116).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L116.1.1 GM1	1	$4/mmm$	$\mathrm{A1_g}$
L116.2.1 GM2	1	$4/mmm$	$\mathrm{B1_g}$
L116.2.2 GM3	1	$4/mmm$	$\mathrm{A2_g}$
L116.2.3 GM4	1	$4/mmm$	$\mathrm{B2_g}$
L116.2.4 M1	0	-	-
L116.2.5 M2	0	-	-

TABLE S347: Coplanar SSGs with parent space group $P\bar{4}c2$ (No. 116).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P116.1.1 GM1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{B2_u}$
P116.2.1 GM2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g} \oplus \mathrm{A2_u}$
P116.2.2 GM3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u} \oplus \mathrm{A2_g}$

Coplanar SSGs with parent space group $P\bar{4}c2$ (No. 116) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P116.2.3 GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{B2_g}$
P116.2.4 M1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P116.2.5 M2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P116.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B2_u}$
P116.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{A2_g}$
P116.3.3 GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_g}$
P116.3.4 GM2 $\oplus$ M1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
P116.3.5 GM2 $\oplus$ M2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
P116.3.6 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{B2_u}$
P116.3.7 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$
P116.3.8 GM3 $\oplus$ M1	$\surd$	1	1	$\times$	-	-
P116.3.9 GM3 $\oplus$ M2	$\surd$	1	1	$\times$	-	-
P116.3.10 GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
P116.3.11 GM4 $\oplus$ M1	$\surd$	1	1	$\times$	-	-
P116.3.12 GM4 $\oplus$ M2	$\surd$	1	1	$\times$	-	-
P116.3.13 M1 $\oplus$ M1	$\surd$	1	1	$\times$	-	-
P116.3.14 M1 $\oplus$ M4	$\surd$	1	1	$\times$	-	-
P116.3.15 M1 $\oplus$ M2	$\surd$	1	1	$\times$	-	-
P116.3.16 M1 $\oplus$ M3	$\surd$	1	1	$\times$	-	-
P116.3.17 M2 $\oplus$ M2	$\surd$	1	1	$\times$	-	-
P116.3.18 M2 $\oplus$ M3	$\surd$	1	1	$\times$	-	-
P116.4.1 Z1Z4	$\surd$	1	1	$\times$	-	-
P116.4.2 A1A4	$\surd$	1	1	$\times$	-	-
P116.6.1 GM5	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{E_g}$
P116.6.2 A5	$\surd$	1	1	$\times$	-	-
P116.6.3 M5	$\surd$	1	1	$\times$	-	-
P116.6.4 Z5	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P116.7.1 X1	$\times$	-	-	-	-	-
P116.7.2 X2	$\times$	-	-	-	-	-
P116.8.1 LD1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P116.8.2 V1	$\surd$	1	1	$\times$	-	-

TABLE S348: Non-coplanar SSGs with parent space group $P\bar{4}c2$ (No. 116).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N116.1.1 GM1	$\surd$	3	3	$\surd$	$\bar{4}m2$	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{A1}$
N116.2.1 GM2	$\surd$	3	3	$\surd$	$4mm$	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{B1}$
N116.2.2 GM3	$\surd$	3	3	$\surd$	$\bar{4}2m$	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{A2}$
N116.2.3 GM4	$\surd$	3	3	$\surd$	422	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{B2}$
N116.2.4 M1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{B2_u}$
N116.2.5 M2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{B2_u}$
N116.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$\bar{4}m2$	$\mathrm{A1} \oplus \mathrm{B1} \oplus \mathrm{B1}$
N116.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	422	$\mathrm{A1} \oplus \mathrm{B1} \oplus \mathrm{A2}$
N116.3.3 GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	$\bar{4}2m$	$\mathrm{A1} \oplus \mathrm{B1} \oplus \mathrm{B2}$
N116.3.4 GM2 $\oplus$ M1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g} \oplus \mathrm{A2_u}$
N116.3.5 GM2 $\oplus$ M2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g} \oplus \mathrm{A2_u}$

Non-coplanar SSGs with parent space group $P\bar{4}c2$ (No. 116) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N116.3.6 GM3 ⊕ GM3	√	3	3	√	$\bar{4}m2$	A1 ⊕ B2 ⊕ B2
N116.3.7 GM3 ⊕ GM4	√	3	3	√	$4mm$	A1 ⊕ B2 ⊕ A2
N116.3.8 GM3 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u} \oplus \mathrm{A2_g}$
N116.3.9 GM3 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u} \oplus \mathrm{A2_g}$
N116.3.10 GM4 ⊕ GM4	√	3	3	√	$\bar{4}m2$	A1 ⊕ A2 ⊕ A2
N116.3.11 GM4 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{B2_g}$
N116.3.12 GM4 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{B2_g}$
N116.3.13 M1 ⊕ M1	√	1	1	√	$\bar{4}m2$	A1
N116.3.14 M1 ⊕ M4	√	1	1	√	422	A1
N116.3.15 M1 ⊕ M2	√	1	1	√	$4mm$	A1
N116.3.16 M1 ⊕ M3	√	1	1	√	$\bar{4}2m$	A1
N116.3.17 M2 ⊕ M2	√	1	1	√	$\bar{4}m2$	A1
N116.3.18 M2 ⊕ M3	√	1	1	√	422	A1
N116.4.1 Z1Z4	√	1	1	√	$\bar{4}m2$	A1
N116.4.2 A1A4	√	1	1	√	$\bar{4}m2$	A1
N116.6.1 GM5	√	3	3	√	$\bar{4}2m$	A1 ⊕ E
N116.6.2 A5	√	1	1	√	$4mm$	A1
N116.6.3 M5	√	1	1	√	$\bar{4}2m$	A1
N116.6.4 Z5	√	1	1	√	$4mm$	A1
N116.7.1 X1	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N116.7.2 X2	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N116.8.1 LD1	√	1	1	√	$4mm$	A1
N116.8.2 V1	√	1	1	√	$4mm$	A1
N116.9.1 GM2 ⊕ GM2 ⊕ GM2	√	3	3	√	$4mm$	B1 ⊕ B1 ⊕ B1
N116.9.2 GM2 ⊕ GM2 ⊕ GM3	√	3	3	√	$\bar{4}2m$	B1 ⊕ B1 ⊕ A2
N116.9.3 GM2 ⊕ GM2 ⊕ GM4	√	3	3	√	422	B1 ⊕ B1 ⊕ B2
N116.9.4 GM2 ⊕ GM2 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B2_u}$
N116.9.5 GM2 ⊕ GM2 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B2_u}$
N116.9.6 GM2 ⊕ GM3 ⊕ GM3	√	3	3	√	$4mm$	B1 ⊕ A2 ⊕ A2
N116.9.7 GM2 ⊕ GM3 ⊕ GM4	√	3	3	√	$\bar{4}m2$	B1 ⊕ B2 ⊕ A2
N116.9.8 GM2 ⊕ GM3 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{A2_g}$
N116.9.9 GM2 ⊕ GM3 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{A2_g}$
N116.9.10 GM2 ⊕ GM4 ⊕ GM4	√	3	3	√	$4mm$	B1 ⊕ B2 ⊕ B2
N116.9.11 GM2 ⊕ GM4 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_g}$
N116.9.12 GM2 ⊕ GM4 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_g}$
N116.9.13 GM2 ⊕ M1 ⊕ M1	√	1	1	√	$4mm$	B1
N116.9.14 GM2 ⊕ M1 ⊕ M4	√	1	1	√	$\bar{4}2m$	B1
N116.9.15 GM2 ⊕ M1 ⊕ M2	√	1	1	√	$\bar{4}m2$	B1
N116.9.16 GM2 ⊕ M1 ⊕ M3	√	1	1	√	422	B1
N116.9.17 GM2 ⊕ M2 ⊕ M2	√	1	1	√	$4mm$	B1
N116.9.18 GM2 ⊕ M2 ⊕ M3	√	1	1	√	$\bar{4}2m$	B1
N116.9.19 GM3 ⊕ GM3 ⊕ GM3	√	3	3	√	$\bar{4}2m$	A2 ⊕ A2 ⊕ A2
N116.9.20 GM3 ⊕ GM3 ⊕ GM4	√	3	3	√	422	A2 ⊕ A2 ⊕ B2
N116.9.21 GM3 ⊕ GM3 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{B2_u}$
N116.9.22 GM3 ⊕ GM3 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{B2_u}$
N116.9.23 GM3 ⊕ GM4 ⊕ GM4	√	3	3	√	$\bar{4}2m$	B2 ⊕ B2 ⊕ A2

Non-coplanar SSGs with parent space group $P\bar{4}c2$ (No. 116) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N116.9.24 GM3 ⊕ GM4 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$
N116.9.25 GM3 ⊕ GM4 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$
N116.9.26 GM3 ⊕ M1 ⊕ M1	√	1	1	×	-	-
N116.9.27 GM3 ⊕ M1 ⊕ M4	√	1	1	×	-	-
N116.9.28 GM3 ⊕ M1 ⊕ M2	√	1	1	×	-	-
N116.9.29 GM3 ⊕ M1 ⊕ M3	√	1	1	×	-	-
N116.9.30 GM3 ⊕ M2 ⊕ M2	√	1	1	×	-	-
N116.9.31 GM3 ⊕ M2 ⊕ M3	√	1	1	×	-	-
N116.9.32 GM4 ⊕ GM4 ⊕ GM4	√	3	3	√	422	B2 ⊕ B2 ⊕ B2
N116.9.33 GM4 ⊕ GM4 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N116.9.34 GM4 ⊕ GM4 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N116.9.35 GM4 ⊕ M1 ⊕ M1	√	1	1	×	-	-
N116.9.36 GM4 ⊕ M1 ⊕ M4	√	1	1	×	-	-
N116.9.37 GM4 ⊕ M1 ⊕ M2	√	1	1	×	-	-
N116.9.38 GM4 ⊕ M1 ⊕ M3	√	1	1	×	-	-
N116.9.39 GM4 ⊕ M2 ⊕ M2	√	1	1	×	-	-
N116.9.40 GM4 ⊕ M2 ⊕ M3	√	1	1	×	-	-
N116.9.41 M1 ⊕ M1 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{B2_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N116.9.42 M1 ⊕ M1 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{B2_u}$
N116.9.43 M1 ⊕ M1 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N116.9.44 M1 ⊕ M1 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B2_u}$
N116.9.45 M1 ⊕ M4 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{A2_u}$
N116.9.46 M1 ⊕ M2 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N116.9.47 M1 ⊕ M2 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{A2_u}$
N116.9.48 M1 ⊕ M3 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B2_u}$
N116.9.49 M2 ⊕ M2 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{B2_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N116.9.50 M2 ⊕ M2 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{B2_u}$
N116.10.1 GM2 ⊕ Z1Z4	√	1	1	×	-	-
N116.10.2 GM2 ⊕ A1A4	√	1	1	×	-	-
N116.10.3 GM3 ⊕ Z1Z4	√	1	1	×	-	-
N116.10.4 GM3 ⊕ A1A4	√	1	1	×	-	-
N116.10.5 GM4 ⊕ Z1Z4	√	1	1	×	-	-
N116.10.6 GM4 ⊕ A1A4	√	1	1	×	-	-
N116.10.7 M1 ⊕ Z1Z4	√	1	1	×	-	-
N116.10.8 M1 ⊕ A1A4	√	1	1	×	-	-
N116.10.9 M2 ⊕ Z1Z4	√	1	1	×	-	-
N116.10.10 M2 ⊕ A1A4	√	1	1	×	-	-
N116.12.1 GM2 ⊕ GM5	√	3	3	√	422	B1 ⊕ E
N116.12.2 GM2 ⊕ A5	√	1	1	√	$\bar{4}m2$	B1
N116.12.3 GM2 ⊕ M5	√	1	1	√	422	B1
N116.12.4 GM2 ⊕ Z5	√	1	1	√	$\bar{4}m2$	B1
N116.12.5 GM3 ⊕ GM5	√	3	3	√	$\bar{4}m2$	B2 ⊕ E
N116.12.6 GM3 ⊕ A5	√	1	1	×	-	-
N116.12.7 GM3 ⊕ M5	√	1	1	×	-	-
N116.12.8 GM3 ⊕ Z5	√	1	1	√	422	A2
N116.12.9 GM4 ⊕ GM5	√	3	3	√	$4mm$	B2 ⊕ E

Non-coplanar SSGs with parent space group $P\bar{4}c2$ (No. 116) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N116.12.10 GM4 $\oplus$ A5	$\surd$	1	1	$\times$	-	-
N116.12.11 GM4 $\oplus$ M5	$\surd$	1	1	$\times$	-	-
N116.12.12 GM4 $\oplus$ Z5	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N116.12.13 M1 $\oplus$ GM5	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{E_g}$
N116.12.14 M1 $\oplus$ A5	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N116.12.15 M1 $\oplus$ M5	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{E_u}$
N116.12.16 M1 $\oplus$ Z5	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N116.12.17 M2 $\oplus$ GM5	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{E_g}$
N116.12.18 M2 $\oplus$ A5	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N116.12.19 M2 $\oplus$ M5	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{E_u}$
N116.12.20 M2 $\oplus$ Z5	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N116.13.1 GM2 $\oplus$ X1	$\surd$	1	1	$\times$	-	-
N116.13.2 GM2 $\oplus$ X2	$\surd$	1	1	$\times$	-	-
N116.13.3 GM3 $\oplus$ X1	$\surd$	1	1	$\times$	-	-
N116.13.4 GM3 $\oplus$ X2	$\surd$	1	1	$\times$	-	-
N116.13.5 GM4 $\oplus$ X1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_g}$
N116.13.6 GM4 $\oplus$ X2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_g}$
N116.13.7 M1 $\oplus$ X1	$\times$	-	-	-	-	-
N116.13.8 M1 $\oplus$ X3	$\times$	-	-	-	-	-
N116.13.9 M1 $\oplus$ X2	$\times$	-	-	-	-	-
N116.13.10 M1 $\oplus$ X4	$\times$	-	-	-	-	-
N116.13.11 M2 $\oplus$ X1	$\times$	-	-	-	-	-
N116.13.12 M2 $\oplus$ X3	$\times$	-	-	-	-	-
N116.13.13 M2 $\oplus$ X2	$\times$	-	-	-	-	-
N116.13.14 M2 $\oplus$ X4	$\times$	-	-	-	-	-
N116.14.1 GM2 $\oplus$ LD1	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N116.14.2 GM2 $\oplus$ V1	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N116.14.3 GM3 $\oplus$ LD1	$\surd$	1	1	$\surd$	422	A2
N116.14.4 GM3 $\oplus$ V1	$\surd$	1	1	$\times$	-	-
N116.14.5 GM4 $\oplus$ LD1	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N116.14.6 GM4 $\oplus$ V1	$\surd$	1	1	$\times$	-	-
N116.14.7 M1 $\oplus$ LD1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N116.14.8 M1 $\oplus$ V1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N116.14.9 M2 $\oplus$ LD1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N116.14.10 M2 $\oplus$ V1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$

TABLE S349: Collinear SSGs with parent space group $P\bar{4}b2$ (No. 117).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L117.1.1 GM1	1	$4/mmm$	$\mathrm{A1_g}$
L117.2.1 GM2	1	$4/mmm$	$\mathrm{B1_g}$
L117.2.2 GM3	1	$4/mmm$	$\mathrm{A2_g}$
L117.2.3 GM4	1	$4/mmm$	$\mathrm{B2_g}$
L117.2.4 Z1	0	-	-
L117.2.5 Z3	0	-	-

TABLE S350: Coplanar SSGs with parent space group $P\bar{4}b2$ (No. 117).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P117.1.1 GM1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{B2_u}$
P117.2.1 GM2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g} \oplus \mathrm{A2_u}$
P117.2.2 GM3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u} \oplus \mathrm{A2_g}$
P117.2.3 GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{B2_g}$
P117.2.4 Z1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P117.2.5 Z3	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P117.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B2_u}$
P117.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{A2_g}$
P117.3.3 GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_g}$
P117.3.4 GM2 $\oplus$ Z1	$\surd$	1	1	$\times$	-	-
P117.3.5 GM2 $\oplus$ Z3	$\surd$	1	1	$\times$	-	-
P117.3.6 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{B2_u}$
P117.3.7 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$
P117.3.8 GM3 $\oplus$ Z1	$\surd$	1	1	$\times$	-	-
P117.3.9 GM3 $\oplus$ Z3	$\surd$	1	1	$\times$	-	-
P117.3.10 GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
P117.3.11 GM4 $\oplus$ Z1	$\surd$	1	1	$\times$	-	-
P117.3.12 GM4 $\oplus$ Z3	$\surd$	1	1	$\times$	-	-
P117.3.13 Z1 $\oplus$ Z1	$\surd$	1	1	$\times$	-	-
P117.3.14 Z1 $\oplus$ Z2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P117.3.15 Z1 $\oplus$ Z3	$\surd$	1	1	$\times$	-	-
P117.3.16 Z1 $\oplus$ Z4	$\surd$	1	1	$\times$	-	-
P117.3.17 Z3 $\oplus$ Z3	$\surd$	1	1	$\times$	-	-
P117.3.18 Z3 $\oplus$ Z4	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P117.4.1 M1M4	$\surd$	1	1	$\times$	-	-
P117.4.2 M2M3	$\surd$	1	1	$\times$	-	-
P117.4.3 A1A4	$\surd$	1	1	$\times$	-	-
P117.6.1 GM5	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{E_g}$
P117.6.2 A5	$\surd$	1	1	$\times$	-	-
P117.6.3 M5	$\surd$	1	1	$\times$	-	-
P117.6.4 Z5	$\surd$	1	1	$\times$	-	-
P117.8.1 LD1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P117.8.2 LD2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P117.8.3 V1	$\surd$	1	1	$\times$	-	-

TABLE S351: Non-coplanar SSGs with parent space group $P\bar{4}b2$ (No. 117).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N117.1.1 GM1	$\surd$	3	3	$\surd$	$\bar{4}m2$	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{A1}$
N117.2.1 GM2	$\surd$	3	3	$\surd$	$4mm$	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{B1}$
N117.2.2 GM3	$\surd$	3	3	$\surd$	$\bar{4}2m$	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{A2}$
N117.2.3 GM4	$\surd$	3	3	$\surd$	422	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{B2}$
N117.2.4 Z1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{B2_u}$
N117.2.5 Z3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{B2_u}$
N117.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$\bar{4}m2$	$\mathrm{A1} \oplus \mathrm{B1} \oplus \mathrm{B1}$
N117.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	422	$\mathrm{A1} \oplus \mathrm{B1} \oplus \mathrm{A2}$

Non-coplanar SSGs with parent space group $P\bar{4}b2$ (No. 117) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N117.3.3 GM2 ⊕ GM4	√	3	3	√	$\bar{4}2m$	A1 ⊕ B1 ⊕ B2
N117.3.4 GM2 ⊕ Z1	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g} \oplus \mathrm{A2_u}$
N117.3.5 GM2 ⊕ Z3	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g} \oplus \mathrm{A2_u}$
N117.3.6 GM3 ⊕ GM3	√	3	3	√	$\bar{4}m2$	A1 ⊕ B2 ⊕ B2
N117.3.7 GM3 ⊕ GM4	√	3	3	√	$4mm$	A1 ⊕ B2 ⊕ A2
N117.3.8 GM3 ⊕ Z1	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u} \oplus \mathrm{A2_g}$
N117.3.9 GM3 ⊕ Z3	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u} \oplus \mathrm{A2_g}$
N117.3.10 GM4 ⊕ GM4	√	3	3	√	$\bar{4}m2$	A1 ⊕ A2 ⊕ A2
N117.3.11 GM4 ⊕ Z1	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{B2_g}$
N117.3.12 GM4 ⊕ Z3	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{B2_g}$
N117.3.13 Z1 ⊕ Z1	√	1	1	√	$\bar{4}m2$	A1
N117.3.14 Z1 ⊕ Z2	√	1	1	√	$4mm$	A1
N117.3.15 Z1 ⊕ Z3	√	1	1	√	$\bar{4}2m$	A1
N117.3.16 Z1 ⊕ Z4	√	1	1	√	422	A1
N117.3.17 Z3 ⊕ Z3	√	1	1	√	$\bar{4}m2$	A1
N117.3.18 Z3 ⊕ Z4	√	1	1	√	$4mm$	A1
N117.4.1 M1M4	√	1	1	√	$\bar{4}m2$	A1
N117.4.2 M2M3	√	1	1	√	$\bar{4}m2$	A1
N117.4.3 A1A4	√	1	1	√	$\bar{4}m2$	A1
N117.6.1 GM5	√	3	3	√	$\bar{4}2m$	A1 ⊕ E
N117.6.2 A5	√	1	1	√	$4mm$	A1
N117.6.3 M5	√	1	1	√	$4mm$	A1
N117.6.4 Z5	√	1	1	√	$\bar{4}2m$	A1
N117.8.1 LD1	√	1	1	√	$4mm$	A1
N117.8.2 LD2	√	1	1	√	$4mm$	A1
N117.8.3 V1	√	1	1	√	$4mm$	A1
N117.9.1 GM2 ⊕ GM2 ⊕ GM2	√	3	3	√	$4mm$	B1 ⊕ B1 ⊕ B1
N117.9.2 GM2 ⊕ GM2 ⊕ GM3	√	3	3	√	$\bar{4}2m$	B1 ⊕ B1 ⊕ A2
N117.9.3 GM2 ⊕ GM2 ⊕ GM4	√	3	3	√	422	B1 ⊕ B1 ⊕ B2
N117.9.4 GM2 ⊕ GM2 ⊕ Z1	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B2_u}$
N117.9.5 GM2 ⊕ GM2 ⊕ Z3	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B2_u}$
N117.9.6 GM2 ⊕ GM3 ⊕ GM3	√	3	3	√	$4mm$	B1 ⊕ A2 ⊕ A2
N117.9.7 GM2 ⊕ GM3 ⊕ GM4	√	3	3	√	$\bar{4}m2$	B1 ⊕ B2 ⊕ A2
N117.9.8 GM2 ⊕ GM3 ⊕ Z1	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{A2_g}$
N117.9.9 GM2 ⊕ GM3 ⊕ Z3	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{A2_g}$
N117.9.10 GM2 ⊕ GM4 ⊕ GM4	√	3	3	√	$4mm$	B1 ⊕ B2 ⊕ B2
N117.9.11 GM2 ⊕ GM4 ⊕ Z1	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_g}$
N117.9.12 GM2 ⊕ GM4 ⊕ Z3	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_g}$
N117.9.13 GM2 ⊕ Z1 ⊕ Z1	√	1	1	×	-	-
N117.9.14 GM2 ⊕ Z1 ⊕ Z2	√	1	1	√	$\bar{4}m2$	B1
N117.9.15 GM2 ⊕ Z1 ⊕ Z3	√	1	1	×	-	-
N117.9.16 GM2 ⊕ Z1 ⊕ Z4	√	1	1	×	-	-
N117.9.17 GM2 ⊕ Z3 ⊕ Z3	√	1	1	×	-	-
N117.9.18 GM2 ⊕ Z3 ⊕ Z4	√	1	1	√	$\bar{4}m2$	B1
N117.9.19 GM3 ⊕ GM3 ⊕ GM3	√	3	3	√	$\bar{4}2m$	A2 ⊕ A2 ⊕ A2
N117.9.20 GM3 ⊕ GM3 ⊕ GM4	√	3	3	√	422	A2 ⊕ A2 ⊕ B2

Non-coplanar SSGs with parent space group $P\bar{4}b2$ (No. 117) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N117.9.21 GM3 ⊕ GM3 ⊕ Z1	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{B2_u}$
N117.9.22 GM3 ⊕ GM3 ⊕ Z3	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{B2_u}$
N117.9.23 GM3 ⊕ GM4 ⊕ GM4	√	3	3	√	$\bar{4}2m$	B2 ⊕ B2 ⊕ A2
N117.9.24 GM3 ⊕ GM4 ⊕ Z1	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$
N117.9.25 GM3 ⊕ GM4 ⊕ Z3	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$
N117.9.26 GM3 ⊕ Z1 ⊕ Z1	√	1	1	×	-	-
N117.9.27 GM3 ⊕ Z1 ⊕ Z2	√	1	1	√	422	A2
N117.9.28 GM3 ⊕ Z1 ⊕ Z3	√	1	1	×	-	-
N117.9.29 GM3 ⊕ Z1 ⊕ Z4	√	1	1	×	-	-
N117.9.30 GM3 ⊕ Z3 ⊕ Z3	√	1	1	×	-	-
N117.9.31 GM3 ⊕ Z3 ⊕ Z4	√	1	1	√	422	A2
N117.9.32 GM4 ⊕ GM4 ⊕ GM4	√	3	3	√	422	B2 ⊕ B2 ⊕ B2
N117.9.33 GM4 ⊕ GM4 ⊕ Z1	√	3	3	√	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N117.9.34 GM4 ⊕ GM4 ⊕ Z3	√	3	3	√	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N117.9.35 GM4 ⊕ Z1 ⊕ Z1	√	1	1	×	-	-
N117.9.36 GM4 ⊕ Z1 ⊕ Z2	√	1	1	√	$\bar{4}2m$	B2
N117.9.37 GM4 ⊕ Z1 ⊕ Z3	√	1	1	×	-	-
N117.9.38 GM4 ⊕ Z1 ⊕ Z4	√	1	1	×	-	-
N117.9.39 GM4 ⊕ Z3 ⊕ Z3	√	1	1	×	-	-
N117.9.40 GM4 ⊕ Z3 ⊕ Z4	√	1	1	√	$\bar{4}2m$	B2
N117.9.41 Z1 ⊕ Z1 ⊕ Z1	√	3	3	√	$4/mmm$	$\mathrm{B2_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N117.9.42 Z1 ⊕ Z1 ⊕ Z2	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N117.9.43 Z1 ⊕ Z1 ⊕ Z3	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B2_u}$
N117.9.44 Z1 ⊕ Z1 ⊕ Z4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{B2_u}$
N117.9.45 Z1 ⊕ Z2 ⊕ Z3	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{A2_u}$
N117.9.46 Z1 ⊕ Z3 ⊕ Z3	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B2_u}$
N117.9.47 Z1 ⊕ Z3 ⊕ Z4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{A2_u}$
N117.9.48 Z1 ⊕ Z4 ⊕ Z4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{B2_u}$
N117.9.49 Z3 ⊕ Z3 ⊕ Z3	√	3	3	√	$4/mmm$	$\mathrm{B2_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N117.9.50 Z3 ⊕ Z3 ⊕ Z4	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N117.10.1 GM2 ⊕ M1M4	√	1	1	√	$4mm$	B1
N117.10.2 GM2 ⊕ M2M3	√	1	1	√	$4mm$	B1
N117.10.3 GM2 ⊕ A1A4	√	1	1	×	-	-
N117.10.4 GM3 ⊕ M1M4	√	1	1	×	-	-
N117.10.5 GM3 ⊕ M2M3	√	1	1	×	-	-
N117.10.6 GM3 ⊕ A1A4	√	1	1	×	-	-
N117.10.7 GM4 ⊕ M1M4	√	1	1	×	-	-
N117.10.8 GM4 ⊕ M2M3	√	1	1	×	-	-
N117.10.9 GM4 ⊕ A1A4	√	1	1	×	-	-
N117.10.10 Z1 ⊕ M1M4	√	1	1	×	-	-
N117.10.11 Z1 ⊕ M2M3	√	1	1	×	-	-
N117.10.12 Z1 ⊕ A1A4	√	1	1	×	-	-
N117.10.13 Z1 ⊕ A2A3	√	1	1	×	-	-
N117.10.14 Z3 ⊕ M1M4	√	1	1	×	-	-
N117.10.15 Z3 ⊕ M2M3	√	1	1	×	-	-
N117.10.16 Z3 ⊕ A1A4	√	1	1	×	-	-

Non-coplanar SSGs with parent space group $P\bar{4}b2$ (No. 117) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N117.10.17 Z3 $\oplus$ A2A3	$\surd$	1	1	$\times$	-	-
N117.12.1 GM2 $\oplus$ GM5	$\surd$	3	3	$\surd$	422	B1 $\oplus$ E
N117.12.2 GM2 $\oplus$ A5	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N117.12.3 GM2 $\oplus$ M5	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N117.12.4 GM2 $\oplus$ Z5	$\surd$	1	1	$\times$	-	-
N117.12.5 GM3 $\oplus$ GM5	$\surd$	3	3	$\surd$	$\bar{4}m2$	B2 $\oplus$ E
N117.12.6 GM3 $\oplus$ A5	$\surd$	1	1	$\times$	-	-
N117.12.7 GM3 $\oplus$ M5	$\surd$	1	1	$\times$	-	-
N117.12.8 GM3 $\oplus$ Z5	$\surd$	1	1	$\times$	-	-
N117.12.9 GM4 $\oplus$ GM5	$\surd$	3	3	$\surd$	$4mm$	B2 $\oplus$ E
N117.12.10 GM4 $\oplus$ A5	$\surd$	1	1	$\times$	-	-
N117.12.11 GM4 $\oplus$ M5	$\surd$	1	1	$\times$	-	-
N117.12.12 GM4 $\oplus$ Z5	$\surd$	1	1	$\times$	-	-
N117.12.13 Z1 $\oplus$ GM5	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{E_g}$
N117.12.14 Z1 $\oplus$ A5	$\surd$	1	1	$\times$	-	-
N117.12.15 Z1 $\oplus$ M5	$\surd$	1	1	$\times$	-	-
N117.12.16 Z1 $\oplus$ Z5	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{E_u}$
N117.12.17 Z3 $\oplus$ GM5	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{E_g}$
N117.12.18 Z3 $\oplus$ A5	$\surd$	1	1	$\times$	-	-
N117.12.19 Z3 $\oplus$ M5	$\surd$	1	1	$\times$	-	-
N117.12.20 Z3 $\oplus$ Z5	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{E_u}$
N117.14.1 GM2 $\oplus$ LD1	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N117.14.2 GM2 $\oplus$ LD2	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N117.14.3 GM2 $\oplus$ V1	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N117.14.4 GM3 $\oplus$ LD1	$\surd$	1	1	$\surd$	422	A2
N117.14.5 GM3 $\oplus$ LD2	$\surd$	1	1	$\surd$	422	A2
N117.14.6 GM3 $\oplus$ V1	$\surd$	1	1	$\times$	-	-
N117.14.7 GM4 $\oplus$ LD1	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N117.14.8 GM4 $\oplus$ LD2	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N117.14.9 GM4 $\oplus$ V1	$\surd$	1	1	$\times$	-	-
N117.14.10 Z1 $\oplus$ LD1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N117.14.11 Z1 $\oplus$ LD2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N117.14.12 Z1 $\oplus$ V1	$\surd$	1	1	$\times$	-	-
N117.14.13 Z3 $\oplus$ LD1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N117.14.14 Z3 $\oplus$ LD2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N117.14.15 Z3 $\oplus$ V1	$\surd$	1	1	$\times$	-	-

TABLE S352: Collinear SSGs with parent space group $P\bar{4}n2$ (No. 118).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L118.1.1 GM1	1	$4/mmm$	$\mathrm{A1_g}$
L118.2.1 GM2	1	$4/mmm$	$\mathrm{B1_g}$
L118.2.2 GM3	1	$4/mmm$	$\mathrm{A2_g}$
L118.2.3 GM4	1	$4/mmm$	$\mathrm{B2_g}$
L118.2.4 A1	0	-	-

TABLE S353: Coplanar SSGs with parent space group $P\bar{4}n2$ (No. 118).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P118.1.1 GM1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{B2_u}$
P118.2.1 GM2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g} \oplus \mathrm{A2_u}$
P118.2.2 GM3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u} \oplus \mathrm{A2_g}$
P118.2.3 GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{B2_g}$
P118.2.4 A1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P118.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B2_u}$
P118.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{A2_g}$
P118.3.3 GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_g}$
P118.3.4 GM2 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
P118.3.5 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{B2_u}$
P118.3.6 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$
P118.3.7 GM3 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
P118.3.8 GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
P118.3.9 GM4 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
P118.3.10 A1 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
P118.3.11 A1 $\oplus$ A2	$\surd$	1	1	$\times$	-	-
P118.3.12 A1 $\oplus$ A3	$\surd$	1	1	$\times$	-	-
P118.3.13 A1 $\oplus$ A4	$\surd$	1	1	$\times$	-	-
P118.4.1 Z1Z4	$\surd$	1	1	$\times$	-	-
P118.4.2 M1M4	$\surd$	1	1	$\times$	-	-
P118.4.3 M2M3	$\surd$	1	1	$\times$	-	-
P118.6.1 GM5	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{E_g}$
P118.6.2 A5	$\surd$	1	1	$\times$	-	-
P118.6.3 M5	$\surd$	1	1	$\times$	-	-
P118.6.4 Z5	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P118.8.1 LD1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P118.8.2 V1	$\surd$	1	1	$\times$	-	-

TABLE S354: Non-coplanar SSGs with parent space group $P\bar{4}n2$ (No. 118).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N118.1.1 GM1	$\surd$	3	3	$\surd$	$\bar{4}m2$	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{A1}$
N118.2.1 GM2	$\surd$	3	3	$\surd$	$4mm$	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{B1}$
N118.2.2 GM3	$\surd$	3	3	$\surd$	$\bar{4}2m$	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{A2}$
N118.2.3 GM4	$\surd$	3	3	$\surd$	422	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{B2}$
N118.2.4 A1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{B2_u}$
N118.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$\bar{4}m2$	$\mathrm{A1} \oplus \mathrm{B1} \oplus \mathrm{B1}$
N118.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	422	$\mathrm{A1} \oplus \mathrm{B1} \oplus \mathrm{A2}$
N118.3.3 GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	$\bar{4}2m$	$\mathrm{A1} \oplus \mathrm{B1} \oplus \mathrm{B2}$
N118.3.4 GM2 $\oplus$ A1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g} \oplus \mathrm{A2_u}$
N118.3.5 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	$\bar{4}m2$	$\mathrm{A1} \oplus \mathrm{B2} \oplus \mathrm{B2}$
N118.3.6 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4mm$	$\mathrm{A1} \oplus \mathrm{B2} \oplus \mathrm{A2}$
N118.3.7 GM3 $\oplus$ A1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u} \oplus \mathrm{A2_g}$
N118.3.8 GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	$\bar{4}m2$	$\mathrm{A1} \oplus \mathrm{A2} \oplus \mathrm{A2}$
N118.3.9 GM4 $\oplus$ A1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{B2_g}$
N118.3.10 A1 $\oplus$ A1	$\surd$	1	1	$\surd$	$\bar{4}m2$	A1

Non-coplanar SSGs with parent space group $P\bar{4}n2$ (No. 118) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N118.3.11 A1 ⊕ A2	√	1	1	√	$4mm$	A1
N118.3.12 A1 ⊕ A3	√	1	1	√	$\bar{4}2m$	A1
N118.3.13 A1 ⊕ A4	√	1	1	√	422	A1
N118.4.1 Z1Z4	√	1	1	√	$\bar{4}m2$	A1
N118.4.2 M1M4	√	1	1	√	$\bar{4}m2$	A1
N118.4.3 M2M3	√	1	1	√	$\bar{4}m2$	A1
N118.6.1 GM5	√	3	3	√	$\bar{4}2m$	A1 ⊕ E
N118.6.2 A5	√	1	1	√	$\bar{4}2m$	A1
N118.6.3 M5	√	1	1	√	$4mm$	A1
N118.6.4 Z5	√	1	1	√	$4mm$	A1
N118.8.1 LD1	√	1	1	√	$4mm$	A1
N118.8.2 V1	√	1	1	√	$4mm$	A1
N118.9.1 GM2 ⊕ GM2 ⊕ GM2	√	3	3	√	$4mm$	B1 ⊕ B1 ⊕ B1
N118.9.2 GM2 ⊕ GM2 ⊕ GM3	√	3	3	√	$\bar{4}2m$	B1 ⊕ B1 ⊕ A2
N118.9.3 GM2 ⊕ GM2 ⊕ GM4	√	3	3	√	422	B1 ⊕ B1 ⊕ B2
N118.9.4 GM2 ⊕ GM2 ⊕ A1	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B2_u}$
N118.9.5 GM2 ⊕ GM3 ⊕ GM3	√	3	3	√	$4mm$	B1 ⊕ A2 ⊕ A2
N118.9.6 GM2 ⊕ GM3 ⊕ GM4	√	3	3	√	$\bar{4}m2$	B1 ⊕ B2 ⊕ A2
N118.9.7 GM2 ⊕ GM3 ⊕ A1	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{A2_g}$
N118.9.8 GM2 ⊕ GM4 ⊕ GM4	√	3	3	√	$4mm$	B1 ⊕ B2 ⊕ B2
N118.9.9 GM2 ⊕ GM4 ⊕ A1	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_g}$
N118.9.10 GM2 ⊕ A1 ⊕ A1	√	1	1	×	-	-
N118.9.11 GM2 ⊕ A1 ⊕ A2	√	1	1	√	$\bar{4}m2$	B1
N118.9.12 GM2 ⊕ A1 ⊕ A3	√	1	1	×	-	-
N118.9.13 GM2 ⊕ A1 ⊕ A4	√	1	1	×	-	-
N118.9.14 GM3 ⊕ GM3 ⊕ GM3	√	3	3	√	$\bar{4}2m$	A2 ⊕ A2 ⊕ A2
N118.9.15 GM3 ⊕ GM3 ⊕ GM4	√	3	3	√	422	A2 ⊕ A2 ⊕ B2
N118.9.16 GM3 ⊕ GM3 ⊕ A1	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{B2_u}$
N118.9.17 GM3 ⊕ GM4 ⊕ GM4	√	3	3	√	$\bar{4}2m$	B2 ⊕ B2 ⊕ A2
N118.9.18 GM3 ⊕ GM4 ⊕ A1	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$
N118.9.19 GM3 ⊕ A1 ⊕ A1	√	1	1	×	-	-
N118.9.20 GM3 ⊕ A1 ⊕ A2	√	1	1	×	-	-
N118.9.21 GM3 ⊕ A1 ⊕ A3	√	1	1	×	-	-
N118.9.22 GM3 ⊕ A1 ⊕ A4	√	1	1	×	-	-
N118.9.23 GM4 ⊕ GM4 ⊕ GM4	√	3	3	√	422	B2 ⊕ B2 ⊕ B2
N118.9.24 GM4 ⊕ GM4 ⊕ A1	√	3	3	√	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N118.9.25 GM4 ⊕ A1 ⊕ A1	√	1	1	×	-	-
N118.9.26 GM4 ⊕ A1 ⊕ A2	√	1	1	×	-	-
N118.9.27 GM4 ⊕ A1 ⊕ A3	√	1	1	×	-	-
N118.9.28 GM4 ⊕ A1 ⊕ A4	√	1	1	×	-	-
N118.9.29 A1 ⊕ A1 ⊕ A1	√	3	3	√	$4/mmm$	$\mathrm{B2_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N118.9.30 A1 ⊕ A1 ⊕ A2	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N118.9.31 A1 ⊕ A1 ⊕ A3	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B2_u}$
N118.9.32 A1 ⊕ A1 ⊕ A4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{B2_u}$
N118.9.33 A1 ⊕ A2 ⊕ A3	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{A2_u}$
N118.10.1 GM2 ⊕ Z1Z4	√	1	1	×	-	-

Non-coplanar SSGs with parent space group $P\bar{4}n2$ (No. 118) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N118.10.2 GM2 ⊕ M1M4	√	1	1	√	$4mm$	B1
N118.10.3 GM2 ⊕ M2M3	√	1	1	√	$4mm$	B1
N118.10.4 GM3 ⊕ Z1Z4	√	1	1	×	-	-
N118.10.5 GM3 ⊕ M1M4	√	1	1	×	-	-
N118.10.6 GM3 ⊕ M2M3	√	1	1	×	-	-
N118.10.7 GM4 ⊕ Z1Z4	√	1	1	×	-	-
N118.10.8 GM4 ⊕ M1M4	√	1	1	×	-	-
N118.10.9 GM4 ⊕ M2M3	√	1	1	×	-	-
N118.10.10 A1 ⊕ Z1Z4	√	1	1	√	$4/mmm$	$\mathrm{B2_u}$
N118.10.11 A1 ⊕ Z2Z3	√	1	1	√	$4/mmm$	$\mathrm{B2_u}$
N118.10.12 A1 ⊕ M1M4	√	1	1	√	$4/mmm$	$\mathrm{B2_u}$
N118.10.13 A1 ⊕ M2M3	√	1	1	√	$4/mmm$	$\mathrm{B2_u}$
N118.12.1 GM2 ⊕ GM5	√	3	3	√	422	B1 ⊕ E
N118.12.2 GM2 ⊕ A5	√	1	1	×	-	-
N118.12.3 GM2 ⊕ M5	√	1	1	√	$\bar{4}m2$	B1
N118.12.4 GM2 ⊕ Z5	√	1	1	√	$\bar{4}m2$	B1
N118.12.5 GM3 ⊕ GM5	√	3	3	√	$\bar{4}m2$	B2 ⊕ E
N118.12.6 GM3 ⊕ A5	√	1	1	×	-	-
N118.12.7 GM3 ⊕ M5	√	1	1	×	-	-
N118.12.8 GM3 ⊕ Z5	√	1	1	√	422	A2
N118.12.9 GM4 ⊕ GM5	√	3	3	√	$4mm$	B2 ⊕ E
N118.12.10 GM4 ⊕ A5	√	1	1	×	-	-
N118.12.11 GM4 ⊕ M5	√	1	1	×	-	-
N118.12.12 GM4 ⊕ Z5	√	1	1	√	$\bar{4}2m$	B2
N118.12.13 A1 ⊕ GM5	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{E_g}$
N118.12.14 A1 ⊕ A5	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{E_u}$
N118.12.15 A1 ⊕ M5	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N118.12.16 A1 ⊕ Z5	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N118.14.1 GM2 ⊕ LD1	√	1	1	√	$\bar{4}m2$	B1
N118.14.2 GM2 ⊕ V1	√	1	1	√	$\bar{4}m2$	B1
N118.14.3 GM3 ⊕ LD1	√	1	1	√	422	A2
N118.14.4 GM3 ⊕ V1	√	1	1	×	-	-
N118.14.5 GM4 ⊕ LD1	√	1	1	√	$\bar{4}2m$	B2
N118.14.6 GM4 ⊕ V1	√	1	1	×	-	-
N118.14.7 A1 ⊕ LD1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N118.14.8 A1 ⊕ V1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$

TABLE S355: Collinear SSGs with parent space group $I\bar{4}m2$ (No. 119).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L119.1.1 GM1	1	$4/mmm$	$\mathrm{A1_g}$
L119.2.1 GM2	1	$4/mmm$	$\mathrm{B1_g}$
L119.2.2 GM3	1	$4/mmm$	$\mathrm{A2_g}$
L119.2.3 GM4	1	$4/mmm$	$\mathrm{B2_g}$
L119.2.4 M1	0	-	-
L119.2.5 M3	0	-	-

Coplanar SSGs with parent space group $I\bar{4}m2$ (No. 119) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation

TABLE S356: Coplanar SSGs with parent space group $I\bar{4}m2$ (No. 119).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P119.1.1 GM1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{B2_u}$
P119.2.1 GM2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}\oplus\mathrm{A2_u}$
P119.2.2 GM3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}\oplus\mathrm{A2_g}$
P119.2.3 GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{B2_g}$
P119.2.4 M1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P119.2.5 M3	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P119.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B2_u}$
P119.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B1_g}\oplus\mathrm{A2_g}$
P119.3.3 GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_u}\oplus\mathrm{B2_g}$
P119.3.4 GM2 $\oplus$ M1	$\surd$	1	1	$\times$	-	-
P119.3.5 GM2 $\oplus$ M3	$\surd$	1	1	$\times$	-	-
P119.3.6 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{A2_g}\oplus\mathrm{B2_u}$
P119.3.7 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{A2_u}\oplus\mathrm{B2_g}$
P119.3.8 GM3 $\oplus$ M1	$\surd$	1	1	$\times$	-	-
P119.3.9 GM3 $\oplus$ M3	$\surd$	1	1	$\times$	-	-
P119.3.10 GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B2_g}\oplus\mathrm{B2_g}\oplus\mathrm{B2_u}$
P119.3.11 GM4 $\oplus$ M1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_g}$
P119.3.12 GM4 $\oplus$ M3	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_g}$
P119.3.13 M1 $\oplus$ M1	$\surd$	1	1	$\times$	-	-
P119.3.14 M1 $\oplus$ M2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P119.3.15 M1 $\oplus$ M3	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_u}$
P119.3.16 M1 $\oplus$ M4	$\surd$	1	1	$\times$	-	-
P119.3.17 M3 $\oplus$ M3	$\surd$	1	1	$\times$	-	-
P119.3.18 M3 $\oplus$ M4	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P119.6.1 GM5	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{E_g}$
P119.6.2 M5	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_u}$
P119.7.1 X1	$\times$	-	-	-	-	-
P119.7.2 X2	$\times$	-	-	-	-	-
P119.7.3 P1	$\surd$	1	1	$\times$	-	-
P119.8.1 LD1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P119.8.2 LD2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$

TABLE S357: Non-coplanar SSGs with parent space group $I\bar{4}m2$ (No. 119).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N119.1.1 GM1	$\surd$	3	3	$\surd$	$\bar{4}m2$	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{A1}$
N119.2.1 GM2	$\surd$	3	3	$\surd$	$4mm$	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{B1}$
N119.2.2 GM3	$\surd$	3	3	$\surd$	$\bar{4}2m$	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{A2}$
N119.2.3 GM4	$\surd$	3	3	$\surd$	422	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{B2}$
N119.2.4 M1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{B2_u}$
N119.2.5 M3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{B2_u}$

Non-coplanar SSGs with parent space group $I\bar{4}m2$ (No. 119) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N119.3.1 GM2 ⊕ GM2	√	3	3	√	$\bar{4}m2$	A1 ⊕ B1 ⊕ B1
N119.3.2 GM2 ⊕ GM3	√	3	3	√	422	A1 ⊕ B1 ⊕ A2
N119.3.3 GM2 ⊕ GM4	√	3	3	√	$\bar{4}2m$	A1 ⊕ B1 ⊕ B2
N119.3.4 GM2 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g} \oplus \mathrm{A2_u}$
N119.3.5 GM2 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g} \oplus \mathrm{A2_u}$
N119.3.6 GM3 ⊕ GM3	√	3	3	√	$\bar{4}m2$	A1 ⊕ B2 ⊕ B2
N119.3.7 GM3 ⊕ GM4	√	3	3	√	$4mm$	A1 ⊕ B2 ⊕ A2
N119.3.8 GM3 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u} \oplus \mathrm{A2_g}$
N119.3.9 GM3 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u} \oplus \mathrm{A2_g}$
N119.3.10 GM4 ⊕ GM4	√	3	3	√	$\bar{4}m2$	A1 ⊕ A2 ⊕ A2
N119.3.11 GM4 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{B2_g}$
N119.3.12 GM4 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{B2_g}$
N119.3.13 M1 ⊕ M1	√	1	1	√	$\bar{4}m2$	A1
N119.3.14 M1 ⊕ M2	√	1	1	√	$4mm$	A1
N119.3.15 M1 ⊕ M3	√	1	1	√	$\bar{4}2m$	A1
N119.3.16 M1 ⊕ M4	√	1	1	√	422	A1
N119.3.17 M3 ⊕ M3	√	1	1	√	$\bar{4}m2$	A1
N119.3.18 M3 ⊕ M4	√	1	1	√	$4mm$	A1
N119.6.1 GM5	√	3	3	√	$\bar{4}2m$	A1 ⊕ E
N119.6.2 M5	√	1	1	√	$\bar{4}2m$	A1
N119.7.1 X1	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N119.7.2 X2	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N119.7.3 P1	√	1	1	√	$\bar{4}2m$	A1
N119.8.1 LD1	√	1	1	√	$4mm$	A1
N119.8.2 LD2	√	1	1	√	$4mm$	A1
N119.9.1 GM2 ⊕ GM2 ⊕ GM2	√	3	3	√	$4mm$	B1 ⊕ B1 ⊕ B1
N119.9.2 GM2 ⊕ GM2 ⊕ GM3	√	3	3	√	$\bar{4}2m$	B1 ⊕ B1 ⊕ A2
N119.9.3 GM2 ⊕ GM2 ⊕ GM4	√	3	3	√	422	B1 ⊕ B1 ⊕ B2
N119.9.4 GM2 ⊕ GM2 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B2_u}$
N119.9.5 GM2 ⊕ GM2 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B2_u}$
N119.9.6 GM2 ⊕ GM3 ⊕ GM3	√	3	3	√	$4mm$	B1 ⊕ A2 ⊕ A2
N119.9.7 GM2 ⊕ GM3 ⊕ GM4	√	3	3	√	$\bar{4}m2$	B1 ⊕ B2 ⊕ A2
N119.9.8 GM2 ⊕ GM3 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{A2_g}$
N119.9.9 GM2 ⊕ GM3 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{A2_g}$
N119.9.10 GM2 ⊕ GM4 ⊕ GM4	√	3	3	√	$4mm$	B1 ⊕ B2 ⊕ B2
N119.9.11 GM2 ⊕ GM4 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_g}$
N119.9.12 GM2 ⊕ GM4 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_g}$
N119.9.13 GM2 ⊕ M1 ⊕ M1	√	1	1	×	-	-
N119.9.14 GM2 ⊕ M1 ⊕ M2	√	1	1	√	$\bar{4}m2$	B1
N119.9.15 GM2 ⊕ M1 ⊕ M3	√	1	1	√	422	B1
N119.9.16 GM2 ⊕ M1 ⊕ M4	√	1	1	×	-	-
N119.9.17 GM2 ⊕ M3 ⊕ M3	√	1	1	×	-	-
N119.9.18 GM2 ⊕ M3 ⊕ M4	√	1	1	√	$\bar{4}m2$	B1
N119.9.19 GM3 ⊕ GM3 ⊕ GM3	√	3	3	√	$\bar{4}2m$	A2 ⊕ A2 ⊕ A2
N119.9.20 GM3 ⊕ GM3 ⊕ GM4	√	3	3	√	422	A2 ⊕ A2 ⊕ B2
N119.9.21 GM3 ⊕ GM3 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{B2_u}$

Non-coplanar SSGs with parent space group $I\bar{4}m2$ (No. 119) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N119.9.22 GM3 ⊕ GM3 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{B2_u}$
N119.9.23 GM3 ⊕ GM4 ⊕ GM4	√	3	3	√	$\bar{4}2m$	$\mathrm{B2} \oplus \mathrm{B2} \oplus \mathrm{A2}$
N119.9.24 GM3 ⊕ GM4 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$
N119.9.25 GM3 ⊕ GM4 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$
N119.9.26 GM3 ⊕ M1 ⊕ M1	√	1	1	×	-	-
N119.9.27 GM3 ⊕ M1 ⊕ M2	√	1	1	√	422	A2
N119.9.28 GM3 ⊕ M1 ⊕ M3	√	1	1	√	$\bar{4}m2$	B2
N119.9.29 GM3 ⊕ M1 ⊕ M4	√	1	1	×	-	-
N119.9.30 GM3 ⊕ M3 ⊕ M3	√	1	1	×	-	-
N119.9.31 GM3 ⊕ M3 ⊕ M4	√	1	1	√	422	A2
N119.9.32 GM4 ⊕ GM4 ⊕ GM4	√	3	3	√	422	$\mathrm{B2} \oplus \mathrm{B2} \oplus \mathrm{B2}$
N119.9.33 GM4 ⊕ GM4 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N119.9.34 GM4 ⊕ GM4 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N119.9.35 GM4 ⊕ M1 ⊕ M1	√	1	1	√	422	B2
N119.9.36 GM4 ⊕ M1 ⊕ M2	√	1	1	√	$\bar{4}2m$	B2
N119.9.37 GM4 ⊕ M1 ⊕ M3	√	1	1	√	$4mm$	B2
N119.9.38 GM4 ⊕ M1 ⊕ M4	√	1	1	√	$\bar{4}m2$	A2
N119.9.39 GM4 ⊕ M3 ⊕ M3	√	1	1	√	422	B2
N119.9.40 GM4 ⊕ M3 ⊕ M4	√	1	1	√	$\bar{4}2m$	B2
N119.9.41 M1 ⊕ M1 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{B2_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N119.9.42 M1 ⊕ M1 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N119.9.43 M1 ⊕ M1 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B2_u}$
N119.9.44 M1 ⊕ M1 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{B2_u}$
N119.9.45 M1 ⊕ M2 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{A2_u}$
N119.9.46 M1 ⊕ M3 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B2_u}$
N119.9.47 M1 ⊕ M3 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{A2_u}$
N119.9.48 M1 ⊕ M4 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{B2_u}$
N119.9.49 M3 ⊕ M3 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{B2_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N119.9.50 M3 ⊕ M3 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N119.12.1 GM2 ⊕ GM5	√	3	3	√	422	$\mathrm{B1} \oplus \mathrm{E}$
N119.12.2 GM2 ⊕ M5	√	1	1	√	422	B1
N119.12.3 GM3 ⊕ GM5	√	3	3	√	$\bar{4}m2$	$\mathrm{B2} \oplus \mathrm{E}$
N119.12.4 GM3 ⊕ M5	√	1	1	√	$\bar{4}m2$	B2
N119.12.5 GM4 ⊕ GM5	√	3	3	√	$4mm$	$\mathrm{B2} \oplus \mathrm{E}$
N119.12.6 GM4 ⊕ M5	√	1	1	√	$4mm$	B2
N119.12.7 M1 ⊕ GM5	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{E_g}$
N119.12.8 M1 ⊕ M5	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{E_u}$
N119.12.9 M3 ⊕ GM5	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{E_g}$
N119.12.10 M3 ⊕ M5	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{E_u}$
N119.13.1 GM2 ⊕ X1	√	1	1	√	$4/mmm$	$\mathrm{B1_g}$
N119.13.2 GM2 ⊕ X2	√	1	1	√	$4/mmm$	$\mathrm{B1_g}$
N119.13.3 GM2 ⊕ P1	√	1	1	×	-	-
N119.13.4 GM3 ⊕ X1	√	1	1	×	-	-
N119.13.5 GM3 ⊕ X2	√	1	1	×	-	-
N119.13.6 GM3 ⊕ P1	√	1	1	×	-	-
N119.13.7 GM4 ⊕ X1	√	1	1	×	-	-

Non-coplanar SSGs with parent space group $I\bar{4}m2$ (No. 119) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N119.13.8 GM4 $\oplus$ X2	$\surd$	1	1	$\times$	-	-
N119.13.9 GM4 $\oplus$ P1	$\surd$	1	1	$\times$	-	-
N119.13.10 M1 $\oplus$ X1	$\times$	-	-	-	-	-
N119.13.11 M1 $\oplus$ X3	$\times$	-	-	-	-	-
N119.13.12 M1 $\oplus$ X2	$\times$	-	-	-	-	-
N119.13.13 M1 $\oplus$ X4	$\times$	-	-	-	-	-
N119.13.14 M1 $\oplus$ P1	$\surd$	1	1	$\times$	-	-
N119.13.15 M1 $\oplus$ P3	$\surd$	1	1	$\times$	-	-
N119.13.16 M3 $\oplus$ X1	$\times$	-	-	-	-	-
N119.13.17 M3 $\oplus$ X3	$\times$	-	-	-	-	-
N119.13.18 M3 $\oplus$ X2	$\times$	-	-	-	-	-
N119.13.19 M3 $\oplus$ X4	$\times$	-	-	-	-	-
N119.13.20 M3 $\oplus$ P1	$\surd$	1	1	$\times$	-	-
N119.13.21 M3 $\oplus$ P3	$\surd$	1	1	$\times$	-	-
N119.14.1 GM2 $\oplus$ LD1	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N119.14.2 GM2 $\oplus$ LD2	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N119.14.3 GM3 $\oplus$ LD1	$\surd$	1	1	$\surd$	422	A2
N119.14.4 GM3 $\oplus$ LD2	$\surd$	1	1	$\surd$	422	A2
N119.14.5 GM4 $\oplus$ LD1	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N119.14.6 GM4 $\oplus$ LD2	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N119.14.7 M1 $\oplus$ LD1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N119.14.8 M1 $\oplus$ LD2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N119.14.9 M3 $\oplus$ LD1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N119.14.10 M3 $\oplus$ LD2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$

TABLE S358: Collinear SSGs with parent space group $I\bar{4}c2$ (No. 120).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L120.1.1 GM1	1	$4/mmm$	$\mathrm{A1_g}$
L120.2.1 GM2	1	$4/mmm$	$\mathrm{B1_g}$
L120.2.2 GM3	1	$4/mmm$	$\mathrm{A2_g}$
L120.2.3 GM4	1	$4/mmm$	$\mathrm{B2_g}$
L120.2.4 M1	0	-	-
L120.2.5 M3	0	-	-

TABLE S359: Coplanar SSGs with parent space group $I\bar{4}c2$ (No. 120).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P120.1.1 GM1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{B2_u}$
P120.2.1 GM2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g} \oplus \mathrm{A2_u}$
P120.2.2 GM3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u} \oplus \mathrm{A2_g}$
P120.2.3 GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{B2_g}$
P120.2.4 M1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P120.2.5 M3	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$

Coplanar SSGs with parent space group $I\bar{4}c2$ (No. 120) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P120.3.1 GM2 ⊕ GM2	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B2_u}$
P120.3.2 GM2 ⊕ GM3	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{A2_g}$
P120.3.3 GM2 ⊕ GM4	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_g}$
P120.3.4 GM2 ⊕ M1	√	1	1	×	-	-
P120.3.5 GM2 ⊕ M3	√	1	1	×	-	-
P120.3.6 GM3 ⊕ GM3	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{B2_u}$
P120.3.7 GM3 ⊕ GM4	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$
P120.3.8 GM3 ⊕ M1	√	1	1	×	-	-
P120.3.9 GM3 ⊕ M3	√	1	1	×	-	-
P120.3.10 GM4 ⊕ GM4	√	3	3	√	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
P120.3.11 GM4 ⊕ M1	√	1	1	√	$4/mmm$	$\mathrm{B2_g}$
P120.3.12 GM4 ⊕ M3	√	1	1	√	$4/mmm$	$\mathrm{B2_g}$
P120.3.13 M1 ⊕ M1	√	1	1	×	-	-
P120.3.14 M1 ⊕ M2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
P120.3.15 M1 ⊕ M3	√	1	1	√	$4/mmm$	$\mathrm{B1_u}$
P120.3.16 M1 ⊕ M4	√	1	1	×	-	-
P120.3.17 M3 ⊕ M3	√	1	1	×	-	-
P120.3.18 M3 ⊕ M4	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
P120.6.1 GM5	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{E_g}$
P120.6.2 M5	√	1	1	√	$4/mmm$	$\mathrm{B1_u}$
P120.7.1 X1	×	-	-	-	-	-
P120.7.2 X2	×	-	-	-	-	-
P120.8.1 LD1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
P120.8.2 LD2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$

TABLE S360: Non-coplanar SSGs with parent space group $I\bar{4}c2$ (No. 120).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N120.1.1 GM1	√	3	3	√	$\bar{4}m2$	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{A1}$
N120.2.1 GM2	√	3	3	√	$4mm$	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{B1}$
N120.2.2 GM3	√	3	3	√	$\bar{4}2m$	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{A2}$
N120.2.3 GM4	√	3	3	√	422	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{B2}$
N120.2.4 M1	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{B2_u}$
N120.2.5 M3	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{B2_u}$
N120.3.1 GM2 ⊕ GM2	√	3	3	√	$\bar{4}m2$	$\mathrm{A1} \oplus \mathrm{B1} \oplus \mathrm{B1}$
N120.3.2 GM2 ⊕ GM3	√	3	3	√	422	$\mathrm{A1} \oplus \mathrm{B1} \oplus \mathrm{A2}$
N120.3.3 GM2 ⊕ GM4	√	3	3	√	$\bar{4}2m$	$\mathrm{A1} \oplus \mathrm{B1} \oplus \mathrm{B2}$
N120.3.4 GM2 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g} \oplus \mathrm{A2_u}$
N120.3.5 GM2 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g} \oplus \mathrm{A2_u}$
N120.3.6 GM3 ⊕ GM3	√	3	3	√	$\bar{4}m2$	$\mathrm{A1} \oplus \mathrm{B2} \oplus \mathrm{B2}$
N120.3.7 GM3 ⊕ GM4	√	3	3	√	$4mm$	$\mathrm{A1} \oplus \mathrm{B2} \oplus \mathrm{A2}$
N120.3.8 GM3 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u} \oplus \mathrm{A2_g}$
N120.3.9 GM3 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u} \oplus \mathrm{A2_g}$
N120.3.10 GM4 ⊕ GM4	√	3	3	√	$\bar{4}m2$	$\mathrm{A1} \oplus \mathrm{A2} \oplus \mathrm{A2}$
N120.3.11 GM4 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{B2_g}$
N120.3.12 GM4 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{B2_g}$

Non-coplanar SSGs with parent space group $I\bar{4}c2$ (No. 120) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N120.3.13 M1 ⊕ M1	√	1	1	√	$\bar{4}m2$	A1
N120.3.14 M1 ⊕ M2	√	1	1	√	$4mm$	A1
N120.3.15 M1 ⊕ M3	√	1	1	√	$\bar{4}2m$	A1
N120.3.16 M1 ⊕ M4	√	1	1	√	422	A1
N120.3.17 M3 ⊕ M3	√	1	1	√	$\bar{4}m2$	A1
N120.3.18 M3 ⊕ M4	√	1	1	√	$4mm$	A1
N120.6.1 GM5	√	3	3	√	$\bar{4}2m$	A1 ⊕ E
N120.6.2 M5	√	1	1	√	$\bar{4}2m$	A1
N120.7.1 X1	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N120.7.2 X2	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N120.8.1 LD1	√	1	1	√	$4mm$	A1
N120.8.2 LD2	√	1	1	√	$4mm$	A1
N120.9.1 GM2 ⊕ GM2 ⊕ GM2	√	3	3	√	$4mm$	B1 ⊕ B1 ⊕ B1
N120.9.2 GM2 ⊕ GM2 ⊕ GM3	√	3	3	√	$\bar{4}2m$	B1 ⊕ B1 ⊕ A2
N120.9.3 GM2 ⊕ GM2 ⊕ GM4	√	3	3	√	422	B1 ⊕ B1 ⊕ B2
N120.9.4 GM2 ⊕ GM2 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B2_u}$
N120.9.5 GM2 ⊕ GM2 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B2_u}$
N120.9.6 GM2 ⊕ GM3 ⊕ GM3	√	3	3	√	$4mm$	B1 ⊕ A2 ⊕ A2
N120.9.7 GM2 ⊕ GM3 ⊕ GM4	√	3	3	√	$\bar{4}m2$	B1 ⊕ B2 ⊕ A2
N120.9.8 GM2 ⊕ GM3 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{A2_g}$
N120.9.9 GM2 ⊕ GM3 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{A2_g}$
N120.9.10 GM2 ⊕ GM4 ⊕ GM4	√	3	3	√	$4mm$	B1 ⊕ B2 ⊕ B2
N120.9.11 GM2 ⊕ GM4 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_g}$
N120.9.12 GM2 ⊕ GM4 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_g}$
N120.9.13 GM2 ⊕ M1 ⊕ M1	√	1	1	×	-	-
N120.9.14 GM2 ⊕ M1 ⊕ M2	√	1	1	√	$\bar{4}m2$	B1
N120.9.15 GM2 ⊕ M1 ⊕ M3	√	1	1	√	422	B1
N120.9.16 GM2 ⊕ M1 ⊕ M4	√	1	1	×	-	-
N120.9.17 GM2 ⊕ M3 ⊕ M3	√	1	1	×	-	-
N120.9.18 GM2 ⊕ M3 ⊕ M4	√	1	1	√	$\bar{4}m2$	B1
N120.9.19 GM3 ⊕ GM3 ⊕ GM3	√	3	3	√	$\bar{4}2m$	A2 ⊕ A2 ⊕ A2
N120.9.20 GM3 ⊕ GM3 ⊕ GM4	√	3	3	√	422	A2 ⊕ A2 ⊕ B2
N120.9.21 GM3 ⊕ GM3 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{B2_u}$
N120.9.22 GM3 ⊕ GM3 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{B2_u}$
N120.9.23 GM3 ⊕ GM4 ⊕ GM4	√	3	3	√	$\bar{4}2m$	B2 ⊕ B2 ⊕ A2
N120.9.24 GM3 ⊕ GM4 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$
N120.9.25 GM3 ⊕ GM4 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$
N120.9.26 GM3 ⊕ M1 ⊕ M1	√	1	1	×	-	-
N120.9.27 GM3 ⊕ M1 ⊕ M2	√	1	1	√	422	A2
N120.9.28 GM3 ⊕ M1 ⊕ M3	√	1	1	√	$\bar{4}m2$	B2
N120.9.29 GM3 ⊕ M1 ⊕ M4	√	1	1	×	-	-
N120.9.30 GM3 ⊕ M3 ⊕ M3	√	1	1	×	-	-
N120.9.31 GM3 ⊕ M3 ⊕ M4	√	1	1	√	422	A2
N120.9.32 GM4 ⊕ GM4 ⊕ GM4	√	3	3	√	422	B2 ⊕ B2 ⊕ B2
N120.9.33 GM4 ⊕ GM4 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N120.9.34 GM4 ⊕ GM4 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$

Non-coplanar SSGs with parent space group $I\bar{4}c2$ (No. 120) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N120.9.35 GM4 ⊕ M1 ⊕ M1	√	1	1	√	422	B2
N120.9.36 GM4 ⊕ M1 ⊕ M2	√	1	1	√	$\bar{4}2m$	B2
N120.9.37 GM4 ⊕ M1 ⊕ M3	√	1	1	√	$4mm$	B2
N120.9.38 GM4 ⊕ M1 ⊕ M4	√	1	1	√	$\bar{4}m2$	A2
N120.9.39 GM4 ⊕ M3 ⊕ M3	√	1	1	√	422	B2
N120.9.40 GM4 ⊕ M3 ⊕ M4	√	1	1	√	$\bar{4}2m$	B2
N120.9.41 M1 ⊕ M1 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{B2_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N120.9.42 M1 ⊕ M1 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N120.9.43 M1 ⊕ M1 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B2_u}$
N120.9.44 M1 ⊕ M1 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{B2_u}$
N120.9.45 M1 ⊕ M2 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{A2_u}$
N120.9.46 M1 ⊕ M3 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B2_u}$
N120.9.47 M1 ⊕ M3 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{A2_u}$
N120.9.48 M1 ⊕ M4 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{B2_u}$
N120.9.49 M3 ⊕ M3 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{B2_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N120.9.50 M3 ⊕ M3 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N120.12.1 GM2 ⊕ GM5	√	3	3	√	422	B1 ⊕ E
N120.12.2 GM2 ⊕ M5	√	1	1	√	422	B1
N120.12.3 GM3 ⊕ GM5	√	3	3	√	$\bar{4}m2$	B2 ⊕ E
N120.12.4 GM3 ⊕ M5	√	1	1	√	$\bar{4}m2$	B2
N120.12.5 GM4 ⊕ GM5	√	3	3	√	$4mm$	B2 ⊕ E
N120.12.6 GM4 ⊕ M5	√	1	1	√	$4mm$	B2
N120.12.7 M1 ⊕ GM5	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{E_g}$
N120.12.8 M1 ⊕ M5	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{E_u}$
N120.12.9 M3 ⊕ GM5	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{E_g}$
N120.12.10 M3 ⊕ M5	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{E_u}$
N120.13.1 GM2 ⊕ X1	√	1	1	√	$4/mmm$	$\mathrm{B1_g}$
N120.13.2 GM2 ⊕ X2	√	1	1	√	$4/mmm$	$\mathrm{B1_g}$
N120.13.3 GM3 ⊕ X1	√	1	1	×	-	-
N120.13.4 GM3 ⊕ X2	√	1	1	×	-	-
N120.13.5 GM4 ⊕ X1	√	1	1	×	-	-
N120.13.6 GM4 ⊕ X2	√	1	1	×	-	-
N120.13.7 M1 ⊕ X1	×	-	-	-	-	-
N120.13.8 M1 ⊕ X3	×	-	-	-	-	-
N120.13.9 M1 ⊕ X2	×	-	-	-	-	-
N120.13.10 M1 ⊕ X4	×	-	-	-	-	-
N120.13.11 M3 ⊕ X1	×	-	-	-	-	-
N120.13.12 M3 ⊕ X3	×	-	-	-	-	-
N120.13.13 M3 ⊕ X2	×	-	-	-	-	-
N120.13.14 M3 ⊕ X4	×	-	-	-	-	-
N120.14.1 GM2 ⊕ LD1	√	1	1	√	$\bar{4}m2$	B1
N120.14.2 GM2 ⊕ LD2	√	1	1	√	$\bar{4}m2$	B1
N120.14.3 GM3 ⊕ LD1	√	1	1	√	422	A2
N120.14.4 GM3 ⊕ LD2	√	1	1	√	422	A2
N120.14.5 GM4 ⊕ LD1	√	1	1	√	$\bar{4}2m$	B2
N120.14.6 GM4 ⊕ LD2	√	1	1	√	$\bar{4}2m$	B2

Non-coplanar SSGs with parent space group $I\bar{4}c2$ (No. 120) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N120.14.7 M1 $\oplus$ LD1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N120.14.8 M1 $\oplus$ LD2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N120.14.9 M3 $\oplus$ LD1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N120.14.10 M3 $\oplus$ LD2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$

TABLE S361: Collinear SSGs with parent space group $I\bar{4}2m$ (No. 121).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L121.1.1 GM1	1	$4/mmm$	$\mathrm{A1_g}$
L121.2.1 GM2	1	$4/mmm$	$\mathrm{B1_g}$
L121.2.2 GM3	1	$4/mmm$	$\mathrm{B2_g}$
L121.2.3 GM4	1	$4/mmm$	$\mathrm{A2_g}$
L121.2.4 M1	0	-	-
L121.2.5 M2	0	-	-
L121.2.6 M3	0	-	-
L121.2.7 M4	0	-	-

TABLE S362: Coplanar SSGs with parent space group $I\bar{4}2m$ (No. 121).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P121.1.1 GM1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{B1_u}$
P121.2.1 GM2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{B1_g}$
P121.2.2 GM3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$
P121.2.3 GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g} \oplus \mathrm{B2_u}$
P121.2.4 M1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P121.2.5 M2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P121.2.6 M3	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P121.2.7 M4	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P121.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
P121.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
P121.3.3 GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
P121.3.4 GM2 $\oplus$ M1	$\surd$	1	1	$\times$	-	-
P121.3.5 GM2 $\oplus$ M2	$\surd$	1	1	$\times$	-	-
P121.3.6 GM2 $\oplus$ M3	$\surd$	1	1	$\times$	-	-
P121.3.7 GM2 $\oplus$ M4	$\surd$	1	1	$\times$	-	-
P121.3.8 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
P121.3.9 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{B2_g}$
P121.3.10 GM3 $\oplus$ M1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_g}$
P121.3.11 GM3 $\oplus$ M2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_g}$
P121.3.12 GM3 $\oplus$ M3	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_g}$
P121.3.13 GM3 $\oplus$ M4	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_g}$
P121.3.14 GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
P121.3.15 GM4 $\oplus$ M1	$\surd$	1	1	$\times$	-	-
P121.3.16 GM4 $\oplus$ M2	$\surd$	1	1	$\times$	-	-
P121.3.17 GM4 $\oplus$ M3	$\surd$	1	1	$\times$	-	-

Coplanar SSGs with parent space group $I\bar{4}2m$ (No. 121) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P121.3.18 GM4 ⊕ M4	√	1	1	×	-	-
P121.3.19 M1 ⊕ M1	√	1	1	√	$4/mmm$	$\mathrm{B1_u}$
P121.3.20 M1 ⊕ M2	√	1	1	×	-	-
P121.3.21 M1 ⊕ M3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
P121.3.22 M1 ⊕ M4	√	1	1	×	-	-
P121.3.23 M2 ⊕ M2	√	1	1	√	$4/mmm$	$\mathrm{B1_u}$
P121.3.24 M2 ⊕ M3	√	1	1	×	-	-
P121.3.25 M2 ⊕ M4	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
P121.3.26 M3 ⊕ M3	√	1	1	√	$4/mmm$	$\mathrm{B1_u}$
P121.3.27 M3 ⊕ M4	√	1	1	×	-	-
P121.3.28 M4 ⊕ M4	√	1	1	√	$4/mmm$	$\mathrm{B1_u}$
P121.4.1 P1PA1	√	1	1	×	-	-
P121.4.2 P2PA2	√	1	1	×	-	-
P121.6.1 GM5	√	3	3	√	$4/mmm$	$\mathrm{B2_u} \oplus \mathrm{E_g}$
P121.6.2 M5	√	1	1	×	-	-
P121.7.1 X1	×	-	-	-	-	-
P121.7.2 X2	×	-	-	-	-	-
P121.7.3 X3	×	-	-	-	-	-
P121.7.4 X4	×	-	-	-	-	-
P121.8.1 LD1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
P121.8.2 LD2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$

TABLE S363: Non-coplanar SSGs with parent space group $I\bar{4}2m$ (No. 121).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N121.1.1 GM1	√	3	3	√	$\bar{4}2m$	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{A1}$
N121.2.1 GM2	√	3	3	√	422	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{B1}$
N121.2.2 GM3	√	3	3	√	$4mm$	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{B2}$
N121.2.3 GM4	√	3	3	√	$\bar{4}m2$	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{B2}$
N121.2.4 M1	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{B1_u}$
N121.2.5 M2	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{B1_u}$
N121.2.6 M3	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{B1_u}$
N121.2.7 M4	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{B1_u}$
N121.3.1 GM2 ⊕ GM2	√	3	3	√	$\bar{4}2m$	$\mathrm{A1} \oplus \mathrm{B1} \oplus \mathrm{B1}$
N121.3.2 GM2 ⊕ GM3	√	3	3	√	$\bar{4}m2$	$\mathrm{A1} \oplus \mathrm{B1} \oplus \mathrm{A2}$
N121.3.3 GM2 ⊕ GM4	√	3	3	√	$4mm$	$\mathrm{A1} \oplus \mathrm{B1} \oplus \mathrm{A2}$
N121.3.4 GM2 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{B1_g}$
N121.3.5 GM2 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{B1_g}$
N121.3.6 GM2 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{B1_g}$
N121.3.7 GM2 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{B1_g}$
N121.3.8 GM3 ⊕ GM3	√	3	3	√	$\bar{4}2m$	$\mathrm{A1} \oplus \mathrm{B2} \oplus \mathrm{B2}$
N121.3.9 GM3 ⊕ GM4	√	3	3	√	422	$\mathrm{A1} \oplus \mathrm{A2} \oplus \mathrm{B2}$
N121.3.10 GM3 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$
N121.3.11 GM3 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$
N121.3.12 GM3 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$
N121.3.13 GM3 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$

Non-coplanar SSGs with parent space group $I\bar{4}2m$ (No. 121) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N121.3.14 GM4 ⊕ GM4	√	3	3	√	$\bar{4}2m$	A1 ⊕ A2 ⊕ A2
N121.3.15 GM4 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g} \oplus \mathrm{B2_u}$
N121.3.16 GM4 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g} \oplus \mathrm{B2_u}$
N121.3.17 GM4 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g} \oplus \mathrm{B2_u}$
N121.3.18 GM4 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g} \oplus \mathrm{B2_u}$
N121.3.19 M1 ⊕ M1	√	1	1	√	$\bar{4}2m$	A1
N121.3.20 M1 ⊕ M2	√	1	1	√	422	A1
N121.3.21 M1 ⊕ M3	√	1	1	√	$4mm$	A1
N121.3.22 M1 ⊕ M4	√	1	1	√	$\bar{4}m2$	A1
N121.3.23 M2 ⊕ M2	√	1	1	√	$\bar{4}2m$	A1
N121.3.24 M2 ⊕ M3	√	1	1	√	$\bar{4}m2$	A1
N121.3.25 M2 ⊕ M4	√	1	1	√	$4mm$	A1
N121.3.26 M3 ⊕ M3	√	1	1	√	$\bar{4}2m$	A1
N121.3.27 M3 ⊕ M4	√	1	1	√	422	A1
N121.3.28 M4 ⊕ M4	√	1	1	√	$\bar{4}2m$	A1
N121.4.1 P1PA1	√	1	1	√	$\bar{4}2m$	A1
N121.4.2 P2PA2	√	1	1	√	$\bar{4}2m$	A1
N121.6.1 GM5	√	3	3	√	$\bar{4}m2$	A1 ⊕ E
N121.6.2 M5	√	1	1	√	$\bar{4}m2$	A1
N121.7.1 X1	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N121.7.2 X2	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N121.7.3 X3	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N121.7.4 X4	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N121.8.1 LD1	√	1	1	√	$4mm$	A1
N121.8.2 LD2	√	1	1	√	$4mm$	A1
N121.9.1 GM2 ⊕ GM2 ⊕ GM2	√	3	3	√	422	B1 ⊕ B1 ⊕ B1
N121.9.2 GM2 ⊕ GM2 ⊕ GM3	√	3	3	√	$4mm$	B1 ⊕ B1 ⊕ B2
N121.9.3 GM2 ⊕ GM2 ⊕ GM4	√	3	3	√	$\bar{4}m2$	B1 ⊕ B1 ⊕ B2
N121.9.4 GM2 ⊕ GM2 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N121.9.5 GM2 ⊕ GM2 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N121.9.6 GM2 ⊕ GM2 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N121.9.7 GM2 ⊕ GM2 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N121.9.8 GM2 ⊕ GM3 ⊕ GM3	√	3	3	√	422	B1 ⊕ B2 ⊕ B2
N121.9.9 GM2 ⊕ GM3 ⊕ GM4	√	3	3	√	$\bar{4}2m$	B1 ⊕ B2 ⊕ A2
N121.9.10 GM2 ⊕ GM3 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N121.9.11 GM2 ⊕ GM3 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N121.9.12 GM2 ⊕ GM3 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N121.9.13 GM2 ⊕ GM3 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N121.9.14 GM2 ⊕ GM4 ⊕ GM4	√	3	3	√	422	B1 ⊕ A2 ⊕ A2
N121.9.15 GM2 ⊕ GM4 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
N121.9.16 GM2 ⊕ GM4 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
N121.9.17 GM2 ⊕ GM4 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
N121.9.18 GM2 ⊕ GM4 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
N121.9.19 GM2 ⊕ M1 ⊕ M1	√	1	1	√	422	B1
N121.9.20 GM2 ⊕ M1 ⊕ M2	√	1	1	×	-	-
N121.9.21 GM2 ⊕ M1 ⊕ M3	√	1	1	√	$\bar{4}m2$	B1

Non-coplanar SSGs with parent space group $I\bar{4}2m$ (No. 121) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N121.9.22 GM2 ⊕ M1 ⊕ M4	√	1	1	×	-	-
N121.9.23 GM2 ⊕ M2 ⊕ M2	√	1	1	√	422	B1
N121.9.24 GM2 ⊕ M2 ⊕ M3	√	1	1	×	-	-
N121.9.25 GM2 ⊕ M2 ⊕ M4	√	1	1	√	$\bar{4}m2$	B1
N121.9.26 GM2 ⊕ M3 ⊕ M3	√	1	1	√	422	B1
N121.9.27 GM2 ⊕ M3 ⊕ M4	√	1	1	×	-	-
N121.9.28 GM2 ⊕ M4 ⊕ M4	√	1	1	√	422	B1
N121.9.29 GM3 ⊕ GM3 ⊕ GM3	√	3	3	√	$4mm$	B2 ⊕ B2 ⊕ B2
N121.9.30 GM3 ⊕ GM3 ⊕ GM4	√	3	3	√	$\bar{4}m2$	B2 ⊕ A2 ⊕ A2
N121.9.31 GM3 ⊕ GM3 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N121.9.32 GM3 ⊕ GM3 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N121.9.33 GM3 ⊕ GM3 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N121.9.34 GM3 ⊕ GM3 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N121.9.35 GM3 ⊕ GM4 ⊕ GM4	√	3	3	√	$4mm$	B2 ⊕ A2 ⊕ A2
N121.9.36 GM3 ⊕ GM4 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{B2_g}$
N121.9.37 GM3 ⊕ GM4 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{B2_g}$
N121.9.38 GM3 ⊕ GM4 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{B2_g}$
N121.9.39 GM3 ⊕ GM4 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{B2_g}$
N121.9.40 GM3 ⊕ M1 ⊕ M1	√	1	1	√	$4mm$	B2
N121.9.41 GM3 ⊕ M1 ⊕ M2	√	1	1	√	$\bar{4}m2$	A2
N121.9.42 GM3 ⊕ M1 ⊕ M3	√	1	1	√	$\bar{4}2m$	B2
N121.9.43 GM3 ⊕ M1 ⊕ M4	√	1	1	√	422	B2
N121.9.44 GM3 ⊕ M2 ⊕ M2	√	1	1	√	$4mm$	B2
N121.9.45 GM3 ⊕ M2 ⊕ M3	√	1	1	√	422	B2
N121.9.46 GM3 ⊕ M2 ⊕ M4	√	1	1	√	$\bar{4}2m$	B2
N121.9.47 GM3 ⊕ M3 ⊕ M3	√	1	1	√	$4mm$	B2
N121.9.48 GM3 ⊕ M3 ⊕ M4	√	1	1	√	$\bar{4}m2$	A2
N121.9.49 GM3 ⊕ M4 ⊕ M4	√	1	1	√	$4mm$	B2
N121.9.50 GM4 ⊕ GM4 ⊕ GM4	√	3	3	√	$\bar{4}m2$	B2 ⊕ B2 ⊕ B2
N121.9.51 GM4 ⊕ GM4 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
N121.9.52 GM4 ⊕ GM4 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
N121.9.53 GM4 ⊕ GM4 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
N121.9.54 GM4 ⊕ GM4 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
N121.9.55 GM4 ⊕ M1 ⊕ M1	√	1	1	√	$\bar{4}m2$	B2
N121.9.56 GM4 ⊕ M1 ⊕ M2	√	1	1	×	-	-
N121.9.57 GM4 ⊕ M1 ⊕ M3	√	1	1	√	422	A2
N121.9.58 GM4 ⊕ M1 ⊕ M4	√	1	1	×	-	-
N121.9.59 GM4 ⊕ M2 ⊕ M2	√	1	1	√	$\bar{4}m2$	B2
N121.9.60 GM4 ⊕ M2 ⊕ M3	√	1	1	×	-	-
N121.9.61 GM4 ⊕ M2 ⊕ M4	√	1	1	√	422	A2
N121.9.62 GM4 ⊕ M3 ⊕ M3	√	1	1	√	$\bar{4}m2$	B2
N121.9.63 GM4 ⊕ M3 ⊕ M4	√	1	1	×	-	-
N121.9.64 GM4 ⊕ M4 ⊕ M4	√	1	1	√	$\bar{4}m2$	B2
N121.9.65 M1 ⊕ M1 ⊕ M1	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N121.9.66 M1 ⊕ M1 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{B1_u}$
N121.9.67 M1 ⊕ M1 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$

Non-coplanar SSGs with parent space group $I\bar{4}2m$ (No. 121) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N121.9.68 M1 ⊕ M1 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N121.9.69 M1 ⊕ M2 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{B1_u}$
N121.9.70 M1 ⊕ M2 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N121.9.71 M1 ⊕ M2 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N121.9.72 M1 ⊕ M3 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N121.9.73 M1 ⊕ M3 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N121.9.74 M1 ⊕ M4 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N121.9.75 M2 ⊕ M2 ⊕ M2	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N121.9.76 M2 ⊕ M2 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N121.9.77 M2 ⊕ M2 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N121.9.78 M2 ⊕ M3 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N121.9.79 M2 ⊕ M3 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N121.9.80 M2 ⊕ M4 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N121.9.81 M3 ⊕ M3 ⊕ M3	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N121.9.82 M3 ⊕ M3 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{B1_u}$
N121.9.83 M3 ⊕ M4 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{B1_u}$
N121.9.84 M4 ⊕ M4 ⊕ M4	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N121.10.1 GM2 ⊕ P1PA1	√	1	1	×	-	-
N121.10.2 GM2 ⊕ P2PA2	√	1	1	×	-	-
N121.10.3 GM3 ⊕ P1PA1	√	1	1	×	-	-
N121.10.4 GM3 ⊕ P2PA2	√	1	1	×	-	-
N121.10.5 GM4 ⊕ P1PA1	√	1	1	×	-	-
N121.10.6 GM4 ⊕ P2PA2	√	1	1	×	-	-
N121.10.7 M1 ⊕ P1PA1	√	1	1	×	-	-
N121.10.8 M1 ⊕ P2PA2	√	1	1	×	-	-
N121.10.9 M2 ⊕ P1PA1	√	1	1	×	-	-
N121.10.10 M2 ⊕ P2PA2	√	1	1	×	-	-
N121.10.11 M3 ⊕ P1PA1	√	1	1	×	-	-
N121.10.12 M3 ⊕ P2PA2	√	1	1	×	-	-
N121.10.13 M4 ⊕ P1PA1	√	1	1	×	-	-
N121.10.14 M4 ⊕ P2PA2	√	1	1	×	-	-
N121.12.1 GM2 ⊕ GM5	√	3	3	√	$4mm$	$\mathrm{B1} \oplus \mathrm{E}$
N121.12.2 GM2 ⊕ M5	√	1	1	×	-	-
N121.12.3 GM3 ⊕ GM5	√	3	3	√	422	$\mathrm{B2} \oplus \mathrm{E}$
N121.12.4 GM3 ⊕ M5	√	1	1	√	422	B2
N121.12.5 GM4 ⊕ GM5	√	3	3	√	$\bar{4}2m$	$\mathrm{A2} \oplus \mathrm{E}$
N121.12.6 GM4 ⊕ M5	√	1	1	×	-	-
N121.12.7 M1 ⊕ GM5	√	3	3	√	$4/mmm$	$\mathrm{B2_u} \oplus \mathrm{E_g}$
N121.12.8 M1 ⊕ M5	√	3	3	√	$4/mmm$	$\mathrm{B2_u} \oplus \mathrm{E_u}$
N121.12.9 M2 ⊕ GM5	√	3	3	√	$4/mmm$	$\mathrm{B2_u} \oplus \mathrm{E_g}$
N121.12.10 M2 ⊕ M5	√	3	3	√	$4/mmm$	$\mathrm{B2_u} \oplus \mathrm{E_u}$
N121.12.11 M3 ⊕ GM5	√	3	3	√	$4/mmm$	$\mathrm{B2_u} \oplus \mathrm{E_g}$
N121.12.12 M3 ⊕ M5	√	3	3	√	$4/mmm$	$\mathrm{B2_u} \oplus \mathrm{E_u}$
N121.12.13 M4 ⊕ GM5	√	3	3	√	$4/mmm$	$\mathrm{B2_u} \oplus \mathrm{E_g}$
N121.12.14 M4 ⊕ M5	√	3	3	√	$4/mmm$	$\mathrm{B2_u} \oplus \mathrm{E_u}$
N121.13.1 GM2 ⊕ X1	√	1	1	√	$4/mmm$	$\mathrm{B1_g}$

Non-coplanar SSGs with parent space group $I\bar{4}2m$ (No. 121) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N121.13.2 GM2 ⊕ X2	√	1	1	√	$4/mmm$	$\mathrm{B1_g}$
N121.13.3 GM2 ⊕ X3	√	1	1	√	$4/mmm$	$\mathrm{B1_g}$
N121.13.4 GM2 ⊕ X4	√	1	1	√	$4/mmm$	$\mathrm{B1_g}$
N121.13.5 GM3 ⊕ X1	√	1	1	×	-	-
N121.13.6 GM3 ⊕ X2	√	1	1	×	-	-
N121.13.7 GM3 ⊕ X3	√	1	1	×	-	-
N121.13.8 GM3 ⊕ X4	√	1	1	×	-	-
N121.13.9 GM4 ⊕ X1	√	1	1	×	-	-
N121.13.10 GM4 ⊕ X2	√	1	1	×	-	-
N121.13.11 GM4 ⊕ X3	√	1	1	×	-	-
N121.13.12 GM4 ⊕ X4	√	1	1	×	-	-
N121.13.13 M1 ⊕ X1	×	-	-	-	-	-
N121.13.14 M1 ⊕ X2	×	-	-	-	-	-
N121.13.15 M1 ⊕ X3	×	-	-	-	-	-
N121.13.16 M1 ⊕ X4	×	-	-	-	-	-
N121.13.17 M2 ⊕ X1	×	-	-	-	-	-
N121.13.18 M2 ⊕ X2	×	-	-	-	-	-
N121.13.19 M2 ⊕ X3	×	-	-	-	-	-
N121.13.20 M2 ⊕ X4	×	-	-	-	-	-
N121.13.21 M3 ⊕ X1	×	-	-	-	-	-
N121.13.22 M3 ⊕ X2	×	-	-	-	-	-
N121.13.23 M3 ⊕ X3	×	-	-	-	-	-
N121.13.24 M3 ⊕ X4	×	-	-	-	-	-
N121.13.25 M4 ⊕ X1	×	-	-	-	-	-
N121.13.26 M4 ⊕ X2	×	-	-	-	-	-
N121.13.27 M4 ⊕ X3	×	-	-	-	-	-
N121.13.28 M4 ⊕ X4	×	-	-	-	-	-
N121.14.1 GM2 ⊕ LD1	√	1	1	√	$\bar{4}m2$	B1
N121.14.2 GM2 ⊕ LD2	√	1	1	√	$\bar{4}m2$	B1
N121.14.3 GM3 ⊕ LD1	√	1	1	√	$\bar{4}2m$	B2
N121.14.4 GM3 ⊕ LD2	√	1	1	√	$\bar{4}2m$	B2
N121.14.5 GM4 ⊕ LD1	√	1	1	√	422	A2
N121.14.6 GM4 ⊕ LD2	√	1	1	√	422	A2
N121.14.7 M1 ⊕ LD1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N121.14.8 M1 ⊕ LD2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N121.14.9 M2 ⊕ LD1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N121.14.10 M2 ⊕ LD2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N121.14.11 M3 ⊕ LD1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N121.14.12 M3 ⊕ LD2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N121.14.13 M4 ⊕ LD1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N121.14.14 M4 ⊕ LD2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$

TABLE S364: Collinear SSGs with parent space group $I\bar{4}2d$ (No. 122).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L122.1.1 GM1	1	$4/mmm$	$\mathrm{A1_g}$

Collinear SSGs with parent space group $I\bar{4}2d$ (No. 122)(continued)

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L122.2.1 GM2	1	$4/mmm$	$\mathrm{B1_g}$
L122.2.2 GM3	1	$4/mmm$	$\mathrm{B2_g}$
L122.2.3 GM4	1	$4/mmm$	$\mathrm{A2_g}$

TABLE S365: Coplanar SSGs with parent space group $I\bar{4}2d$ (No. 122).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P122.1.1 GM1	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{B1_u}$
P122.2.1 GM2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{B1_g}$
P122.2.2 GM3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_u}\oplus\mathrm{B2_g}$
P122.2.3 GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_g}\oplus\mathrm{B2_u}$
P122.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B1_u}$
P122.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B2_g}\oplus\mathrm{B2_u}$
P122.3.3 GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_u}$
P122.3.4 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{B2_g}\oplus\mathrm{B2_g}$
P122.3.5 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A2_g}\oplus\mathrm{B2_g}$
P122.3.6 GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{A2_g}\oplus\mathrm{A2_g}$
P122.4.1 M1M2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_u}$
P122.4.2 M3M4	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_u}$
P122.6.1 GM5	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B2_u}\oplus\mathrm{E_g}$
P122.6.2 M5	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P122.8.1 LD1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$

TABLE S366: Non-coplanar SSGs with parent space group $I\bar{4}2d$ (No. 122).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N122.1.1 GM1	$\surd$	3	3	$\surd$	$\bar{4}2m$	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{A1}$
N122.2.1 GM2	$\surd$	3	3	$\surd$	422	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{B1}$
N122.2.2 GM3	$\surd$	3	3	$\surd$	$4mm$	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{B2}$
N122.2.3 GM4	$\surd$	3	3	$\surd$	$\bar{4}m2$	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{B2}$
N122.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$\bar{4}2m$	$\mathrm{A1}\oplus\mathrm{B1}\oplus\mathrm{B1}$
N122.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$\bar{4}m2$	$\mathrm{A1}\oplus\mathrm{B1}\oplus\mathrm{A2}$
N122.3.3 GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4mm$	$\mathrm{A1}\oplus\mathrm{B1}\oplus\mathrm{A2}$
N122.3.4 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	$\bar{4}2m$	$\mathrm{A1}\oplus\mathrm{B2}\oplus\mathrm{B2}$
N122.3.5 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	422	$\mathrm{A1}\oplus\mathrm{A2}\oplus\mathrm{B2}$
N122.3.6 GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	$\bar{4}2m$	$\mathrm{A1}\oplus\mathrm{A2}\oplus\mathrm{A2}$
N122.4.1 M1M2	$\surd$	1	1	$\surd$	$\bar{4}2m$	A1
N122.4.2 M3M4	$\surd$	1	1	$\surd$	$\bar{4}2m$	A1
N122.6.1 GM5	$\surd$	3	3	$\surd$	$\bar{4}m2$	$\mathrm{A1}\oplus\mathrm{E}$
N122.6.2 M5	$\surd$	1	1	$\surd$	$4mm$	A1
N122.8.1 LD1	$\surd$	1	1	$\surd$	$4mm$	A1
N122.9.1 GM2 $\oplus$ GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	422	$\mathrm{B1}\oplus\mathrm{B1}\oplus\mathrm{B1}$
N122.9.2 GM2 $\oplus$ GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$4mm$	$\mathrm{B1}\oplus\mathrm{B1}\oplus\mathrm{B2}$
N122.9.3 GM2 $\oplus$ GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	$\bar{4}m2$	$\mathrm{B1}\oplus\mathrm{B1}\oplus\mathrm{B2}$
N122.9.4 GM2 $\oplus$ GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	422	$\mathrm{B1}\oplus\mathrm{B2}\oplus\mathrm{B2}$

Non-coplanar SSGs with parent space group $I\bar{4}2d$ (No. 122) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N122.9.5 GM2 $\oplus$ GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	$\bar{4}2m$	B1 $\oplus$ B2 $\oplus$ A2
N122.9.6 GM2 $\oplus$ GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	422	B1 $\oplus$ A2 $\oplus$ A2
N122.9.7 GM3 $\oplus$ GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	$4mm$	B2 $\oplus$ B2 $\oplus$ B2
N122.9.8 GM3 $\oplus$ GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	$\bar{4}m2$	B2 $\oplus$ A2 $\oplus$ A2
N122.9.9 GM3 $\oplus$ GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	$4mm$	B2 $\oplus$ A2 $\oplus$ A2
N122.9.10 GM4 $\oplus$ GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	$\bar{4}m2$	B2 $\oplus$ B2 $\oplus$ B2
N122.10.1 GM2 $\oplus$ M1M2	$\surd$	1	1	$\surd$	422	B1
N122.10.2 GM2 $\oplus$ M3M4	$\surd$	1	1	$\surd$	422	B1
N122.10.3 GM3 $\oplus$ M1M2	$\surd$	1	1	$\surd$	$4mm$	B2
N122.10.4 GM3 $\oplus$ M3M4	$\surd$	1	1	$\surd$	$4mm$	B2
N122.10.5 GM4 $\oplus$ M1M2	$\surd$	1	1	$\surd$	$\bar{4}m2$	B2
N122.10.6 GM4 $\oplus$ M3M4	$\surd$	1	1	$\surd$	$\bar{4}m2$	B2
N122.12.1 GM2 $\oplus$ GM5	$\surd$	3	3	$\surd$	$4mm$	B1 $\oplus$ E
N122.12.2 GM2 $\oplus$ M5	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N122.12.3 GM3 $\oplus$ GM5	$\surd$	3	3	$\surd$	422	B2 $\oplus$ E
N122.12.4 GM3 $\oplus$ M5	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N122.12.5 GM4 $\oplus$ GM5	$\surd$	3	3	$\surd$	$\bar{4}2m$	A2 $\oplus$ E
N122.12.6 GM4 $\oplus$ M5	$\surd$	1	1	$\surd$	422	A2
N122.14.1 GM2 $\oplus$ LD1	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N122.14.2 GM3 $\oplus$ LD1	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N122.14.3 GM4 $\oplus$ LD1	$\surd$	1	1	$\surd$	422	A2

TABLE S367: Collinear SSGs with parent space group $P4/mmm$ (No. 123).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L123.1.1 $\mathrm{GM1}^+$	1	$4/mmm$	$\mathrm{A1_g}$
L123.2.1 $\mathrm{GM1}^-$	0	-	-
L123.2.2 $\mathrm{GM2}^+$	1	$4/mmm$	$\mathrm{B1_g}$
L123.2.3 $\mathrm{GM2}^-$	0	-	-
L123.2.4 $\mathrm{GM3}^+$	1	$4/mmm$	$\mathrm{A2_g}$
L123.2.5 $\mathrm{GM3}^-$	0	-	-
L123.2.6 $\mathrm{GM4}^+$	1	$4/mmm$	$\mathrm{B2_g}$
L123.2.7 $\mathrm{GM4}^-$	0	-	-
L123.2.8 $\mathrm{A1}^+$	0	-	-
L123.2.9 $\mathrm{A1}^-$	0	-	-
L123.2.10 $\mathrm{M1}^+$	0	-	-
L123.2.11 $\mathrm{M1}^-$	0	-	-
L123.2.12 $\mathrm{M2}^+$	0	-	-
L123.2.13 $\mathrm{M2}^-$	0	-	-
L123.2.14 $\mathrm{Z1}^+$	0	-	-
L123.2.15 $\mathrm{Z1}^-$	0	-	-
L123.2.16 $\mathrm{Z2}^+$	0	-	-
L123.2.17 $\mathrm{Z2}^-$	0	-	-

TABLE S368: Coplanar SSGs with parent space group $P4/mmm$ (No. 123).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P123.1.1 $\mathrm{GM1}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}$
P123.2.1 $\mathrm{GM1}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}$
P123.2.2 $\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}$
P123.2.3 $\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}$
P123.2.4 $\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_g}$
P123.2.5 $\mathrm{GM3}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_u}$
P123.2.6 $\mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_g}$
P123.2.7 $\mathrm{GM4}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_u}$
P123.2.8 $\mathrm{A1}^{+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P123.2.9 $\mathrm{A1}^{-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P123.2.10 $\mathrm{M1}^{+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P123.2.11 $\mathrm{M1}^{-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P123.2.12 $\mathrm{M2}^{+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P123.2.13 $\mathrm{M2}^{-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P123.2.14 $\mathrm{Z1}^{+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P123.2.15 $\mathrm{Z1}^{-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P123.2.16 $\mathrm{Z2}^{+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P123.2.17 $\mathrm{Z2}^{-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P123.3.1 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}$	$\surd$	0	0	$\surd$	-	-
P123.3.2 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_u}$
P123.3.3 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
P123.3.4 $\mathrm{GM1}^{-}\oplus\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{A2_u}$
P123.3.5 $\mathrm{GM1}^{-}\oplus\mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
P123.3.6 $\mathrm{GM1}^{-}\oplus\mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g}\oplus\mathrm{B2_u}$
P123.3.7 $\mathrm{GM1}^{-}\oplus\mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
P123.3.8 $\mathrm{GM1}^{-}\oplus\mathrm{A1}^{+}$	$\surd$	1	1	$\times$	-	-
P123.3.9 $\mathrm{GM1}^{-}\oplus\mathrm{A1}^{-}$	$\surd$	1	1	$\times$	-	-
P123.3.10 $\mathrm{GM1}^{-}\oplus\mathrm{M1}^{+}$	$\surd$	1	1	$\times$	-	-
P123.3.11 $\mathrm{GM1}^{-}\oplus\mathrm{M1}^{-}$	$\surd$	1	1	$\times$	-	-
P123.3.12 $\mathrm{GM1}^{-}\oplus\mathrm{M2}^{+}$	$\surd$	1	1	$\times$	-	-
P123.3.13 $\mathrm{GM1}^{-}\oplus\mathrm{M2}^{-}$	$\surd$	1	1	$\times$	-	-
P123.3.14 $\mathrm{GM1}^{-}\oplus\mathrm{Z1}^{+}$	$\surd$	1	1	$\times$	-	-
P123.3.15 $\mathrm{GM1}^{-}\oplus\mathrm{Z1}^{-}$	$\surd$	1	1	$\times$	-	-
P123.3.16 $\mathrm{GM1}^{-}\oplus\mathrm{Z2}^{+}$	$\surd$	1	1	$\times$	-	-
P123.3.17 $\mathrm{GM1}^{-}\oplus\mathrm{Z2}^{-}$	$\surd$	1	1	$\times$	-	-
P123.3.18 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_g}$
P123.3.19 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B1_g}$
P123.3.20 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_g}$
P123.3.21 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B2_u}$
P123.3.22 $\mathrm{GM2}^{+}\oplus\mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B2_g}$
P123.3.23 $\mathrm{GM2}^{+}\oplus\mathrm{GM4}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_u}$
P123.3.24 $\mathrm{GM2}^{+}\oplus\mathrm{A1}^{+}$	$\surd$	1	0	$\times$	-	-
P123.3.25 $\mathrm{GM2}^{+}\oplus\mathrm{A1}^{-}$	$\surd$	1	0	$\times$	-	-
P123.3.26 $\mathrm{GM2}^{+}\oplus\mathrm{M1}^{+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
P123.3.27 $\mathrm{GM2}^{+}\oplus\mathrm{M1}^{-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
P123.3.28 $\mathrm{GM2}^{+}\oplus\mathrm{M2}^{+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$

Coplanar SSGs with parent space group $P4/mmm$ (No. 123) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P123.3.29 $\mathrm{GM2}^{+} \oplus \mathrm{M2}^{-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
P123.3.30 $\mathrm{GM2}^{+} \oplus \mathrm{Z1}^{+}$	$\surd$	1	0	$\times$	-	-
P123.3.31 $\mathrm{GM2}^{+} \oplus \mathrm{Z1}^{-}$	$\surd$	1	0	$\times$	-	-
P123.3.32 $\mathrm{GM2}^{+} \oplus \mathrm{Z2}^{+}$	$\surd$	1	0	$\times$	-	-
P123.3.33 $\mathrm{GM2}^{+} \oplus \mathrm{Z2}^{-}$	$\surd$	1	0	$\times$	-	-
P123.3.34 $\mathrm{GM2}^{-} \oplus \mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
P123.3.35 $\mathrm{GM2}^{-} \oplus \mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_u}$
P123.3.36 $\mathrm{GM2}^{-} \oplus \mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
P123.3.37 $\mathrm{GM2}^{-} \oplus \mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g}$
P123.3.38 $\mathrm{GM2}^{-} \oplus \mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
P123.3.39 $\mathrm{GM2}^{-} \oplus \mathrm{A1}^{+}$	$\surd$	1	1	$\times$	-	-
P123.3.40 $\mathrm{GM2}^{-} \oplus \mathrm{A1}^{-}$	$\surd$	1	1	$\times$	-	-
P123.3.41 $\mathrm{GM2}^{-} \oplus \mathrm{M1}^{+}$	$\surd$	1	1	$\times$	-	-
P123.3.42 $\mathrm{GM2}^{-} \oplus \mathrm{M1}^{-}$	$\surd$	1	1	$\times$	-	-
P123.3.43 $\mathrm{GM2}^{-} \oplus \mathrm{M2}^{+}$	$\surd$	1	1	$\times$	-	-
P123.3.44 $\mathrm{GM2}^{-} \oplus \mathrm{M2}^{-}$	$\surd$	1	1	$\times$	-	-
P123.3.45 $\mathrm{GM2}^{-} \oplus \mathrm{Z1}^{+}$	$\surd$	1	1	$\times$	-	-
P123.3.46 $\mathrm{GM2}^{-} \oplus \mathrm{Z1}^{-}$	$\surd$	1	1	$\times$	-	-
P123.3.47 $\mathrm{GM2}^{-} \oplus \mathrm{Z2}^{+}$	$\surd$	1	1	$\times$	-	-
P123.3.48 $\mathrm{GM2}^{-} \oplus \mathrm{Z2}^{-}$	$\surd$	1	1	$\times$	-	-
P123.3.49 $\mathrm{GM3}^{+} \oplus \mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g}$
P123.3.50 $\mathrm{GM3}^{+} \oplus \mathrm{GM3}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g}$
P123.3.51 $\mathrm{GM3}^{+} \oplus \mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g}$
P123.3.52 $\mathrm{GM3}^{+} \oplus \mathrm{GM4}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g}$
P123.3.53 $\mathrm{GM3}^{+} \oplus \mathrm{A1}^{+}$	$\surd$	1	0	$\times$	-	-
P123.3.54 $\mathrm{GM3}^{+} \oplus \mathrm{A1}^{-}$	$\surd$	1	0	$\times$	-	-
P123.3.55 $\mathrm{GM3}^{+} \oplus \mathrm{M1}^{+}$	$\surd$	1	0	$\times$	-	-
P123.3.56 $\mathrm{GM3}^{+} \oplus \mathrm{M1}^{-}$	$\surd$	1	0	$\times$	-	-
P123.3.57 $\mathrm{GM3}^{+} \oplus \mathrm{M2}^{+}$	$\surd$	1	0	$\times$	-	-
P123.3.58 $\mathrm{GM3}^{+} \oplus \mathrm{M2}^{-}$	$\surd$	1	0	$\times$	-	-
P123.3.59 $\mathrm{GM3}^{+} \oplus \mathrm{Z1}^{+}$	$\surd$	1	0	$\times$	-	-
P123.3.60 $\mathrm{GM3}^{+} \oplus \mathrm{Z1}^{-}$	$\surd$	1	0	$\times$	-	-
P123.3.61 $\mathrm{GM3}^{+} \oplus \mathrm{Z2}^{+}$	$\surd$	1	0	$\times$	-	-
P123.3.62 $\mathrm{GM3}^{+} \oplus \mathrm{Z2}^{-}$	$\surd$	1	0	$\times$	-	-
P123.3.63 $\mathrm{GM3}^{-} \oplus \mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
P123.3.64 $\mathrm{GM3}^{-} \oplus \mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_g}$
P123.3.65 $\mathrm{GM3}^{-} \oplus \mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
P123.3.66 $\mathrm{GM3}^{-} \oplus \mathrm{A1}^{+}$	$\surd$	1	1	$\times$	-	-
P123.3.67 $\mathrm{GM3}^{-} \oplus \mathrm{A1}^{-}$	$\surd$	1	1	$\times$	-	-
P123.3.68 $\mathrm{GM3}^{-} \oplus \mathrm{M1}^{+}$	$\surd$	1	1	$\times$	-	-
P123.3.69 $\mathrm{GM3}^{-} \oplus \mathrm{M1}^{-}$	$\surd$	1	1	$\times$	-	-
P123.3.70 $\mathrm{GM3}^{-} \oplus \mathrm{M2}^{+}$	$\surd$	1	1	$\times$	-	-
P123.3.71 $\mathrm{GM3}^{-} \oplus \mathrm{M2}^{-}$	$\surd$	1	1	$\times$	-	-
P123.3.72 $\mathrm{GM3}^{-} \oplus \mathrm{Z1}^{+}$	$\surd$	1	1	$\times$	-	-
P123.3.73 $\mathrm{GM3}^{-} \oplus \mathrm{Z1}^{-}$	$\surd$	1	1	$\times$	-	-
P123.3.74 $\mathrm{GM3}^{-} \oplus \mathrm{Z2}^{+}$	$\surd$	1	1	$\times$	-	-

Coplanar SSGs with parent space group $P4/mmm$ (No. 123) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P123.3.75 $\mathrm{GM3^-} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
P123.3.76 $\mathrm{GM4^+} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_g}$
P123.3.77 $\mathrm{GM4^+} \oplus \mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g}$
P123.3.78 $\mathrm{GM4^+} \oplus \mathrm{A1^+}$	$\surd$	1	0	$\times$	-	-
P123.3.79 $\mathrm{GM4^+} \oplus \mathrm{A1^-}$	$\surd$	1	0	$\times$	-	-
P123.3.80 $\mathrm{GM4^+} \oplus \mathrm{M1^+}$	$\surd$	1	0	$\times$	-	-
P123.3.81 $\mathrm{GM4^+} \oplus \mathrm{M1^-}$	$\surd$	1	0	$\times$	-	-
P123.3.82 $\mathrm{GM4^+} \oplus \mathrm{M2^+}$	$\surd$	1	0	$\times$	-	-
P123.3.83 $\mathrm{GM4^+} \oplus \mathrm{M2^-}$	$\surd$	1	0	$\times$	-	-
P123.3.84 $\mathrm{GM4^+} \oplus \mathrm{Z1^+}$	$\surd$	1	0	$\times$	-	-
P123.3.85 $\mathrm{GM4^+} \oplus \mathrm{Z1^-}$	$\surd$	1	0	$\times$	-	-
P123.3.86 $\mathrm{GM4^+} \oplus \mathrm{Z2^+}$	$\surd$	1	0	$\times$	-	-
P123.3.87 $\mathrm{GM4^+} \oplus \mathrm{Z2^-}$	$\surd$	1	0	$\times$	-	-
P123.3.88 $\mathrm{GM4^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
P123.3.89 $\mathrm{GM4^-} \oplus \mathrm{A1^+}$	$\surd$	1	1	$\times$	-	-
P123.3.90 $\mathrm{GM4^-} \oplus \mathrm{A1^-}$	$\surd$	1	1	$\times$	-	-
P123.3.91 $\mathrm{GM4^-} \oplus \mathrm{M1^+}$	$\surd$	1	1	$\times$	-	-
P123.3.92 $\mathrm{GM4^-} \oplus \mathrm{M1^-}$	$\surd$	1	1	$\times$	-	-
P123.3.93 $\mathrm{GM4^-} \oplus \mathrm{M2^+}$	$\surd$	1	1	$\times$	-	-
P123.3.94 $\mathrm{GM4^-} \oplus \mathrm{M2^-}$	$\surd$	1	1	$\times$	-	-
P123.3.95 $\mathrm{GM4^-} \oplus \mathrm{Z1^+}$	$\surd$	1	1	$\times$	-	-
P123.3.96 $\mathrm{GM4^-} \oplus \mathrm{Z1^-}$	$\surd$	1	1	$\times$	-	-
P123.3.97 $\mathrm{GM4^-} \oplus \mathrm{Z2^+}$	$\surd$	1	1	$\times$	-	-
P123.3.98 $\mathrm{GM4^-} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
P123.3.99 $\mathrm{A1^+} \oplus \mathrm{A1^+}$	$\surd$	1	0	$\times$	-	-
P123.3.100 $\mathrm{A1^+} \oplus \mathrm{A2^-}$	$\surd$	1	1	$\times$	-	-
P123.3.101 $\mathrm{A1^+} \oplus \mathrm{A3^-}$	$\surd$	1	1	$\times$	-	-
P123.3.102 $\mathrm{A1^+} \oplus \mathrm{A4^+}$	$\surd$	1	0	$\times$	-	-
P123.3.103 $\mathrm{A1^+} \oplus \mathrm{A1^-}$	$\surd$	1	1	$\times$	-	-
P123.3.104 $\mathrm{A1^+} \oplus \mathrm{A2^+}$	$\surd$	1	0	$\times$	-	-
P123.3.105 $\mathrm{A1^+} \oplus \mathrm{A3^+}$	$\surd$	1	0	$\times$	-	-
P123.3.106 $\mathrm{A1^+} \oplus \mathrm{A4^-}$	$\surd$	1	1	$\times$	-	-
P123.3.107 $\mathrm{A1^+} \oplus \mathrm{M1^+}$	$\times$	-	-	-	-	-
P123.3.108 $\mathrm{A1^+} \oplus \mathrm{M4^+}$	$\times$	-	-	-	-	-
P123.3.109 $\mathrm{A1^+} \oplus \mathrm{M1^-}$	$\times$	-	-	-	-	-
P123.3.110 $\mathrm{A1^+} \oplus \mathrm{M4^-}$	$\times$	-	-	-	-	-
P123.3.111 $\mathrm{A1^+} \oplus \mathrm{M2^+}$	$\times$	-	-	-	-	-
P123.3.112 $\mathrm{A1^+} \oplus \mathrm{M3^+}$	$\times$	-	-	-	-	-
P123.3.113 $\mathrm{A1^+} \oplus \mathrm{M2^-}$	$\times$	-	-	-	-	-
P123.3.114 $\mathrm{A1^+} \oplus \mathrm{M3^-}$	$\times$	-	-	-	-	-
P123.3.115 $\mathrm{A1^+} \oplus \mathrm{Z1^+}$	$\times$	-	-	-	-	-
P123.3.116 $\mathrm{A1^+} \oplus \mathrm{Z3^-}$	$\times$	-	-	-	-	-
P123.3.117 $\mathrm{A1^+} \oplus \mathrm{Z1^-}$	$\times$	-	-	-	-	-
P123.3.118 $\mathrm{A1^+} \oplus \mathrm{Z3^+}$	$\times$	-	-	-	-	-
P123.3.119 $\mathrm{A1^+} \oplus \mathrm{Z2^+}$	$\times$	-	-	-	-	-
P123.3.120 $\mathrm{A1^+} \oplus \mathrm{Z4^-}$	$\times$	-	-	-	-	-

Coplanar SSGs with parent space group $P4/mmm$ (No. 123) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P123.3.121 $\mathrm{A1}^{+} \oplus \mathrm{Z2}^{-}$	$\times$	-	-	-	-	-
P123.3.122 $\mathrm{A1}^{+} \oplus \mathrm{Z4}^{+}$	$\times$	-	-	-	-	-
P123.3.123 $\mathrm{A1}^{-} \oplus \mathrm{A1}^{-}$	$\surd$	1	0	$\times$	-	-
P123.3.124 $\mathrm{A1}^{-} \oplus \mathrm{A2}^{+}$	$\surd$	1	1	$\times$	-	-
P123.3.125 $\mathrm{A1}^{-} \oplus \mathrm{A3}^{+}$	$\surd$	1	1	$\times$	-	-
P123.3.126 $\mathrm{A1}^{-} \oplus \mathrm{A4}^{-}$	$\surd$	1	0	$\times$	-	-
P123.3.127 $\mathrm{A1}^{-} \oplus \mathrm{M1}^{+}$	$\times$	-	-	-	-	-
P123.3.128 $\mathrm{A1}^{-} \oplus \mathrm{M4}^{+}$	$\times$	-	-	-	-	-
P123.3.129 $\mathrm{A1}^{-} \oplus \mathrm{M1}^{-}$	$\times$	-	-	-	-	-
P123.3.130 $\mathrm{A1}^{-} \oplus \mathrm{M4}^{-}$	$\times$	-	-	-	-	-
P123.3.131 $\mathrm{A1}^{-} \oplus \mathrm{M2}^{+}$	$\times$	-	-	-	-	-
P123.3.132 $\mathrm{A1}^{-} \oplus \mathrm{M3}^{+}$	$\times$	-	-	-	-	-
P123.3.133 $\mathrm{A1}^{-} \oplus \mathrm{M2}^{-}$	$\times$	-	-	-	-	-
P123.3.134 $\mathrm{A1}^{-} \oplus \mathrm{M3}^{-}$	$\times$	-	-	-	-	-
P123.3.135 $\mathrm{A1}^{-} \oplus \mathrm{Z1}^{+}$	$\times$	-	-	-	-	-
P123.3.136 $\mathrm{A1}^{-} \oplus \mathrm{Z3}^{-}$	$\times$	-	-	-	-	-
P123.3.137 $\mathrm{A1}^{-} \oplus \mathrm{Z1}^{-}$	$\times$	-	-	-	-	-
P123.3.138 $\mathrm{A1}^{-} \oplus \mathrm{Z3}^{+}$	$\times$	-	-	-	-	-
P123.3.139 $\mathrm{A1}^{-} \oplus \mathrm{Z2}^{+}$	$\times$	-	-	-	-	-
P123.3.140 $\mathrm{A1}^{-} \oplus \mathrm{Z4}^{-}$	$\times$	-	-	-	-	-
P123.3.141 $\mathrm{A1}^{-} \oplus \mathrm{Z2}^{-}$	$\times$	-	-	-	-	-
P123.3.142 $\mathrm{A1}^{-} \oplus \mathrm{Z4}^{+}$	$\times$	-	-	-	-	-
P123.3.143 $\mathrm{M1}^{+} \oplus \mathrm{M1}^{+}$	$\surd$	1	0	$\times$	-	-
P123.3.144 $\mathrm{M1}^{+} \oplus \mathrm{M4}^{+}$	$\surd$	1	0	$\times$	-	-
P123.3.145 $\mathrm{M1}^{+} \oplus \mathrm{M1}^{-}$	$\surd$	1	1	$\times$	-	-
P123.3.146 $\mathrm{M1}^{+} \oplus \mathrm{M4}^{-}$	$\surd$	1	1	$\times$	-	-
P123.3.147 $\mathrm{M1}^{+} \oplus \mathrm{M2}^{+}$	$\surd$	1	0	$\times$	-	-
P123.3.148 $\mathrm{M1}^{+} \oplus \mathrm{M3}^{+}$	$\surd$	1	0	$\times$	-	-
P123.3.149 $\mathrm{M1}^{+} \oplus \mathrm{M2}^{-}$	$\surd$	1	1	$\times$	-	-
P123.3.150 $\mathrm{M1}^{+} \oplus \mathrm{M3}^{-}$	$\surd$	1	1	$\times$	-	-
P123.3.151 $\mathrm{M1}^{+} \oplus \mathrm{Z1}^{+}$	$\times$	-	-	-	-	-
P123.3.152 $\mathrm{M1}^{+} \oplus \mathrm{Z1}^{-}$	$\times$	-	-	-	-	-
P123.3.153 $\mathrm{M1}^{+} \oplus \mathrm{Z2}^{+}$	$\times$	-	-	-	-	-
P123.3.154 $\mathrm{M1}^{+} \oplus \mathrm{Z2}^{-}$	$\times$	-	-	-	-	-
P123.3.155 $\mathrm{M1}^{-} \oplus \mathrm{M1}^{-}$	$\surd$	1	0	$\times$	-	-
P123.3.156 $\mathrm{M1}^{-} \oplus \mathrm{M4}^{-}$	$\surd$	1	0	$\times$	-	-
P123.3.157 $\mathrm{M1}^{-} \oplus \mathrm{M2}^{+}$	$\surd$	1	1	$\times$	-	-
P123.3.158 $\mathrm{M1}^{-} \oplus \mathrm{M3}^{+}$	$\surd$	1	1	$\times$	-	-
P123.3.159 $\mathrm{M1}^{-} \oplus \mathrm{M2}^{-}$	$\surd$	1	0	$\times$	-	-
P123.3.160 $\mathrm{M1}^{-} \oplus \mathrm{M3}^{-}$	$\surd$	1	0	$\times$	-	-
P123.3.161 $\mathrm{M1}^{-} \oplus \mathrm{Z1}^{+}$	$\times$	-	-	-	-	-
P123.3.162 $\mathrm{M1}^{-} \oplus \mathrm{Z1}^{-}$	$\times$	-	-	-	-	-
P123.3.163 $\mathrm{M1}^{-} \oplus \mathrm{Z2}^{+}$	$\times$	-	-	-	-	-
P123.3.164 $\mathrm{M1}^{-} \oplus \mathrm{Z2}^{-}$	$\times$	-	-	-	-	-
P123.3.165 $\mathrm{M2}^{+} \oplus \mathrm{M2}^{+}$	$\surd$	1	0	$\times$	-	-
P123.3.166 $\mathrm{M2}^{+} \oplus \mathrm{M3}^{+}$	$\surd$	1	0	$\times$	-	-

Coplanar SSGs with parent space group $P4/mmm$ (No. 123) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P123.3.167 $\mathrm{M2^+ \oplus M2^-}$	$\surd$	1	1	$\times$	-	-
P123.3.168 $\mathrm{M2^+ \oplus M3^-}$	$\surd$	1	1	$\times$	-	-
P123.3.169 $\mathrm{M2^+ \oplus Z1^+}$	$\times$	-	-	-	-	-
P123.3.170 $\mathrm{M2^+ \oplus Z1^-}$	$\times$	-	-	-	-	-
P123.3.171 $\mathrm{M2^+ \oplus Z2^+}$	$\times$	-	-	-	-	-
P123.3.172 $\mathrm{M2^+ \oplus Z2^-}$	$\times$	-	-	-	-	-
P123.3.173 $\mathrm{M2^- \oplus M2^-}$	$\surd$	1	0	$\times$	-	-
P123.3.174 $\mathrm{M2^- \oplus M3^-}$	$\surd$	1	0	$\times$	-	-
P123.3.175 $\mathrm{M2^- \oplus Z1^+}$	$\times$	-	-	-	-	-
P123.3.176 $\mathrm{M2^- \oplus Z1^-}$	$\times$	-	-	-	-	-
P123.3.177 $\mathrm{M2^- \oplus Z2^+}$	$\times$	-	-	-	-	-
P123.3.178 $\mathrm{M2^- \oplus Z2^-}$	$\times$	-	-	-	-	-
P123.3.179 $\mathrm{Z1^+ \oplus Z1^+}$	$\surd$	1	0	$\times$	-	-
P123.3.180 $\mathrm{Z1^+ \oplus Z3^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P123.3.181 $\mathrm{Z1^+ \oplus Z1^-}$	$\surd$	1	1	$\times$	-	-
P123.3.182 $\mathrm{Z1^+ \oplus Z3^+}$	$\surd$	1	0	$\times$	-	-
P123.3.183 $\mathrm{Z1^+ \oplus Z2^+}$	$\surd$	1	0	$\times$	-	-
P123.3.184 $\mathrm{Z1^+ \oplus Z4^-}$	$\surd$	1	1	$\times$	-	-
P123.3.185 $\mathrm{Z1^+ \oplus Z2^-}$	$\surd$	1	1	$\times$	-	-
P123.3.186 $\mathrm{Z1^+ \oplus Z4^+}$	$\surd$	1	0	$\times$	-	-
P123.3.187 $\mathrm{Z1^- \oplus Z1^-}$	$\surd$	1	0	$\times$	-	-
P123.3.188 $\mathrm{Z1^- \oplus Z3^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P123.3.189 $\mathrm{Z1^- \oplus Z2^+}$	$\surd$	1	1	$\times$	-	-
P123.3.190 $\mathrm{Z1^- \oplus Z4^-}$	$\surd$	1	0	$\times$	-	-
P123.3.191 $\mathrm{Z1^- \oplus Z2^-}$	$\surd$	1	0	$\times$	-	-
P123.3.192 $\mathrm{Z1^- \oplus Z4^+}$	$\surd$	1	1	$\times$	-	-
P123.3.193 $\mathrm{Z2^+ \oplus Z2^+}$	$\surd$	1	0	$\times$	-	-
P123.3.194 $\mathrm{Z2^+ \oplus Z4^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P123.3.195 $\mathrm{Z2^+ \oplus Z2^-}$	$\surd$	1	1	$\times$	-	-
P123.3.196 $\mathrm{Z2^+ \oplus Z4^+}$	$\surd$	1	0	$\times$	-	-
P123.3.197 $\mathrm{Z2^- \oplus Z2^-}$	$\surd$	1	0	$\times$	-	-
P123.3.198 $\mathrm{Z2^- \oplus Z4^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P123.6.1 $\mathrm{GM5^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_g}$
P123.6.2 $\mathrm{GM5^-}$	$\surd$	0	0	$\surd$	-	-
P123.6.3 $\mathrm{A5^+}$	$\surd$	1	0	$\times$	-	-
P123.6.4 $\mathrm{M5^+}$	$\surd$	1	0	$\times$	-	-
P123.6.5 $\mathrm{M5^-}$	$\surd$	1	0	$\times$	-	-
P123.6.6 $\mathrm{Z5^+}$	$\surd$	1	0	$\times$	-	-
P123.7.1 $\mathrm{R1^+}$	$\times$	-	-	-	-	-
P123.7.2 $\mathrm{R1^-}$	$\times$	-	-	-	-	-
P123.7.3 $\mathrm{X1^+}$	$\times$	-	-	-	-	-
P123.7.4 $\mathrm{X1^-}$	$\times$	-	-	-	-	-
P123.7.5 $\mathrm{X2^+}$	$\times$	-	-	-	-	-
P123.7.6 $\mathrm{X2^-}$	$\times$	-	-	-	-	-
P123.8.1 LD1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P123.8.2 LD2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$

Coplanar SSGs with parent space group $P4/mmm$ (No. 123) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P123.8.3 LD3	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P123.8.4 LD4	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P123.8.5 V1	$\surd$	1	1	$\times$	-	-
P123.8.6 V2	$\surd$	1	1	$\times$	-	-

TABLE S369: Non-coplanar SSGs with parent space group $P4/mmm$ (No. 123).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N123.1.1 $\mathrm{GM1^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A1_g}$
N123.2.1 $\mathrm{GM1^-}$	$\surd$	2	2	$\surd$	422	$\mathrm{A1}\oplus\mathrm{A1}$
N123.2.2 $\mathrm{GM2^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{B1_g}$
N123.2.3 $\mathrm{GM2^-}$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{A1}\oplus\mathrm{A1}$
N123.2.4 $\mathrm{GM3^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A2_g}$
N123.2.5 $\mathrm{GM3^-}$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{A1}\oplus\mathrm{A1}$
N123.2.6 $\mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{B2_g}$
N123.2.7 $\mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{A1}\oplus\mathrm{A1}$
N123.2.8 $\mathrm{A1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}$
N123.2.9 $\mathrm{A1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}$
N123.2.10 $\mathrm{M1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}$
N123.2.11 $\mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}$
N123.2.12 $\mathrm{M2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}$
N123.2.13 $\mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}$
N123.2.14 $\mathrm{Z1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}$
N123.2.15 $\mathrm{Z1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}$
N123.2.16 $\mathrm{Z2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}$
N123.2.17 $\mathrm{Z2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}$
N123.3.1 $\mathrm{GM1^-}\oplus\mathrm{GM1^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{A1_u}$
N123.3.2 $\mathrm{GM1^-}\oplus\mathrm{GM2^+}$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{A1}\oplus\mathrm{B1}$
N123.3.3 $\mathrm{GM1^-}\oplus\mathrm{GM2^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{B1_u}$
N123.3.4 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{A1}\oplus\mathrm{A2}$
N123.3.5 $\mathrm{GM1^-}\oplus\mathrm{GM3^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{A2_u}$
N123.3.6 $\mathrm{GM1^-}\oplus\mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{A1}\oplus\mathrm{A2}$
N123.3.7 $\mathrm{GM1^-}\oplus\mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{B2_u}$
N123.3.8 $\mathrm{GM1^-}\oplus\mathrm{A1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}$
N123.3.9 $\mathrm{GM1^-}\oplus\mathrm{A1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}$
N123.3.10 $\mathrm{GM1^-}\oplus\mathrm{M1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}$
N123.3.11 $\mathrm{GM1^-}\oplus\mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}$
N123.3.12 $\mathrm{GM1^-}\oplus\mathrm{M2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}$
N123.3.13 $\mathrm{GM1^-}\oplus\mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}$
N123.3.14 $\mathrm{GM1^-}\oplus\mathrm{Z1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}$
N123.3.15 $\mathrm{GM1^-}\oplus\mathrm{Z1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}$
N123.3.16 $\mathrm{GM1^-}\oplus\mathrm{Z2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}$
N123.3.17 $\mathrm{GM1^-}\oplus\mathrm{Z2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}$
N123.3.18 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B1_g}$
N123.3.19 $\mathrm{GM2^+}\oplus\mathrm{GM2^-}$	$\surd$	2	2	$\surd$	422	$\mathrm{A1}\oplus\mathrm{B1}$
N123.3.20 $\mathrm{GM2^+}\oplus\mathrm{GM3^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}\oplus\mathrm{A2_g}$

Non-coplanar SSGs with parent space group $P4/mmm$ (No. 123) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N123.3.21 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{A1} \oplus \mathrm{B1}$
N123.3.22 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B2_g}$
N123.3.23 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{A1} \oplus \mathrm{B1}$
N123.3.24 $\mathrm{GM2}^+ \oplus \mathrm{A1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g}$
N123.3.25 $\mathrm{GM2}^+ \oplus \mathrm{A1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g}$
N123.3.26 $\mathrm{GM2}^+ \oplus \mathrm{M1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g}$
N123.3.27 $\mathrm{GM2}^+ \oplus \mathrm{M1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g}$
N123.3.28 $\mathrm{GM2}^+ \oplus \mathrm{M2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g}$
N123.3.29 $\mathrm{GM2}^+ \oplus \mathrm{M2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g}$
N123.3.30 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g}$
N123.3.31 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g}$
N123.3.32 $\mathrm{GM2}^+ \oplus \mathrm{Z2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g}$
N123.3.33 $\mathrm{GM2}^+ \oplus \mathrm{Z2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g}$
N123.3.34 $\mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N123.3.35 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{A1} \oplus \mathrm{B2}$
N123.3.36 $\mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u} \oplus \mathrm{A2_u}$
N123.3.37 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{A1} \oplus \mathrm{B2}$
N123.3.38 $\mathrm{GM2}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_u}$
N123.3.39 $\mathrm{GM2}^- \oplus \mathrm{A1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u}$
N123.3.40 $\mathrm{GM2}^- \oplus \mathrm{A1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u}$
N123.3.41 $\mathrm{GM2}^- \oplus \mathrm{M1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u}$
N123.3.42 $\mathrm{GM2}^- \oplus \mathrm{M1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u}$
N123.3.43 $\mathrm{GM2}^- \oplus \mathrm{M2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u}$
N123.3.44 $\mathrm{GM2}^- \oplus \mathrm{M2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u}$
N123.3.45 $\mathrm{GM2}^- \oplus \mathrm{Z1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u}$
N123.3.46 $\mathrm{GM2}^- \oplus \mathrm{Z1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u}$
N123.3.47 $\mathrm{GM2}^- \oplus \mathrm{Z2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u}$
N123.3.48 $\mathrm{GM2}^- \oplus \mathrm{Z2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u}$
N123.3.49 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
N123.3.50 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	422	$\mathrm{A1} \oplus \mathrm{A2}$
N123.3.51 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g} \oplus \mathrm{B2_g}$
N123.3.52 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{A1} \oplus \mathrm{A2}$
N123.3.53 $\mathrm{GM3}^+ \oplus \mathrm{A1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g}$
N123.3.54 $\mathrm{GM3}^+ \oplus \mathrm{A1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g}$
N123.3.55 $\mathrm{GM3}^+ \oplus \mathrm{M1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g}$
N123.3.56 $\mathrm{GM3}^+ \oplus \mathrm{M1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g}$
N123.3.57 $\mathrm{GM3}^+ \oplus \mathrm{M2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g}$
N123.3.58 $\mathrm{GM3}^+ \oplus \mathrm{M2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g}$
N123.3.59 $\mathrm{GM3}^+ \oplus \mathrm{Z1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g}$
N123.3.60 $\mathrm{GM3}^+ \oplus \mathrm{Z1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g}$
N123.3.61 $\mathrm{GM3}^+ \oplus \mathrm{Z2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g}$
N123.3.62 $\mathrm{GM3}^+ \oplus \mathrm{Z2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g}$
N123.3.63 $\mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N123.3.64 $\mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{A1} \oplus \mathrm{B2}$
N123.3.65 $\mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N123.3.66 $\mathrm{GM3}^- \oplus \mathrm{A1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_u}$

Non-coplanar SSGs with parent space group $P4/mmm$ (No. 123) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N123.3.67 GM3$^-$ ⊕ A1$^-$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_u}$
N123.3.68 GM3$^-$ ⊕ M1$^+$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_u}$
N123.3.69 GM3$^-$ ⊕ M1$^-$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_u}$
N123.3.70 GM3$^-$ ⊕ M2$^+$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_u}$
N123.3.71 GM3$^-$ ⊕ M2$^-$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_u}$
N123.3.72 GM3$^-$ ⊕ Z1$^+$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_u}$
N123.3.73 GM3$^-$ ⊕ Z1$^-$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_u}$
N123.3.74 GM3$^-$ ⊕ Z2$^+$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_u}$
N123.3.75 GM3$^-$ ⊕ Z2$^-$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_u}$
N123.3.76 GM4$^+$ ⊕ GM4$^+$	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N123.3.77 GM4$^+$ ⊕ GM4$^-$	√	2	2	√	422	A1 ⊕ B2
N123.3.78 GM4$^+$ ⊕ A1$^+$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_g}$
N123.3.79 GM4$^+$ ⊕ A1$^-$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_g}$
N123.3.80 GM4$^+$ ⊕ M1$^+$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_g}$
N123.3.81 GM4$^+$ ⊕ M1$^-$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_g}$
N123.3.82 GM4$^+$ ⊕ M2$^+$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_g}$
N123.3.83 GM4$^+$ ⊕ M2$^-$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_g}$
N123.3.84 GM4$^+$ ⊕ Z1$^+$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_g}$
N123.3.85 GM4$^+$ ⊕ Z1$^-$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_g}$
N123.3.86 GM4$^+$ ⊕ Z2$^+$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_g}$
N123.3.87 GM4$^+$ ⊕ Z2$^-$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_g}$
N123.3.88 GM4$^-$ ⊕ GM4$^-$	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N123.3.89 GM4$^-$ ⊕ A1$^+$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_u}$
N123.3.90 GM4$^-$ ⊕ A1$^-$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_u}$
N123.3.91 GM4$^-$ ⊕ M1$^+$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_u}$
N123.3.92 GM4$^-$ ⊕ M1$^-$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_u}$
N123.3.93 GM4$^-$ ⊕ M2$^+$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_u}$
N123.3.94 GM4$^-$ ⊕ M2$^-$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_u}$
N123.3.95 GM4$^-$ ⊕ Z1$^+$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_u}$
N123.3.96 GM4$^-$ ⊕ Z1$^-$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_u}$
N123.3.97 GM4$^-$ ⊕ Z2$^+$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_u}$
N123.3.98 GM4$^-$ ⊕ Z2$^-$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_u}$
N123.3.99 A1$^+$ ⊕ A1$^+$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N123.3.100 A1$^+$ ⊕ A2$^-$	√	1	1	√	$\bar{4}2m$	A1
N123.3.101 A1$^+$ ⊕ A3$^-$	√	1	1	√	$4mm$	A1
N123.3.102 A1$^+$ ⊕ A4$^+$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N123.3.103 A1$^+$ ⊕ A1$^-$	√	1	1	√	422	A1
N123.3.104 A1$^+$ ⊕ A2$^+$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N123.3.105 A1$^+$ ⊕ A3$^+$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N123.3.106 A1$^+$ ⊕ A4$^-$	√	1	1	√	$\bar{4}m2$	A1
N123.3.107 A1$^+$ ⊕ M1$^+$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N123.3.108 A1$^+$ ⊕ M4$^+$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N123.3.109 A1$^+$ ⊕ M1$^-$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N123.3.110 A1$^+$ ⊕ M4$^-$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N123.3.111 A1$^+$ ⊕ M2$^+$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N123.3.112 A1$^+$ ⊕ M3$^+$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$

Non-coplanar SSGs with parent space group $P4/mmm$ (No. 123) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N123.3.113 $\mathrm{A1}^{+}\oplus\mathrm{M2}^{-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N123.3.114 $\mathrm{A1}^{+}\oplus\mathrm{M3}^{-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N123.3.115 $\mathrm{A1}^{+}\oplus\mathrm{Z1}^{+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N123.3.116 $\mathrm{A1}^{+}\oplus\mathrm{Z3}^{-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N123.3.117 $\mathrm{A1}^{+}\oplus\mathrm{Z1}^{-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N123.3.118 $\mathrm{A1}^{+}\oplus\mathrm{Z3}^{+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N123.3.119 $\mathrm{A1}^{+}\oplus\mathrm{Z2}^{+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N123.3.120 $\mathrm{A1}^{+}\oplus\mathrm{Z4}^{-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N123.3.121 $\mathrm{A1}^{+}\oplus\mathrm{Z2}^{-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N123.3.122 $\mathrm{A1}^{+}\oplus\mathrm{Z4}^{+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N123.3.123 $\mathrm{A1}^{-}\oplus\mathrm{A1}^{-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N123.3.124 $\mathrm{A1}^{-}\oplus\mathrm{A2}^{+}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	A1
N123.3.125 $\mathrm{A1}^{-}\oplus\mathrm{A3}^{+}$	$\surd$	1	1	$\surd$	$4mm$	A1
N123.3.126 $\mathrm{A1}^{-}\oplus\mathrm{A4}^{-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N123.3.127 $\mathrm{A1}^{-}\oplus\mathrm{M1}^{+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N123.3.128 $\mathrm{A1}^{-}\oplus\mathrm{M4}^{+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N123.3.129 $\mathrm{A1}^{-}\oplus\mathrm{M1}^{-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N123.3.130 $\mathrm{A1}^{-}\oplus\mathrm{M4}^{-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N123.3.131 $\mathrm{A1}^{-}\oplus\mathrm{M2}^{+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N123.3.132 $\mathrm{A1}^{-}\oplus\mathrm{M3}^{+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N123.3.133 $\mathrm{A1}^{-}\oplus\mathrm{M2}^{-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N123.3.134 $\mathrm{A1}^{-}\oplus\mathrm{M3}^{-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N123.3.135 $\mathrm{A1}^{-}\oplus\mathrm{Z1}^{+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N123.3.136 $\mathrm{A1}^{-}\oplus\mathrm{Z3}^{-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N123.3.137 $\mathrm{A1}^{-}\oplus\mathrm{Z1}^{-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N123.3.138 $\mathrm{A1}^{-}\oplus\mathrm{Z3}^{+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N123.3.139 $\mathrm{A1}^{-}\oplus\mathrm{Z2}^{+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N123.3.140 $\mathrm{A1}^{-}\oplus\mathrm{Z4}^{-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N123.3.141 $\mathrm{A1}^{-}\oplus\mathrm{Z2}^{-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N123.3.142 $\mathrm{A1}^{-}\oplus\mathrm{Z4}^{+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N123.3.143 $\mathrm{M1}^{+}\oplus\mathrm{M1}^{+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N123.3.144 $\mathrm{M1}^{+}\oplus\mathrm{M4}^{+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N123.3.145 $\mathrm{M1}^{+}\oplus\mathrm{M1}^{-}$	$\surd$	1	1	$\surd$	422	A1
N123.3.146 $\mathrm{M1}^{+}\oplus\mathrm{M4}^{-}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	A1
N123.3.147 $\mathrm{M1}^{+}\oplus\mathrm{M2}^{+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N123.3.148 $\mathrm{M1}^{+}\oplus\mathrm{M3}^{+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N123.3.149 $\mathrm{M1}^{+}\oplus\mathrm{M2}^{-}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	A1
N123.3.150 $\mathrm{M1}^{+}\oplus\mathrm{M3}^{-}$	$\surd$	1	1	$\surd$	$4mm$	A1
N123.3.151 $\mathrm{M1}^{+}\oplus\mathrm{Z1}^{+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N123.3.152 $\mathrm{M1}^{+}\oplus\mathrm{Z1}^{-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N123.3.153 $\mathrm{M1}^{+}\oplus\mathrm{Z2}^{+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N123.3.154 $\mathrm{M1}^{+}\oplus\mathrm{Z2}^{-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N123.3.155 $\mathrm{M1}^{-}\oplus\mathrm{M1}^{-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N123.3.156 $\mathrm{M1}^{-}\oplus\mathrm{M4}^{-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N123.3.157 $\mathrm{M1}^{-}\oplus\mathrm{M2}^{+}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	A1
N123.3.158 $\mathrm{M1}^{-}\oplus\mathrm{M3}^{+}$	$\surd$	1	1	$\surd$	$4mm$	A1

Non-coplanar SSGs with parent space group $P4/mmm$ (No. 123) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N123.3.159 $\mathrm{M1}^{-}\oplus\mathrm{M2}^{-}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N123.3.160 $\mathrm{M1}^{-}\oplus\mathrm{M3}^{-}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N123.3.161 $\mathrm{M1}^{-}\oplus\mathrm{Z1}^{+}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N123.3.162 $\mathrm{M1}^{-}\oplus\mathrm{Z1}^{-}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N123.3.163 $\mathrm{M1}^{-}\oplus\mathrm{Z2}^{+}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N123.3.164 $\mathrm{M1}^{-}\oplus\mathrm{Z2}^{-}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N123.3.165 $\mathrm{M2}^{+}\oplus\mathrm{M2}^{+}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N123.3.166 $\mathrm{M2}^{+}\oplus\mathrm{M3}^{+}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N123.3.167 $\mathrm{M2}^{+}\oplus\mathrm{M2}^{-}$	√	1	1	√	422	A1
N123.3.168 $\mathrm{M2}^{+}\oplus\mathrm{M3}^{-}$	√	1	1	√	$\bar{4}m2$	A1
N123.3.169 $\mathrm{M2}^{+}\oplus\mathrm{Z1}^{+}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N123.3.170 $\mathrm{M2}^{+}\oplus\mathrm{Z1}^{-}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N123.3.171 $\mathrm{M2}^{+}\oplus\mathrm{Z2}^{+}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N123.3.172 $\mathrm{M2}^{+}\oplus\mathrm{Z2}^{-}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N123.3.173 $\mathrm{M2}^{-}\oplus\mathrm{M2}^{-}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N123.3.174 $\mathrm{M2}^{-}\oplus\mathrm{M3}^{-}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N123.3.175 $\mathrm{M2}^{-}\oplus\mathrm{Z1}^{+}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N123.3.176 $\mathrm{M2}^{-}\oplus\mathrm{Z1}^{-}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N123.3.177 $\mathrm{M2}^{-}\oplus\mathrm{Z2}^{+}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N123.3.178 $\mathrm{M2}^{-}\oplus\mathrm{Z2}^{-}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N123.3.179 $\mathrm{Z1}^{+}\oplus\mathrm{Z1}^{+}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N123.3.180 $\mathrm{Z1}^{+}\oplus\mathrm{Z3}^{-}$	√	1	1	√	$4mm$	A1
N123.3.181 $\mathrm{Z1}^{+}\oplus\mathrm{Z1}^{-}$	√	1	1	√	422	A1
N123.3.182 $\mathrm{Z1}^{+}\oplus\mathrm{Z3}^{+}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N123.3.183 $\mathrm{Z1}^{+}\oplus\mathrm{Z2}^{+}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N123.3.184 $\mathrm{Z1}^{+}\oplus\mathrm{Z4}^{-}$	√	1	1	√	$\bar{4}m2$	A1
N123.3.185 $\mathrm{Z1}^{+}\oplus\mathrm{Z2}^{-}$	√	1	1	√	$\bar{4}2m$	A1
N123.3.186 $\mathrm{Z1}^{+}\oplus\mathrm{Z4}^{+}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N123.3.187 $\mathrm{Z1}^{-}\oplus\mathrm{Z1}^{-}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N123.3.188 $\mathrm{Z1}^{-}\oplus\mathrm{Z3}^{+}$	√	1	1	√	$4mm$	A1
N123.3.189 $\mathrm{Z1}^{-}\oplus\mathrm{Z2}^{+}$	√	1	1	√	$\bar{4}2m$	A1
N123.3.190 $\mathrm{Z1}^{-}\oplus\mathrm{Z4}^{-}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N123.3.191 $\mathrm{Z1}^{-}\oplus\mathrm{Z2}^{-}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N123.3.192 $\mathrm{Z1}^{-}\oplus\mathrm{Z4}^{+}$	√	1	1	√	$\bar{4}m2$	A1
N123.3.193 $\mathrm{Z2}^{+}\oplus\mathrm{Z2}^{+}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N123.3.194 $\mathrm{Z2}^{+}\oplus\mathrm{Z4}^{-}$	√	1	1	√	$4mm$	A1
N123.3.195 $\mathrm{Z2}^{+}\oplus\mathrm{Z2}^{-}$	√	1	1	√	422	A1
N123.3.196 $\mathrm{Z2}^{+}\oplus\mathrm{Z4}^{+}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N123.3.197 $\mathrm{Z2}^{-}\oplus\mathrm{Z2}^{-}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N123.3.198 $\mathrm{Z2}^{-}\oplus\mathrm{Z4}^{+}$	√	1	1	√	$4mm$	A1
N123.6.1 $\mathrm{GM5}^{+}$	√	3	3	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{E_g}$
N123.6.2 $\mathrm{GM5}^{-}$	√	3	3	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{E_u}$
N123.6.3 $\mathrm{A5}^{+}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N123.6.4 $\mathrm{M5}^{+}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N123.6.5 $\mathrm{M5}^{-}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N123.6.6 $\mathrm{Z5}^{+}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$

Non-coplanar SSGs with parent space group $P4/mmm$ (No. 123) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N123.7.1 $\mathrm{R1}^{+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N123.7.2 $\mathrm{R1}^{-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N123.7.3 $\mathrm{X1}^{+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N123.7.4 $\mathrm{X1}^{-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N123.7.5 $\mathrm{X2}^{+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N123.7.6 $\mathrm{X2}^{-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N123.8.1 LD1	$\surd$	1	1	$\surd$	$4mm$	A1
N123.8.2 LD2	$\surd$	1	1	$\surd$	$4mm$	A1
N123.8.3 LD3	$\surd$	1	1	$\surd$	$4mm$	A1
N123.8.4 LD4	$\surd$	1	1	$\surd$	$4mm$	A1
N123.8.5 V1	$\surd$	1	1	$\surd$	$4mm$	A1
N123.8.6 V2	$\surd$	1	1	$\surd$	$4mm$	A1
N123.9.1 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}$	$\surd$	0	0	$\surd$	-	-
N123.9.2 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_u}\oplus\mathrm{B1_u}$
N123.9.3 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
N123.9.4 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}\oplus\mathrm{GM3}^{+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{A2_u}\oplus\mathrm{A2_u}$
N123.9.5 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}\oplus\mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
N123.9.6 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}\oplus\mathrm{GM4}^{+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B2_g}\oplus\mathrm{B2_u}\oplus\mathrm{B2_u}$
N123.9.7 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}\oplus\mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
N123.9.8 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}\oplus\mathrm{A1}^{+}$	$\surd$	0	0	$\surd$	-	-
N123.9.9 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}\oplus\mathrm{A1}^{-}$	$\surd$	0	0	$\surd$	-	-
N123.9.10 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}\oplus\mathrm{M1}^{+}$	$\surd$	0	0	$\surd$	-	-
N123.9.11 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}\oplus\mathrm{M1}^{-}$	$\surd$	0	0	$\surd$	-	-
N123.9.12 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}\oplus\mathrm{M2}^{+}$	$\surd$	0	0	$\surd$	-	-
N123.9.13 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}\oplus\mathrm{M2}^{-}$	$\surd$	0	0	$\surd$	-	-
N123.9.14 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}\oplus\mathrm{Z1}^{+}$	$\surd$	0	0	$\surd$	-	-
N123.9.15 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}\oplus\mathrm{Z1}^{-}$	$\surd$	0	0	$\surd$	-	-
N123.9.16 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}\oplus\mathrm{Z2}^{+}$	$\surd$	0	0	$\surd$	-	-
N123.9.17 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}\oplus\mathrm{Z2}^{-}$	$\surd$	0	0	$\surd$	-	-
N123.9.18 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	422	$\mathrm{B1}\oplus\mathrm{B1}$
N123.9.19 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B1_g}\oplus\mathrm{B1_u}$
N123.9.20 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{B1}\oplus\mathrm{B2}$
N123.9.21 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_u}\oplus\mathrm{B2_u}$
N123.9.22 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}\oplus\mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{B1}\oplus\mathrm{B2}$
N123.9.23 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}\oplus\mathrm{GM4}^{-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_u}\oplus\mathrm{A2_u}$
N123.9.24 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}\oplus\mathrm{A1}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_u}$
N123.9.25 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}\oplus\mathrm{A1}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_u}$
N123.9.26 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}\oplus\mathrm{M1}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_u}$
N123.9.27 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}\oplus\mathrm{M1}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_u}$
N123.9.28 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}\oplus\mathrm{M2}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_u}$
N123.9.29 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}\oplus\mathrm{M2}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_u}$
N123.9.30 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}\oplus\mathrm{Z1}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_u}$
N123.9.31 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}\oplus\mathrm{Z1}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_u}$
N123.9.32 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}\oplus\mathrm{Z2}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_u}$
N123.9.33 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}\oplus\mathrm{Z2}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_u}$
N123.9.34 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-

Non-coplanar SSGs with parent space group $P4/mmm$ (No. 123) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N123.9.35 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{GM3^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N123.9.36 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
N123.9.37 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N123.9.38 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N123.9.39 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{A1^+}$	$\surd$	0	0	$\surd$	-	-
N123.9.40 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{A1^-}$	$\surd$	0	0	$\surd$	-	-
N123.9.41 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{M1^+}$	$\surd$	0	0	$\surd$	-	-
N123.9.42 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{M1^-}$	$\surd$	0	0	$\surd$	-	-
N123.9.43 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{M2^+}$	$\surd$	0	0	$\surd$	-	-
N123.9.44 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{M2^-}$	$\surd$	0	0	$\surd$	-	-
N123.9.45 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{Z1^+}$	$\surd$	0	0	$\surd$	-	-
N123.9.46 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{Z1^-}$	$\surd$	0	0	$\surd$	-	-
N123.9.47 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{Z2^+}$	$\surd$	0	0	$\surd$	-	-
N123.9.48 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{Z2^-}$	$\surd$	0	0	$\surd$	-	-
N123.9.49 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{GM3^+}$	$\surd$	2	2	$\surd$	422	$\mathrm{A2} \oplus \mathrm{A2}$
N123.9.50 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{GM3^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
N123.9.51 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B2} \oplus \mathrm{A2}$
N123.9.52 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
N123.9.53 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{A1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u}$
N123.9.54 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{A1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u}$
N123.9.55 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{M1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u}$
N123.9.56 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u}$
N123.9.57 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{M2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u}$
N123.9.58 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u}$
N123.9.59 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{Z1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u}$
N123.9.60 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{Z1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u}$
N123.9.61 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{Z2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u}$
N123.9.62 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{Z2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u}$
N123.9.63 $\mathrm{GM1^-} \oplus \mathrm{GM3^-} \oplus \mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
N123.9.64 $\mathrm{GM1^-} \oplus \mathrm{GM3^-} \oplus \mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N123.9.65 $\mathrm{GM1^-} \oplus \mathrm{GM3^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N123.9.66 $\mathrm{GM1^-} \oplus \mathrm{GM3^-} \oplus \mathrm{A1^+}$	$\surd$	0	0	$\surd$	-	-
N123.9.67 $\mathrm{GM1^-} \oplus \mathrm{GM3^-} \oplus \mathrm{A1^-}$	$\surd$	0	0	$\surd$	-	-
N123.9.68 $\mathrm{GM1^-} \oplus \mathrm{GM3^-} \oplus \mathrm{M1^+}$	$\surd$	0	0	$\surd$	-	-
N123.9.69 $\mathrm{GM1^-} \oplus \mathrm{GM3^-} \oplus \mathrm{M1^-}$	$\surd$	0	0	$\surd$	-	-
N123.9.70 $\mathrm{GM1^-} \oplus \mathrm{GM3^-} \oplus \mathrm{M2^+}$	$\surd$	0	0	$\surd$	-	-
N123.9.71 $\mathrm{GM1^-} \oplus \mathrm{GM3^-} \oplus \mathrm{M2^-}$	$\surd$	0	0	$\surd$	-	-
N123.9.72 $\mathrm{GM1^-} \oplus \mathrm{GM3^-} \oplus \mathrm{Z1^+}$	$\surd$	0	0	$\surd$	-	-
N123.9.73 $\mathrm{GM1^-} \oplus \mathrm{GM3^-} \oplus \mathrm{Z1^-}$	$\surd$	0	0	$\surd$	-	-
N123.9.74 $\mathrm{GM1^-} \oplus \mathrm{GM3^-} \oplus \mathrm{Z2^+}$	$\surd$	0	0	$\surd$	-	-
N123.9.75 $\mathrm{GM1^-} \oplus \mathrm{GM3^-} \oplus \mathrm{Z2^-}$	$\surd$	0	0	$\surd$	-	-
N123.9.76 $\mathrm{GM1^-} \oplus \mathrm{GM4^+} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	422	$\mathrm{B2} \oplus \mathrm{B2}$
N123.9.77 $\mathrm{GM1^-} \oplus \mathrm{GM4^+} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N123.9.78 $\mathrm{GM1^-} \oplus \mathrm{GM4^+} \oplus \mathrm{A1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_u}$
N123.9.79 $\mathrm{GM1^-} \oplus \mathrm{GM4^+} \oplus \mathrm{A1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_u}$
N123.9.80 $\mathrm{GM1^-} \oplus \mathrm{GM4^+} \oplus \mathrm{M1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_u}$

Non-coplanar SSGs with parent space group $P4/mmm$ (No. 123) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N123.9.81 $\mathrm{GM1^-}\oplus\mathrm{GM4^+}\oplus\mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g}\oplus\mathrm{B2_u}$
N123.9.82 $\mathrm{GM1^-}\oplus\mathrm{GM4^+}\oplus\mathrm{M2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g}\oplus\mathrm{B2_u}$
N123.9.83 $\mathrm{GM1^-}\oplus\mathrm{GM4^+}\oplus\mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g}\oplus\mathrm{B2_u}$
N123.9.84 $\mathrm{GM1^-}\oplus\mathrm{GM4^+}\oplus\mathrm{Z1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g}\oplus\mathrm{B2_u}$
N123.9.85 $\mathrm{GM1^-}\oplus\mathrm{GM4^+}\oplus\mathrm{Z1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g}\oplus\mathrm{B2_u}$
N123.9.86 $\mathrm{GM1^-}\oplus\mathrm{GM4^+}\oplus\mathrm{Z2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g}\oplus\mathrm{B2_u}$
N123.9.87 $\mathrm{GM1^-}\oplus\mathrm{GM4^+}\oplus\mathrm{Z2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g}\oplus\mathrm{B2_u}$
N123.9.88 $\mathrm{GM1^-}\oplus\mathrm{GM4^-}\oplus\mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N123.9.89 $\mathrm{GM1^-}\oplus\mathrm{GM4^-}\oplus\mathrm{A1^+}$	$\surd$	0	0	$\surd$	-	-
N123.9.90 $\mathrm{GM1^-}\oplus\mathrm{GM4^-}\oplus\mathrm{A1^-}$	$\surd$	0	0	$\surd$	-	-
N123.9.91 $\mathrm{GM1^-}\oplus\mathrm{GM4^-}\oplus\mathrm{M1^+}$	$\surd$	0	0	$\surd$	-	-
N123.9.92 $\mathrm{GM1^-}\oplus\mathrm{GM4^-}\oplus\mathrm{M1^-}$	$\surd$	0	0	$\surd$	-	-
N123.9.93 $\mathrm{GM1^-}\oplus\mathrm{GM4^-}\oplus\mathrm{M2^+}$	$\surd$	0	0	$\surd$	-	-
N123.9.94 $\mathrm{GM1^-}\oplus\mathrm{GM4^-}\oplus\mathrm{M2^-}$	$\surd$	0	0	$\surd$	-	-
N123.9.95 $\mathrm{GM1^-}\oplus\mathrm{GM4^-}\oplus\mathrm{Z1^+}$	$\surd$	0	0	$\surd$	-	-
N123.9.96 $\mathrm{GM1^-}\oplus\mathrm{GM4^-}\oplus\mathrm{Z1^-}$	$\surd$	0	0	$\surd$	-	-
N123.9.97 $\mathrm{GM1^-}\oplus\mathrm{GM4^-}\oplus\mathrm{Z2^+}$	$\surd$	0	0	$\surd$	-	-
N123.9.98 $\mathrm{GM1^-}\oplus\mathrm{GM4^-}\oplus\mathrm{Z2^-}$	$\surd$	0	0	$\surd$	-	-
N123.9.99 $\mathrm{GM1^-}\oplus\mathrm{A1^+}\oplus\mathrm{A1^+}$	$\surd$	1	0	$\times$	-	-
N123.9.100 $\mathrm{GM1^-}\oplus\mathrm{A1^+}\oplus\mathrm{A2^-}$	$\surd$	1	1	$\times$	-	-
N123.9.101 $\mathrm{GM1^-}\oplus\mathrm{A1^+}\oplus\mathrm{A3^-}$	$\surd$	1	1	$\times$	-	-
N123.9.102 $\mathrm{GM1^-}\oplus\mathrm{A1^+}\oplus\mathrm{A4^+}$	$\surd$	1	0	$\times$	-	-
N123.9.103 $\mathrm{GM1^-}\oplus\mathrm{A1^+}\oplus\mathrm{A1^-}$	$\surd$	1	1	$\times$	-	-
N123.9.104 $\mathrm{GM1^-}\oplus\mathrm{A1^+}\oplus\mathrm{A2^+}$	$\surd$	1	0	$\times$	-	-
N123.9.105 $\mathrm{GM1^-}\oplus\mathrm{A1^+}\oplus\mathrm{A3^+}$	$\surd$	1	0	$\times$	-	-
N123.9.106 $\mathrm{GM1^-}\oplus\mathrm{A1^+}\oplus\mathrm{A4^-}$	$\surd$	1	1	$\times$	-	-
N123.9.107 $\mathrm{GM1^-}\oplus\mathrm{A1^+}\oplus\mathrm{M1^+}$	$\surd$	1	0	$\times$	-	-
N123.9.108 $\mathrm{GM1^-}\oplus\mathrm{A1^+}\oplus\mathrm{M4^+}$	$\surd$	1	0	$\times$	-	-
N123.9.109 $\mathrm{GM1^-}\oplus\mathrm{A1^+}\oplus\mathrm{M1^-}$	$\surd$	1	0	$\times$	-	-
N123.9.110 $\mathrm{GM1^-}\oplus\mathrm{A1^+}\oplus\mathrm{M4^-}$	$\surd$	1	0	$\times$	-	-
N123.9.111 $\mathrm{GM1^-}\oplus\mathrm{A1^+}\oplus\mathrm{M2^+}$	$\surd$	1	0	$\times$	-	-
N123.9.112 $\mathrm{GM1^-}\oplus\mathrm{A1^+}\oplus\mathrm{M3^+}$	$\surd$	1	0	$\times$	-	-
N123.9.113 $\mathrm{GM1^-}\oplus\mathrm{A1^+}\oplus\mathrm{M2^-}$	$\surd$	1	0	$\times$	-	-
N123.9.114 $\mathrm{GM1^-}\oplus\mathrm{A1^+}\oplus\mathrm{M3^-}$	$\surd$	1	0	$\times$	-	-
N123.9.115 $\mathrm{GM1^-}\oplus\mathrm{A1^+}\oplus\mathrm{Z1^+}$	$\surd$	1	0	$\times$	-	-
N123.9.116 $\mathrm{GM1^-}\oplus\mathrm{A1^+}\oplus\mathrm{Z3^-}$	$\surd$	1	0	$\times$	-	-
N123.9.117 $\mathrm{GM1^-}\oplus\mathrm{A1^+}\oplus\mathrm{Z1^-}$	$\surd$	1	0	$\times$	-	-
N123.9.118 $\mathrm{GM1^-}\oplus\mathrm{A1^+}\oplus\mathrm{Z3^+}$	$\surd$	1	0	$\times$	-	-
N123.9.119 $\mathrm{GM1^-}\oplus\mathrm{A1^+}\oplus\mathrm{Z2^+}$	$\surd$	1	0	$\times$	-	-
N123.9.120 $\mathrm{GM1^-}\oplus\mathrm{A1^+}\oplus\mathrm{Z4^-}$	$\surd$	1	0	$\times$	-	-
N123.9.121 $\mathrm{GM1^-}\oplus\mathrm{A1^+}\oplus\mathrm{Z2^-}$	$\surd$	1	0	$\times$	-	-
N123.9.122 $\mathrm{GM1^-}\oplus\mathrm{A1^+}\oplus\mathrm{Z4^+}$	$\surd$	1	0	$\times$	-	-
N123.9.123 $\mathrm{GM1^-}\oplus\mathrm{A1^-}\oplus\mathrm{A1^-}$	$\surd$	1	0	$\times$	-	-
N123.9.124 $\mathrm{GM1^-}\oplus\mathrm{A1^-}\oplus\mathrm{A2^+}$	$\surd$	1	1	$\times$	-	-
N123.9.125 $\mathrm{GM1^-}\oplus\mathrm{A1^-}\oplus\mathrm{A3^+}$	$\surd$	1	1	$\times$	-	-
N123.9.126 $\mathrm{GM1^-}\oplus\mathrm{A1^-}\oplus\mathrm{A4^-}$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $P4/mmm$ (No. 123) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N123.9.127 $\mathrm{GM1}^- \oplus \mathrm{A1}^- \oplus \mathrm{M1}^+$	$\surd$	1	0	$\times$	-	-
N123.9.128 $\mathrm{GM1}^- \oplus \mathrm{A1}^- \oplus \mathrm{M4}^+$	$\surd$	1	0	$\times$	-	-
N123.9.129 $\mathrm{GM1}^- \oplus \mathrm{A1}^- \oplus \mathrm{M1}^-$	$\surd$	1	0	$\times$	-	-
N123.9.130 $\mathrm{GM1}^- \oplus \mathrm{A1}^- \oplus \mathrm{M4}^-$	$\surd$	1	0	$\times$	-	-
N123.9.131 $\mathrm{GM1}^- \oplus \mathrm{A1}^- \oplus \mathrm{M2}^+$	$\surd$	1	0	$\times$	-	-
N123.9.132 $\mathrm{GM1}^- \oplus \mathrm{A1}^- \oplus \mathrm{M3}^+$	$\surd$	1	0	$\times$	-	-
N123.9.133 $\mathrm{GM1}^- \oplus \mathrm{A1}^- \oplus \mathrm{M2}^-$	$\surd$	1	0	$\times$	-	-
N123.9.134 $\mathrm{GM1}^- \oplus \mathrm{A1}^- \oplus \mathrm{M3}^-$	$\surd$	1	0	$\times$	-	-
N123.9.135 $\mathrm{GM1}^- \oplus \mathrm{A1}^- \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N123.9.136 $\mathrm{GM1}^- \oplus \mathrm{A1}^- \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N123.9.137 $\mathrm{GM1}^- \oplus \mathrm{A1}^- \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N123.9.138 $\mathrm{GM1}^- \oplus \mathrm{A1}^- \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N123.9.139 $\mathrm{GM1}^- \oplus \mathrm{A1}^- \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N123.9.140 $\mathrm{GM1}^- \oplus \mathrm{A1}^- \oplus \mathrm{Z4}^-$	$\surd$	1	0	$\times$	-	-
N123.9.141 $\mathrm{GM1}^- \oplus \mathrm{A1}^- \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-
N123.9.142 $\mathrm{GM1}^- \oplus \mathrm{A1}^- \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N123.9.143 $\mathrm{GM1}^- \oplus \mathrm{M1}^+ \oplus \mathrm{M1}^+$	$\surd$	1	0	$\times$	-	-
N123.9.144 $\mathrm{GM1}^- \oplus \mathrm{M1}^+ \oplus \mathrm{M4}^+$	$\surd$	1	0	$\times$	-	-
N123.9.145 $\mathrm{GM1}^- \oplus \mathrm{M1}^+ \oplus \mathrm{M1}^-$	$\surd$	1	1	$\times$	-	-
N123.9.146 $\mathrm{GM1}^- \oplus \mathrm{M1}^+ \oplus \mathrm{M4}^-$	$\surd$	1	1	$\times$	-	-
N123.9.147 $\mathrm{GM1}^- \oplus \mathrm{M1}^+ \oplus \mathrm{M2}^+$	$\surd$	1	0	$\times$	-	-
N123.9.148 $\mathrm{GM1}^- \oplus \mathrm{M1}^+ \oplus \mathrm{M3}^+$	$\surd$	1	0	$\times$	-	-
N123.9.149 $\mathrm{GM1}^- \oplus \mathrm{M1}^+ \oplus \mathrm{M2}^-$	$\surd$	1	1	$\times$	-	-
N123.9.150 $\mathrm{GM1}^- \oplus \mathrm{M1}^+ \oplus \mathrm{M3}^-$	$\surd$	1	1	$\times$	-	-
N123.9.151 $\mathrm{GM1}^- \oplus \mathrm{M1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N123.9.152 $\mathrm{GM1}^- \oplus \mathrm{M1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N123.9.153 $\mathrm{GM1}^- \oplus \mathrm{M1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N123.9.154 $\mathrm{GM1}^- \oplus \mathrm{M1}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-
N123.9.155 $\mathrm{GM1}^- \oplus \mathrm{M1}^- \oplus \mathrm{M1}^-$	$\surd$	1	0	$\times$	-	-
N123.9.156 $\mathrm{GM1}^- \oplus \mathrm{M1}^- \oplus \mathrm{M4}^-$	$\surd$	1	0	$\times$	-	-
N123.9.157 $\mathrm{GM1}^- \oplus \mathrm{M1}^- \oplus \mathrm{M2}^+$	$\surd$	1	1	$\times$	-	-
N123.9.158 $\mathrm{GM1}^- \oplus \mathrm{M1}^- \oplus \mathrm{M3}^+$	$\surd$	1	1	$\times$	-	-
N123.9.159 $\mathrm{GM1}^- \oplus \mathrm{M1}^- \oplus \mathrm{M2}^-$	$\surd$	1	0	$\times$	-	-
N123.9.160 $\mathrm{GM1}^- \oplus \mathrm{M1}^- \oplus \mathrm{M3}^-$	$\surd$	1	0	$\times$	-	-
N123.9.161 $\mathrm{GM1}^- \oplus \mathrm{M1}^- \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N123.9.162 $\mathrm{GM1}^- \oplus \mathrm{M1}^- \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N123.9.163 $\mathrm{GM1}^- \oplus \mathrm{M1}^- \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N123.9.164 $\mathrm{GM1}^- \oplus \mathrm{M1}^- \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-
N123.9.165 $\mathrm{GM1}^- \oplus \mathrm{M2}^+ \oplus \mathrm{M2}^+$	$\surd$	1	0	$\times$	-	-
N123.9.166 $\mathrm{GM1}^- \oplus \mathrm{M2}^+ \oplus \mathrm{M3}^+$	$\surd$	1	0	$\times$	-	-
N123.9.167 $\mathrm{GM1}^- \oplus \mathrm{M2}^+ \oplus \mathrm{M2}^-$	$\surd$	1	1	$\times$	-	-
N123.9.168 $\mathrm{GM1}^- \oplus \mathrm{M2}^+ \oplus \mathrm{M3}^-$	$\surd$	1	1	$\times$	-	-
N123.9.169 $\mathrm{GM1}^- \oplus \mathrm{M2}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N123.9.170 $\mathrm{GM1}^- \oplus \mathrm{M2}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N123.9.171 $\mathrm{GM1}^- \oplus \mathrm{M2}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N123.9.172 $\mathrm{GM1}^- \oplus \mathrm{M2}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $P4/mmm$ (No. 123) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N123.9.173 $\mathrm{GM1^-} \oplus \mathrm{M2^-} \oplus \mathrm{M2^-}$	$\surd$	1	0	$\times$	-	-
N123.9.174 $\mathrm{GM1^-} \oplus \mathrm{M2^-} \oplus \mathrm{M3^-}$	$\surd$	1	0	$\times$	-	-
N123.9.175 $\mathrm{GM1^-} \oplus \mathrm{M2^-} \oplus \mathrm{Z1^+}$	$\surd$	1	0	$\times$	-	-
N123.9.176 $\mathrm{GM1^-} \oplus \mathrm{M2^-} \oplus \mathrm{Z1^-}$	$\surd$	1	0	$\times$	-	-
N123.9.177 $\mathrm{GM1^-} \oplus \mathrm{M2^-} \oplus \mathrm{Z2^+}$	$\surd$	1	0	$\times$	-	-
N123.9.178 $\mathrm{GM1^-} \oplus \mathrm{M2^-} \oplus \mathrm{Z2^-}$	$\surd$	1	0	$\times$	-	-
N123.9.179 $\mathrm{GM1^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z1^+}$	$\surd$	1	0	$\times$	-	-
N123.9.180 $\mathrm{GM1^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z3^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.9.181 $\mathrm{GM1^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z1^-}$	$\surd$	1	1	$\times$	-	-
N123.9.182 $\mathrm{GM1^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z3^+}$	$\surd$	1	0	$\times$	-	-
N123.9.183 $\mathrm{GM1^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z2^+}$	$\surd$	1	0	$\times$	-	-
N123.9.184 $\mathrm{GM1^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z4^-}$	$\surd$	1	1	$\times$	-	-
N123.9.185 $\mathrm{GM1^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
N123.9.186 $\mathrm{GM1^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z4^+}$	$\surd$	1	0	$\times$	-	-
N123.9.187 $\mathrm{GM1^-} \oplus \mathrm{Z1^-} \oplus \mathrm{Z1^-}$	$\surd$	1	0	$\times$	-	-
N123.9.188 $\mathrm{GM1^-} \oplus \mathrm{Z1^-} \oplus \mathrm{Z3^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.9.189 $\mathrm{GM1^-} \oplus \mathrm{Z1^-} \oplus \mathrm{Z2^+}$	$\surd$	1	1	$\times$	-	-
N123.9.190 $\mathrm{GM1^-} \oplus \mathrm{Z1^-} \oplus \mathrm{Z4^-}$	$\surd$	1	0	$\times$	-	-
N123.9.191 $\mathrm{GM1^-} \oplus \mathrm{Z1^-} \oplus \mathrm{Z2^-}$	$\surd$	1	0	$\times$	-	-
N123.9.192 $\mathrm{GM1^-} \oplus \mathrm{Z1^-} \oplus \mathrm{Z4^+}$	$\surd$	1	1	$\times$	-	-
N123.9.193 $\mathrm{GM1^-} \oplus \mathrm{Z2^+} \oplus \mathrm{Z2^+}$	$\surd$	1	0	$\times$	-	-
N123.9.194 $\mathrm{GM1^-} \oplus \mathrm{Z2^+} \oplus \mathrm{Z4^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.9.195 $\mathrm{GM1^-} \oplus \mathrm{Z2^+} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
N123.9.196 $\mathrm{GM1^-} \oplus \mathrm{Z2^+} \oplus \mathrm{Z4^+}$	$\surd$	1	0	$\times$	-	-
N123.9.197 $\mathrm{GM1^-} \oplus \mathrm{Z2^-} \oplus \mathrm{Z2^-}$	$\surd$	1	0	$\times$	-	-
N123.9.198 $\mathrm{GM1^-} \oplus \mathrm{Z2^-} \oplus \mathrm{Z4^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.9.199 $\mathrm{GM2^+} \oplus \mathrm{GM2^+} \oplus \mathrm{GM2^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N123.9.200 $\mathrm{GM2^+} \oplus \mathrm{GM2^+} \oplus \mathrm{GM2^-}$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B1} \oplus \mathrm{B1}$
N123.9.201 $\mathrm{GM2^+} \oplus \mathrm{GM2^+} \oplus \mathrm{GM3^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{A2_g}$
N123.9.202 $\mathrm{GM2^+} \oplus \mathrm{GM2^+} \oplus \mathrm{GM3^-}$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{B1} \oplus \mathrm{B1}$
N123.9.203 $\mathrm{GM2^+} \oplus \mathrm{GM2^+} \oplus \mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B2_g}$
N123.9.204 $\mathrm{GM2^+} \oplus \mathrm{GM2^+} \oplus \mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{B1} \oplus \mathrm{B1}$
N123.9.205 $\mathrm{GM2^+} \oplus \mathrm{GM2^+} \oplus \mathrm{A1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N123.9.206 $\mathrm{GM2^+} \oplus \mathrm{GM2^+} \oplus \mathrm{A1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N123.9.207 $\mathrm{GM2^+} \oplus \mathrm{GM2^+} \oplus \mathrm{M1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N123.9.208 $\mathrm{GM2^+} \oplus \mathrm{GM2^+} \oplus \mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N123.9.209 $\mathrm{GM2^+} \oplus \mathrm{GM2^+} \oplus \mathrm{M2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N123.9.210 $\mathrm{GM2^+} \oplus \mathrm{GM2^+} \oplus \mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N123.9.211 $\mathrm{GM2^+} \oplus \mathrm{GM2^+} \oplus \mathrm{Z1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N123.9.212 $\mathrm{GM2^+} \oplus \mathrm{GM2^+} \oplus \mathrm{Z1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N123.9.213 $\mathrm{GM2^+} \oplus \mathrm{GM2^+} \oplus \mathrm{Z2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N123.9.214 $\mathrm{GM2^+} \oplus \mathrm{GM2^+} \oplus \mathrm{Z2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N123.9.215 $\mathrm{GM2^+} \oplus \mathrm{GM2^-} \oplus \mathrm{GM2^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{B1_g}$
N123.9.216 $\mathrm{GM2^+} \oplus \mathrm{GM2^-} \oplus \mathrm{GM3^+}$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{B1} \oplus \mathrm{A2}$
N123.9.217 $\mathrm{GM2^+} \oplus \mathrm{GM2^-} \oplus \mathrm{GM3^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B2_u}$
N123.9.218 $\mathrm{GM2^+} \oplus \mathrm{GM2^-} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{B1} \oplus \mathrm{A2}$

Non-coplanar SSGs with parent space group $P4/mmm$ (No. 123) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N123.9.219 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{A2_u}$
N123.9.220 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{A1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g}$
N123.9.221 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{A1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g}$
N123.9.222 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{M1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g}$
N123.9.223 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{M1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g}$
N123.9.224 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{M2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g}$
N123.9.225 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{M2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g}$
N123.9.226 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{Z1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g}$
N123.9.227 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{Z1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g}$
N123.9.228 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{Z2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g}$
N123.9.229 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{Z2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g}$
N123.9.230 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
N123.9.231 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B1} \oplus \mathrm{A2}$
N123.9.232 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g} \oplus \mathrm{B2_g}$
N123.9.233 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	422	$\mathrm{B1} \oplus \mathrm{A2}$
N123.9.234 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{A1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g}$
N123.9.235 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{A1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g}$
N123.9.236 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{M1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g}$
N123.9.237 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{M1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g}$
N123.9.238 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{M2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g}$
N123.9.239 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{M2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g}$
N123.9.240 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Z1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g}$
N123.9.241 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Z1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g}$
N123.9.242 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Z2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g}$
N123.9.243 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Z2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g}$
N123.9.244 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N123.9.245 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	422	$\mathrm{B1} \oplus \mathrm{B2}$
N123.9.246 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N123.9.247 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{A1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N123.9.248 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{A1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N123.9.249 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{M1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N123.9.250 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{M1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N123.9.251 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{M2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N123.9.252 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{M2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N123.9.253 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Z1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N123.9.254 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Z1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N123.9.255 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Z2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N123.9.256 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Z2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N123.9.257 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N123.9.258 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B1} \oplus \mathrm{B2}$
N123.9.259 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{A1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
N123.9.260 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{A1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
N123.9.261 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{M1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
N123.9.262 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{M1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
N123.9.263 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{M2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
N123.9.264 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{M2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_g}$

Non-coplanar SSGs with parent space group $P4/mmm$ (No. 123) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N123.9.265 $\mathrm{GM2^+} \oplus \mathrm{GM4^+} \oplus \mathrm{Z1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
N123.9.266 $\mathrm{GM2^+} \oplus \mathrm{GM4^+} \oplus \mathrm{Z1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
N123.9.267 $\mathrm{GM2^+} \oplus \mathrm{GM4^+} \oplus \mathrm{Z2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
N123.9.268 $\mathrm{GM2^+} \oplus \mathrm{GM4^+} \oplus \mathrm{Z2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
N123.9.269 $\mathrm{GM2^+} \oplus \mathrm{GM4^-} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N123.9.270 $\mathrm{GM2^+} \oplus \mathrm{GM4^-} \oplus \mathrm{A1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u}$
N123.9.271 $\mathrm{GM2^+} \oplus \mathrm{GM4^-} \oplus \mathrm{A1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u}$
N123.9.272 $\mathrm{GM2^+} \oplus \mathrm{GM4^-} \oplus \mathrm{M1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u}$
N123.9.273 $\mathrm{GM2^+} \oplus \mathrm{GM4^-} \oplus \mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u}$
N123.9.274 $\mathrm{GM2^+} \oplus \mathrm{GM4^-} \oplus \mathrm{M2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u}$
N123.9.275 $\mathrm{GM2^+} \oplus \mathrm{GM4^-} \oplus \mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u}$
N123.9.276 $\mathrm{GM2^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Z1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u}$
N123.9.277 $\mathrm{GM2^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Z1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u}$
N123.9.278 $\mathrm{GM2^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Z2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u}$
N123.9.279 $\mathrm{GM2^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Z2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u}$
N123.9.280 $\mathrm{GM2^+} \oplus \mathrm{A1^+} \oplus \mathrm{A1^+}$	$\surd$	1	1	$\times$	-	-
N123.9.281 $\mathrm{GM2^+} \oplus \mathrm{A1^+} \oplus \mathrm{A2^-}$	$\surd$	1	1	$\times$	-	-
N123.9.282 $\mathrm{GM2^+} \oplus \mathrm{A1^+} \oplus \mathrm{A3^-}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N123.9.283 $\mathrm{GM2^+} \oplus \mathrm{A1^+} \oplus \mathrm{A4^+}$	$\surd$	1	1	$\times$	-	-
N123.9.284 $\mathrm{GM2^+} \oplus \mathrm{A1^+} \oplus \mathrm{A1^-}$	$\surd$	1	1	$\times$	-	-
N123.9.285 $\mathrm{GM2^+} \oplus \mathrm{A1^+} \oplus \mathrm{A2^+}$	$\surd$	1	1	$\times$	-	-
N123.9.286 $\mathrm{GM2^+} \oplus \mathrm{A1^+} \oplus \mathrm{A3^+}$	$\surd$	1	1	$\times$	-	-
N123.9.287 $\mathrm{GM2^+} \oplus \mathrm{A1^+} \oplus \mathrm{A4^-}$	$\surd$	1	1	$\times$	-	-
N123.9.288 $\mathrm{GM2^+} \oplus \mathrm{A1^+} \oplus \mathrm{M1^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N123.9.289 $\mathrm{GM2^+} \oplus \mathrm{A1^+} \oplus \mathrm{M4^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N123.9.290 $\mathrm{GM2^+} \oplus \mathrm{A1^+} \oplus \mathrm{M1^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N123.9.291 $\mathrm{GM2^+} \oplus \mathrm{A1^+} \oplus \mathrm{M4^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N123.9.292 $\mathrm{GM2^+} \oplus \mathrm{A1^+} \oplus \mathrm{M2^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N123.9.293 $\mathrm{GM2^+} \oplus \mathrm{A1^+} \oplus \mathrm{M3^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N123.9.294 $\mathrm{GM2^+} \oplus \mathrm{A1^+} \oplus \mathrm{M2^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N123.9.295 $\mathrm{GM2^+} \oplus \mathrm{A1^+} \oplus \mathrm{M3^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N123.9.296 $\mathrm{GM2^+} \oplus \mathrm{A1^+} \oplus \mathrm{Z1^+}$	$\surd$	1	1	$\times$	-	-
N123.9.297 $\mathrm{GM2^+} \oplus \mathrm{A1^+} \oplus \mathrm{Z3^-}$	$\surd$	1	1	$\times$	-	-
N123.9.298 $\mathrm{GM2^+} \oplus \mathrm{A1^+} \oplus \mathrm{Z1^-}$	$\surd$	1	1	$\times$	-	-
N123.9.299 $\mathrm{GM2^+} \oplus \mathrm{A1^+} \oplus \mathrm{Z3^+}$	$\surd$	1	1	$\times$	-	-
N123.9.300 $\mathrm{GM2^+} \oplus \mathrm{A1^+} \oplus \mathrm{Z2^+}$	$\surd$	1	1	$\times$	-	-
N123.9.301 $\mathrm{GM2^+} \oplus \mathrm{A1^+} \oplus \mathrm{Z4^-}$	$\surd$	1	1	$\times$	-	-
N123.9.302 $\mathrm{GM2^+} \oplus \mathrm{A1^+} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
N123.9.303 $\mathrm{GM2^+} \oplus \mathrm{A1^+} \oplus \mathrm{Z4^+}$	$\surd$	1	1	$\times$	-	-
N123.9.304 $\mathrm{GM2^+} \oplus \mathrm{A1^-} \oplus \mathrm{A1^-}$	$\surd$	1	1	$\times$	-	-
N123.9.305 $\mathrm{GM2^+} \oplus \mathrm{A1^-} \oplus \mathrm{A2^+}$	$\surd$	1	1	$\times$	-	-
N123.9.306 $\mathrm{GM2^+} \oplus \mathrm{A1^-} \oplus \mathrm{A3^+}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N123.9.307 $\mathrm{GM2^+} \oplus \mathrm{A1^-} \oplus \mathrm{A4^-}$	$\surd$	1	1	$\times$	-	-
N123.9.308 $\mathrm{GM2^+} \oplus \mathrm{A1^-} \oplus \mathrm{M1^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N123.9.309 $\mathrm{GM2^+} \oplus \mathrm{A1^-} \oplus \mathrm{M4^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N123.9.310 $\mathrm{GM2^+} \oplus \mathrm{A1^-} \oplus \mathrm{M1^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$

Non-coplanar SSGs with parent space group $P4/mmm$ (No. 123) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N123.9.311 $\mathrm{GM2}^+ \oplus \mathrm{A1}^- \oplus \mathrm{M4}^-$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N123.9.312 $\mathrm{GM2}^+ \oplus \mathrm{A1}^- \oplus \mathrm{M2}^+$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N123.9.313 $\mathrm{GM2}^+ \oplus \mathrm{A1}^- \oplus \mathrm{M3}^+$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N123.9.314 $\mathrm{GM2}^+ \oplus \mathrm{A1}^- \oplus \mathrm{M2}^-$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N123.9.315 $\mathrm{GM2}^+ \oplus \mathrm{A1}^- \oplus \mathrm{M3}^-$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N123.9.316 $\mathrm{GM2}^+ \oplus \mathrm{A1}^- \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\times$	-	-
N123.9.317 $\mathrm{GM2}^+ \oplus \mathrm{A1}^- \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\times$	-	-
N123.9.318 $\mathrm{GM2}^+ \oplus \mathrm{A1}^- \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
N123.9.319 $\mathrm{GM2}^+ \oplus \mathrm{A1}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
N123.9.320 $\mathrm{GM2}^+ \oplus \mathrm{A1}^- \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\times$	-	-
N123.9.321 $\mathrm{GM2}^+ \oplus \mathrm{A1}^- \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\times$	-	-
N123.9.322 $\mathrm{GM2}^+ \oplus \mathrm{A1}^- \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\times$	-	-
N123.9.323 $\mathrm{GM2}^+ \oplus \mathrm{A1}^- \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\times$	-	-
N123.9.324 $\mathrm{GM2}^+ \oplus \mathrm{M1}^+ \oplus \mathrm{M1}^+$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N123.9.325 $\mathrm{GM2}^+ \oplus \mathrm{M1}^+ \oplus \mathrm{M4}^+$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N123.9.326 $\mathrm{GM2}^+ \oplus \mathrm{M1}^+ \oplus \mathrm{M1}^-$	$\surd$	1	1	$\surd$	$\bar{4}2m$	B1
N123.9.327 $\mathrm{GM2}^+ \oplus \mathrm{M1}^+ \oplus \mathrm{M4}^-$	$\surd$	1	1	$\surd$	$4mm$	B1
N123.9.328 $\mathrm{GM2}^+ \oplus \mathrm{M1}^+ \oplus \mathrm{M2}^+$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N123.9.329 $\mathrm{GM2}^+ \oplus \mathrm{M1}^+ \oplus \mathrm{M3}^+$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N123.9.330 $\mathrm{GM2}^+ \oplus \mathrm{M1}^+ \oplus \mathrm{M2}^-$	$\surd$	1	1	$\surd$	422	B1
N123.9.331 $\mathrm{GM2}^+ \oplus \mathrm{M1}^+ \oplus \mathrm{M3}^-$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N123.9.332 $\mathrm{GM2}^+ \oplus \mathrm{M1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N123.9.333 $\mathrm{GM2}^+ \oplus \mathrm{M1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N123.9.334 $\mathrm{GM2}^+ \oplus \mathrm{M1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N123.9.335 $\mathrm{GM2}^+ \oplus \mathrm{M1}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N123.9.336 $\mathrm{GM2}^+ \oplus \mathrm{M1}^- \oplus \mathrm{M1}^-$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N123.9.337 $\mathrm{GM2}^+ \oplus \mathrm{M1}^- \oplus \mathrm{M4}^-$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N123.9.338 $\mathrm{GM2}^+ \oplus \mathrm{M1}^- \oplus \mathrm{M2}^+$	$\surd$	1	1	$\surd$	422	B1
N123.9.339 $\mathrm{GM2}^+ \oplus \mathrm{M1}^- \oplus \mathrm{M3}^+$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N123.9.340 $\mathrm{GM2}^+ \oplus \mathrm{M1}^- \oplus \mathrm{M2}^-$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N123.9.341 $\mathrm{GM2}^+ \oplus \mathrm{M1}^- \oplus \mathrm{M3}^-$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N123.9.342 $\mathrm{GM2}^+ \oplus \mathrm{M1}^- \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N123.9.343 $\mathrm{GM2}^+ \oplus \mathrm{M1}^- \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N123.9.344 $\mathrm{GM2}^+ \oplus \mathrm{M1}^- \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N123.9.345 $\mathrm{GM2}^+ \oplus \mathrm{M1}^- \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N123.9.346 $\mathrm{GM2}^+ \oplus \mathrm{M2}^+ \oplus \mathrm{M2}^+$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N123.9.347 $\mathrm{GM2}^+ \oplus \mathrm{M2}^+ \oplus \mathrm{M3}^+$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N123.9.348 $\mathrm{GM2}^+ \oplus \mathrm{M2}^+ \oplus \mathrm{M2}^-$	$\surd$	1	1	$\surd$	$\bar{4}2m$	B1
N123.9.349 $\mathrm{GM2}^+ \oplus \mathrm{M2}^+ \oplus \mathrm{M3}^-$	$\surd$	1	1	$\surd$	$4mm$	B1
N123.9.350 $\mathrm{GM2}^+ \oplus \mathrm{M2}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N123.9.351 $\mathrm{GM2}^+ \oplus \mathrm{M2}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N123.9.352 $\mathrm{GM2}^+ \oplus \mathrm{M2}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N123.9.353 $\mathrm{GM2}^+ \oplus \mathrm{M2}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N123.9.354 $\mathrm{GM2}^+ \oplus \mathrm{M2}^- \oplus \mathrm{M2}^-$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N123.9.355 $\mathrm{GM2}^+ \oplus \mathrm{M2}^- \oplus \mathrm{M3}^-$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N123.9.356 $\mathrm{GM2}^+ \oplus \mathrm{M2}^- \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$

Non-coplanar SSGs with parent space group $P4/mmm$ (No. 123) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N123.9.357 $\mathrm{GM2}^+ \oplus \mathrm{M2}^- \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N123.9.358 $\mathrm{GM2}^+ \oplus \mathrm{M2}^- \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N123.9.359 $\mathrm{GM2}^+ \oplus \mathrm{M2}^- \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N123.9.360 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\times$	-	-
N123.9.361 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N123.9.362 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
N123.9.363 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
N123.9.364 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\times$	-	-
N123.9.365 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\times$	-	-
N123.9.366 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\times$	-	-
N123.9.367 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\times$	-	-
N123.9.368 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
N123.9.369 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N123.9.370 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\times$	-	-
N123.9.371 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\times$	-	-
N123.9.372 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\times$	-	-
N123.9.373 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\times$	-	-
N123.9.374 $\mathrm{GM2}^+ \oplus \mathrm{Z2}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\times$	-	-
N123.9.375 $\mathrm{GM2}^+ \oplus \mathrm{Z2}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N123.9.376 $\mathrm{GM2}^+ \oplus \mathrm{Z2}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\times$	-	-
N123.9.377 $\mathrm{GM2}^+ \oplus \mathrm{Z2}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\times$	-	-
N123.9.378 $\mathrm{GM2}^+ \oplus \mathrm{Z2}^- \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\times$	-	-
N123.9.379 $\mathrm{GM2}^+ \oplus \mathrm{Z2}^- \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N123.9.380 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
N123.9.381 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N123.9.382 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N123.9.383 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$
N123.9.384 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N123.9.385 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{A1}^+$	$\surd$	0	0	$\surd$	-	-
N123.9.386 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{A1}^-$	$\surd$	0	0	$\surd$	-	-
N123.9.387 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{M1}^+$	$\surd$	0	0	$\surd$	-	-
N123.9.388 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{M1}^-$	$\surd$	0	0	$\surd$	-	-
N123.9.389 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{M2}^+$	$\surd$	0	0	$\surd$	-	-
N123.9.390 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{M2}^-$	$\surd$	0	0	$\surd$	-	-
N123.9.391 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Z1}^+$	$\surd$	0	0	$\surd$	-	-
N123.9.392 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Z1}^-$	$\surd$	0	0	$\surd$	-	-
N123.9.393 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Z2}^+$	$\surd$	0	0	$\surd$	-	-
N123.9.394 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Z2}^-$	$\surd$	0	0	$\surd$	-	-
N123.9.395 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{A2} \oplus \mathrm{A2}$
N123.9.396 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{B2_u}$
N123.9.397 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	422	$\mathrm{A2} \oplus \mathrm{B2}$
N123.9.398 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g} \oplus \mathrm{B2_u}$
N123.9.399 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{A1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_u}$
N123.9.400 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{A1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_u}$
N123.9.401 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{M1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_u}$
N123.9.402 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{M1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_u}$

Non-coplanar SSGs with parent space group $P4/mmm$ (No. 123) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N123.9.403 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{M2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_u}$
N123.9.404 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{M2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_u}$
N123.9.405 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Z1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_u}$
N123.9.406 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Z1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_u}$
N123.9.407 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Z2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_u}$
N123.9.408 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Z2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_u}$
N123.9.409 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N123.9.410 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$
N123.9.411 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N123.9.412 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{A1}^+$	$\surd$	0	0	$\surd$	-	-
N123.9.413 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{A1}^-$	$\surd$	0	0	$\surd$	-	-
N123.9.414 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{M1}^+$	$\surd$	0	0	$\surd$	-	-
N123.9.415 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{M1}^-$	$\surd$	0	0	$\surd$	-	-
N123.9.416 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{M2}^+$	$\surd$	0	0	$\surd$	-	-
N123.9.417 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{M2}^-$	$\surd$	0	0	$\surd$	-	-
N123.9.418 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Z1}^+$	$\surd$	0	0	$\surd$	-	-
N123.9.419 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Z1}^-$	$\surd$	0	0	$\surd$	-	-
N123.9.420 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Z2}^+$	$\surd$	0	0	$\surd$	-	-
N123.9.421 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Z2}^-$	$\surd$	0	0	$\surd$	-	-
N123.9.422 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B2} \oplus \mathrm{B2}$
N123.9.423 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$
N123.9.424 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{A1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g}$
N123.9.425 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{A1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g}$
N123.9.426 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{M1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g}$
N123.9.427 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{M1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g}$
N123.9.428 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{M2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g}$
N123.9.429 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{M2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g}$
N123.9.430 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{Z1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g}$
N123.9.431 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{Z1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g}$
N123.9.432 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{Z2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g}$
N123.9.433 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{Z2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g}$
N123.9.434 $\mathrm{GM2}^- \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N123.9.435 $\mathrm{GM2}^- \oplus \mathrm{GM4}^- \oplus \mathrm{A1}^+$	$\surd$	0	0	$\surd$	-	-
N123.9.436 $\mathrm{GM2}^- \oplus \mathrm{GM4}^- \oplus \mathrm{A1}^-$	$\surd$	0	0	$\surd$	-	-
N123.9.437 $\mathrm{GM2}^- \oplus \mathrm{GM4}^- \oplus \mathrm{M1}^+$	$\surd$	0	0	$\surd$	-	-
N123.9.438 $\mathrm{GM2}^- \oplus \mathrm{GM4}^- \oplus \mathrm{M1}^-$	$\surd$	0	0	$\surd$	-	-
N123.9.439 $\mathrm{GM2}^- \oplus \mathrm{GM4}^- \oplus \mathrm{M2}^+$	$\surd$	0	0	$\surd$	-	-
N123.9.440 $\mathrm{GM2}^- \oplus \mathrm{GM4}^- \oplus \mathrm{M2}^-$	$\surd$	0	0	$\surd$	-	-
N123.9.441 $\mathrm{GM2}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Z1}^+$	$\surd$	0	0	$\surd$	-	-
N123.9.442 $\mathrm{GM2}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Z1}^-$	$\surd$	0	0	$\surd$	-	-
N123.9.443 $\mathrm{GM2}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Z2}^+$	$\surd$	0	0	$\surd$	-	-
N123.9.444 $\mathrm{GM2}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Z2}^-$	$\surd$	0	0	$\surd$	-	-
N123.9.445 $\mathrm{GM2}^- \oplus \mathrm{A1}^+ \oplus \mathrm{A1}^+$	$\surd$	1	0	$\times$	-	-
N123.9.446 $\mathrm{GM2}^- \oplus \mathrm{A1}^+ \oplus \mathrm{A2}^-$	$\surd$	1	1	$\times$	-	-
N123.9.447 $\mathrm{GM2}^- \oplus \mathrm{A1}^+ \oplus \mathrm{A3}^-$	$\surd$	1	1	$\times$	-	-
N123.9.448 $\mathrm{GM2}^- \oplus \mathrm{A1}^+ \oplus \mathrm{A4}^+$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $P4/mmm$ (No. 123) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N123.9.449 $\mathrm{GM2}^- \oplus \mathrm{A1}^+ \oplus \mathrm{A1}^-$	$\surd$	1	1	$\times$	-	-
N123.9.450 $\mathrm{GM2}^- \oplus \mathrm{A1}^+ \oplus \mathrm{A2}^+$	$\surd$	1	0	$\times$	-	-
N123.9.451 $\mathrm{GM2}^- \oplus \mathrm{A1}^+ \oplus \mathrm{A3}^+$	$\surd$	1	0	$\times$	-	-
N123.9.452 $\mathrm{GM2}^- \oplus \mathrm{A1}^+ \oplus \mathrm{A4}^-$	$\surd$	1	1	$\times$	-	-
N123.9.453 $\mathrm{GM2}^- \oplus \mathrm{A1}^+ \oplus \mathrm{M1}^+$	$\surd$	1	0	$\times$	-	-
N123.9.454 $\mathrm{GM2}^- \oplus \mathrm{A1}^+ \oplus \mathrm{M4}^+$	$\surd$	1	0	$\times$	-	-
N123.9.455 $\mathrm{GM2}^- \oplus \mathrm{A1}^+ \oplus \mathrm{M1}^-$	$\surd$	1	0	$\times$	-	-
N123.9.456 $\mathrm{GM2}^- \oplus \mathrm{A1}^+ \oplus \mathrm{M4}^-$	$\surd$	1	0	$\times$	-	-
N123.9.457 $\mathrm{GM2}^- \oplus \mathrm{A1}^+ \oplus \mathrm{M2}^+$	$\surd$	1	0	$\times$	-	-
N123.9.458 $\mathrm{GM2}^- \oplus \mathrm{A1}^+ \oplus \mathrm{M3}^+$	$\surd$	1	0	$\times$	-	-
N123.9.459 $\mathrm{GM2}^- \oplus \mathrm{A1}^+ \oplus \mathrm{M2}^-$	$\surd$	1	0	$\times$	-	-
N123.9.460 $\mathrm{GM2}^- \oplus \mathrm{A1}^+ \oplus \mathrm{M3}^-$	$\surd$	1	0	$\times$	-	-
N123.9.461 $\mathrm{GM2}^- \oplus \mathrm{A1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N123.9.462 $\mathrm{GM2}^- \oplus \mathrm{A1}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N123.9.463 $\mathrm{GM2}^- \oplus \mathrm{A1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N123.9.464 $\mathrm{GM2}^- \oplus \mathrm{A1}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N123.9.465 $\mathrm{GM2}^- \oplus \mathrm{A1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N123.9.466 $\mathrm{GM2}^- \oplus \mathrm{A1}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	0	$\times$	-	-
N123.9.467 $\mathrm{GM2}^- \oplus \mathrm{A1}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-
N123.9.468 $\mathrm{GM2}^- \oplus \mathrm{A1}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N123.9.469 $\mathrm{GM2}^- \oplus \mathrm{A1}^- \oplus \mathrm{A1}^-$	$\surd$	1	0	$\times$	-	-
N123.9.470 $\mathrm{GM2}^- \oplus \mathrm{A1}^- \oplus \mathrm{A2}^+$	$\surd$	1	1	$\times$	-	-
N123.9.471 $\mathrm{GM2}^- \oplus \mathrm{A1}^- \oplus \mathrm{A3}^+$	$\surd$	1	1	$\times$	-	-
N123.9.472 $\mathrm{GM2}^- \oplus \mathrm{A1}^- \oplus \mathrm{A4}^-$	$\surd$	1	0	$\times$	-	-
N123.9.473 $\mathrm{GM2}^- \oplus \mathrm{A1}^- \oplus \mathrm{M1}^+$	$\surd$	1	0	$\times$	-	-
N123.9.474 $\mathrm{GM2}^- \oplus \mathrm{A1}^- \oplus \mathrm{M4}^+$	$\surd$	1	0	$\times$	-	-
N123.9.475 $\mathrm{GM2}^- \oplus \mathrm{A1}^- \oplus \mathrm{M1}^-$	$\surd$	1	0	$\times$	-	-
N123.9.476 $\mathrm{GM2}^- \oplus \mathrm{A1}^- \oplus \mathrm{M4}^-$	$\surd$	1	0	$\times$	-	-
N123.9.477 $\mathrm{GM2}^- \oplus \mathrm{A1}^- \oplus \mathrm{M2}^+$	$\surd$	1	0	$\times$	-	-
N123.9.478 $\mathrm{GM2}^- \oplus \mathrm{A1}^- \oplus \mathrm{M3}^+$	$\surd$	1	0	$\times$	-	-
N123.9.479 $\mathrm{GM2}^- \oplus \mathrm{A1}^- \oplus \mathrm{M2}^-$	$\surd$	1	0	$\times$	-	-
N123.9.480 $\mathrm{GM2}^- \oplus \mathrm{A1}^- \oplus \mathrm{M3}^-$	$\surd$	1	0	$\times$	-	-
N123.9.481 $\mathrm{GM2}^- \oplus \mathrm{A1}^- \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N123.9.482 $\mathrm{GM2}^- \oplus \mathrm{A1}^- \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N123.9.483 $\mathrm{GM2}^- \oplus \mathrm{A1}^- \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N123.9.484 $\mathrm{GM2}^- \oplus \mathrm{A1}^- \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N123.9.485 $\mathrm{GM2}^- \oplus \mathrm{A1}^- \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N123.9.486 $\mathrm{GM2}^- \oplus \mathrm{A1}^- \oplus \mathrm{Z4}^-$	$\surd$	1	0	$\times$	-	-
N123.9.487 $\mathrm{GM2}^- \oplus \mathrm{A1}^- \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-
N123.9.488 $\mathrm{GM2}^- \oplus \mathrm{A1}^- \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N123.9.489 $\mathrm{GM2}^- \oplus \mathrm{M1}^+ \oplus \mathrm{M1}^+$	$\surd$	1	0	$\times$	-	-
N123.9.490 $\mathrm{GM2}^- \oplus \mathrm{M1}^+ \oplus \mathrm{M4}^+$	$\surd$	1	0	$\times$	-	-
N123.9.491 $\mathrm{GM2}^- \oplus \mathrm{M1}^+ \oplus \mathrm{M1}^-$	$\surd$	1	1	$\times$	-	-
N123.9.492 $\mathrm{GM2}^- \oplus \mathrm{M1}^+ \oplus \mathrm{M4}^-$	$\surd$	1	1	$\times$	-	-
N123.9.493 $\mathrm{GM2}^- \oplus \mathrm{M1}^+ \oplus \mathrm{M2}^+$	$\surd$	1	0	$\times$	-	-
N123.9.494 $\mathrm{GM2}^- \oplus \mathrm{M1}^+ \oplus \mathrm{M3}^+$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $P4/mmm$ (No. 123) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N123.9.495 $\mathrm{GM2^-} \oplus \mathrm{M1^+} \oplus \mathrm{M2^-}$	$\surd$	1	1	$\times$	-	-
N123.9.496 $\mathrm{GM2^-} \oplus \mathrm{M1^+} \oplus \mathrm{M3^-}$	$\surd$	1	1	$\times$	-	-
N123.9.497 $\mathrm{GM2^-} \oplus \mathrm{M1^+} \oplus \mathrm{Z1^+}$	$\surd$	1	0	$\times$	-	-
N123.9.498 $\mathrm{GM2^-} \oplus \mathrm{M1^+} \oplus \mathrm{Z1^-}$	$\surd$	1	0	$\times$	-	-
N123.9.499 $\mathrm{GM2^-} \oplus \mathrm{M1^+} \oplus \mathrm{Z2^+}$	$\surd$	1	0	$\times$	-	-
N123.9.500 $\mathrm{GM2^-} \oplus \mathrm{M1^+} \oplus \mathrm{Z2^-}$	$\surd$	1	0	$\times$	-	-
N123.9.501 $\mathrm{GM2^-} \oplus \mathrm{M1^-} \oplus \mathrm{M1^-}$	$\surd$	1	0	$\times$	-	-
N123.9.502 $\mathrm{GM2^-} \oplus \mathrm{M1^-} \oplus \mathrm{M4^-}$	$\surd$	1	0	$\times$	-	-
N123.9.503 $\mathrm{GM2^-} \oplus \mathrm{M1^-} \oplus \mathrm{M2^+}$	$\surd$	1	1	$\times$	-	-
N123.9.504 $\mathrm{GM2^-} \oplus \mathrm{M1^-} \oplus \mathrm{M3^+}$	$\surd$	1	1	$\times$	-	-
N123.9.505 $\mathrm{GM2^-} \oplus \mathrm{M1^-} \oplus \mathrm{M2^-}$	$\surd$	1	0	$\times$	-	-
N123.9.506 $\mathrm{GM2^-} \oplus \mathrm{M1^-} \oplus \mathrm{M3^-}$	$\surd$	1	0	$\times$	-	-
N123.9.507 $\mathrm{GM2^-} \oplus \mathrm{M1^-} \oplus \mathrm{Z1^+}$	$\surd$	1	0	$\times$	-	-
N123.9.508 $\mathrm{GM2^-} \oplus \mathrm{M1^-} \oplus \mathrm{Z1^-}$	$\surd$	1	0	$\times$	-	-
N123.9.509 $\mathrm{GM2^-} \oplus \mathrm{M1^-} \oplus \mathrm{Z2^+}$	$\surd$	1	0	$\times$	-	-
N123.9.510 $\mathrm{GM2^-} \oplus \mathrm{M1^-} \oplus \mathrm{Z2^-}$	$\surd$	1	0	$\times$	-	-
N123.9.511 $\mathrm{GM2^-} \oplus \mathrm{M2^+} \oplus \mathrm{M2^+}$	$\surd$	1	0	$\times$	-	-
N123.9.512 $\mathrm{GM2^-} \oplus \mathrm{M2^+} \oplus \mathrm{M3^+}$	$\surd$	1	0	$\times$	-	-
N123.9.513 $\mathrm{GM2^-} \oplus \mathrm{M2^+} \oplus \mathrm{M2^-}$	$\surd$	1	1	$\times$	-	-
N123.9.514 $\mathrm{GM2^-} \oplus \mathrm{M2^+} \oplus \mathrm{M3^-}$	$\surd$	1	1	$\times$	-	-
N123.9.515 $\mathrm{GM2^-} \oplus \mathrm{M2^+} \oplus \mathrm{Z1^+}$	$\surd$	1	0	$\times$	-	-
N123.9.516 $\mathrm{GM2^-} \oplus \mathrm{M2^+} \oplus \mathrm{Z1^-}$	$\surd$	1	0	$\times$	-	-
N123.9.517 $\mathrm{GM2^-} \oplus \mathrm{M2^+} \oplus \mathrm{Z2^+}$	$\surd$	1	0	$\times$	-	-
N123.9.518 $\mathrm{GM2^-} \oplus \mathrm{M2^+} \oplus \mathrm{Z2^-}$	$\surd$	1	0	$\times$	-	-
N123.9.519 $\mathrm{GM2^-} \oplus \mathrm{M2^-} \oplus \mathrm{M2^-}$	$\surd$	1	0	$\times$	-	-
N123.9.520 $\mathrm{GM2^-} \oplus \mathrm{M2^-} \oplus \mathrm{M3^-}$	$\surd$	1	0	$\times$	-	-
N123.9.521 $\mathrm{GM2^-} \oplus \mathrm{M2^-} \oplus \mathrm{Z1^+}$	$\surd$	1	0	$\times$	-	-
N123.9.522 $\mathrm{GM2^-} \oplus \mathrm{M2^-} \oplus \mathrm{Z1^-}$	$\surd$	1	0	$\times$	-	-
N123.9.523 $\mathrm{GM2^-} \oplus \mathrm{M2^-} \oplus \mathrm{Z2^+}$	$\surd$	1	0	$\times$	-	-
N123.9.524 $\mathrm{GM2^-} \oplus \mathrm{M2^-} \oplus \mathrm{Z2^-}$	$\surd$	1	0	$\times$	-	-
N123.9.525 $\mathrm{GM2^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z1^+}$	$\surd$	1	0	$\times$	-	-
N123.9.526 $\mathrm{GM2^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z3^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.9.527 $\mathrm{GM2^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z1^-}$	$\surd$	1	1	$\times$	-	-
N123.9.528 $\mathrm{GM2^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z3^+}$	$\surd$	1	0	$\times$	-	-
N123.9.529 $\mathrm{GM2^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z2^+}$	$\surd$	1	0	$\times$	-	-
N123.9.530 $\mathrm{GM2^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z4^-}$	$\surd$	1	1	$\times$	-	-
N123.9.531 $\mathrm{GM2^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
N123.9.532 $\mathrm{GM2^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z4^+}$	$\surd$	1	0	$\times$	-	-
N123.9.533 $\mathrm{GM2^-} \oplus \mathrm{Z1^-} \oplus \mathrm{Z1^-}$	$\surd$	1	0	$\times$	-	-
N123.9.534 $\mathrm{GM2^-} \oplus \mathrm{Z1^-} \oplus \mathrm{Z3^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.9.535 $\mathrm{GM2^-} \oplus \mathrm{Z1^-} \oplus \mathrm{Z2^+}$	$\surd$	1	1	$\times$	-	-
N123.9.536 $\mathrm{GM2^-} \oplus \mathrm{Z1^-} \oplus \mathrm{Z4^-}$	$\surd$	1	0	$\times$	-	-
N123.9.537 $\mathrm{GM2^-} \oplus \mathrm{Z1^-} \oplus \mathrm{Z2^-}$	$\surd$	1	0	$\times$	-	-
N123.9.538 $\mathrm{GM2^-} \oplus \mathrm{Z1^-} \oplus \mathrm{Z4^+}$	$\surd$	1	1	$\times$	-	-
N123.9.539 $\mathrm{GM2^-} \oplus \mathrm{Z2^+} \oplus \mathrm{Z2^+}$	$\surd$	1	0	$\times$	-	-
N123.9.540 $\mathrm{GM2^-} \oplus \mathrm{Z2^+} \oplus \mathrm{Z4^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$

Non-coplanar SSGs with parent space group $P4/mmm$ (No. 123) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N123.9.541 $\mathrm{GM2^-} \oplus \mathrm{Z2^+} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
N123.9.542 $\mathrm{GM2^-} \oplus \mathrm{Z2^+} \oplus \mathrm{Z4^+}$	$\surd$	1	0	$\times$	-	-
N123.9.543 $\mathrm{GM2^-} \oplus \mathrm{Z2^-} \oplus \mathrm{Z2^-}$	$\surd$	1	0	$\times$	-	-
N123.9.544 $\mathrm{GM2^-} \oplus \mathrm{Z2^-} \oplus \mathrm{Z4^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.9.545 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{GM3^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
N123.9.546 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{GM3^-}$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{A2} \oplus \mathrm{A2}$
N123.9.547 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{B2_g}$
N123.9.548 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{B2} \oplus \mathrm{B2}$
N123.9.549 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{A1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g}$
N123.9.550 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{A1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g}$
N123.9.551 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{M1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g}$
N123.9.552 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g}$
N123.9.553 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{M2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g}$
N123.9.554 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g}$
N123.9.555 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{Z1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g}$
N123.9.556 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{Z1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g}$
N123.9.557 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{Z2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g}$
N123.9.558 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{Z2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g}$
N123.9.559 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{GM3^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A2_g}$
N123.9.560 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{B2} \oplus \mathrm{A2}$
N123.9.561 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{A2_g}$
N123.9.562 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{A1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g}$
N123.9.563 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{A1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g}$
N123.9.564 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{M1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g}$
N123.9.565 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g}$
N123.9.566 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{M2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g}$
N123.9.567 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g}$
N123.9.568 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{Z1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g}$
N123.9.569 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{Z1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g}$
N123.9.570 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{Z2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g}$
N123.9.571 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{Z2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g}$
N123.9.572 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N123.9.573 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{B2} \oplus \mathrm{A2}$
N123.9.574 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{A1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g}$
N123.9.575 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{A1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g}$
N123.9.576 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{M1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g}$
N123.9.577 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g}$
N123.9.578 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{M2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g}$
N123.9.579 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g}$
N123.9.580 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{Z1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g}$
N123.9.581 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{Z1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g}$
N123.9.582 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{Z2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g}$
N123.9.583 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{Z2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g}$
N123.9.584 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{A2_g}$
N123.9.585 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{A1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g}$
N123.9.586 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{A1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g}$

Non-coplanar SSGs with parent space group $P4/mmm$ (No. 123) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N123.9.587 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{M1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g}$
N123.9.588 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g}$
N123.9.589 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{M2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g}$
N123.9.590 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g}$
N123.9.591 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Z1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g}$
N123.9.592 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Z1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g}$
N123.9.593 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Z2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g}$
N123.9.594 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Z2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g}$
N123.9.595 $\mathrm{GM3^+} \oplus \mathrm{A1^+} \oplus \mathrm{A1^+}$	$\surd$	1	1	$\times$	-	-
N123.9.596 $\mathrm{GM3^+} \oplus \mathrm{A1^+} \oplus \mathrm{A2^-}$	$\surd$	1	1	$\times$	-	-
N123.9.597 $\mathrm{GM3^+} \oplus \mathrm{A1^+} \oplus \mathrm{A3^-}$	$\surd$	1	1	$\times$	-	-
N123.9.598 $\mathrm{GM3^+} \oplus \mathrm{A1^+} \oplus \mathrm{A4^+}$	$\surd$	1	1	$\times$	-	-
N123.9.599 $\mathrm{GM3^+} \oplus \mathrm{A1^+} \oplus \mathrm{A1^-}$	$\surd$	1	1	$\times$	-	-
N123.9.600 $\mathrm{GM3^+} \oplus \mathrm{A1^+} \oplus \mathrm{A2^+}$	$\surd$	1	1	$\times$	-	-
N123.9.601 $\mathrm{GM3^+} \oplus \mathrm{A1^+} \oplus \mathrm{A3^+}$	$\surd$	1	1	$\times$	-	-
N123.9.602 $\mathrm{GM3^+} \oplus \mathrm{A1^+} \oplus \mathrm{A4^-}$	$\surd$	1	1	$\times$	-	-
N123.9.603 $\mathrm{GM3^+} \oplus \mathrm{A1^+} \oplus \mathrm{M1^+}$	$\surd$	1	1	$\times$	-	-
N123.9.604 $\mathrm{GM3^+} \oplus \mathrm{A1^+} \oplus \mathrm{M4^+}$	$\surd$	1	1	$\times$	-	-
N123.9.605 $\mathrm{GM3^+} \oplus \mathrm{A1^+} \oplus \mathrm{M1^-}$	$\surd$	1	1	$\times$	-	-
N123.9.606 $\mathrm{GM3^+} \oplus \mathrm{A1^+} \oplus \mathrm{M4^-}$	$\surd$	1	1	$\times$	-	-
N123.9.607 $\mathrm{GM3^+} \oplus \mathrm{A1^+} \oplus \mathrm{M2^+}$	$\surd$	1	1	$\times$	-	-
N123.9.608 $\mathrm{GM3^+} \oplus \mathrm{A1^+} \oplus \mathrm{M3^+}$	$\surd$	1	1	$\times$	-	-
N123.9.609 $\mathrm{GM3^+} \oplus \mathrm{A1^+} \oplus \mathrm{M2^-}$	$\surd$	1	1	$\times$	-	-
N123.9.610 $\mathrm{GM3^+} \oplus \mathrm{A1^+} \oplus \mathrm{M3^-}$	$\surd$	1	1	$\times$	-	-
N123.9.611 $\mathrm{GM3^+} \oplus \mathrm{A1^+} \oplus \mathrm{Z1^+}$	$\surd$	1	1	$\times$	-	-
N123.9.612 $\mathrm{GM3^+} \oplus \mathrm{A1^+} \oplus \mathrm{Z3^-}$	$\surd$	1	1	$\times$	-	-
N123.9.613 $\mathrm{GM3^+} \oplus \mathrm{A1^+} \oplus \mathrm{Z1^-}$	$\surd$	1	1	$\times$	-	-
N123.9.614 $\mathrm{GM3^+} \oplus \mathrm{A1^+} \oplus \mathrm{Z3^+}$	$\surd$	1	1	$\times$	-	-
N123.9.615 $\mathrm{GM3^+} \oplus \mathrm{A1^+} \oplus \mathrm{Z2^+}$	$\surd$	1	1	$\times$	-	-
N123.9.616 $\mathrm{GM3^+} \oplus \mathrm{A1^+} \oplus \mathrm{Z4^-}$	$\surd$	1	1	$\times$	-	-
N123.9.617 $\mathrm{GM3^+} \oplus \mathrm{A1^+} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
N123.9.618 $\mathrm{GM3^+} \oplus \mathrm{A1^+} \oplus \mathrm{Z4^+}$	$\surd$	1	1	$\times$	-	-
N123.9.619 $\mathrm{GM3^+} \oplus \mathrm{A1^-} \oplus \mathrm{A1^-}$	$\surd$	1	1	$\times$	-	-
N123.9.620 $\mathrm{GM3^+} \oplus \mathrm{A1^-} \oplus \mathrm{A2^+}$	$\surd$	1	1	$\times$	-	-
N123.9.621 $\mathrm{GM3^+} \oplus \mathrm{A1^-} \oplus \mathrm{A3^+}$	$\surd$	1	1	$\times$	-	-
N123.9.622 $\mathrm{GM3^+} \oplus \mathrm{A1^-} \oplus \mathrm{A4^-}$	$\surd$	1	1	$\times$	-	-
N123.9.623 $\mathrm{GM3^+} \oplus \mathrm{A1^-} \oplus \mathrm{M1^+}$	$\surd$	1	1	$\times$	-	-
N123.9.624 $\mathrm{GM3^+} \oplus \mathrm{A1^-} \oplus \mathrm{M4^+}$	$\surd$	1	1	$\times$	-	-
N123.9.625 $\mathrm{GM3^+} \oplus \mathrm{A1^-} \oplus \mathrm{M1^-}$	$\surd$	1	1	$\times$	-	-
N123.9.626 $\mathrm{GM3^+} \oplus \mathrm{A1^-} \oplus \mathrm{M4^-}$	$\surd$	1	1	$\times$	-	-
N123.9.627 $\mathrm{GM3^+} \oplus \mathrm{A1^-} \oplus \mathrm{M2^+}$	$\surd$	1	1	$\times$	-	-
N123.9.628 $\mathrm{GM3^+} \oplus \mathrm{A1^-} \oplus \mathrm{M3^+}$	$\surd$	1	1	$\times$	-	-
N123.9.629 $\mathrm{GM3^+} \oplus \mathrm{A1^-} \oplus \mathrm{M2^-}$	$\surd$	1	1	$\times$	-	-
N123.9.630 $\mathrm{GM3^+} \oplus \mathrm{A1^-} \oplus \mathrm{M3^-}$	$\surd$	1	1	$\times$	-	-
N123.9.631 $\mathrm{GM3^+} \oplus \mathrm{A1^-} \oplus \mathrm{Z1^+}$	$\surd$	1	1	$\times$	-	-
N123.9.632 $\mathrm{GM3^+} \oplus \mathrm{A1^-} \oplus \mathrm{Z3^-}$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $P4/mmm$ (No. 123) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N123.9.633 $\mathrm{GM3^+} \oplus \mathrm{A1^-} \oplus \mathrm{Z1^-}$	$\surd$	1	1	$\times$	-	-
N123.9.634 $\mathrm{GM3^+} \oplus \mathrm{A1^-} \oplus \mathrm{Z3^+}$	$\surd$	1	1	$\times$	-	-
N123.9.635 $\mathrm{GM3^+} \oplus \mathrm{A1^-} \oplus \mathrm{Z2^+}$	$\surd$	1	1	$\times$	-	-
N123.9.636 $\mathrm{GM3^+} \oplus \mathrm{A1^-} \oplus \mathrm{Z4^-}$	$\surd$	1	1	$\times$	-	-
N123.9.637 $\mathrm{GM3^+} \oplus \mathrm{A1^-} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
N123.9.638 $\mathrm{GM3^+} \oplus \mathrm{A1^-} \oplus \mathrm{Z4^+}$	$\surd$	1	1	$\times$	-	-
N123.9.639 $\mathrm{GM3^+} \oplus \mathrm{M1^+} \oplus \mathrm{M1^+}$	$\surd$	1	1	$\times$	-	-
N123.9.640 $\mathrm{GM3^+} \oplus \mathrm{M1^+} \oplus \mathrm{M4^+}$	$\surd$	1	1	$\times$	-	-
N123.9.641 $\mathrm{GM3^+} \oplus \mathrm{M1^+} \oplus \mathrm{M1^-}$	$\surd$	1	1	$\times$	-	-
N123.9.642 $\mathrm{GM3^+} \oplus \mathrm{M1^+} \oplus \mathrm{M4^-}$	$\surd$	1	1	$\times$	-	-
N123.9.643 $\mathrm{GM3^+} \oplus \mathrm{M1^+} \oplus \mathrm{M2^+}$	$\surd$	1	1	$\times$	-	-
N123.9.644 $\mathrm{GM3^+} \oplus \mathrm{M1^+} \oplus \mathrm{M3^+}$	$\surd$	1	1	$\times$	-	-
N123.9.645 $\mathrm{GM3^+} \oplus \mathrm{M1^+} \oplus \mathrm{M2^-}$	$\surd$	1	1	$\times$	-	-
N123.9.646 $\mathrm{GM3^+} \oplus \mathrm{M1^+} \oplus \mathrm{M3^-}$	$\surd$	1	1	$\times$	-	-
N123.9.647 $\mathrm{GM3^+} \oplus \mathrm{M1^+} \oplus \mathrm{Z1^+}$	$\surd$	1	1	$\times$	-	-
N123.9.648 $\mathrm{GM3^+} \oplus \mathrm{M1^+} \oplus \mathrm{Z1^-}$	$\surd$	1	1	$\times$	-	-
N123.9.649 $\mathrm{GM3^+} \oplus \mathrm{M1^+} \oplus \mathrm{Z2^+}$	$\surd$	1	1	$\times$	-	-
N123.9.650 $\mathrm{GM3^+} \oplus \mathrm{M1^+} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
N123.9.651 $\mathrm{GM3^+} \oplus \mathrm{M1^-} \oplus \mathrm{M1^-}$	$\surd$	1	1	$\times$	-	-
N123.9.652 $\mathrm{GM3^+} \oplus \mathrm{M1^-} \oplus \mathrm{M4^-}$	$\surd$	1	1	$\times$	-	-
N123.9.653 $\mathrm{GM3^+} \oplus \mathrm{M1^-} \oplus \mathrm{M2^+}$	$\surd$	1	1	$\times$	-	-
N123.9.654 $\mathrm{GM3^+} \oplus \mathrm{M1^-} \oplus \mathrm{M3^+}$	$\surd$	1	1	$\times$	-	-
N123.9.655 $\mathrm{GM3^+} \oplus \mathrm{M1^-} \oplus \mathrm{M2^-}$	$\surd$	1	1	$\times$	-	-
N123.9.656 $\mathrm{GM3^+} \oplus \mathrm{M1^-} \oplus \mathrm{M3^-}$	$\surd$	1	1	$\times$	-	-
N123.9.657 $\mathrm{GM3^+} \oplus \mathrm{M1^-} \oplus \mathrm{Z1^+}$	$\surd$	1	1	$\times$	-	-
N123.9.658 $\mathrm{GM3^+} \oplus \mathrm{M1^-} \oplus \mathrm{Z1^-}$	$\surd$	1	1	$\times$	-	-
N123.9.659 $\mathrm{GM3^+} \oplus \mathrm{M1^-} \oplus \mathrm{Z2^+}$	$\surd$	1	1	$\times$	-	-
N123.9.660 $\mathrm{GM3^+} \oplus \mathrm{M1^-} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
N123.9.661 $\mathrm{GM3^+} \oplus \mathrm{M2^+} \oplus \mathrm{M2^+}$	$\surd$	1	1	$\times$	-	-
N123.9.662 $\mathrm{GM3^+} \oplus \mathrm{M2^+} \oplus \mathrm{M3^+}$	$\surd$	1	1	$\times$	-	-
N123.9.663 $\mathrm{GM3^+} \oplus \mathrm{M2^+} \oplus \mathrm{M2^-}$	$\surd$	1	1	$\times$	-	-
N123.9.664 $\mathrm{GM3^+} \oplus \mathrm{M2^+} \oplus \mathrm{M3^-}$	$\surd$	1	1	$\times$	-	-
N123.9.665 $\mathrm{GM3^+} \oplus \mathrm{M2^+} \oplus \mathrm{Z1^+}$	$\surd$	1	1	$\times$	-	-
N123.9.666 $\mathrm{GM3^+} \oplus \mathrm{M2^+} \oplus \mathrm{Z1^-}$	$\surd$	1	1	$\times$	-	-
N123.9.667 $\mathrm{GM3^+} \oplus \mathrm{M2^+} \oplus \mathrm{Z2^+}$	$\surd$	1	1	$\times$	-	-
N123.9.668 $\mathrm{GM3^+} \oplus \mathrm{M2^+} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
N123.9.669 $\mathrm{GM3^+} \oplus \mathrm{M2^-} \oplus \mathrm{M2^-}$	$\surd$	1	1	$\times$	-	-
N123.9.670 $\mathrm{GM3^+} \oplus \mathrm{M2^-} \oplus \mathrm{M3^-}$	$\surd$	1	1	$\times$	-	-
N123.9.671 $\mathrm{GM3^+} \oplus \mathrm{M2^-} \oplus \mathrm{Z1^+}$	$\surd$	1	1	$\times$	-	-
N123.9.672 $\mathrm{GM3^+} \oplus \mathrm{M2^-} \oplus \mathrm{Z1^-}$	$\surd$	1	1	$\times$	-	-
N123.9.673 $\mathrm{GM3^+} \oplus \mathrm{M2^-} \oplus \mathrm{Z2^+}$	$\surd$	1	1	$\times$	-	-
N123.9.674 $\mathrm{GM3^+} \oplus \mathrm{M2^-} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
N123.9.675 $\mathrm{GM3^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z1^+}$	$\surd$	1	1	$\times$	-	-
N123.9.676 $\mathrm{GM3^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z3^-}$	$\surd$	1	1	$\surd$	422	A2
N123.9.677 $\mathrm{GM3^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z1^-}$	$\surd$	1	1	$\times$	-	-
N123.9.678 $\mathrm{GM3^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z3^+}$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $P4/mmm$ (No. 123) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N123.9.679 $\mathrm{GM3^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z2^+}$	$\surd$	1	1	$\times$	-	-
N123.9.680 $\mathrm{GM3^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z4^-}$	$\surd$	1	1	$\times$	-	-
N123.9.681 $\mathrm{GM3^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
N123.9.682 $\mathrm{GM3^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z4^+}$	$\surd$	1	1	$\times$	-	-
N123.9.683 $\mathrm{GM3^+} \oplus \mathrm{Z1^-} \oplus \mathrm{Z1^-}$	$\surd$	1	1	$\times$	-	-
N123.9.684 $\mathrm{GM3^+} \oplus \mathrm{Z1^-} \oplus \mathrm{Z3^+}$	$\surd$	1	1	$\surd$	422	A2
N123.9.685 $\mathrm{GM3^+} \oplus \mathrm{Z1^-} \oplus \mathrm{Z2^+}$	$\surd$	1	1	$\times$	-	-
N123.9.686 $\mathrm{GM3^+} \oplus \mathrm{Z1^-} \oplus \mathrm{Z4^-}$	$\surd$	1	1	$\times$	-	-
N123.9.687 $\mathrm{GM3^+} \oplus \mathrm{Z1^-} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
N123.9.688 $\mathrm{GM3^+} \oplus \mathrm{Z1^-} \oplus \mathrm{Z4^+}$	$\surd$	1	1	$\times$	-	-
N123.9.689 $\mathrm{GM3^+} \oplus \mathrm{Z2^+} \oplus \mathrm{Z2^+}$	$\surd$	1	1	$\times$	-	-
N123.9.690 $\mathrm{GM3^+} \oplus \mathrm{Z2^+} \oplus \mathrm{Z4^-}$	$\surd$	1	1	$\surd$	422	A2
N123.9.691 $\mathrm{GM3^+} \oplus \mathrm{Z2^+} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
N123.9.692 $\mathrm{GM3^+} \oplus \mathrm{Z2^+} \oplus \mathrm{Z4^+}$	$\surd$	1	1	$\times$	-	-
N123.9.693 $\mathrm{GM3^+} \oplus \mathrm{Z2^-} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
N123.9.694 $\mathrm{GM3^+} \oplus \mathrm{Z2^-} \oplus \mathrm{Z4^+}$	$\surd$	1	1	$\surd$	422	A2
N123.9.695 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
N123.9.696 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B2_g}$
N123.9.697 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N123.9.698 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{A1^+}$	$\surd$	0	0	$\surd$	-	-
N123.9.699 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{A1^-}$	$\surd$	0	0	$\surd$	-	-
N123.9.700 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{M1^+}$	$\surd$	0	0	$\surd$	-	-
N123.9.701 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{M1^-}$	$\surd$	0	0	$\surd$	-	-
N123.9.702 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{M2^+}$	$\surd$	0	0	$\surd$	-	-
N123.9.703 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{M2^-}$	$\surd$	0	0	$\surd$	-	-
N123.9.704 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{Z1^+}$	$\surd$	0	0	$\surd$	-	-
N123.9.705 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{Z1^-}$	$\surd$	0	0	$\surd$	-	-
N123.9.706 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{Z2^+}$	$\surd$	0	0	$\surd$	-	-
N123.9.707 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{Z2^-}$	$\surd$	0	0	$\surd$	-	-
N123.9.708 $\mathrm{GM3^-} \oplus \mathrm{GM4^+} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{B2} \oplus \mathrm{B2}$
N123.9.709 $\mathrm{GM3^-} \oplus \mathrm{GM4^+} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B2_g}$
N123.9.710 $\mathrm{GM3^-} \oplus \mathrm{GM4^+} \oplus \mathrm{A1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_g}$
N123.9.711 $\mathrm{GM3^-} \oplus \mathrm{GM4^+} \oplus \mathrm{A1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_g}$
N123.9.712 $\mathrm{GM3^-} \oplus \mathrm{GM4^+} \oplus \mathrm{M1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_g}$
N123.9.713 $\mathrm{GM3^-} \oplus \mathrm{GM4^+} \oplus \mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_g}$
N123.9.714 $\mathrm{GM3^-} \oplus \mathrm{GM4^+} \oplus \mathrm{M2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_g}$
N123.9.715 $\mathrm{GM3^-} \oplus \mathrm{GM4^+} \oplus \mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_g}$
N123.9.716 $\mathrm{GM3^-} \oplus \mathrm{GM4^+} \oplus \mathrm{Z1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_g}$
N123.9.717 $\mathrm{GM3^-} \oplus \mathrm{GM4^+} \oplus \mathrm{Z1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_g}$
N123.9.718 $\mathrm{GM3^-} \oplus \mathrm{GM4^+} \oplus \mathrm{Z2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_g}$
N123.9.719 $\mathrm{GM3^-} \oplus \mathrm{GM4^+} \oplus \mathrm{Z2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_g}$
N123.9.720 $\mathrm{GM3^-} \oplus \mathrm{GM4^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N123.9.721 $\mathrm{GM3^-} \oplus \mathrm{GM4^-} \oplus \mathrm{A1^+}$	$\surd$	0	0	$\surd$	-	-
N123.9.722 $\mathrm{GM3^-} \oplus \mathrm{GM4^-} \oplus \mathrm{A1^-}$	$\surd$	0	0	$\surd$	-	-
N123.9.723 $\mathrm{GM3^-} \oplus \mathrm{GM4^-} \oplus \mathrm{M1^+}$	$\surd$	0	0	$\surd$	-	-
N123.9.724 $\mathrm{GM3^-} \oplus \mathrm{GM4^-} \oplus \mathrm{M1^-}$	$\surd$	0	0	$\surd$	-	-

Non-coplanar SSGs with parent space group $P4/mmm$ (No. 123) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N123.9.725 $\mathrm{GM3^-} \oplus \mathrm{GM4^-} \oplus \mathrm{M2^+}$	$\surd$	0	0	$\surd$	-	-
N123.9.726 $\mathrm{GM3^-} \oplus \mathrm{GM4^-} \oplus \mathrm{M2^-}$	$\surd$	0	0	$\surd$	-	-
N123.9.727 $\mathrm{GM3^-} \oplus \mathrm{GM4^-} \oplus \mathrm{Z1^+}$	$\surd$	0	0	$\surd$	-	-
N123.9.728 $\mathrm{GM3^-} \oplus \mathrm{GM4^-} \oplus \mathrm{Z1^-}$	$\surd$	0	0	$\surd$	-	-
N123.9.729 $\mathrm{GM3^-} \oplus \mathrm{GM4^-} \oplus \mathrm{Z2^+}$	$\surd$	0	0	$\surd$	-	-
N123.9.730 $\mathrm{GM3^-} \oplus \mathrm{GM4^-} \oplus \mathrm{Z2^-}$	$\surd$	0	0	$\surd$	-	-
N123.9.731 $\mathrm{GM3^-} \oplus \mathrm{A1^+} \oplus \mathrm{A1^+}$	$\surd$	1	0	$\times$	-	-
N123.9.732 $\mathrm{GM3^-} \oplus \mathrm{A1^+} \oplus \mathrm{A2^-}$	$\surd$	1	1	$\times$	-	-
N123.9.733 $\mathrm{GM3^-} \oplus \mathrm{A1^+} \oplus \mathrm{A3^-}$	$\surd$	1	1	$\times$	-	-
N123.9.734 $\mathrm{GM3^-} \oplus \mathrm{A1^+} \oplus \mathrm{A4^+}$	$\surd$	1	0	$\times$	-	-
N123.9.735 $\mathrm{GM3^-} \oplus \mathrm{A1^+} \oplus \mathrm{A1^-}$	$\surd$	1	1	$\times$	-	-
N123.9.736 $\mathrm{GM3^-} \oplus \mathrm{A1^+} \oplus \mathrm{A2^+}$	$\surd$	1	0	$\times$	-	-
N123.9.737 $\mathrm{GM3^-} \oplus \mathrm{A1^+} \oplus \mathrm{A3^+}$	$\surd$	1	0	$\times$	-	-
N123.9.738 $\mathrm{GM3^-} \oplus \mathrm{A1^+} \oplus \mathrm{A4^-}$	$\surd$	1	1	$\times$	-	-
N123.9.739 $\mathrm{GM3^-} \oplus \mathrm{A1^+} \oplus \mathrm{M1^+}$	$\surd$	1	0	$\times$	-	-
N123.9.740 $\mathrm{GM3^-} \oplus \mathrm{A1^+} \oplus \mathrm{M4^+}$	$\surd$	1	0	$\times$	-	-
N123.9.741 $\mathrm{GM3^-} \oplus \mathrm{A1^+} \oplus \mathrm{M1^-}$	$\surd$	1	0	$\times$	-	-
N123.9.742 $\mathrm{GM3^-} \oplus \mathrm{A1^+} \oplus \mathrm{M4^-}$	$\surd$	1	0	$\times$	-	-
N123.9.743 $\mathrm{GM3^-} \oplus \mathrm{A1^+} \oplus \mathrm{M2^+}$	$\surd$	1	0	$\times$	-	-
N123.9.744 $\mathrm{GM3^-} \oplus \mathrm{A1^+} \oplus \mathrm{M3^+}$	$\surd$	1	0	$\times$	-	-
N123.9.745 $\mathrm{GM3^-} \oplus \mathrm{A1^+} \oplus \mathrm{M2^-}$	$\surd$	1	0	$\times$	-	-
N123.9.746 $\mathrm{GM3^-} \oplus \mathrm{A1^+} \oplus \mathrm{M3^-}$	$\surd$	1	0	$\times$	-	-
N123.9.747 $\mathrm{GM3^-} \oplus \mathrm{A1^+} \oplus \mathrm{Z1^+}$	$\surd$	1	0	$\times$	-	-
N123.9.748 $\mathrm{GM3^-} \oplus \mathrm{A1^+} \oplus \mathrm{Z3^-}$	$\surd$	1	0	$\times$	-	-
N123.9.749 $\mathrm{GM3^-} \oplus \mathrm{A1^+} \oplus \mathrm{Z1^-}$	$\surd$	1	0	$\times$	-	-
N123.9.750 $\mathrm{GM3^-} \oplus \mathrm{A1^+} \oplus \mathrm{Z3^+}$	$\surd$	1	0	$\times$	-	-
N123.9.751 $\mathrm{GM3^-} \oplus \mathrm{A1^+} \oplus \mathrm{Z2^+}$	$\surd$	1	0	$\times$	-	-
N123.9.752 $\mathrm{GM3^-} \oplus \mathrm{A1^+} \oplus \mathrm{Z4^-}$	$\surd$	1	0	$\times$	-	-
N123.9.753 $\mathrm{GM3^-} \oplus \mathrm{A1^+} \oplus \mathrm{Z2^-}$	$\surd$	1	0	$\times$	-	-
N123.9.754 $\mathrm{GM3^-} \oplus \mathrm{A1^+} \oplus \mathrm{Z4^+}$	$\surd$	1	0	$\times$	-	-
N123.9.755 $\mathrm{GM3^-} \oplus \mathrm{A1^-} \oplus \mathrm{A1^-}$	$\surd$	1	0	$\times$	-	-
N123.9.756 $\mathrm{GM3^-} \oplus \mathrm{A1^-} \oplus \mathrm{A2^+}$	$\surd$	1	1	$\times$	-	-
N123.9.757 $\mathrm{GM3^-} \oplus \mathrm{A1^-} \oplus \mathrm{A3^+}$	$\surd$	1	1	$\times$	-	-
N123.9.758 $\mathrm{GM3^-} \oplus \mathrm{A1^-} \oplus \mathrm{A4^-}$	$\surd$	1	0	$\times$	-	-
N123.9.759 $\mathrm{GM3^-} \oplus \mathrm{A1^-} \oplus \mathrm{M1^+}$	$\surd$	1	0	$\times$	-	-
N123.9.760 $\mathrm{GM3^-} \oplus \mathrm{A1^-} \oplus \mathrm{M4^+}$	$\surd$	1	0	$\times$	-	-
N123.9.761 $\mathrm{GM3^-} \oplus \mathrm{A1^-} \oplus \mathrm{M1^-}$	$\surd$	1	0	$\times$	-	-
N123.9.762 $\mathrm{GM3^-} \oplus \mathrm{A1^-} \oplus \mathrm{M4^-}$	$\surd$	1	0	$\times$	-	-
N123.9.763 $\mathrm{GM3^-} \oplus \mathrm{A1^-} \oplus \mathrm{M2^+}$	$\surd$	1	0	$\times$	-	-
N123.9.764 $\mathrm{GM3^-} \oplus \mathrm{A1^-} \oplus \mathrm{M3^+}$	$\surd$	1	0	$\times$	-	-
N123.9.765 $\mathrm{GM3^-} \oplus \mathrm{A1^-} \oplus \mathrm{M2^-}$	$\surd$	1	0	$\times$	-	-
N123.9.766 $\mathrm{GM3^-} \oplus \mathrm{A1^-} \oplus \mathrm{M3^-}$	$\surd$	1	0	$\times$	-	-
N123.9.767 $\mathrm{GM3^-} \oplus \mathrm{A1^-} \oplus \mathrm{Z1^+}$	$\surd$	1	0	$\times$	-	-
N123.9.768 $\mathrm{GM3^-} \oplus \mathrm{A1^-} \oplus \mathrm{Z3^-}$	$\surd$	1	0	$\times$	-	-
N123.9.769 $\mathrm{GM3^-} \oplus \mathrm{A1^-} \oplus \mathrm{Z1^-}$	$\surd$	1	0	$\times$	-	-
N123.9.770 $\mathrm{GM3^-} \oplus \mathrm{A1^-} \oplus \mathrm{Z3^+}$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $P4/mmm$ (No. 123) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N123.9.771 $\mathrm{GM3^-} \oplus \mathrm{A1^-} \oplus \mathrm{Z2^+}$	$\surd$	1	0	$\times$	-	-
N123.9.772 $\mathrm{GM3^-} \oplus \mathrm{A1^-} \oplus \mathrm{Z4^-}$	$\surd$	1	0	$\times$	-	-
N123.9.773 $\mathrm{GM3^-} \oplus \mathrm{A1^-} \oplus \mathrm{Z2^-}$	$\surd$	1	0	$\times$	-	-
N123.9.774 $\mathrm{GM3^-} \oplus \mathrm{A1^-} \oplus \mathrm{Z4^+}$	$\surd$	1	0	$\times$	-	-
N123.9.775 $\mathrm{GM3^-} \oplus \mathrm{M1^+} \oplus \mathrm{M1^+}$	$\surd$	1	0	$\times$	-	-
N123.9.776 $\mathrm{GM3^-} \oplus \mathrm{M1^+} \oplus \mathrm{M4^+}$	$\surd$	1	0	$\times$	-	-
N123.9.777 $\mathrm{GM3^-} \oplus \mathrm{M1^+} \oplus \mathrm{M1^-}$	$\surd$	1	1	$\times$	-	-
N123.9.778 $\mathrm{GM3^-} \oplus \mathrm{M1^+} \oplus \mathrm{M4^-}$	$\surd$	1	1	$\times$	-	-
N123.9.779 $\mathrm{GM3^-} \oplus \mathrm{M1^+} \oplus \mathrm{M2^+}$	$\surd$	1	0	$\times$	-	-
N123.9.780 $\mathrm{GM3^-} \oplus \mathrm{M1^+} \oplus \mathrm{M3^+}$	$\surd$	1	0	$\times$	-	-
N123.9.781 $\mathrm{GM3^-} \oplus \mathrm{M1^+} \oplus \mathrm{M2^-}$	$\surd$	1	1	$\times$	-	-
N123.9.782 $\mathrm{GM3^-} \oplus \mathrm{M1^+} \oplus \mathrm{M3^-}$	$\surd$	1	1	$\times$	-	-
N123.9.783 $\mathrm{GM3^-} \oplus \mathrm{M1^+} \oplus \mathrm{Z1^+}$	$\surd$	1	0	$\times$	-	-
N123.9.784 $\mathrm{GM3^-} \oplus \mathrm{M1^+} \oplus \mathrm{Z1^-}$	$\surd$	1	0	$\times$	-	-
N123.9.785 $\mathrm{GM3^-} \oplus \mathrm{M1^+} \oplus \mathrm{Z2^+}$	$\surd$	1	0	$\times$	-	-
N123.9.786 $\mathrm{GM3^-} \oplus \mathrm{M1^+} \oplus \mathrm{Z2^-}$	$\surd$	1	0	$\times$	-	-
N123.9.787 $\mathrm{GM3^-} \oplus \mathrm{M1^-} \oplus \mathrm{M1^-}$	$\surd$	1	0	$\times$	-	-
N123.9.788 $\mathrm{GM3^-} \oplus \mathrm{M1^-} \oplus \mathrm{M4^-}$	$\surd$	1	0	$\times$	-	-
N123.9.789 $\mathrm{GM3^-} \oplus \mathrm{M1^-} \oplus \mathrm{M2^+}$	$\surd$	1	1	$\times$	-	-
N123.9.790 $\mathrm{GM3^-} \oplus \mathrm{M1^-} \oplus \mathrm{M3^+}$	$\surd$	1	1	$\times$	-	-
N123.9.791 $\mathrm{GM3^-} \oplus \mathrm{M1^-} \oplus \mathrm{M2^-}$	$\surd$	1	0	$\times$	-	-
N123.9.792 $\mathrm{GM3^-} \oplus \mathrm{M1^-} \oplus \mathrm{M3^-}$	$\surd$	1	0	$\times$	-	-
N123.9.793 $\mathrm{GM3^-} \oplus \mathrm{M1^-} \oplus \mathrm{Z1^+}$	$\surd$	1	0	$\times$	-	-
N123.9.794 $\mathrm{GM3^-} \oplus \mathrm{M1^-} \oplus \mathrm{Z1^-}$	$\surd$	1	0	$\times$	-	-
N123.9.795 $\mathrm{GM3^-} \oplus \mathrm{M1^-} \oplus \mathrm{Z2^+}$	$\surd$	1	0	$\times$	-	-
N123.9.796 $\mathrm{GM3^-} \oplus \mathrm{M1^-} \oplus \mathrm{Z2^-}$	$\surd$	1	0	$\times$	-	-
N123.9.797 $\mathrm{GM3^-} \oplus \mathrm{M2^+} \oplus \mathrm{M2^+}$	$\surd$	1	0	$\times$	-	-
N123.9.798 $\mathrm{GM3^-} \oplus \mathrm{M2^+} \oplus \mathrm{M3^+}$	$\surd$	1	0	$\times$	-	-
N123.9.799 $\mathrm{GM3^-} \oplus \mathrm{M2^+} \oplus \mathrm{M2^-}$	$\surd$	1	1	$\times$	-	-
N123.9.800 $\mathrm{GM3^-} \oplus \mathrm{M2^+} \oplus \mathrm{M3^-}$	$\surd$	1	1	$\times$	-	-
N123.9.801 $\mathrm{GM3^-} \oplus \mathrm{M2^+} \oplus \mathrm{Z1^+}$	$\surd$	1	0	$\times$	-	-
N123.9.802 $\mathrm{GM3^-} \oplus \mathrm{M2^+} \oplus \mathrm{Z1^-}$	$\surd$	1	0	$\times$	-	-
N123.9.803 $\mathrm{GM3^-} \oplus \mathrm{M2^+} \oplus \mathrm{Z2^+}$	$\surd$	1	0	$\times$	-	-
N123.9.804 $\mathrm{GM3^-} \oplus \mathrm{M2^+} \oplus \mathrm{Z2^-}$	$\surd$	1	0	$\times$	-	-
N123.9.805 $\mathrm{GM3^-} \oplus \mathrm{M2^-} \oplus \mathrm{M2^-}$	$\surd$	1	0	$\times$	-	-
N123.9.806 $\mathrm{GM3^-} \oplus \mathrm{M2^-} \oplus \mathrm{M3^-}$	$\surd$	1	0	$\times$	-	-
N123.9.807 $\mathrm{GM3^-} \oplus \mathrm{M2^-} \oplus \mathrm{Z1^+}$	$\surd$	1	0	$\times$	-	-
N123.9.808 $\mathrm{GM3^-} \oplus \mathrm{M2^-} \oplus \mathrm{Z1^-}$	$\surd$	1	0	$\times$	-	-
N123.9.809 $\mathrm{GM3^-} \oplus \mathrm{M2^-} \oplus \mathrm{Z2^+}$	$\surd$	1	0	$\times$	-	-
N123.9.810 $\mathrm{GM3^-} \oplus \mathrm{M2^-} \oplus \mathrm{Z2^-}$	$\surd$	1	0	$\times$	-	-
N123.9.811 $\mathrm{GM3^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z1^+}$	$\surd$	1	0	$\times$	-	-
N123.9.812 $\mathrm{GM3^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z3^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.9.813 $\mathrm{GM3^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z1^-}$	$\surd$	1	1	$\times$	-	-
N123.9.814 $\mathrm{GM3^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z3^+}$	$\surd$	1	0	$\times$	-	-
N123.9.815 $\mathrm{GM3^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z2^+}$	$\surd$	1	0	$\times$	-	-
N123.9.816 $\mathrm{GM3^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z4^-}$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $P4/mmm$ (No. 123) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N123.9.817 $\mathrm{GM3^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
N123.9.818 $\mathrm{GM3^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z4^+}$	$\surd$	1	0	$\times$	-	-
N123.9.819 $\mathrm{GM3^-} \oplus \mathrm{Z1^-} \oplus \mathrm{Z1^-}$	$\surd$	1	0	$\times$	-	-
N123.9.820 $\mathrm{GM3^-} \oplus \mathrm{Z1^-} \oplus \mathrm{Z3^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.9.821 $\mathrm{GM3^-} \oplus \mathrm{Z1^-} \oplus \mathrm{Z2^+}$	$\surd$	1	1	$\times$	-	-
N123.9.822 $\mathrm{GM3^-} \oplus \mathrm{Z1^-} \oplus \mathrm{Z4^-}$	$\surd$	1	0	$\times$	-	-
N123.9.823 $\mathrm{GM3^-} \oplus \mathrm{Z1^-} \oplus \mathrm{Z2^-}$	$\surd$	1	0	$\times$	-	-
N123.9.824 $\mathrm{GM3^-} \oplus \mathrm{Z1^-} \oplus \mathrm{Z4^+}$	$\surd$	1	1	$\times$	-	-
N123.9.825 $\mathrm{GM3^-} \oplus \mathrm{Z2^+} \oplus \mathrm{Z2^+}$	$\surd$	1	0	$\times$	-	-
N123.9.826 $\mathrm{GM3^-} \oplus \mathrm{Z2^+} \oplus \mathrm{Z4^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.9.827 $\mathrm{GM3^-} \oplus \mathrm{Z2^+} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
N123.9.828 $\mathrm{GM3^-} \oplus \mathrm{Z2^+} \oplus \mathrm{Z4^+}$	$\surd$	1	0	$\times$	-	-
N123.9.829 $\mathrm{GM3^-} \oplus \mathrm{Z2^-} \oplus \mathrm{Z2^-}$	$\surd$	1	0	$\times$	-	-
N123.9.830 $\mathrm{GM3^-} \oplus \mathrm{Z2^-} \oplus \mathrm{Z4^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.9.831 $\mathrm{GM4^+} \oplus \mathrm{GM4^+} \oplus \mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N123.9.832 $\mathrm{GM4^+} \oplus \mathrm{GM4^+} \oplus \mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{A2} \oplus \mathrm{A2}$
N123.9.833 $\mathrm{GM4^+} \oplus \mathrm{GM4^+} \oplus \mathrm{A1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_g}$
N123.9.834 $\mathrm{GM4^+} \oplus \mathrm{GM4^+} \oplus \mathrm{A1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_g}$
N123.9.835 $\mathrm{GM4^+} \oplus \mathrm{GM4^+} \oplus \mathrm{M1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_g}$
N123.9.836 $\mathrm{GM4^+} \oplus \mathrm{GM4^+} \oplus \mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_g}$
N123.9.837 $\mathrm{GM4^+} \oplus \mathrm{GM4^+} \oplus \mathrm{M2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_g}$
N123.9.838 $\mathrm{GM4^+} \oplus \mathrm{GM4^+} \oplus \mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_g}$
N123.9.839 $\mathrm{GM4^+} \oplus \mathrm{GM4^+} \oplus \mathrm{Z1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_g}$
N123.9.840 $\mathrm{GM4^+} \oplus \mathrm{GM4^+} \oplus \mathrm{Z1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_g}$
N123.9.841 $\mathrm{GM4^+} \oplus \mathrm{GM4^+} \oplus \mathrm{Z2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_g}$
N123.9.842 $\mathrm{GM4^+} \oplus \mathrm{GM4^+} \oplus \mathrm{Z2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_g}$
N123.9.843 $\mathrm{GM4^+} \oplus \mathrm{GM4^-} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{B2_g}$
N123.9.844 $\mathrm{GM4^+} \oplus \mathrm{GM4^-} \oplus \mathrm{A1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g}$
N123.9.845 $\mathrm{GM4^+} \oplus \mathrm{GM4^-} \oplus \mathrm{A1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g}$
N123.9.846 $\mathrm{GM4^+} \oplus \mathrm{GM4^-} \oplus \mathrm{M1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g}$
N123.9.847 $\mathrm{GM4^+} \oplus \mathrm{GM4^-} \oplus \mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g}$
N123.9.848 $\mathrm{GM4^+} \oplus \mathrm{GM4^-} \oplus \mathrm{M2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g}$
N123.9.849 $\mathrm{GM4^+} \oplus \mathrm{GM4^-} \oplus \mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g}$
N123.9.850 $\mathrm{GM4^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Z1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g}$
N123.9.851 $\mathrm{GM4^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Z1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g}$
N123.9.852 $\mathrm{GM4^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Z2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g}$
N123.9.853 $\mathrm{GM4^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Z2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g}$
N123.9.854 $\mathrm{GM4^+} \oplus \mathrm{A1^+} \oplus \mathrm{A1^+}$	$\surd$	1	1	$\times$	-	-
N123.9.855 $\mathrm{GM4^+} \oplus \mathrm{A1^+} \oplus \mathrm{A2^-}$	$\surd$	1	1	$\times$	-	-
N123.9.856 $\mathrm{GM4^+} \oplus \mathrm{A1^+} \oplus \mathrm{A3^-}$	$\surd$	1	1	$\times$	-	-
N123.9.857 $\mathrm{GM4^+} \oplus \mathrm{A1^+} \oplus \mathrm{A4^+}$	$\surd$	1	1	$\times$	-	-
N123.9.858 $\mathrm{GM4^+} \oplus \mathrm{A1^+} \oplus \mathrm{A1^-}$	$\surd$	1	1	$\times$	-	-
N123.9.859 $\mathrm{GM4^+} \oplus \mathrm{A1^+} \oplus \mathrm{A2^+}$	$\surd$	1	1	$\times$	-	-
N123.9.860 $\mathrm{GM4^+} \oplus \mathrm{A1^+} \oplus \mathrm{A3^+}$	$\surd$	1	1	$\times$	-	-
N123.9.861 $\mathrm{GM4^+} \oplus \mathrm{A1^+} \oplus \mathrm{A4^-}$	$\surd$	1	1	$\times$	-	-
N123.9.862 $\mathrm{GM4^+} \oplus \mathrm{A1^+} \oplus \mathrm{M1^+}$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $P4/mmm$ (No. 123) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N123.9.863 $\mathrm{GM4^+} \oplus \mathrm{A1^+} \oplus \mathrm{M4^+}$	$\surd$	1	1	$\times$	-	-
N123.9.864 $\mathrm{GM4^+} \oplus \mathrm{A1^+} \oplus \mathrm{M1^-}$	$\surd$	1	1	$\times$	-	-
N123.9.865 $\mathrm{GM4^+} \oplus \mathrm{A1^+} \oplus \mathrm{M4^-}$	$\surd$	1	1	$\times$	-	-
N123.9.866 $\mathrm{GM4^+} \oplus \mathrm{A1^+} \oplus \mathrm{M2^+}$	$\surd$	1	1	$\times$	-	-
N123.9.867 $\mathrm{GM4^+} \oplus \mathrm{A1^+} \oplus \mathrm{M3^+}$	$\surd$	1	1	$\times$	-	-
N123.9.868 $\mathrm{GM4^+} \oplus \mathrm{A1^+} \oplus \mathrm{M2^-}$	$\surd$	1	1	$\times$	-	-
N123.9.869 $\mathrm{GM4^+} \oplus \mathrm{A1^+} \oplus \mathrm{M3^-}$	$\surd$	1	1	$\times$	-	-
N123.9.870 $\mathrm{GM4^+} \oplus \mathrm{A1^+} \oplus \mathrm{Z1^+}$	$\surd$	1	1	$\times$	-	-
N123.9.871 $\mathrm{GM4^+} \oplus \mathrm{A1^+} \oplus \mathrm{Z3^-}$	$\surd$	1	1	$\times$	-	-
N123.9.872 $\mathrm{GM4^+} \oplus \mathrm{A1^+} \oplus \mathrm{Z1^-}$	$\surd$	1	1	$\times$	-	-
N123.9.873 $\mathrm{GM4^+} \oplus \mathrm{A1^+} \oplus \mathrm{Z3^+}$	$\surd$	1	1	$\times$	-	-
N123.9.874 $\mathrm{GM4^+} \oplus \mathrm{A1^+} \oplus \mathrm{Z2^+}$	$\surd$	1	1	$\times$	-	-
N123.9.875 $\mathrm{GM4^+} \oplus \mathrm{A1^+} \oplus \mathrm{Z4^-}$	$\surd$	1	1	$\times$	-	-
N123.9.876 $\mathrm{GM4^+} \oplus \mathrm{A1^+} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
N123.9.877 $\mathrm{GM4^+} \oplus \mathrm{A1^+} \oplus \mathrm{Z4^+}$	$\surd$	1	1	$\times$	-	-
N123.9.878 $\mathrm{GM4^+} \oplus \mathrm{A1^-} \oplus \mathrm{A1^-}$	$\surd$	1	1	$\times$	-	-
N123.9.879 $\mathrm{GM4^+} \oplus \mathrm{A1^-} \oplus \mathrm{A2^+}$	$\surd$	1	1	$\times$	-	-
N123.9.880 $\mathrm{GM4^+} \oplus \mathrm{A1^-} \oplus \mathrm{A3^+}$	$\surd$	1	1	$\times$	-	-
N123.9.881 $\mathrm{GM4^+} \oplus \mathrm{A1^-} \oplus \mathrm{A4^-}$	$\surd$	1	1	$\times$	-	-
N123.9.882 $\mathrm{GM4^+} \oplus \mathrm{A1^-} \oplus \mathrm{M1^+}$	$\surd$	1	1	$\times$	-	-
N123.9.883 $\mathrm{GM4^+} \oplus \mathrm{A1^-} \oplus \mathrm{M4^+}$	$\surd$	1	1	$\times$	-	-
N123.9.884 $\mathrm{GM4^+} \oplus \mathrm{A1^-} \oplus \mathrm{M1^-}$	$\surd$	1	1	$\times$	-	-
N123.9.885 $\mathrm{GM4^+} \oplus \mathrm{A1^-} \oplus \mathrm{M4^-}$	$\surd$	1	1	$\times$	-	-
N123.9.886 $\mathrm{GM4^+} \oplus \mathrm{A1^-} \oplus \mathrm{M2^+}$	$\surd$	1	1	$\times$	-	-
N123.9.887 $\mathrm{GM4^+} \oplus \mathrm{A1^-} \oplus \mathrm{M3^+}$	$\surd$	1	1	$\times$	-	-
N123.9.888 $\mathrm{GM4^+} \oplus \mathrm{A1^-} \oplus \mathrm{M2^-}$	$\surd$	1	1	$\times$	-	-
N123.9.889 $\mathrm{GM4^+} \oplus \mathrm{A1^-} \oplus \mathrm{M3^-}$	$\surd$	1	1	$\times$	-	-
N123.9.890 $\mathrm{GM4^+} \oplus \mathrm{A1^-} \oplus \mathrm{Z1^+}$	$\surd$	1	1	$\times$	-	-
N123.9.891 $\mathrm{GM4^+} \oplus \mathrm{A1^-} \oplus \mathrm{Z3^-}$	$\surd$	1	1	$\times$	-	-
N123.9.892 $\mathrm{GM4^+} \oplus \mathrm{A1^-} \oplus \mathrm{Z1^-}$	$\surd$	1	1	$\times$	-	-
N123.9.893 $\mathrm{GM4^+} \oplus \mathrm{A1^-} \oplus \mathrm{Z3^+}$	$\surd$	1	1	$\times$	-	-
N123.9.894 $\mathrm{GM4^+} \oplus \mathrm{A1^-} \oplus \mathrm{Z2^+}$	$\surd$	1	1	$\times$	-	-
N123.9.895 $\mathrm{GM4^+} \oplus \mathrm{A1^-} \oplus \mathrm{Z4^-}$	$\surd$	1	1	$\times$	-	-
N123.9.896 $\mathrm{GM4^+} \oplus \mathrm{A1^-} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
N123.9.897 $\mathrm{GM4^+} \oplus \mathrm{A1^-} \oplus \mathrm{Z4^+}$	$\surd$	1	1	$\times$	-	-
N123.9.898 $\mathrm{GM4^+} \oplus \mathrm{M1^+} \oplus \mathrm{M1^+}$	$\surd$	1	1	$\times$	-	-
N123.9.899 $\mathrm{GM4^+} \oplus \mathrm{M1^+} \oplus \mathrm{M4^+}$	$\surd$	1	1	$\times$	-	-
N123.9.900 $\mathrm{GM4^+} \oplus \mathrm{M1^+} \oplus \mathrm{M1^-}$	$\surd$	1	1	$\times$	-	-
N123.9.901 $\mathrm{GM4^+} \oplus \mathrm{M1^+} \oplus \mathrm{M4^-}$	$\surd$	1	1	$\times$	-	-
N123.9.902 $\mathrm{GM4^+} \oplus \mathrm{M1^+} \oplus \mathrm{M2^+}$	$\surd$	1	1	$\times$	-	-
N123.9.903 $\mathrm{GM4^+} \oplus \mathrm{M1^+} \oplus \mathrm{M3^+}$	$\surd$	1	1	$\times$	-	-
N123.9.904 $\mathrm{GM4^+} \oplus \mathrm{M1^+} \oplus \mathrm{M2^-}$	$\surd$	1	1	$\times$	-	-
N123.9.905 $\mathrm{GM4^+} \oplus \mathrm{M1^+} \oplus \mathrm{M3^-}$	$\surd$	1	1	$\times$	-	-
N123.9.906 $\mathrm{GM4^+} \oplus \mathrm{M1^+} \oplus \mathrm{Z1^+}$	$\surd$	1	1	$\times$	-	-
N123.9.907 $\mathrm{GM4^+} \oplus \mathrm{M1^+} \oplus \mathrm{Z1^-}$	$\surd$	1	1	$\times$	-	-
N123.9.908 $\mathrm{GM4^+} \oplus \mathrm{M1^+} \oplus \mathrm{Z2^+}$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $P4/mmm$ (No. 123) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N123.9.909 $\mathrm{GM4^+} \oplus \mathrm{M1^+} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
N123.9.910 $\mathrm{GM4^+} \oplus \mathrm{M1^-} \oplus \mathrm{M1^-}$	$\surd$	1	1	$\times$	-	-
N123.9.911 $\mathrm{GM4^+} \oplus \mathrm{M1^-} \oplus \mathrm{M4^-}$	$\surd$	1	1	$\times$	-	-
N123.9.912 $\mathrm{GM4^+} \oplus \mathrm{M1^-} \oplus \mathrm{M2^+}$	$\surd$	1	1	$\times$	-	-
N123.9.913 $\mathrm{GM4^+} \oplus \mathrm{M1^-} \oplus \mathrm{M3^+}$	$\surd$	1	1	$\times$	-	-
N123.9.914 $\mathrm{GM4^+} \oplus \mathrm{M1^-} \oplus \mathrm{M2^-}$	$\surd$	1	1	$\times$	-	-
N123.9.915 $\mathrm{GM4^+} \oplus \mathrm{M1^-} \oplus \mathrm{M3^-}$	$\surd$	1	1	$\times$	-	-
N123.9.916 $\mathrm{GM4^+} \oplus \mathrm{M1^-} \oplus \mathrm{Z1^+}$	$\surd$	1	1	$\times$	-	-
N123.9.917 $\mathrm{GM4^+} \oplus \mathrm{M1^-} \oplus \mathrm{Z1^-}$	$\surd$	1	1	$\times$	-	-
N123.9.918 $\mathrm{GM4^+} \oplus \mathrm{M1^-} \oplus \mathrm{Z2^+}$	$\surd$	1	1	$\times$	-	-
N123.9.919 $\mathrm{GM4^+} \oplus \mathrm{M1^-} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
N123.9.920 $\mathrm{GM4^+} \oplus \mathrm{M2^+} \oplus \mathrm{M2^+}$	$\surd$	1	1	$\times$	-	-
N123.9.921 $\mathrm{GM4^+} \oplus \mathrm{M2^+} \oplus \mathrm{M3^+}$	$\surd$	1	1	$\times$	-	-
N123.9.922 $\mathrm{GM4^+} \oplus \mathrm{M2^+} \oplus \mathrm{M2^-}$	$\surd$	1	1	$\times$	-	-
N123.9.923 $\mathrm{GM4^+} \oplus \mathrm{M2^+} \oplus \mathrm{M3^-}$	$\surd$	1	1	$\times$	-	-
N123.9.924 $\mathrm{GM4^+} \oplus \mathrm{M2^+} \oplus \mathrm{Z1^+}$	$\surd$	1	1	$\times$	-	-
N123.9.925 $\mathrm{GM4^+} \oplus \mathrm{M2^+} \oplus \mathrm{Z1^-}$	$\surd$	1	1	$\times$	-	-
N123.9.926 $\mathrm{GM4^+} \oplus \mathrm{M2^+} \oplus \mathrm{Z2^+}$	$\surd$	1	1	$\times$	-	-
N123.9.927 $\mathrm{GM4^+} \oplus \mathrm{M2^+} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
N123.9.928 $\mathrm{GM4^+} \oplus \mathrm{M2^-} \oplus \mathrm{M2^-}$	$\surd$	1	1	$\times$	-	-
N123.9.929 $\mathrm{GM4^+} \oplus \mathrm{M2^-} \oplus \mathrm{M3^-}$	$\surd$	1	1	$\times$	-	-
N123.9.930 $\mathrm{GM4^+} \oplus \mathrm{M2^-} \oplus \mathrm{Z1^+}$	$\surd$	1	1	$\times$	-	-
N123.9.931 $\mathrm{GM4^+} \oplus \mathrm{M2^-} \oplus \mathrm{Z1^-}$	$\surd$	1	1	$\times$	-	-
N123.9.932 $\mathrm{GM4^+} \oplus \mathrm{M2^-} \oplus \mathrm{Z2^+}$	$\surd$	1	1	$\times$	-	-
N123.9.933 $\mathrm{GM4^+} \oplus \mathrm{M2^-} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
N123.9.934 $\mathrm{GM4^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z1^+}$	$\surd$	1	1	$\times$	-	-
N123.9.935 $\mathrm{GM4^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z3^-}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N123.9.936 $\mathrm{GM4^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z1^-}$	$\surd$	1	1	$\times$	-	-
N123.9.937 $\mathrm{GM4^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z3^+}$	$\surd$	1	1	$\times$	-	-
N123.9.938 $\mathrm{GM4^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z2^+}$	$\surd$	1	1	$\times$	-	-
N123.9.939 $\mathrm{GM4^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z4^-}$	$\surd$	1	1	$\times$	-	-
N123.9.940 $\mathrm{GM4^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
N123.9.941 $\mathrm{GM4^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z4^+}$	$\surd$	1	1	$\times$	-	-
N123.9.942 $\mathrm{GM4^+} \oplus \mathrm{Z1^-} \oplus \mathrm{Z1^-}$	$\surd$	1	1	$\times$	-	-
N123.9.943 $\mathrm{GM4^+} \oplus \mathrm{Z1^-} \oplus \mathrm{Z3^+}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N123.9.944 $\mathrm{GM4^+} \oplus \mathrm{Z1^-} \oplus \mathrm{Z2^+}$	$\surd$	1	1	$\times$	-	-
N123.9.945 $\mathrm{GM4^+} \oplus \mathrm{Z1^-} \oplus \mathrm{Z4^-}$	$\surd$	1	1	$\times$	-	-
N123.9.946 $\mathrm{GM4^+} \oplus \mathrm{Z1^-} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
N123.9.947 $\mathrm{GM4^+} \oplus \mathrm{Z1^-} \oplus \mathrm{Z4^+}$	$\surd$	1	1	$\times$	-	-
N123.9.948 $\mathrm{GM4^+} \oplus \mathrm{Z2^+} \oplus \mathrm{Z2^+}$	$\surd$	1	1	$\times$	-	-
N123.9.949 $\mathrm{GM4^+} \oplus \mathrm{Z2^+} \oplus \mathrm{Z4^-}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N123.9.950 $\mathrm{GM4^+} \oplus \mathrm{Z2^+} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
N123.9.951 $\mathrm{GM4^+} \oplus \mathrm{Z2^+} \oplus \mathrm{Z4^+}$	$\surd$	1	1	$\times$	-	-
N123.9.952 $\mathrm{GM4^+} \oplus \mathrm{Z2^-} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
N123.9.953 $\mathrm{GM4^+} \oplus \mathrm{Z2^-} \oplus \mathrm{Z4^+}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N123.9.954 $\mathrm{GM4^-} \oplus \mathrm{GM4^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-

Non-coplanar SSGs with parent space group $P4/mmm$ (No. 123) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N123.9.955 $\mathrm{GM4^-} \oplus \mathrm{GM4^-} \oplus \mathrm{A1^+}$	$\surd$	0	0	$\surd$	-	-
N123.9.956 $\mathrm{GM4^-} \oplus \mathrm{GM4^-} \oplus \mathrm{A1^-}$	$\surd$	0	0	$\surd$	-	-
N123.9.957 $\mathrm{GM4^-} \oplus \mathrm{GM4^-} \oplus \mathrm{M1^+}$	$\surd$	0	0	$\surd$	-	-
N123.9.958 $\mathrm{GM4^-} \oplus \mathrm{GM4^-} \oplus \mathrm{M1^-}$	$\surd$	0	0	$\surd$	-	-
N123.9.959 $\mathrm{GM4^-} \oplus \mathrm{GM4^-} \oplus \mathrm{M2^+}$	$\surd$	0	0	$\surd$	-	-
N123.9.960 $\mathrm{GM4^-} \oplus \mathrm{GM4^-} \oplus \mathrm{M2^-}$	$\surd$	0	0	$\surd$	-	-
N123.9.961 $\mathrm{GM4^-} \oplus \mathrm{GM4^-} \oplus \mathrm{Z1^+}$	$\surd$	0	0	$\surd$	-	-
N123.9.962 $\mathrm{GM4^-} \oplus \mathrm{GM4^-} \oplus \mathrm{Z1^-}$	$\surd$	0	0	$\surd$	-	-
N123.9.963 $\mathrm{GM4^-} \oplus \mathrm{GM4^-} \oplus \mathrm{Z2^+}$	$\surd$	0	0	$\surd$	-	-
N123.9.964 $\mathrm{GM4^-} \oplus \mathrm{GM4^-} \oplus \mathrm{Z2^-}$	$\surd$	0	0	$\surd$	-	-
N123.9.965 $\mathrm{GM4^-} \oplus \mathrm{A1^+} \oplus \mathrm{A1^+}$	$\surd$	1	0	$\times$	-	-
N123.9.966 $\mathrm{GM4^-} \oplus \mathrm{A1^+} \oplus \mathrm{A2^-}$	$\surd$	1	1	$\times$	-	-
N123.9.967 $\mathrm{GM4^-} \oplus \mathrm{A1^+} \oplus \mathrm{A3^-}$	$\surd$	1	1	$\times$	-	-
N123.9.968 $\mathrm{GM4^-} \oplus \mathrm{A1^+} \oplus \mathrm{A4^+}$	$\surd$	1	0	$\times$	-	-
N123.9.969 $\mathrm{GM4^-} \oplus \mathrm{A1^+} \oplus \mathrm{A1^-}$	$\surd$	1	1	$\times$	-	-
N123.9.970 $\mathrm{GM4^-} \oplus \mathrm{A1^+} \oplus \mathrm{A2^+}$	$\surd$	1	0	$\times$	-	-
N123.9.971 $\mathrm{GM4^-} \oplus \mathrm{A1^+} \oplus \mathrm{A3^+}$	$\surd$	1	0	$\times$	-	-
N123.9.972 $\mathrm{GM4^-} \oplus \mathrm{A1^+} \oplus \mathrm{A4^-}$	$\surd$	1	1	$\times$	-	-
N123.9.973 $\mathrm{GM4^-} \oplus \mathrm{A1^+} \oplus \mathrm{M1^+}$	$\surd$	1	0	$\times$	-	-
N123.9.974 $\mathrm{GM4^-} \oplus \mathrm{A1^+} \oplus \mathrm{M4^+}$	$\surd$	1	0	$\times$	-	-
N123.9.975 $\mathrm{GM4^-} \oplus \mathrm{A1^+} \oplus \mathrm{M1^-}$	$\surd$	1	0	$\times$	-	-
N123.9.976 $\mathrm{GM4^-} \oplus \mathrm{A1^+} \oplus \mathrm{M4^-}$	$\surd$	1	0	$\times$	-	-
N123.9.977 $\mathrm{GM4^-} \oplus \mathrm{A1^+} \oplus \mathrm{M2^+}$	$\surd$	1	0	$\times$	-	-
N123.9.978 $\mathrm{GM4^-} \oplus \mathrm{A1^+} \oplus \mathrm{M3^+}$	$\surd$	1	0	$\times$	-	-
N123.9.979 $\mathrm{GM4^-} \oplus \mathrm{A1^+} \oplus \mathrm{M2^-}$	$\surd$	1	0	$\times$	-	-
N123.9.980 $\mathrm{GM4^-} \oplus \mathrm{A1^+} \oplus \mathrm{M3^-}$	$\surd$	1	0	$\times$	-	-
N123.9.981 $\mathrm{GM4^-} \oplus \mathrm{A1^+} \oplus \mathrm{Z1^+}$	$\surd$	1	0	$\times$	-	-
N123.9.982 $\mathrm{GM4^-} \oplus \mathrm{A1^+} \oplus \mathrm{Z3^-}$	$\surd$	1	0	$\times$	-	-
N123.9.983 $\mathrm{GM4^-} \oplus \mathrm{A1^+} \oplus \mathrm{Z1^-}$	$\surd$	1	0	$\times$	-	-
N123.9.984 $\mathrm{GM4^-} \oplus \mathrm{A1^+} \oplus \mathrm{Z3^+}$	$\surd$	1	0	$\times$	-	-
N123.9.985 $\mathrm{GM4^-} \oplus \mathrm{A1^+} \oplus \mathrm{Z2^+}$	$\surd$	1	0	$\times$	-	-
N123.9.986 $\mathrm{GM4^-} \oplus \mathrm{A1^+} \oplus \mathrm{Z4^-}$	$\surd$	1	0	$\times$	-	-
N123.9.987 $\mathrm{GM4^-} \oplus \mathrm{A1^+} \oplus \mathrm{Z2^-}$	$\surd$	1	0	$\times$	-	-
N123.9.988 $\mathrm{GM4^-} \oplus \mathrm{A1^+} \oplus \mathrm{Z4^+}$	$\surd$	1	0	$\times$	-	-
N123.9.989 $\mathrm{GM4^-} \oplus \mathrm{A1^-} \oplus \mathrm{A1^-}$	$\surd$	1	0	$\times$	-	-
N123.9.990 $\mathrm{GM4^-} \oplus \mathrm{A1^-} \oplus \mathrm{A2^+}$	$\surd$	1	1	$\times$	-	-
N123.9.991 $\mathrm{GM4^-} \oplus \mathrm{A1^-} \oplus \mathrm{A3^+}$	$\surd$	1	1	$\times$	-	-
N123.9.992 $\mathrm{GM4^-} \oplus \mathrm{A1^-} \oplus \mathrm{A4^-}$	$\surd$	1	0	$\times$	-	-
N123.9.993 $\mathrm{GM4^-} \oplus \mathrm{A1^-} \oplus \mathrm{M1^+}$	$\surd$	1	0	$\times$	-	-
N123.9.994 $\mathrm{GM4^-} \oplus \mathrm{A1^-} \oplus \mathrm{M4^+}$	$\surd$	1	0	$\times$	-	-
N123.9.995 $\mathrm{GM4^-} \oplus \mathrm{A1^-} \oplus \mathrm{M1^-}$	$\surd$	1	0	$\times$	-	-
N123.9.996 $\mathrm{GM4^-} \oplus \mathrm{A1^-} \oplus \mathrm{M4^-}$	$\surd$	1	0	$\times$	-	-
N123.9.997 $\mathrm{GM4^-} \oplus \mathrm{A1^-} \oplus \mathrm{M2^+}$	$\surd$	1	0	$\times$	-	-
N123.9.998 $\mathrm{GM4^-} \oplus \mathrm{A1^-} \oplus \mathrm{M3^+}$	$\surd$	1	0	$\times$	-	-
N123.9.999 $\mathrm{GM4^-} \oplus \mathrm{A1^-} \oplus \mathrm{M2^-}$	$\surd$	1	0	$\times$	-	-
N123.9.1000 $\mathrm{GM4^-} \oplus \mathrm{A1^-} \oplus \mathrm{M3^-}$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $P4/mmm$ (No. 123) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N123.9.1001 $\mathrm{GM4^-} \oplus \mathrm{A1^-} \oplus \mathrm{Z1^+}$	$\surd$	1	0	$\times$	-	-
N123.9.1002 $\mathrm{GM4^-} \oplus \mathrm{A1^-} \oplus \mathrm{Z3^-}$	$\surd$	1	0	$\times$	-	-
N123.9.1003 $\mathrm{GM4^-} \oplus \mathrm{A1^-} \oplus \mathrm{Z1^-}$	$\surd$	1	0	$\times$	-	-
N123.9.1004 $\mathrm{GM4^-} \oplus \mathrm{A1^-} \oplus \mathrm{Z3^+}$	$\surd$	1	0	$\times$	-	-
N123.9.1005 $\mathrm{GM4^-} \oplus \mathrm{A1^-} \oplus \mathrm{Z2^+}$	$\surd$	1	0	$\times$	-	-
N123.9.1006 $\mathrm{GM4^-} \oplus \mathrm{A1^-} \oplus \mathrm{Z4^-}$	$\surd$	1	0	$\times$	-	-
N123.9.1007 $\mathrm{GM4^-} \oplus \mathrm{A1^-} \oplus \mathrm{Z2^-}$	$\surd$	1	0	$\times$	-	-
N123.9.1008 $\mathrm{GM4^-} \oplus \mathrm{A1^-} \oplus \mathrm{Z4^+}$	$\surd$	1	0	$\times$	-	-
N123.9.1009 $\mathrm{GM4^-} \oplus \mathrm{M1^+} \oplus \mathrm{M1^+}$	$\surd$	1	0	$\times$	-	-
N123.9.1010 $\mathrm{GM4^-} \oplus \mathrm{M1^+} \oplus \mathrm{M4^+}$	$\surd$	1	0	$\times$	-	-
N123.9.1011 $\mathrm{GM4^-} \oplus \mathrm{M1^+} \oplus \mathrm{M1^-}$	$\surd$	1	1	$\times$	-	-
N123.9.1012 $\mathrm{GM4^-} \oplus \mathrm{M1^+} \oplus \mathrm{M4^-}$	$\surd$	1	1	$\times$	-	-
N123.9.1013 $\mathrm{GM4^-} \oplus \mathrm{M1^+} \oplus \mathrm{M2^+}$	$\surd$	1	0	$\times$	-	-
N123.9.1014 $\mathrm{GM4^-} \oplus \mathrm{M1^+} \oplus \mathrm{M3^+}$	$\surd$	1	0	$\times$	-	-
N123.9.1015 $\mathrm{GM4^-} \oplus \mathrm{M1^+} \oplus \mathrm{M2^-}$	$\surd$	1	1	$\times$	-	-
N123.9.1016 $\mathrm{GM4^-} \oplus \mathrm{M1^+} \oplus \mathrm{M3^-}$	$\surd$	1	1	$\times$	-	-
N123.9.1017 $\mathrm{GM4^-} \oplus \mathrm{M1^+} \oplus \mathrm{Z1^+}$	$\surd$	1	0	$\times$	-	-
N123.9.1018 $\mathrm{GM4^-} \oplus \mathrm{M1^+} \oplus \mathrm{Z1^-}$	$\surd$	1	0	$\times$	-	-
N123.9.1019 $\mathrm{GM4^-} \oplus \mathrm{M1^+} \oplus \mathrm{Z2^+}$	$\surd$	1	0	$\times$	-	-
N123.9.1020 $\mathrm{GM4^-} \oplus \mathrm{M1^+} \oplus \mathrm{Z2^-}$	$\surd$	1	0	$\times$	-	-
N123.9.1021 $\mathrm{GM4^-} \oplus \mathrm{M1^-} \oplus \mathrm{M1^-}$	$\surd$	1	0	$\times$	-	-
N123.9.1022 $\mathrm{GM4^-} \oplus \mathrm{M1^-} \oplus \mathrm{M4^-}$	$\surd$	1	0	$\times$	-	-
N123.9.1023 $\mathrm{GM4^-} \oplus \mathrm{M1^-} \oplus \mathrm{M2^+}$	$\surd$	1	1	$\times$	-	-
N123.9.1024 $\mathrm{GM4^-} \oplus \mathrm{M1^-} \oplus \mathrm{M3^+}$	$\surd$	1	1	$\times$	-	-
N123.9.1025 $\mathrm{GM4^-} \oplus \mathrm{M1^-} \oplus \mathrm{M2^-}$	$\surd$	1	0	$\times$	-	-
N123.9.1026 $\mathrm{GM4^-} \oplus \mathrm{M1^-} \oplus \mathrm{M3^-}$	$\surd$	1	0	$\times$	-	-
N123.9.1027 $\mathrm{GM4^-} \oplus \mathrm{M1^-} \oplus \mathrm{Z1^+}$	$\surd$	1	0	$\times$	-	-
N123.9.1028 $\mathrm{GM4^-} \oplus \mathrm{M1^-} \oplus \mathrm{Z1^-}$	$\surd$	1	0	$\times$	-	-
N123.9.1029 $\mathrm{GM4^-} \oplus \mathrm{M1^-} \oplus \mathrm{Z2^+}$	$\surd$	1	0	$\times$	-	-
N123.9.1030 $\mathrm{GM4^-} \oplus \mathrm{M1^-} \oplus \mathrm{Z2^-}$	$\surd$	1	0	$\times$	-	-
N123.9.1031 $\mathrm{GM4^-} \oplus \mathrm{M2^+} \oplus \mathrm{M2^+}$	$\surd$	1	0	$\times$	-	-
N123.9.1032 $\mathrm{GM4^-} \oplus \mathrm{M2^+} \oplus \mathrm{M3^+}$	$\surd$	1	0	$\times$	-	-
N123.9.1033 $\mathrm{GM4^-} \oplus \mathrm{M2^+} \oplus \mathrm{M2^-}$	$\surd$	1	1	$\times$	-	-
N123.9.1034 $\mathrm{GM4^-} \oplus \mathrm{M2^+} \oplus \mathrm{M3^-}$	$\surd$	1	1	$\times$	-	-
N123.9.1035 $\mathrm{GM4^-} \oplus \mathrm{M2^+} \oplus \mathrm{Z1^+}$	$\surd$	1	0	$\times$	-	-
N123.9.1036 $\mathrm{GM4^-} \oplus \mathrm{M2^+} \oplus \mathrm{Z1^-}$	$\surd$	1	0	$\times$	-	-
N123.9.1037 $\mathrm{GM4^-} \oplus \mathrm{M2^+} \oplus \mathrm{Z2^+}$	$\surd$	1	0	$\times$	-	-
N123.9.1038 $\mathrm{GM4^-} \oplus \mathrm{M2^+} \oplus \mathrm{Z2^-}$	$\surd$	1	0	$\times$	-	-
N123.9.1039 $\mathrm{GM4^-} \oplus \mathrm{M2^-} \oplus \mathrm{M2^-}$	$\surd$	1	0	$\times$	-	-
N123.9.1040 $\mathrm{GM4^-} \oplus \mathrm{M2^-} \oplus \mathrm{M3^-}$	$\surd$	1	0	$\times$	-	-
N123.9.1041 $\mathrm{GM4^-} \oplus \mathrm{M2^-} \oplus \mathrm{Z1^+}$	$\surd$	1	0	$\times$	-	-
N123.9.1042 $\mathrm{GM4^-} \oplus \mathrm{M2^-} \oplus \mathrm{Z1^-}$	$\surd$	1	0	$\times$	-	-
N123.9.1043 $\mathrm{GM4^-} \oplus \mathrm{M2^-} \oplus \mathrm{Z2^+}$	$\surd$	1	0	$\times$	-	-
N123.9.1044 $\mathrm{GM4^-} \oplus \mathrm{M2^-} \oplus \mathrm{Z2^-}$	$\surd$	1	0	$\times$	-	-
N123.9.1045 $\mathrm{GM4^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z1^+}$	$\surd$	1	0	$\times$	-	-
N123.9.1046 $\mathrm{GM4^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z3^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$

Non-coplanar SSGs with parent space group $P4/mmm$ (No. 123) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N123.9.1047 $\mathrm{GM4^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z1^-}$	$\surd$	1	1	$\times$	-	-
N123.9.1048 $\mathrm{GM4^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z3^+}$	$\surd$	1	0	$\times$	-	-
N123.9.1049 $\mathrm{GM4^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z2^+}$	$\surd$	1	0	$\times$	-	-
N123.9.1050 $\mathrm{GM4^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z4^-}$	$\surd$	1	1	$\times$	-	-
N123.9.1051 $\mathrm{GM4^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
N123.9.1052 $\mathrm{GM4^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z4^+}$	$\surd$	1	0	$\times$	-	-
N123.9.1053 $\mathrm{GM4^-} \oplus \mathrm{Z1^-} \oplus \mathrm{Z1^-}$	$\surd$	1	0	$\times$	-	-
N123.9.1054 $\mathrm{GM4^-} \oplus \mathrm{Z1^-} \oplus \mathrm{Z3^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.9.1055 $\mathrm{GM4^-} \oplus \mathrm{Z1^-} \oplus \mathrm{Z2^+}$	$\surd$	1	1	$\times$	-	-
N123.9.1056 $\mathrm{GM4^-} \oplus \mathrm{Z1^-} \oplus \mathrm{Z4^-}$	$\surd$	1	0	$\times$	-	-
N123.9.1057 $\mathrm{GM4^-} \oplus \mathrm{Z1^-} \oplus \mathrm{Z2^-}$	$\surd$	1	0	$\times$	-	-
N123.9.1058 $\mathrm{GM4^-} \oplus \mathrm{Z1^-} \oplus \mathrm{Z4^+}$	$\surd$	1	1	$\times$	-	-
N123.9.1059 $\mathrm{GM4^-} \oplus \mathrm{Z2^+} \oplus \mathrm{Z2^+}$	$\surd$	1	0	$\times$	-	-
N123.9.1060 $\mathrm{GM4^-} \oplus \mathrm{Z2^+} \oplus \mathrm{Z4^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.9.1061 $\mathrm{GM4^-} \oplus \mathrm{Z2^+} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
N123.9.1062 $\mathrm{GM4^-} \oplus \mathrm{Z2^+} \oplus \mathrm{Z4^+}$	$\surd$	1	0	$\times$	-	-
N123.9.1063 $\mathrm{GM4^-} \oplus \mathrm{Z2^-} \oplus \mathrm{Z2^-}$	$\surd$	1	0	$\times$	-	-
N123.9.1064 $\mathrm{GM4^-} \oplus \mathrm{Z2^-} \oplus \mathrm{Z4^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.9.1065 $\mathrm{A1^+} \oplus \mathrm{A1^+} \oplus \mathrm{A1^+}$	$\surd$	0	0	$\surd$	-	-
N123.9.1066 $\mathrm{A1^+} \oplus \mathrm{A1^+} \oplus \mathrm{A2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N123.9.1067 $\mathrm{A1^+} \oplus \mathrm{A1^+} \oplus \mathrm{A3^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u}$
N123.9.1068 $\mathrm{A1^+} \oplus \mathrm{A1^+} \oplus \mathrm{A4^+}$	$\surd$	0	0	$\surd$	-	-
N123.9.1069 $\mathrm{A1^+} \oplus \mathrm{A2^-} \oplus \mathrm{A3^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_u}$
N123.9.1070 $\mathrm{A1^+} \oplus \mathrm{A1^+} \oplus \mathrm{A1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u}$
N123.9.1071 $\mathrm{A1^+} \oplus \mathrm{A1^+} \oplus \mathrm{A2^+}$	$\surd$	0	0	$\surd$	-	-
N123.9.1072 $\mathrm{A1^+} \oplus \mathrm{A1^+} \oplus \mathrm{A3^+}$	$\surd$	0	0	$\surd$	-	-
N123.9.1073 $\mathrm{A1^+} \oplus \mathrm{A1^+} \oplus \mathrm{A4^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_u} \oplus \mathrm{B2_u}$
N123.9.1074 $\mathrm{A1^+} \oplus \mathrm{A2^-} \oplus \mathrm{A1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u}$
N123.9.1075 $\mathrm{A1^+} \oplus \mathrm{A2^-} \oplus \mathrm{A3^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N123.9.1076 $\mathrm{A1^+} \oplus \mathrm{A3^-} \oplus \mathrm{A1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u}$
N123.9.1077 $\mathrm{A1^+} \oplus \mathrm{A3^-} \oplus \mathrm{A2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_u}$
N123.9.1078 $\mathrm{A1^+} \oplus \mathrm{A4^+} \oplus \mathrm{A1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_u}$
N123.9.1079 $\mathrm{A1^+} \oplus \mathrm{A4^+} \oplus \mathrm{A2^+}$	$\surd$	0	0	$\surd$	-	-
N123.9.1080 $\mathrm{A1^+} \oplus \mathrm{A1^+} \oplus \mathrm{M1^+}$	$\surd$	1	0	$\times$	-	-
N123.9.1081 $\mathrm{A1^+} \oplus \mathrm{A1^+} \oplus \mathrm{M4^+}$	$\surd$	1	0	$\times$	-	-
N123.9.1082 $\mathrm{A1^+} \oplus \mathrm{A2^-} \oplus \mathrm{M1^+}$	$\surd$	1	1	$\times$	-	-
N123.9.1083 $\mathrm{A1^+} \oplus \mathrm{A3^-} \oplus \mathrm{M1^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.9.1084 $\mathrm{A1^+} \oplus \mathrm{A3^-} \oplus \mathrm{M4^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.9.1085 $\mathrm{A1^+} \oplus \mathrm{A4^+} \oplus \mathrm{M1^+}$	$\surd$	1	0	$\times$	-	-
N123.9.1086 $\mathrm{A1^+} \oplus \mathrm{A1^+} \oplus \mathrm{M1^-}$	$\surd$	1	0	$\times$	-	-
N123.9.1087 $\mathrm{A1^+} \oplus \mathrm{A1^+} \oplus \mathrm{M4^-}$	$\surd$	1	0	$\times$	-	-
N123.9.1088 $\mathrm{A1^+} \oplus \mathrm{A2^-} \oplus \mathrm{M1^-}$	$\surd$	1	1	$\times$	-	-
N123.9.1089 $\mathrm{A1^+} \oplus \mathrm{A3^-} \oplus \mathrm{M1^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.9.1090 $\mathrm{A1^+} \oplus \mathrm{A3^-} \oplus \mathrm{M4^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.9.1091 $\mathrm{A1^+} \oplus \mathrm{A4^+} \oplus \mathrm{M1^-}$	$\surd$	1	0	$\times$	-	-
N123.9.1092 $\mathrm{A1^+} \oplus \mathrm{A1^+} \oplus \mathrm{M2^+}$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $P4/mmm$ (No. 123) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N123.9.1093 $\mathrm{A1}^{+}\oplus\mathrm{A1}^{+}\oplus\mathrm{M3}^{+}$	$\surd$	1	0	$\times$	-	-
N123.9.1094 $\mathrm{A1}^{+}\oplus\mathrm{A2}^{-}\oplus\mathrm{M2}^{+}$	$\surd$	1	1	$\times$	-	-
N123.9.1095 $\mathrm{A1}^{+}\oplus\mathrm{A3}^{-}\oplus\mathrm{M2}^{+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.9.1096 $\mathrm{A1}^{+}\oplus\mathrm{A3}^{-}\oplus\mathrm{M3}^{+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.9.1097 $\mathrm{A1}^{+}\oplus\mathrm{A4}^{+}\oplus\mathrm{M2}^{+}$	$\surd$	1	0	$\times$	-	-
N123.9.1098 $\mathrm{A1}^{+}\oplus\mathrm{A1}^{+}\oplus\mathrm{M2}^{-}$	$\surd$	1	0	$\times$	-	-
N123.9.1099 $\mathrm{A1}^{+}\oplus\mathrm{A1}^{+}\oplus\mathrm{M3}^{-}$	$\surd$	1	0	$\times$	-	-
N123.9.1100 $\mathrm{A1}^{+}\oplus\mathrm{A2}^{-}\oplus\mathrm{M2}^{-}$	$\surd$	1	1	$\times$	-	-
N123.9.1101 $\mathrm{A1}^{+}\oplus\mathrm{A3}^{-}\oplus\mathrm{M2}^{-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.9.1102 $\mathrm{A1}^{+}\oplus\mathrm{A3}^{-}\oplus\mathrm{M3}^{-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.9.1103 $\mathrm{A1}^{+}\oplus\mathrm{A4}^{+}\oplus\mathrm{M2}^{-}$	$\surd$	1	0	$\times$	-	-
N123.9.1104 $\mathrm{A1}^{+}\oplus\mathrm{A1}^{+}\oplus\mathrm{Z1}^{+}$	$\surd$	1	0	$\times$	-	-
N123.9.1105 $\mathrm{A1}^{+}\oplus\mathrm{A1}^{+}\oplus\mathrm{Z3}^{-}$	$\surd$	1	0	$\times$	-	-
N123.9.1106 $\mathrm{A1}^{+}\oplus\mathrm{A2}^{-}\oplus\mathrm{Z1}^{+}$	$\surd$	1	1	$\times$	-	-
N123.9.1107 $\mathrm{A1}^{+}\oplus\mathrm{A3}^{-}\oplus\mathrm{Z1}^{+}$	$\surd$	1	1	$\times$	-	-
N123.9.1108 $\mathrm{A1}^{+}\oplus\mathrm{A4}^{+}\oplus\mathrm{Z1}^{+}$	$\surd$	1	0	$\times$	-	-
N123.9.1109 $\mathrm{A1}^{+}\oplus\mathrm{A4}^{+}\oplus\mathrm{Z3}^{-}$	$\surd$	1	0	$\times$	-	-
N123.9.1110 $\mathrm{A1}^{+}\oplus\mathrm{A1}^{+}\oplus\mathrm{Z1}^{-}$	$\surd$	1	0	$\times$	-	-
N123.9.1111 $\mathrm{A1}^{+}\oplus\mathrm{A1}^{+}\oplus\mathrm{Z3}^{+}$	$\surd$	1	0	$\times$	-	-
N123.9.1112 $\mathrm{A1}^{+}\oplus\mathrm{A2}^{-}\oplus\mathrm{Z1}^{-}$	$\surd$	1	1	$\times$	-	-
N123.9.1113 $\mathrm{A1}^{+}\oplus\mathrm{A3}^{-}\oplus\mathrm{Z1}^{-}$	$\surd$	1	1	$\times$	-	-
N123.9.1114 $\mathrm{A1}^{+}\oplus\mathrm{A4}^{+}\oplus\mathrm{Z1}^{-}$	$\surd$	1	0	$\times$	-	-
N123.9.1115 $\mathrm{A1}^{+}\oplus\mathrm{A4}^{+}\oplus\mathrm{Z3}^{+}$	$\surd$	1	0	$\times$	-	-
N123.9.1116 $\mathrm{A1}^{+}\oplus\mathrm{A1}^{+}\oplus\mathrm{Z2}^{+}$	$\surd$	1	0	$\times$	-	-
N123.9.1117 $\mathrm{A1}^{+}\oplus\mathrm{A1}^{+}\oplus\mathrm{Z4}^{-}$	$\surd$	1	0	$\times$	-	-
N123.9.1118 $\mathrm{A1}^{+}\oplus\mathrm{A2}^{-}\oplus\mathrm{Z2}^{+}$	$\surd$	1	1	$\times$	-	-
N123.9.1119 $\mathrm{A1}^{+}\oplus\mathrm{A3}^{-}\oplus\mathrm{Z2}^{+}$	$\surd$	1	1	$\times$	-	-
N123.9.1120 $\mathrm{A1}^{+}\oplus\mathrm{A4}^{+}\oplus\mathrm{Z2}^{+}$	$\surd$	1	0	$\times$	-	-
N123.9.1121 $\mathrm{A1}^{+}\oplus\mathrm{A4}^{+}\oplus\mathrm{Z4}^{-}$	$\surd$	1	0	$\times$	-	-
N123.9.1122 $\mathrm{A1}^{+}\oplus\mathrm{A1}^{+}\oplus\mathrm{Z2}^{-}$	$\surd$	1	0	$\times$	-	-
N123.9.1123 $\mathrm{A1}^{+}\oplus\mathrm{A1}^{+}\oplus\mathrm{Z4}^{+}$	$\surd$	1	0	$\times$	-	-
N123.9.1124 $\mathrm{A1}^{+}\oplus\mathrm{A2}^{-}\oplus\mathrm{Z2}^{-}$	$\surd$	1	1	$\times$	-	-
N123.9.1125 $\mathrm{A1}^{+}\oplus\mathrm{A3}^{-}\oplus\mathrm{Z2}^{-}$	$\surd$	1	1	$\times$	-	-
N123.9.1126 $\mathrm{A1}^{+}\oplus\mathrm{A4}^{+}\oplus\mathrm{Z2}^{-}$	$\surd$	1	0	$\times$	-	-
N123.9.1127 $\mathrm{A1}^{+}\oplus\mathrm{A4}^{+}\oplus\mathrm{Z4}^{+}$	$\surd$	1	0	$\times$	-	-
N123.9.1128 $\mathrm{A1}^{+}\oplus\mathrm{A1}^{-}\oplus\mathrm{A1}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A1_u}$
N123.9.1129 $\mathrm{A1}^{+}\oplus\mathrm{A1}^{-}\oplus\mathrm{A2}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B1_u}$
N123.9.1130 $\mathrm{A1}^{+}\oplus\mathrm{A1}^{-}\oplus\mathrm{A3}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A2_u}$
N123.9.1131 $\mathrm{A1}^{+}\oplus\mathrm{A1}^{-}\oplus\mathrm{A4}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B2_u}$
N123.9.1132 $\mathrm{A1}^{+}\oplus\mathrm{A2}^{+}\oplus\mathrm{A2}^{+}$	$\surd$	0	0	$\surd$	-	-
N123.9.1133 $\mathrm{A1}^{+}\oplus\mathrm{A2}^{+}\oplus\mathrm{A3}^{+}$	$\surd$	0	0	$\surd$	-	-
N123.9.1134 $\mathrm{A1}^{+}\oplus\mathrm{A2}^{+}\oplus\mathrm{A4}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u}\oplus\mathrm{B2_u}$
N123.9.1135 $\mathrm{A1}^{+}\oplus\mathrm{A3}^{+}\oplus\mathrm{A3}^{+}$	$\surd$	0	0	$\surd$	-	-
N123.9.1136 $\mathrm{A1}^{+}\oplus\mathrm{A3}^{+}\oplus\mathrm{A4}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{B2_u}$
N123.9.1137 $\mathrm{A1}^{+}\oplus\mathrm{A4}^{-}\oplus\mathrm{A4}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_u}\oplus\mathrm{B2_u}$
N123.9.1138 $\mathrm{A1}^{+}\oplus\mathrm{A1}^{-}\oplus\mathrm{M1}^{+}$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $P4/mmm$ (No. 123) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N123.9.1139 $\mathrm{A1}^{+} \oplus \mathrm{A1}^{-} \oplus \mathrm{M4}^{+}$	$\surd$	1	1	$\times$	-	-
N123.9.1140 $\mathrm{A1}^{+} \oplus \mathrm{A2}^{+} \oplus \mathrm{M1}^{+}$	$\surd$	1	0	$\times$	-	-
N123.9.1141 $\mathrm{A1}^{+} \oplus \mathrm{A2}^{+} \oplus \mathrm{M4}^{+}$	$\surd$	1	0	$\times$	-	-
N123.9.1142 $\mathrm{A1}^{+} \oplus \mathrm{A3}^{+} \oplus \mathrm{M1}^{+}$	$\surd$	1	0	$\times$	-	-
N123.9.1143 $\mathrm{A1}^{+} \oplus \mathrm{A3}^{+} \oplus \mathrm{M4}^{+}$	$\surd$	1	0	$\times$	-	-
N123.9.1144 $\mathrm{A1}^{+} \oplus \mathrm{A4}^{-} \oplus \mathrm{M1}^{+}$	$\surd$	1	1	$\times$	-	-
N123.9.1145 $\mathrm{A1}^{+} \oplus \mathrm{A4}^{-} \oplus \mathrm{M4}^{+}$	$\surd$	1	1	$\times$	-	-
N123.9.1146 $\mathrm{A1}^{+} \oplus \mathrm{A1}^{-} \oplus \mathrm{M1}^{-}$	$\surd$	1	1	$\times$	-	-
N123.9.1147 $\mathrm{A1}^{+} \oplus \mathrm{A1}^{-} \oplus \mathrm{M4}^{-}$	$\surd$	1	1	$\times$	-	-
N123.9.1148 $\mathrm{A1}^{+} \oplus \mathrm{A2}^{+} \oplus \mathrm{M1}^{-}$	$\surd$	1	0	$\times$	-	-
N123.9.1149 $\mathrm{A1}^{+} \oplus \mathrm{A2}^{+} \oplus \mathrm{M4}^{-}$	$\surd$	1	0	$\times$	-	-
N123.9.1150 $\mathrm{A1}^{+} \oplus \mathrm{A3}^{+} \oplus \mathrm{M1}^{-}$	$\surd$	1	0	$\times$	-	-
N123.9.1151 $\mathrm{A1}^{+} \oplus \mathrm{A3}^{+} \oplus \mathrm{M4}^{-}$	$\surd$	1	0	$\times$	-	-
N123.9.1152 $\mathrm{A1}^{+} \oplus \mathrm{A4}^{-} \oplus \mathrm{M1}^{-}$	$\surd$	1	1	$\times$	-	-
N123.9.1153 $\mathrm{A1}^{+} \oplus \mathrm{A4}^{-} \oplus \mathrm{M4}^{-}$	$\surd$	1	1	$\times$	-	-
N123.9.1154 $\mathrm{A1}^{+} \oplus \mathrm{A1}^{-} \oplus \mathrm{M2}^{+}$	$\surd$	1	1	$\times$	-	-
N123.9.1155 $\mathrm{A1}^{+} \oplus \mathrm{A1}^{-} \oplus \mathrm{M3}^{+}$	$\surd$	1	1	$\times$	-	-
N123.9.1156 $\mathrm{A1}^{+} \oplus \mathrm{A2}^{+} \oplus \mathrm{M2}^{+}$	$\surd$	1	0	$\times$	-	-
N123.9.1157 $\mathrm{A1}^{+} \oplus \mathrm{A2}^{+} \oplus \mathrm{M3}^{+}$	$\surd$	1	0	$\times$	-	-
N123.9.1158 $\mathrm{A1}^{+} \oplus \mathrm{A3}^{+} \oplus \mathrm{M2}^{+}$	$\surd$	1	0	$\times$	-	-
N123.9.1159 $\mathrm{A1}^{+} \oplus \mathrm{A3}^{+} \oplus \mathrm{M3}^{+}$	$\surd$	1	0	$\times$	-	-
N123.9.1160 $\mathrm{A1}^{+} \oplus \mathrm{A4}^{-} \oplus \mathrm{M2}^{+}$	$\surd$	1	1	$\times$	-	-
N123.9.1161 $\mathrm{A1}^{+} \oplus \mathrm{A4}^{-} \oplus \mathrm{M3}^{+}$	$\surd$	1	1	$\times$	-	-
N123.9.1162 $\mathrm{A1}^{+} \oplus \mathrm{A1}^{-} \oplus \mathrm{M2}^{-}$	$\surd$	1	1	$\times$	-	-
N123.9.1163 $\mathrm{A1}^{+} \oplus \mathrm{A1}^{-} \oplus \mathrm{M3}^{-}$	$\surd$	1	1	$\times$	-	-
N123.9.1164 $\mathrm{A1}^{+} \oplus \mathrm{A2}^{+} \oplus \mathrm{M2}^{-}$	$\surd$	1	0	$\times$	-	-
N123.9.1165 $\mathrm{A1}^{+} \oplus \mathrm{A2}^{+} \oplus \mathrm{M3}^{-}$	$\surd$	1	0	$\times$	-	-
N123.9.1166 $\mathrm{A1}^{+} \oplus \mathrm{A3}^{+} \oplus \mathrm{M2}^{-}$	$\surd$	1	0	$\times$	-	-
N123.9.1167 $\mathrm{A1}^{+} \oplus \mathrm{A3}^{+} \oplus \mathrm{M3}^{-}$	$\surd$	1	0	$\times$	-	-
N123.9.1168 $\mathrm{A1}^{+} \oplus \mathrm{A4}^{-} \oplus \mathrm{M2}^{-}$	$\surd$	1	1	$\times$	-	-
N123.9.1169 $\mathrm{A1}^{+} \oplus \mathrm{A4}^{-} \oplus \mathrm{M3}^{-}$	$\surd$	1	1	$\times$	-	-
N123.9.1170 $\mathrm{A1}^{+} \oplus \mathrm{A1}^{-} \oplus \mathrm{Z1}^{+}$	$\surd$	1	1	$\times$	-	-
N123.9.1171 $\mathrm{A1}^{+} \oplus \mathrm{A1}^{-} \oplus \mathrm{Z3}^{-}$	$\surd$	1	1	$\times$	-	-
N123.9.1172 $\mathrm{A1}^{+} \oplus \mathrm{A2}^{+} \oplus \mathrm{Z1}^{+}$	$\surd$	1	0	$\times$	-	-
N123.9.1173 $\mathrm{A1}^{+} \oplus \mathrm{A2}^{+} \oplus \mathrm{Z3}^{-}$	$\surd$	1	0	$\times$	-	-
N123.9.1174 $\mathrm{A1}^{+} \oplus \mathrm{A3}^{+} \oplus \mathrm{Z1}^{+}$	$\surd$	1	0	$\times$	-	-
N123.9.1175 $\mathrm{A1}^{+} \oplus \mathrm{A3}^{+} \oplus \mathrm{Z3}^{-}$	$\surd$	1	0	$\times$	-	-
N123.9.1176 $\mathrm{A1}^{+} \oplus \mathrm{A4}^{-} \oplus \mathrm{Z1}^{+}$	$\surd$	1	1	$\times$	-	-
N123.9.1177 $\mathrm{A1}^{+} \oplus \mathrm{A4}^{-} \oplus \mathrm{Z3}^{-}$	$\surd$	1	1	$\times$	-	-
N123.9.1178 $\mathrm{A1}^{+} \oplus \mathrm{A1}^{-} \oplus \mathrm{Z1}^{-}$	$\surd$	1	1	$\times$	-	-
N123.9.1179 $\mathrm{A1}^{+} \oplus \mathrm{A1}^{-} \oplus \mathrm{Z3}^{+}$	$\surd$	1	1	$\times$	-	-
N123.9.1180 $\mathrm{A1}^{+} \oplus \mathrm{A2}^{+} \oplus \mathrm{Z1}^{-}$	$\surd$	1	0	$\times$	-	-
N123.9.1181 $\mathrm{A1}^{+} \oplus \mathrm{A2}^{+} \oplus \mathrm{Z3}^{+}$	$\surd$	1	0	$\times$	-	-
N123.9.1182 $\mathrm{A1}^{+} \oplus \mathrm{A3}^{+} \oplus \mathrm{Z1}^{-}$	$\surd$	1	0	$\times$	-	-
N123.9.1183 $\mathrm{A1}^{+} \oplus \mathrm{A3}^{+} \oplus \mathrm{Z3}^{+}$	$\surd$	1	0	$\times$	-	-
N123.9.1184 $\mathrm{A1}^{+} \oplus \mathrm{A4}^{-} \oplus \mathrm{Z1}^{-}$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $P4/mmm$ (No. 123) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N123.9.1185 $\mathrm{A1}^+ \oplus \mathrm{A4}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
N123.9.1186 $\mathrm{A1}^+ \oplus \mathrm{A1}^- \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\times$	-	-
N123.9.1187 $\mathrm{A1}^+ \oplus \mathrm{A1}^- \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\times$	-	-
N123.9.1188 $\mathrm{A1}^+ \oplus \mathrm{A2}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N123.9.1189 $\mathrm{A1}^+ \oplus \mathrm{A2}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	0	$\times$	-	-
N123.9.1190 $\mathrm{A1}^+ \oplus \mathrm{A3}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N123.9.1191 $\mathrm{A1}^+ \oplus \mathrm{A3}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	0	$\times$	-	-
N123.9.1192 $\mathrm{A1}^+ \oplus \mathrm{A4}^- \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\times$	-	-
N123.9.1193 $\mathrm{A1}^+ \oplus \mathrm{A4}^- \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\times$	-	-
N123.9.1194 $\mathrm{A1}^+ \oplus \mathrm{A1}^- \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\times$	-	-
N123.9.1195 $\mathrm{A1}^+ \oplus \mathrm{A1}^- \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\times$	-	-
N123.9.1196 $\mathrm{A1}^+ \oplus \mathrm{A2}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-
N123.9.1197 $\mathrm{A1}^+ \oplus \mathrm{A2}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N123.9.1198 $\mathrm{A1}^+ \oplus \mathrm{A3}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-
N123.9.1199 $\mathrm{A1}^+ \oplus \mathrm{A3}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N123.9.1200 $\mathrm{A1}^+ \oplus \mathrm{A4}^- \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\times$	-	-
N123.9.1201 $\mathrm{A1}^+ \oplus \mathrm{A4}^- \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\times$	-	-
N123.9.1202 $\mathrm{A1}^+ \oplus \mathrm{M1}^+ \oplus \mathrm{M1}^+$	$\surd$	1	0	$\times$	-	-
N123.9.1203 $\mathrm{A1}^+ \oplus \mathrm{M1}^+ \oplus \mathrm{M4}^+$	$\surd$	1	0	$\times$	-	-
N123.9.1204 $\mathrm{A1}^+ \oplus \mathrm{M4}^+ \oplus \mathrm{M4}^+$	$\surd$	1	0	$\times$	-	-
N123.9.1205 $\mathrm{A1}^+ \oplus \mathrm{M1}^+ \oplus \mathrm{M1}^-$	$\surd$	1	1	$\times$	-	-
N123.9.1206 $\mathrm{A1}^+ \oplus \mathrm{M1}^+ \oplus \mathrm{M4}^-$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_u}$
N123.9.1207 $\mathrm{A1}^+ \oplus \mathrm{M4}^+ \oplus \mathrm{M1}^-$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_u}$
N123.9.1208 $\mathrm{A1}^+ \oplus \mathrm{M4}^+ \oplus \mathrm{M4}^-$	$\surd$	1	1	$\times$	-	-
N123.9.1209 $\mathrm{A1}^+ \oplus \mathrm{M1}^+ \oplus \mathrm{M2}^+$	$\surd$	1	0	$\times$	-	-
N123.9.1210 $\mathrm{A1}^+ \oplus \mathrm{M1}^+ \oplus \mathrm{M3}^+$	$\surd$	1	0	$\times$	-	-
N123.9.1211 $\mathrm{A1}^+ \oplus \mathrm{M4}^+ \oplus \mathrm{M2}^+$	$\surd$	1	0	$\times$	-	-
N123.9.1212 $\mathrm{A1}^+ \oplus \mathrm{M4}^+ \oplus \mathrm{M3}^+$	$\surd$	1	0	$\times$	-	-
N123.9.1213 $\mathrm{A1}^+ \oplus \mathrm{M1}^+ \oplus \mathrm{M2}^-$	$\surd$	1	1	$\times$	-	-
N123.9.1214 $\mathrm{A1}^+ \oplus \mathrm{M1}^+ \oplus \mathrm{M3}^-$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.9.1215 $\mathrm{A1}^+ \oplus \mathrm{M4}^+ \oplus \mathrm{M2}^-$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.9.1216 $\mathrm{A1}^+ \oplus \mathrm{M4}^+ \oplus \mathrm{M3}^-$	$\surd$	1	1	$\times$	-	-
N123.9.1217 $\mathrm{A1}^+ \oplus \mathrm{M1}^+ \oplus \mathrm{Z1}^+$	$\times$	-	-	-	-	-
N123.9.1218 $\mathrm{A1}^+ \oplus \mathrm{M1}^+ \oplus \mathrm{Z3}^-$	$\times$	-	-	-	-	-
N123.9.1219 $\mathrm{A1}^+ \oplus \mathrm{M4}^+ \oplus \mathrm{Z1}^+$	$\times$	-	-	-	-	-
N123.9.1220 $\mathrm{A1}^+ \oplus \mathrm{M4}^+ \oplus \mathrm{Z3}^-$	$\times$	-	-	-	-	-
N123.9.1221 $\mathrm{A1}^+ \oplus \mathrm{M1}^+ \oplus \mathrm{Z1}^-$	$\times$	-	-	-	-	-
N123.9.1222 $\mathrm{A1}^+ \oplus \mathrm{M1}^+ \oplus \mathrm{Z3}^+$	$\times$	-	-	-	-	-
N123.9.1223 $\mathrm{A1}^+ \oplus \mathrm{M4}^+ \oplus \mathrm{Z1}^-$	$\times$	-	-	-	-	-
N123.9.1224 $\mathrm{A1}^+ \oplus \mathrm{M4}^+ \oplus \mathrm{Z3}^+$	$\times$	-	-	-	-	-
N123.9.1225 $\mathrm{A1}^+ \oplus \mathrm{M1}^+ \oplus \mathrm{Z2}^+$	$\times$	-	-	-	-	-
N123.9.1226 $\mathrm{A1}^+ \oplus \mathrm{M1}^+ \oplus \mathrm{Z4}^-$	$\times$	-	-	-	-	-
N123.9.1227 $\mathrm{A1}^+ \oplus \mathrm{M4}^+ \oplus \mathrm{Z2}^+$	$\times$	-	-	-	-	-
N123.9.1228 $\mathrm{A1}^+ \oplus \mathrm{M4}^+ \oplus \mathrm{Z4}^-$	$\times$	-	-	-	-	-
N123.9.1229 $\mathrm{A1}^+ \oplus \mathrm{M1}^+ \oplus \mathrm{Z2}^-$	$\times$	-	-	-	-	-
N123.9.1230 $\mathrm{A1}^+ \oplus \mathrm{M1}^+ \oplus \mathrm{Z4}^+$	$\times$	-	-	-	-	-

Non-coplanar SSGs with parent space group $P4/mmm$ (No. 123) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N123.9.1231 $\mathrm{A1}^{+}\oplus\mathrm{M4}^{+}\oplus\mathrm{Z2}^{-}$	$\times$	-	-	-	-	-
N123.9.1232 $\mathrm{A1}^{+}\oplus\mathrm{M4}^{+}\oplus\mathrm{Z4}^{+}$	$\times$	-	-	-	-	-
N123.9.1233 $\mathrm{A1}^{+}\oplus\mathrm{M1}^{-}\oplus\mathrm{M1}^{-}$	$\surd$	1	0	$\times$	-	-
N123.9.1234 $\mathrm{A1}^{+}\oplus\mathrm{M1}^{-}\oplus\mathrm{M4}^{-}$	$\surd$	1	0	$\times$	-	-
N123.9.1235 $\mathrm{A1}^{+}\oplus\mathrm{M4}^{-}\oplus\mathrm{M4}^{-}$	$\surd$	1	0	$\times$	-	-
N123.9.1236 $\mathrm{A1}^{+}\oplus\mathrm{M1}^{-}\oplus\mathrm{M2}^{+}$	$\surd$	1	1	$\times$	-	-
N123.9.1237 $\mathrm{A1}^{+}\oplus\mathrm{M1}^{-}\oplus\mathrm{M3}^{+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.9.1238 $\mathrm{A1}^{+}\oplus\mathrm{M4}^{-}\oplus\mathrm{M2}^{+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.9.1239 $\mathrm{A1}^{+}\oplus\mathrm{M4}^{-}\oplus\mathrm{M3}^{+}$	$\surd$	1	1	$\times$	-	-
N123.9.1240 $\mathrm{A1}^{+}\oplus\mathrm{M1}^{-}\oplus\mathrm{M2}^{-}$	$\surd$	1	0	$\times$	-	-
N123.9.1241 $\mathrm{A1}^{+}\oplus\mathrm{M1}^{-}\oplus\mathrm{M3}^{-}$	$\surd$	1	0	$\times$	-	-
N123.9.1242 $\mathrm{A1}^{+}\oplus\mathrm{M4}^{-}\oplus\mathrm{M2}^{-}$	$\surd$	1	0	$\times$	-	-
N123.9.1243 $\mathrm{A1}^{+}\oplus\mathrm{M4}^{-}\oplus\mathrm{M3}^{-}$	$\surd$	1	0	$\times$	-	-
N123.9.1244 $\mathrm{A1}^{+}\oplus\mathrm{M1}^{-}\oplus\mathrm{Z1}^{+}$	$\times$	-	-	-	-	-
N123.9.1245 $\mathrm{A1}^{+}\oplus\mathrm{M1}^{-}\oplus\mathrm{Z3}^{-}$	$\times$	-	-	-	-	-
N123.9.1246 $\mathrm{A1}^{+}\oplus\mathrm{M4}^{-}\oplus\mathrm{Z1}^{+}$	$\times$	-	-	-	-	-
N123.9.1247 $\mathrm{A1}^{+}\oplus\mathrm{M4}^{-}\oplus\mathrm{Z3}^{-}$	$\times$	-	-	-	-	-
N123.9.1248 $\mathrm{A1}^{+}\oplus\mathrm{M1}^{-}\oplus\mathrm{Z1}^{-}$	$\times$	-	-	-	-	-
N123.9.1249 $\mathrm{A1}^{+}\oplus\mathrm{M1}^{-}\oplus\mathrm{Z3}^{+}$	$\times$	-	-	-	-	-
N123.9.1250 $\mathrm{A1}^{+}\oplus\mathrm{M4}^{-}\oplus\mathrm{Z1}^{-}$	$\times$	-	-	-	-	-
N123.9.1251 $\mathrm{A1}^{+}\oplus\mathrm{M4}^{-}\oplus\mathrm{Z3}^{+}$	$\times$	-	-	-	-	-
N123.9.1252 $\mathrm{A1}^{+}\oplus\mathrm{M1}^{-}\oplus\mathrm{Z2}^{+}$	$\times$	-	-	-	-	-
N123.9.1253 $\mathrm{A1}^{+}\oplus\mathrm{M1}^{-}\oplus\mathrm{Z4}^{-}$	$\times$	-	-	-	-	-
N123.9.1254 $\mathrm{A1}^{+}\oplus\mathrm{M4}^{-}\oplus\mathrm{Z2}^{+}$	$\times$	-	-	-	-	-
N123.9.1255 $\mathrm{A1}^{+}\oplus\mathrm{M4}^{-}\oplus\mathrm{Z4}^{-}$	$\times$	-	-	-	-	-
N123.9.1256 $\mathrm{A1}^{+}\oplus\mathrm{M1}^{-}\oplus\mathrm{Z2}^{-}$	$\times$	-	-	-	-	-
N123.9.1257 $\mathrm{A1}^{+}\oplus\mathrm{M1}^{-}\oplus\mathrm{Z4}^{+}$	$\times$	-	-	-	-	-
N123.9.1258 $\mathrm{A1}^{+}\oplus\mathrm{M4}^{-}\oplus\mathrm{Z2}^{-}$	$\times$	-	-	-	-	-
N123.9.1259 $\mathrm{A1}^{+}\oplus\mathrm{M4}^{-}\oplus\mathrm{Z4}^{+}$	$\times$	-	-	-	-	-
N123.9.1260 $\mathrm{A1}^{+}\oplus\mathrm{M2}^{+}\oplus\mathrm{M2}^{+}$	$\surd$	1	0	$\times$	-	-
N123.9.1261 $\mathrm{A1}^{+}\oplus\mathrm{M2}^{+}\oplus\mathrm{M3}^{+}$	$\surd$	1	0	$\times$	-	-
N123.9.1262 $\mathrm{A1}^{+}\oplus\mathrm{M3}^{+}\oplus\mathrm{M3}^{+}$	$\surd$	1	0	$\times$	-	-
N123.9.1263 $\mathrm{A1}^{+}\oplus\mathrm{M2}^{+}\oplus\mathrm{M2}^{-}$	$\surd$	1	1	$\times$	-	-
N123.9.1264 $\mathrm{A1}^{+}\oplus\mathrm{M2}^{+}\oplus\mathrm{M3}^{-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_u}$
N123.9.1265 $\mathrm{A1}^{+}\oplus\mathrm{M3}^{+}\oplus\mathrm{M2}^{-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_u}$
N123.9.1266 $\mathrm{A1}^{+}\oplus\mathrm{M3}^{+}\oplus\mathrm{M3}^{-}$	$\surd$	1	1	$\times$	-	-
N123.9.1267 $\mathrm{A1}^{+}\oplus\mathrm{M2}^{+}\oplus\mathrm{Z1}^{+}$	$\times$	-	-	-	-	-
N123.9.1268 $\mathrm{A1}^{+}\oplus\mathrm{M2}^{+}\oplus\mathrm{Z3}^{-}$	$\times$	-	-	-	-	-
N123.9.1269 $\mathrm{A1}^{+}\oplus\mathrm{M3}^{+}\oplus\mathrm{Z1}^{+}$	$\times$	-	-	-	-	-
N123.9.1270 $\mathrm{A1}^{+}\oplus\mathrm{M3}^{+}\oplus\mathrm{Z3}^{-}$	$\times$	-	-	-	-	-
N123.9.1271 $\mathrm{A1}^{+}\oplus\mathrm{M2}^{+}\oplus\mathrm{Z1}^{-}$	$\times$	-	-	-	-	-
N123.9.1272 $\mathrm{A1}^{+}\oplus\mathrm{M2}^{+}\oplus\mathrm{Z3}^{+}$	$\times$	-	-	-	-	-
N123.9.1273 $\mathrm{A1}^{+}\oplus\mathrm{M3}^{+}\oplus\mathrm{Z1}^{-}$	$\times$	-	-	-	-	-
N123.9.1274 $\mathrm{A1}^{+}\oplus\mathrm{M3}^{+}\oplus\mathrm{Z3}^{+}$	$\times$	-	-	-	-	-
N123.9.1275 $\mathrm{A1}^{+}\oplus\mathrm{M2}^{+}\oplus\mathrm{Z2}^{+}$	$\times$	-	-	-	-	-
N123.9.1276 $\mathrm{A1}^{+}\oplus\mathrm{M2}^{+}\oplus\mathrm{Z4}^{-}$	$\times$	-	-	-	-	-

Non-coplanar SSGs with parent space group $P4/mmm$ (No. 123) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N123.9.1277 $\mathrm{A1}^{+}\oplus\mathrm{M3}^{+}\oplus\mathrm{Z2}^{+}$	$\times$	-	-	-	-	-
N123.9.1278 $\mathrm{A1}^{+}\oplus\mathrm{M3}^{+}\oplus\mathrm{Z4}^{-}$	$\times$	-	-	-	-	-
N123.9.1279 $\mathrm{A1}^{+}\oplus\mathrm{M2}^{+}\oplus\mathrm{Z2}^{-}$	$\times$	-	-	-	-	-
N123.9.1280 $\mathrm{A1}^{+}\oplus\mathrm{M2}^{+}\oplus\mathrm{Z4}^{+}$	$\times$	-	-	-	-	-
N123.9.1281 $\mathrm{A1}^{+}\oplus\mathrm{M3}^{+}\oplus\mathrm{Z2}^{-}$	$\times$	-	-	-	-	-
N123.9.1282 $\mathrm{A1}^{+}\oplus\mathrm{M3}^{+}\oplus\mathrm{Z4}^{+}$	$\times$	-	-	-	-	-
N123.9.1283 $\mathrm{A1}^{+}\oplus\mathrm{M2}^{-}\oplus\mathrm{M2}^{-}$	$\surd$	1	0	$\times$	-	-
N123.9.1284 $\mathrm{A1}^{+}\oplus\mathrm{M2}^{-}\oplus\mathrm{M3}^{-}$	$\surd$	1	0	$\times$	-	-
N123.9.1285 $\mathrm{A1}^{+}\oplus\mathrm{M3}^{-}\oplus\mathrm{M3}^{-}$	$\surd$	1	0	$\times$	-	-
N123.9.1286 $\mathrm{A1}^{+}\oplus\mathrm{M2}^{-}\oplus\mathrm{Z1}^{+}$	$\times$	-	-	-	-	-
N123.9.1287 $\mathrm{A1}^{+}\oplus\mathrm{M2}^{-}\oplus\mathrm{Z3}^{-}$	$\times$	-	-	-	-	-
N123.9.1288 $\mathrm{A1}^{+}\oplus\mathrm{M3}^{-}\oplus\mathrm{Z1}^{+}$	$\times$	-	-	-	-	-
N123.9.1289 $\mathrm{A1}^{+}\oplus\mathrm{M3}^{-}\oplus\mathrm{Z3}^{-}$	$\times$	-	-	-	-	-
N123.9.1290 $\mathrm{A1}^{+}\oplus\mathrm{M2}^{-}\oplus\mathrm{Z1}^{-}$	$\times$	-	-	-	-	-
N123.9.1291 $\mathrm{A1}^{+}\oplus\mathrm{M2}^{-}\oplus\mathrm{Z3}^{+}$	$\times$	-	-	-	-	-
N123.9.1292 $\mathrm{A1}^{+}\oplus\mathrm{M3}^{-}\oplus\mathrm{Z1}^{-}$	$\times$	-	-	-	-	-
N123.9.1293 $\mathrm{A1}^{+}\oplus\mathrm{M3}^{-}\oplus\mathrm{Z3}^{+}$	$\times$	-	-	-	-	-
N123.9.1294 $\mathrm{A1}^{+}\oplus\mathrm{M2}^{-}\oplus\mathrm{Z2}^{+}$	$\times$	-	-	-	-	-
N123.9.1295 $\mathrm{A1}^{+}\oplus\mathrm{M2}^{-}\oplus\mathrm{Z4}^{-}$	$\times$	-	-	-	-	-
N123.9.1296 $\mathrm{A1}^{+}\oplus\mathrm{M3}^{-}\oplus\mathrm{Z2}^{+}$	$\times$	-	-	-	-	-
N123.9.1297 $\mathrm{A1}^{+}\oplus\mathrm{M3}^{-}\oplus\mathrm{Z4}^{-}$	$\times$	-	-	-	-	-
N123.9.1298 $\mathrm{A1}^{+}\oplus\mathrm{M2}^{-}\oplus\mathrm{Z2}^{-}$	$\times$	-	-	-	-	-
N123.9.1299 $\mathrm{A1}^{+}\oplus\mathrm{M2}^{-}\oplus\mathrm{Z4}^{+}$	$\times$	-	-	-	-	-
N123.9.1300 $\mathrm{A1}^{+}\oplus\mathrm{M3}^{-}\oplus\mathrm{Z2}^{-}$	$\times$	-	-	-	-	-
N123.9.1301 $\mathrm{A1}^{+}\oplus\mathrm{M3}^{-}\oplus\mathrm{Z4}^{+}$	$\times$	-	-	-	-	-
N123.9.1302 $\mathrm{A1}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z1}^{+}$	$\surd$	1	0	$\times$	-	-
N123.9.1303 $\mathrm{A1}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z3}^{-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.9.1304 $\mathrm{A1}^{+}\oplus\mathrm{Z3}^{-}\oplus\mathrm{Z3}^{-}$	$\surd$	1	0	$\times$	-	-
N123.9.1305 $\mathrm{A1}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z1}^{-}$	$\surd$	1	1	$\times$	-	-
N123.9.1306 $\mathrm{A1}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z3}^{+}$	$\surd$	1	0	$\times$	-	-
N123.9.1307 $\mathrm{A1}^{+}\oplus\mathrm{Z3}^{-}\oplus\mathrm{Z1}^{-}$	$\surd$	1	0	$\times$	-	-
N123.9.1308 $\mathrm{A1}^{+}\oplus\mathrm{Z3}^{-}\oplus\mathrm{Z3}^{+}$	$\surd$	1	1	$\times$	-	-
N123.9.1309 $\mathrm{A1}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z2}^{+}$	$\surd$	1	0	$\times$	-	-
N123.9.1310 $\mathrm{A1}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z4}^{-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_u}$
N123.9.1311 $\mathrm{A1}^{+}\oplus\mathrm{Z3}^{-}\oplus\mathrm{Z2}^{+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_u}$
N123.9.1312 $\mathrm{A1}^{+}\oplus\mathrm{Z3}^{-}\oplus\mathrm{Z4}^{-}$	$\surd$	1	0	$\times$	-	-
N123.9.1313 $\mathrm{A1}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z2}^{-}$	$\surd$	1	1	$\times$	-	-
N123.9.1314 $\mathrm{A1}^{+}\oplus\mathrm{Z1}^{+}\oplus\mathrm{Z4}^{+}$	$\surd$	1	0	$\times$	-	-
N123.9.1315 $\mathrm{A1}^{+}\oplus\mathrm{Z3}^{-}\oplus\mathrm{Z2}^{-}$	$\surd$	1	0	$\times$	-	-
N123.9.1316 $\mathrm{A1}^{+}\oplus\mathrm{Z3}^{-}\oplus\mathrm{Z4}^{+}$	$\surd$	1	1	$\times$	-	-
N123.9.1317 $\mathrm{A1}^{+}\oplus\mathrm{Z1}^{-}\oplus\mathrm{Z1}^{-}$	$\surd$	1	0	$\times$	-	-
N123.9.1318 $\mathrm{A1}^{+}\oplus\mathrm{Z1}^{-}\oplus\mathrm{Z3}^{+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.9.1319 $\mathrm{A1}^{+}\oplus\mathrm{Z3}^{+}\oplus\mathrm{Z3}^{+}$	$\surd$	1	0	$\times$	-	-
N123.9.1320 $\mathrm{A1}^{+}\oplus\mathrm{Z1}^{-}\oplus\mathrm{Z2}^{+}$	$\surd$	1	1	$\times$	-	-
N123.9.1321 $\mathrm{A1}^{+}\oplus\mathrm{Z1}^{-}\oplus\mathrm{Z4}^{-}$	$\surd$	1	0	$\times$	-	-
N123.9.1322 $\mathrm{A1}^{+}\oplus\mathrm{Z3}^{+}\oplus\mathrm{Z2}^{+}$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $P4/mmm$ (No. 123) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N123.9.1323 $\mathrm{A1}^{+}\oplus\mathrm{Z3}^{+}\oplus\mathrm{Z4}^{-}$	$\surd$	1	1	$\times$	-	-
N123.9.1324 $\mathrm{A1}^{+}\oplus\mathrm{Z1}^{-}\oplus\mathrm{Z2}^{-}$	$\surd$	1	0	$\times$	-	-
N123.9.1325 $\mathrm{A1}^{+}\oplus\mathrm{Z1}^{-}\oplus\mathrm{Z4}^{+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_u}$
N123.9.1326 $\mathrm{A1}^{+}\oplus\mathrm{Z3}^{+}\oplus\mathrm{Z2}^{-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_u}$
N123.9.1327 $\mathrm{A1}^{+}\oplus\mathrm{Z3}^{+}\oplus\mathrm{Z4}^{+}$	$\surd$	1	0	$\times$	-	-
N123.9.1328 $\mathrm{A1}^{+}\oplus\mathrm{Z2}^{+}\oplus\mathrm{Z2}^{+}$	$\surd$	1	0	$\times$	-	-
N123.9.1329 $\mathrm{A1}^{+}\oplus\mathrm{Z2}^{+}\oplus\mathrm{Z4}^{-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.9.1330 $\mathrm{A1}^{+}\oplus\mathrm{Z4}^{-}\oplus\mathrm{Z4}^{-}$	$\surd$	1	0	$\times$	-	-
N123.9.1331 $\mathrm{A1}^{+}\oplus\mathrm{Z2}^{+}\oplus\mathrm{Z2}^{-}$	$\surd$	1	1	$\times$	-	-
N123.9.1332 $\mathrm{A1}^{+}\oplus\mathrm{Z2}^{+}\oplus\mathrm{Z4}^{+}$	$\surd$	1	0	$\times$	-	-
N123.9.1333 $\mathrm{A1}^{+}\oplus\mathrm{Z4}^{-}\oplus\mathrm{Z2}^{-}$	$\surd$	1	0	$\times$	-	-
N123.9.1334 $\mathrm{A1}^{+}\oplus\mathrm{Z4}^{-}\oplus\mathrm{Z4}^{+}$	$\surd$	1	1	$\times$	-	-
N123.9.1335 $\mathrm{A1}^{+}\oplus\mathrm{Z2}^{-}\oplus\mathrm{Z2}^{-}$	$\surd$	1	0	$\times$	-	-
N123.9.1336 $\mathrm{A1}^{+}\oplus\mathrm{Z2}^{-}\oplus\mathrm{Z4}^{+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.9.1337 $\mathrm{A1}^{+}\oplus\mathrm{Z4}^{+}\oplus\mathrm{Z4}^{+}$	$\surd$	1	0	$\times$	-	-
N123.9.1338 $\mathrm{A1}^{-}\oplus\mathrm{A1}^{-}\oplus\mathrm{A1}^{-}$	$\surd$	0	0	$\surd$	-	-
N123.9.1339 $\mathrm{A1}^{-}\oplus\mathrm{A1}^{-}\oplus\mathrm{A2}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{B1_u}$
N123.9.1340 $\mathrm{A1}^{-}\oplus\mathrm{A1}^{-}\oplus\mathrm{A3}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u}\oplus\mathrm{A2_u}$
N123.9.1341 $\mathrm{A1}^{-}\oplus\mathrm{A1}^{-}\oplus\mathrm{A4}^{-}$	$\surd$	0	0	$\surd$	-	-
N123.9.1342 $\mathrm{A1}^{-}\oplus\mathrm{A2}^{+}\oplus\mathrm{A3}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{A2_u}$
N123.9.1343 $\mathrm{A1}^{-}\oplus\mathrm{A1}^{-}\oplus\mathrm{M1}^{+}$	$\surd$	1	0	$\times$	-	-
N123.9.1344 $\mathrm{A1}^{-}\oplus\mathrm{A1}^{-}\oplus\mathrm{M4}^{+}$	$\surd$	1	0	$\times$	-	-
N123.9.1345 $\mathrm{A1}^{-}\oplus\mathrm{A2}^{+}\oplus\mathrm{M1}^{+}$	$\surd$	1	1	$\times$	-	-
N123.9.1346 $\mathrm{A1}^{-}\oplus\mathrm{A3}^{+}\oplus\mathrm{M1}^{+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.9.1347 $\mathrm{A1}^{-}\oplus\mathrm{A3}^{+}\oplus\mathrm{M4}^{+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.9.1348 $\mathrm{A1}^{-}\oplus\mathrm{A4}^{-}\oplus\mathrm{M1}^{+}$	$\surd$	1	0	$\times$	-	-
N123.9.1349 $\mathrm{A1}^{-}\oplus\mathrm{A1}^{-}\oplus\mathrm{M1}^{-}$	$\surd$	1	0	$\times$	-	-
N123.9.1350 $\mathrm{A1}^{-}\oplus\mathrm{A1}^{-}\oplus\mathrm{M4}^{-}$	$\surd$	1	0	$\times$	-	-
N123.9.1351 $\mathrm{A1}^{-}\oplus\mathrm{A2}^{+}\oplus\mathrm{M1}^{-}$	$\surd$	1	1	$\times$	-	-
N123.9.1352 $\mathrm{A1}^{-}\oplus\mathrm{A3}^{+}\oplus\mathrm{M1}^{-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.9.1353 $\mathrm{A1}^{-}\oplus\mathrm{A3}^{+}\oplus\mathrm{M4}^{-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.9.1354 $\mathrm{A1}^{-}\oplus\mathrm{A4}^{-}\oplus\mathrm{M1}^{-}$	$\surd$	1	0	$\times$	-	-
N123.9.1355 $\mathrm{A1}^{-}\oplus\mathrm{A1}^{-}\oplus\mathrm{M2}^{+}$	$\surd$	1	0	$\times$	-	-
N123.9.1356 $\mathrm{A1}^{-}\oplus\mathrm{A1}^{-}\oplus\mathrm{M3}^{+}$	$\surd$	1	0	$\times$	-	-
N123.9.1357 $\mathrm{A1}^{-}\oplus\mathrm{A2}^{+}\oplus\mathrm{M2}^{+}$	$\surd$	1	1	$\times$	-	-
N123.9.1358 $\mathrm{A1}^{-}\oplus\mathrm{A3}^{+}\oplus\mathrm{M2}^{+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.9.1359 $\mathrm{A1}^{-}\oplus\mathrm{A3}^{+}\oplus\mathrm{M3}^{+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.9.1360 $\mathrm{A1}^{-}\oplus\mathrm{A4}^{-}\oplus\mathrm{M2}^{+}$	$\surd$	1	0	$\times$	-	-
N123.9.1361 $\mathrm{A1}^{-}\oplus\mathrm{A1}^{-}\oplus\mathrm{M2}^{-}$	$\surd$	1	0	$\times$	-	-
N123.9.1362 $\mathrm{A1}^{-}\oplus\mathrm{A1}^{-}\oplus\mathrm{M3}^{-}$	$\surd$	1	0	$\times$	-	-
N123.9.1363 $\mathrm{A1}^{-}\oplus\mathrm{A2}^{+}\oplus\mathrm{M2}^{-}$	$\surd$	1	1	$\times$	-	-
N123.9.1364 $\mathrm{A1}^{-}\oplus\mathrm{A3}^{+}\oplus\mathrm{M2}^{-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.9.1365 $\mathrm{A1}^{-}\oplus\mathrm{A3}^{+}\oplus\mathrm{M3}^{-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.9.1366 $\mathrm{A1}^{-}\oplus\mathrm{A4}^{-}\oplus\mathrm{M2}^{-}$	$\surd$	1	0	$\times$	-	-
N123.9.1367 $\mathrm{A1}^{-}\oplus\mathrm{A1}^{-}\oplus\mathrm{Z1}^{+}$	$\surd$	1	0	$\times$	-	-
N123.9.1368 $\mathrm{A1}^{-}\oplus\mathrm{A1}^{-}\oplus\mathrm{Z3}^{-}$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $P4/mmm$ (No. 123) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N123.9.1369 $\mathrm{A1}^- \oplus \mathrm{A2}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\times$	-	-
N123.9.1370 $\mathrm{A1}^- \oplus \mathrm{A3}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\times$	-	-
N123.9.1371 $\mathrm{A1}^- \oplus \mathrm{A4}^- \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N123.9.1372 $\mathrm{A1}^- \oplus \mathrm{A4}^- \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N123.9.1373 $\mathrm{A1}^- \oplus \mathrm{A1}^- \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N123.9.1374 $\mathrm{A1}^- \oplus \mathrm{A1}^- \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N123.9.1375 $\mathrm{A1}^- \oplus \mathrm{A2}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
N123.9.1376 $\mathrm{A1}^- \oplus \mathrm{A3}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
N123.9.1377 $\mathrm{A1}^- \oplus \mathrm{A4}^- \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N123.9.1378 $\mathrm{A1}^- \oplus \mathrm{A4}^- \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N123.9.1379 $\mathrm{A1}^- \oplus \mathrm{A1}^- \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N123.9.1380 $\mathrm{A1}^- \oplus \mathrm{A1}^- \oplus \mathrm{Z4}^-$	$\surd$	1	0	$\times$	-	-
N123.9.1381 $\mathrm{A1}^- \oplus \mathrm{A2}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\times$	-	-
N123.9.1382 $\mathrm{A1}^- \oplus \mathrm{A3}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\times$	-	-
N123.9.1383 $\mathrm{A1}^- \oplus \mathrm{A4}^- \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N123.9.1384 $\mathrm{A1}^- \oplus \mathrm{A4}^- \oplus \mathrm{Z4}^-$	$\surd$	1	0	$\times$	-	-
N123.9.1385 $\mathrm{A1}^- \oplus \mathrm{A1}^- \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-
N123.9.1386 $\mathrm{A1}^- \oplus \mathrm{A1}^- \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N123.9.1387 $\mathrm{A1}^- \oplus \mathrm{A2}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\times$	-	-
N123.9.1388 $\mathrm{A1}^- \oplus \mathrm{A3}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\times$	-	-
N123.9.1389 $\mathrm{A1}^- \oplus \mathrm{A4}^- \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-
N123.9.1390 $\mathrm{A1}^- \oplus \mathrm{A4}^- \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N123.9.1391 $\mathrm{A1}^- \oplus \mathrm{M1}^+ \oplus \mathrm{M1}^+$	$\surd$	1	0	$\times$	-	-
N123.9.1392 $\mathrm{A1}^- \oplus \mathrm{M1}^+ \oplus \mathrm{M4}^+$	$\surd$	1	0	$\times$	-	-
N123.9.1393 $\mathrm{A1}^- \oplus \mathrm{M4}^+ \oplus \mathrm{M4}^+$	$\surd$	1	0	$\times$	-	-
N123.9.1394 $\mathrm{A1}^- \oplus \mathrm{M1}^+ \oplus \mathrm{M1}^-$	$\surd$	1	1	$\times$	-	-
N123.9.1395 $\mathrm{A1}^- \oplus \mathrm{M1}^+ \oplus \mathrm{M4}^-$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_u}$
N123.9.1396 $\mathrm{A1}^- \oplus \mathrm{M4}^+ \oplus \mathrm{M1}^-$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_u}$
N123.9.1397 $\mathrm{A1}^- \oplus \mathrm{M4}^+ \oplus \mathrm{M4}^-$	$\surd$	1	1	$\times$	-	-
N123.9.1398 $\mathrm{A1}^- \oplus \mathrm{M1}^+ \oplus \mathrm{M2}^+$	$\surd$	1	0	$\times$	-	-
N123.9.1399 $\mathrm{A1}^- \oplus \mathrm{M1}^+ \oplus \mathrm{M3}^+$	$\surd$	1	0	$\times$	-	-
N123.9.1400 $\mathrm{A1}^- \oplus \mathrm{M4}^+ \oplus \mathrm{M2}^+$	$\surd$	1	0	$\times$	-	-
N123.9.1401 $\mathrm{A1}^- \oplus \mathrm{M4}^+ \oplus \mathrm{M3}^+$	$\surd$	1	0	$\times$	-	-
N123.9.1402 $\mathrm{A1}^- \oplus \mathrm{M1}^+ \oplus \mathrm{M2}^-$	$\surd$	1	1	$\times$	-	-
N123.9.1403 $\mathrm{A1}^- \oplus \mathrm{M1}^+ \oplus \mathrm{M3}^-$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.9.1404 $\mathrm{A1}^- \oplus \mathrm{M4}^+ \oplus \mathrm{M2}^-$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.9.1405 $\mathrm{A1}^- \oplus \mathrm{M4}^+ \oplus \mathrm{M3}^-$	$\surd$	1	1	$\times$	-	-
N123.9.1406 $\mathrm{A1}^- \oplus \mathrm{M1}^+ \oplus \mathrm{Z1}^+$	$\times$	-	-	-	-	-
N123.9.1407 $\mathrm{A1}^- \oplus \mathrm{M1}^+ \oplus \mathrm{Z3}^-$	$\times$	-	-	-	-	-
N123.9.1408 $\mathrm{A1}^- \oplus \mathrm{M4}^+ \oplus \mathrm{Z1}^+$	$\times$	-	-	-	-	-
N123.9.1409 $\mathrm{A1}^- \oplus \mathrm{M4}^+ \oplus \mathrm{Z3}^-$	$\times$	-	-	-	-	-
N123.9.1410 $\mathrm{A1}^- \oplus \mathrm{M1}^+ \oplus \mathrm{Z1}^-$	$\times$	-	-	-	-	-
N123.9.1411 $\mathrm{A1}^- \oplus \mathrm{M1}^+ \oplus \mathrm{Z3}^+$	$\times$	-	-	-	-	-
N123.9.1412 $\mathrm{A1}^- \oplus \mathrm{M4}^+ \oplus \mathrm{Z1}^-$	$\times$	-	-	-	-	-
N123.9.1413 $\mathrm{A1}^- \oplus \mathrm{M4}^+ \oplus \mathrm{Z3}^+$	$\times$	-	-	-	-	-
N123.9.1414 $\mathrm{A1}^- \oplus \mathrm{M1}^+ \oplus \mathrm{Z2}^+$	$\times$	-	-	-	-	-

Non-coplanar SSGs with parent space group $P4/mmm$ (No. 123) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N123.9.1415 $\mathrm{A1}^{-}\oplus\mathrm{M1}^{+}\oplus\mathrm{Z4}^{-}$	$\times$	-	-	-	-	-
N123.9.1416 $\mathrm{A1}^{-}\oplus\mathrm{M4}^{+}\oplus\mathrm{Z2}^{+}$	$\times$	-	-	-	-	-
N123.9.1417 $\mathrm{A1}^{-}\oplus\mathrm{M4}^{+}\oplus\mathrm{Z4}^{-}$	$\times$	-	-	-	-	-
N123.9.1418 $\mathrm{A1}^{-}\oplus\mathrm{M1}^{+}\oplus\mathrm{Z2}^{-}$	$\times$	-	-	-	-	-
N123.9.1419 $\mathrm{A1}^{-}\oplus\mathrm{M1}^{+}\oplus\mathrm{Z4}^{+}$	$\times$	-	-	-	-	-
N123.9.1420 $\mathrm{A1}^{-}\oplus\mathrm{M4}^{+}\oplus\mathrm{Z2}^{-}$	$\times$	-	-	-	-	-
N123.9.1421 $\mathrm{A1}^{-}\oplus\mathrm{M4}^{+}\oplus\mathrm{Z4}^{+}$	$\times$	-	-	-	-	-
N123.9.1422 $\mathrm{A1}^{-}\oplus\mathrm{M1}^{-}\oplus\mathrm{M1}^{-}$	$\surd$	1	0	$\times$	-	-
N123.9.1423 $\mathrm{A1}^{-}\oplus\mathrm{M1}^{-}\oplus\mathrm{M4}^{-}$	$\surd$	1	0	$\times$	-	-
N123.9.1424 $\mathrm{A1}^{-}\oplus\mathrm{M4}^{-}\oplus\mathrm{M4}^{-}$	$\surd$	1	0	$\times$	-	-
N123.9.1425 $\mathrm{A1}^{-}\oplus\mathrm{M1}^{-}\oplus\mathrm{M2}^{+}$	$\surd$	1	1	$\times$	-	-
N123.9.1426 $\mathrm{A1}^{-}\oplus\mathrm{M1}^{-}\oplus\mathrm{M3}^{+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.9.1427 $\mathrm{A1}^{-}\oplus\mathrm{M4}^{-}\oplus\mathrm{M2}^{+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.9.1428 $\mathrm{A1}^{-}\oplus\mathrm{M4}^{-}\oplus\mathrm{M3}^{+}$	$\surd$	1	1	$\times$	-	-
N123.9.1429 $\mathrm{A1}^{-}\oplus\mathrm{M1}^{-}\oplus\mathrm{M2}^{-}$	$\surd$	1	0	$\times$	-	-
N123.9.1430 $\mathrm{A1}^{-}\oplus\mathrm{M1}^{-}\oplus\mathrm{M3}^{-}$	$\surd$	1	0	$\times$	-	-
N123.9.1431 $\mathrm{A1}^{-}\oplus\mathrm{M4}^{-}\oplus\mathrm{M2}^{-}$	$\surd$	1	0	$\times$	-	-
N123.9.1432 $\mathrm{A1}^{-}\oplus\mathrm{M4}^{-}\oplus\mathrm{M3}^{-}$	$\surd$	1	0	$\times$	-	-
N123.9.1433 $\mathrm{A1}^{-}\oplus\mathrm{M1}^{-}\oplus\mathrm{Z1}^{+}$	$\times$	-	-	-	-	-
N123.9.1434 $\mathrm{A1}^{-}\oplus\mathrm{M1}^{-}\oplus\mathrm{Z3}^{-}$	$\times$	-	-	-	-	-
N123.9.1435 $\mathrm{A1}^{-}\oplus\mathrm{M4}^{-}\oplus\mathrm{Z1}^{+}$	$\times$	-	-	-	-	-
N123.9.1436 $\mathrm{A1}^{-}\oplus\mathrm{M4}^{-}\oplus\mathrm{Z3}^{-}$	$\times$	-	-	-	-	-
N123.9.1437 $\mathrm{A1}^{-}\oplus\mathrm{M1}^{-}\oplus\mathrm{Z1}^{-}$	$\times$	-	-	-	-	-
N123.9.1438 $\mathrm{A1}^{-}\oplus\mathrm{M1}^{-}\oplus\mathrm{Z3}^{+}$	$\times$	-	-	-	-	-
N123.9.1439 $\mathrm{A1}^{-}\oplus\mathrm{M4}^{-}\oplus\mathrm{Z1}^{-}$	$\times$	-	-	-	-	-
N123.9.1440 $\mathrm{A1}^{-}\oplus\mathrm{M4}^{-}\oplus\mathrm{Z3}^{+}$	$\times$	-	-	-	-	-
N123.9.1441 $\mathrm{A1}^{-}\oplus\mathrm{M1}^{-}\oplus\mathrm{Z2}^{+}$	$\times$	-	-	-	-	-
N123.9.1442 $\mathrm{A1}^{-}\oplus\mathrm{M1}^{-}\oplus\mathrm{Z4}^{-}$	$\times$	-	-	-	-	-
N123.9.1443 $\mathrm{A1}^{-}\oplus\mathrm{M4}^{-}\oplus\mathrm{Z2}^{+}$	$\times$	-	-	-	-	-
N123.9.1444 $\mathrm{A1}^{-}\oplus\mathrm{M4}^{-}\oplus\mathrm{Z4}^{-}$	$\times$	-	-	-	-	-
N123.9.1445 $\mathrm{A1}^{-}\oplus\mathrm{M1}^{-}\oplus\mathrm{Z2}^{-}$	$\times$	-	-	-	-	-
N123.9.1446 $\mathrm{A1}^{-}\oplus\mathrm{M1}^{-}\oplus\mathrm{Z4}^{+}$	$\times$	-	-	-	-	-
N123.9.1447 $\mathrm{A1}^{-}\oplus\mathrm{M4}^{-}\oplus\mathrm{Z2}^{-}$	$\times$	-	-	-	-	-
N123.9.1448 $\mathrm{A1}^{-}\oplus\mathrm{M4}^{-}\oplus\mathrm{Z4}^{+}$	$\times$	-	-	-	-	-
N123.9.1449 $\mathrm{A1}^{-}\oplus\mathrm{M2}^{+}\oplus\mathrm{M2}^{+}$	$\surd$	1	0	$\times$	-	-
N123.9.1450 $\mathrm{A1}^{-}\oplus\mathrm{M2}^{+}\oplus\mathrm{M3}^{+}$	$\surd$	1	0	$\times$	-	-
N123.9.1451 $\mathrm{A1}^{-}\oplus\mathrm{M3}^{+}\oplus\mathrm{M3}^{+}$	$\surd$	1	0	$\times$	-	-
N123.9.1452 $\mathrm{A1}^{-}\oplus\mathrm{M2}^{+}\oplus\mathrm{M2}^{-}$	$\surd$	1	1	$\times$	-	-
N123.9.1453 $\mathrm{A1}^{-}\oplus\mathrm{M2}^{+}\oplus\mathrm{M3}^{-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_u}$
N123.9.1454 $\mathrm{A1}^{-}\oplus\mathrm{M3}^{+}\oplus\mathrm{M2}^{-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_u}$
N123.9.1455 $\mathrm{A1}^{-}\oplus\mathrm{M3}^{+}\oplus\mathrm{M3}^{-}$	$\surd$	1	1	$\times$	-	-
N123.9.1456 $\mathrm{A1}^{-}\oplus\mathrm{M2}^{+}\oplus\mathrm{Z1}^{+}$	$\times$	-	-	-	-	-
N123.9.1457 $\mathrm{A1}^{-}\oplus\mathrm{M2}^{+}\oplus\mathrm{Z3}^{-}$	$\times$	-	-	-	-	-
N123.9.1458 $\mathrm{A1}^{-}\oplus\mathrm{M3}^{+}\oplus\mathrm{Z1}^{+}$	$\times$	-	-	-	-	-
N123.9.1459 $\mathrm{A1}^{-}\oplus\mathrm{M3}^{+}\oplus\mathrm{Z3}^{-}$	$\times$	-	-	-	-	-
N123.9.1460 $\mathrm{A1}^{-}\oplus\mathrm{M2}^{+}\oplus\mathrm{Z1}^{-}$	$\times$	-	-	-	-	-

Non-coplanar SSGs with parent space group $P4/mmm$ (No. 123) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N123.9.1461 $\mathrm{A1}^- \oplus \mathrm{M2}^+ \oplus \mathrm{Z3}^+$	$\times$	-	-	-	-	-
N123.9.1462 $\mathrm{A1}^- \oplus \mathrm{M3}^+ \oplus \mathrm{Z1}^-$	$\times$	-	-	-	-	-
N123.9.1463 $\mathrm{A1}^- \oplus \mathrm{M3}^+ \oplus \mathrm{Z3}^+$	$\times$	-	-	-	-	-
N123.9.1464 $\mathrm{A1}^- \oplus \mathrm{M2}^+ \oplus \mathrm{Z2}^+$	$\times$	-	-	-	-	-
N123.9.1465 $\mathrm{A1}^- \oplus \mathrm{M2}^+ \oplus \mathrm{Z4}^-$	$\times$	-	-	-	-	-
N123.9.1466 $\mathrm{A1}^- \oplus \mathrm{M3}^+ \oplus \mathrm{Z2}^+$	$\times$	-	-	-	-	-
N123.9.1467 $\mathrm{A1}^- \oplus \mathrm{M3}^+ \oplus \mathrm{Z4}^-$	$\times$	-	-	-	-	-
N123.9.1468 $\mathrm{A1}^- \oplus \mathrm{M2}^+ \oplus \mathrm{Z2}^-$	$\times$	-	-	-	-	-
N123.9.1469 $\mathrm{A1}^- \oplus \mathrm{M2}^+ \oplus \mathrm{Z4}^+$	$\times$	-	-	-	-	-
N123.9.1470 $\mathrm{A1}^- \oplus \mathrm{M3}^+ \oplus \mathrm{Z2}^-$	$\times$	-	-	-	-	-
N123.9.1471 $\mathrm{A1}^- \oplus \mathrm{M3}^+ \oplus \mathrm{Z4}^+$	$\times$	-	-	-	-	-
N123.9.1472 $\mathrm{A1}^- \oplus \mathrm{M2}^- \oplus \mathrm{M2}^-$	$\surd$	1	0	$\times$	-	-
N123.9.1473 $\mathrm{A1}^- \oplus \mathrm{M2}^- \oplus \mathrm{M3}^-$	$\surd$	1	0	$\times$	-	-
N123.9.1474 $\mathrm{A1}^- \oplus \mathrm{M3}^- \oplus \mathrm{M3}^-$	$\surd$	1	0	$\times$	-	-
N123.9.1475 $\mathrm{A1}^- \oplus \mathrm{M2}^- \oplus \mathrm{Z1}^+$	$\times$	-	-	-	-	-
N123.9.1476 $\mathrm{A1}^- \oplus \mathrm{M2}^- \oplus \mathrm{Z3}^-$	$\times$	-	-	-	-	-
N123.9.1477 $\mathrm{A1}^- \oplus \mathrm{M3}^- \oplus \mathrm{Z1}^+$	$\times$	-	-	-	-	-
N123.9.1478 $\mathrm{A1}^- \oplus \mathrm{M3}^- \oplus \mathrm{Z3}^-$	$\times$	-	-	-	-	-
N123.9.1479 $\mathrm{A1}^- \oplus \mathrm{M2}^- \oplus \mathrm{Z1}^-$	$\times$	-	-	-	-	-
N123.9.1480 $\mathrm{A1}^- \oplus \mathrm{M2}^- \oplus \mathrm{Z3}^+$	$\times$	-	-	-	-	-
N123.9.1481 $\mathrm{A1}^- \oplus \mathrm{M3}^- \oplus \mathrm{Z1}^-$	$\times$	-	-	-	-	-
N123.9.1482 $\mathrm{A1}^- \oplus \mathrm{M3}^- \oplus \mathrm{Z3}^+$	$\times$	-	-	-	-	-
N123.9.1483 $\mathrm{A1}^- \oplus \mathrm{M2}^- \oplus \mathrm{Z2}^+$	$\times$	-	-	-	-	-
N123.9.1484 $\mathrm{A1}^- \oplus \mathrm{M2}^- \oplus \mathrm{Z4}^-$	$\times$	-	-	-	-	-
N123.9.1485 $\mathrm{A1}^- \oplus \mathrm{M3}^- \oplus \mathrm{Z2}^+$	$\times$	-	-	-	-	-
N123.9.1486 $\mathrm{A1}^- \oplus \mathrm{M3}^- \oplus \mathrm{Z4}^-$	$\times$	-	-	-	-	-
N123.9.1487 $\mathrm{A1}^- \oplus \mathrm{M2}^- \oplus \mathrm{Z2}^-$	$\times$	-	-	-	-	-
N123.9.1488 $\mathrm{A1}^- \oplus \mathrm{M2}^- \oplus \mathrm{Z4}^+$	$\times$	-	-	-	-	-
N123.9.1489 $\mathrm{A1}^- \oplus \mathrm{M3}^- \oplus \mathrm{Z2}^-$	$\times$	-	-	-	-	-
N123.9.1490 $\mathrm{A1}^- \oplus \mathrm{M3}^- \oplus \mathrm{Z4}^+$	$\times$	-	-	-	-	-
N123.9.1491 $\mathrm{A1}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N123.9.1492 $\mathrm{A1}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.9.1493 $\mathrm{A1}^- \oplus \mathrm{Z3}^- \oplus \mathrm{Z3}^-$	$\surd$	1	0	$\times$	-	-
N123.9.1494 $\mathrm{A1}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
N123.9.1495 $\mathrm{A1}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N123.9.1496 $\mathrm{A1}^- \oplus \mathrm{Z3}^- \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N123.9.1497 $\mathrm{A1}^- \oplus \mathrm{Z3}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
N123.9.1498 $\mathrm{A1}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N123.9.1499 $\mathrm{A1}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_u}$
N123.9.1500 $\mathrm{A1}^- \oplus \mathrm{Z3}^- \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_u}$
N123.9.1501 $\mathrm{A1}^- \oplus \mathrm{Z3}^- \oplus \mathrm{Z4}^-$	$\surd$	1	0	$\times$	-	-
N123.9.1502 $\mathrm{A1}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\times$	-	-
N123.9.1503 $\mathrm{A1}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N123.9.1504 $\mathrm{A1}^- \oplus \mathrm{Z3}^- \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-
N123.9.1505 $\mathrm{A1}^- \oplus \mathrm{Z3}^- \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\times$	-	-
N123.9.1506 $\mathrm{A1}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $P4/mmm$ (No. 123) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N123.9.1507 $\mathrm{A1}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.9.1508 $\mathrm{A1}^- \oplus \mathrm{Z3}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N123.9.1509 $\mathrm{A1}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\times$	-	-
N123.9.1510 $\mathrm{A1}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z4}^-$	$\surd$	1	0	$\times$	-	-
N123.9.1511 $\mathrm{A1}^- \oplus \mathrm{Z3}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N123.9.1512 $\mathrm{A1}^- \oplus \mathrm{Z3}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\times$	-	-
N123.9.1513 $\mathrm{A1}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-
N123.9.1514 $\mathrm{A1}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_u}$
N123.9.1515 $\mathrm{A1}^- \oplus \mathrm{Z3}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_u}$
N123.9.1516 $\mathrm{A1}^- \oplus \mathrm{Z3}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N123.9.1517 $\mathrm{A1}^- \oplus \mathrm{Z2}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N123.9.1518 $\mathrm{A1}^- \oplus \mathrm{Z2}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.9.1519 $\mathrm{A1}^- \oplus \mathrm{Z4}^- \oplus \mathrm{Z4}^-$	$\surd$	1	0	$\times$	-	-
N123.9.1520 $\mathrm{A1}^- \oplus \mathrm{Z2}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\times$	-	-
N123.9.1521 $\mathrm{A1}^- \oplus \mathrm{Z2}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N123.9.1522 $\mathrm{A1}^- \oplus \mathrm{Z4}^- \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-
N123.9.1523 $\mathrm{A1}^- \oplus \mathrm{Z4}^- \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\times$	-	-
N123.9.1524 $\mathrm{A1}^- \oplus \mathrm{Z2}^- \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-
N123.9.1525 $\mathrm{A1}^- \oplus \mathrm{Z2}^- \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.9.1526 $\mathrm{A1}^- \oplus \mathrm{Z4}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N123.9.1527 $\mathrm{M1}^+ \oplus \mathrm{M1}^+ \oplus \mathrm{M1}^+$	$\surd$	0	0	$\surd$	-	-
N123.9.1528 $\mathrm{M1}^+ \oplus \mathrm{M1}^+ \oplus \mathrm{M4}^+$	$\surd$	0	0	$\surd$	-	-
N123.9.1529 $\mathrm{M1}^+ \oplus \mathrm{M1}^+ \oplus \mathrm{M1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u}$
N123.9.1530 $\mathrm{M1}^+ \oplus \mathrm{M1}^+ \oplus \mathrm{M4}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_u} \oplus \mathrm{B2_u}$
N123.9.1531 $\mathrm{M1}^+ \oplus \mathrm{M4}^+ \oplus \mathrm{M1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_u}$
N123.9.1532 $\mathrm{M1}^+ \oplus \mathrm{M1}^+ \oplus \mathrm{M2}^+$	$\surd$	0	0	$\surd$	-	-
N123.9.1533 $\mathrm{M1}^+ \oplus \mathrm{M1}^+ \oplus \mathrm{M3}^+$	$\surd$	0	0	$\surd$	-	-
N123.9.1534 $\mathrm{M1}^+ \oplus \mathrm{M4}^+ \oplus \mathrm{M2}^+$	$\surd$	0	0	$\surd$	-	-
N123.9.1535 $\mathrm{M1}^+ \oplus \mathrm{M1}^+ \oplus \mathrm{M2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N123.9.1536 $\mathrm{M1}^+ \oplus \mathrm{M1}^+ \oplus \mathrm{M3}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u}$
N123.9.1537 $\mathrm{M1}^+ \oplus \mathrm{M4}^+ \oplus \mathrm{M2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_u}$
N123.9.1538 $\mathrm{M1}^+ \oplus \mathrm{M1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N123.9.1539 $\mathrm{M1}^+ \oplus \mathrm{M4}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N123.9.1540 $\mathrm{M1}^+ \oplus \mathrm{M1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N123.9.1541 $\mathrm{M1}^+ \oplus \mathrm{M4}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N123.9.1542 $\mathrm{M1}^+ \oplus \mathrm{M1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N123.9.1543 $\mathrm{M1}^+ \oplus \mathrm{M4}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N123.9.1544 $\mathrm{M1}^+ \oplus \mathrm{M1}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-
N123.9.1545 $\mathrm{M1}^+ \oplus \mathrm{M4}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-
N123.9.1546 $\mathrm{M1}^+ \oplus \mathrm{M1}^- \oplus \mathrm{M1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u}$
N123.9.1547 $\mathrm{M1}^+ \oplus \mathrm{M1}^- \oplus \mathrm{M4}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_u}$
N123.9.1548 $\mathrm{M1}^+ \oplus \mathrm{M4}^- \oplus \mathrm{M4}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_u} \oplus \mathrm{B2_u}$
N123.9.1549 $\mathrm{M1}^+ \oplus \mathrm{M1}^- \oplus \mathrm{M2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u}$
N123.9.1550 $\mathrm{M1}^+ \oplus \mathrm{M1}^- \oplus \mathrm{M3}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u}$
N123.9.1551 $\mathrm{M1}^+ \oplus \mathrm{M4}^- \oplus \mathrm{M2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_u}$
N123.9.1552 $\mathrm{M1}^+ \oplus \mathrm{M4}^- \oplus \mathrm{M3}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_u}$

Non-coplanar SSGs with parent space group $P4/mmm$ (No. 123) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N123.9.1553 $\mathrm{M1}^+ \oplus \mathrm{M1}^- \oplus \mathrm{M2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u}$
N123.9.1554 $\mathrm{M1}^+ \oplus \mathrm{M1}^- \oplus \mathrm{M3}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u}$
N123.9.1555 $\mathrm{M1}^+ \oplus \mathrm{M4}^- \oplus \mathrm{M2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N123.9.1556 $\mathrm{M1}^+ \oplus \mathrm{M4}^- \oplus \mathrm{M3}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_u}$
N123.9.1557 $\mathrm{M1}^+ \oplus \mathrm{M1}^- \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\times$	-	-
N123.9.1558 $\mathrm{M1}^+ \oplus \mathrm{M4}^- \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\times$	-	-
N123.9.1559 $\mathrm{M1}^+ \oplus \mathrm{M1}^- \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
N123.9.1560 $\mathrm{M1}^+ \oplus \mathrm{M4}^- \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
N123.9.1561 $\mathrm{M1}^+ \oplus \mathrm{M1}^- \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\times$	-	-
N123.9.1562 $\mathrm{M1}^+ \oplus \mathrm{M4}^- \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\times$	-	-
N123.9.1563 $\mathrm{M1}^+ \oplus \mathrm{M1}^- \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\times$	-	-
N123.9.1564 $\mathrm{M1}^+ \oplus \mathrm{M4}^- \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\times$	-	-
N123.9.1565 $\mathrm{M1}^+ \oplus \mathrm{M2}^+ \oplus \mathrm{M2}^+$	$\surd$	0	0	$\surd$	-	-
N123.9.1566 $\mathrm{M1}^+ \oplus \mathrm{M2}^+ \oplus \mathrm{M3}^+$	$\surd$	0	0	$\surd$	-	-
N123.9.1567 $\mathrm{M1}^+ \oplus \mathrm{M3}^+ \oplus \mathrm{M3}^+$	$\surd$	0	0	$\surd$	-	-
N123.9.1568 $\mathrm{M1}^+ \oplus \mathrm{M2}^+ \oplus \mathrm{M2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u}$
N123.9.1569 $\mathrm{M1}^+ \oplus \mathrm{M2}^+ \oplus \mathrm{M3}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_u}$
N123.9.1570 $\mathrm{M1}^+ \oplus \mathrm{M3}^+ \oplus \mathrm{M2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N123.9.1571 $\mathrm{M1}^+ \oplus \mathrm{M3}^+ \oplus \mathrm{M3}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u}$
N123.9.1572 $\mathrm{M1}^+ \oplus \mathrm{M2}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N123.9.1573 $\mathrm{M1}^+ \oplus \mathrm{M3}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N123.9.1574 $\mathrm{M1}^+ \oplus \mathrm{M2}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N123.9.1575 $\mathrm{M1}^+ \oplus \mathrm{M3}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N123.9.1576 $\mathrm{M1}^+ \oplus \mathrm{M2}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N123.9.1577 $\mathrm{M1}^+ \oplus \mathrm{M3}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N123.9.1578 $\mathrm{M1}^+ \oplus \mathrm{M2}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-
N123.9.1579 $\mathrm{M1}^+ \oplus \mathrm{M3}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-
N123.9.1580 $\mathrm{M1}^+ \oplus \mathrm{M2}^- \oplus \mathrm{M2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N123.9.1581 $\mathrm{M1}^+ \oplus \mathrm{M2}^- \oplus \mathrm{M3}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_u}$
N123.9.1582 $\mathrm{M1}^+ \oplus \mathrm{M3}^- \oplus \mathrm{M3}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u}$
N123.9.1583 $\mathrm{M1}^+ \oplus \mathrm{M2}^- \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\times$	-	-
N123.9.1584 $\mathrm{M1}^+ \oplus \mathrm{M3}^- \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\times$	-	-
N123.9.1585 $\mathrm{M1}^+ \oplus \mathrm{M2}^- \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
N123.9.1586 $\mathrm{M1}^+ \oplus \mathrm{M3}^- \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
N123.9.1587 $\mathrm{M1}^+ \oplus \mathrm{M2}^- \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\times$	-	-
N123.9.1588 $\mathrm{M1}^+ \oplus \mathrm{M3}^- \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\times$	-	-
N123.9.1589 $\mathrm{M1}^+ \oplus \mathrm{M2}^- \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\times$	-	-
N123.9.1590 $\mathrm{M1}^+ \oplus \mathrm{M3}^- \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\times$	-	-
N123.9.1591 $\mathrm{M1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N123.9.1592 $\mathrm{M1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.9.1593 $\mathrm{M1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
N123.9.1594 $\mathrm{M1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N123.9.1595 $\mathrm{M1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N123.9.1596 $\mathrm{M1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\times$	-	-
N123.9.1597 $\mathrm{M1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\times$	-	-
N123.9.1598 $\mathrm{M1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $P4/mmm$ (No. 123) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N123.9.1599 $\mathrm{M1}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N123.9.1600 $\mathrm{M1}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.9.1601 $\mathrm{M1}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\times$	-	-
N123.9.1602 $\mathrm{M1}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z4}^-$	$\surd$	1	0	$\times$	-	-
N123.9.1603 $\mathrm{M1}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-
N123.9.1604 $\mathrm{M1}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\times$	-	-
N123.9.1605 $\mathrm{M1}^+ \oplus \mathrm{Z2}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N123.9.1606 $\mathrm{M1}^+ \oplus \mathrm{Z2}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.9.1607 $\mathrm{M1}^+ \oplus \mathrm{Z2}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\times$	-	-
N123.9.1608 $\mathrm{M1}^+ \oplus \mathrm{Z2}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N123.9.1609 $\mathrm{M1}^+ \oplus \mathrm{Z2}^- \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-
N123.9.1610 $\mathrm{M1}^+ \oplus \mathrm{Z2}^- \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.9.1611 $\mathrm{M1}^- \oplus \mathrm{M1}^- \oplus \mathrm{M1}^-$	$\surd$	0	0	$\surd$	-	-
N123.9.1612 $\mathrm{M1}^- \oplus \mathrm{M1}^- \oplus \mathrm{M4}^-$	$\surd$	0	0	$\surd$	-	-
N123.9.1613 $\mathrm{M1}^- \oplus \mathrm{M1}^- \oplus \mathrm{M2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N123.9.1614 $\mathrm{M1}^- \oplus \mathrm{M1}^- \oplus \mathrm{M3}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u}$
N123.9.1615 $\mathrm{M1}^- \oplus \mathrm{M4}^- \oplus \mathrm{M2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_u}$
N123.9.1616 $\mathrm{M1}^- \oplus \mathrm{M1}^- \oplus \mathrm{M2}^-$	$\surd$	0	0	$\surd$	-	-
N123.9.1617 $\mathrm{M1}^- \oplus \mathrm{M1}^- \oplus \mathrm{M3}^-$	$\surd$	0	0	$\surd$	-	-
N123.9.1618 $\mathrm{M1}^- \oplus \mathrm{M4}^- \oplus \mathrm{M2}^-$	$\surd$	0	0	$\surd$	-	-
N123.9.1619 $\mathrm{M1}^- \oplus \mathrm{M1}^- \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N123.9.1620 $\mathrm{M1}^- \oplus \mathrm{M4}^- \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N123.9.1621 $\mathrm{M1}^- \oplus \mathrm{M1}^- \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N123.9.1622 $\mathrm{M1}^- \oplus \mathrm{M4}^- \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N123.9.1623 $\mathrm{M1}^- \oplus \mathrm{M1}^- \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N123.9.1624 $\mathrm{M1}^- \oplus \mathrm{M4}^- \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N123.9.1625 $\mathrm{M1}^- \oplus \mathrm{M1}^- \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-
N123.9.1626 $\mathrm{M1}^- \oplus \mathrm{M4}^- \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-
N123.9.1627 $\mathrm{M1}^- \oplus \mathrm{M2}^+ \oplus \mathrm{M2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N123.9.1628 $\mathrm{M1}^- \oplus \mathrm{M2}^+ \oplus \mathrm{M3}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_u}$
N123.9.1629 $\mathrm{M1}^- \oplus \mathrm{M3}^+ \oplus \mathrm{M3}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u}$
N123.9.1630 $\mathrm{M1}^- \oplus \mathrm{M2}^+ \oplus \mathrm{M2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u}$
N123.9.1631 $\mathrm{M1}^- \oplus \mathrm{M2}^+ \oplus \mathrm{M3}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N123.9.1632 $\mathrm{M1}^- \oplus \mathrm{M3}^+ \oplus \mathrm{M2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_u}$
N123.9.1633 $\mathrm{M1}^- \oplus \mathrm{M3}^+ \oplus \mathrm{M3}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u}$
N123.9.1634 $\mathrm{M1}^- \oplus \mathrm{M2}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\times$	-	-
N123.9.1635 $\mathrm{M1}^- \oplus \mathrm{M3}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\times$	-	-
N123.9.1636 $\mathrm{M1}^- \oplus \mathrm{M2}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
N123.9.1637 $\mathrm{M1}^- \oplus \mathrm{M3}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
N123.9.1638 $\mathrm{M1}^- \oplus \mathrm{M2}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\times$	-	-
N123.9.1639 $\mathrm{M1}^- \oplus \mathrm{M3}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\times$	-	-
N123.9.1640 $\mathrm{M1}^- \oplus \mathrm{M2}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\times$	-	-
N123.9.1641 $\mathrm{M1}^- \oplus \mathrm{M3}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\times$	-	-
N123.9.1642 $\mathrm{M1}^- \oplus \mathrm{M2}^- \oplus \mathrm{M2}^-$	$\surd$	0	0	$\surd$	-	-
N123.9.1643 $\mathrm{M1}^- \oplus \mathrm{M2}^- \oplus \mathrm{M3}^-$	$\surd$	0	0	$\surd$	-	-
N123.9.1644 $\mathrm{M1}^- \oplus \mathrm{M3}^- \oplus \mathrm{M3}^-$	$\surd$	0	0	$\surd$	-	-

Non-coplanar SSGs with parent space group $P4/mmm$ (No. 123) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N123.9.1645 $\mathrm{M1}^- \oplus \mathrm{M2}^- \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N123.9.1646 $\mathrm{M1}^- \oplus \mathrm{M3}^- \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N123.9.1647 $\mathrm{M1}^- \oplus \mathrm{M2}^- \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N123.9.1648 $\mathrm{M1}^- \oplus \mathrm{M3}^- \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N123.9.1649 $\mathrm{M1}^- \oplus \mathrm{M2}^- \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N123.9.1650 $\mathrm{M1}^- \oplus \mathrm{M3}^- \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N123.9.1651 $\mathrm{M1}^- \oplus \mathrm{M2}^- \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-
N123.9.1652 $\mathrm{M1}^- \oplus \mathrm{M3}^- \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-
N123.9.1653 $\mathrm{M1}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N123.9.1654 $\mathrm{M1}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.9.1655 $\mathrm{M1}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
N123.9.1656 $\mathrm{M1}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N123.9.1657 $\mathrm{M1}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N123.9.1658 $\mathrm{M1}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\times$	-	-
N123.9.1659 $\mathrm{M1}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\times$	-	-
N123.9.1660 $\mathrm{M1}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N123.9.1661 $\mathrm{M1}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N123.9.1662 $\mathrm{M1}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.9.1663 $\mathrm{M1}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\times$	-	-
N123.9.1664 $\mathrm{M1}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z4}^-$	$\surd$	1	0	$\times$	-	-
N123.9.1665 $\mathrm{M1}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-
N123.9.1666 $\mathrm{M1}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\times$	-	-
N123.9.1667 $\mathrm{M1}^- \oplus \mathrm{Z2}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N123.9.1668 $\mathrm{M1}^- \oplus \mathrm{Z2}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.9.1669 $\mathrm{M1}^- \oplus \mathrm{Z2}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\times$	-	-
N123.9.1670 $\mathrm{M1}^- \oplus \mathrm{Z2}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N123.9.1671 $\mathrm{M1}^- \oplus \mathrm{Z2}^- \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-
N123.9.1672 $\mathrm{M1}^- \oplus \mathrm{Z2}^- \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.9.1673 $\mathrm{M2}^+ \oplus \mathrm{M2}^+ \oplus \mathrm{M2}^+$	$\surd$	0	0	$\surd$	-	-
N123.9.1674 $\mathrm{M2}^+ \oplus \mathrm{M2}^+ \oplus \mathrm{M3}^+$	$\surd$	0	0	$\surd$	-	-
N123.9.1675 $\mathrm{M2}^+ \oplus \mathrm{M2}^+ \oplus \mathrm{M2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u}$
N123.9.1676 $\mathrm{M2}^+ \oplus \mathrm{M2}^+ \oplus \mathrm{M3}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_u} \oplus \mathrm{B2_u}$
N123.9.1677 $\mathrm{M2}^+ \oplus \mathrm{M3}^+ \oplus \mathrm{M2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_u}$
N123.9.1678 $\mathrm{M2}^+ \oplus \mathrm{M2}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N123.9.1679 $\mathrm{M2}^+ \oplus \mathrm{M3}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N123.9.1680 $\mathrm{M2}^+ \oplus \mathrm{M2}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N123.9.1681 $\mathrm{M2}^+ \oplus \mathrm{M3}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N123.9.1682 $\mathrm{M2}^+ \oplus \mathrm{M2}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N123.9.1683 $\mathrm{M2}^+ \oplus \mathrm{M3}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N123.9.1684 $\mathrm{M2}^+ \oplus \mathrm{M2}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-
N123.9.1685 $\mathrm{M2}^+ \oplus \mathrm{M3}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-
N123.9.1686 $\mathrm{M2}^+ \oplus \mathrm{M2}^- \oplus \mathrm{M2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u}$
N123.9.1687 $\mathrm{M2}^+ \oplus \mathrm{M2}^- \oplus \mathrm{M3}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_u}$
N123.9.1688 $\mathrm{M2}^+ \oplus \mathrm{M3}^- \oplus \mathrm{M3}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_u} \oplus \mathrm{B2_u}$
N123.9.1689 $\mathrm{M2}^+ \oplus \mathrm{M2}^- \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\times$	-	-
N123.9.1690 $\mathrm{M2}^+ \oplus \mathrm{M3}^- \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $P4/mmm$ (No. 123) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N123.9.1691 $\mathrm{M2^+}\oplus\mathrm{M2^-}\oplus\mathrm{Z1^-}$	$\surd$	1	1	$\times$	-	-
N123.9.1692 $\mathrm{M2^+}\oplus\mathrm{M3^-}\oplus\mathrm{Z1^-}$	$\surd$	1	1	$\times$	-	-
N123.9.1693 $\mathrm{M2^+}\oplus\mathrm{M2^-}\oplus\mathrm{Z2^+}$	$\surd$	1	1	$\times$	-	-
N123.9.1694 $\mathrm{M2^+}\oplus\mathrm{M3^-}\oplus\mathrm{Z2^+}$	$\surd$	1	1	$\times$	-	-
N123.9.1695 $\mathrm{M2^+}\oplus\mathrm{M2^-}\oplus\mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
N123.9.1696 $\mathrm{M2^+}\oplus\mathrm{M3^-}\oplus\mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
N123.9.1697 $\mathrm{M2^+}\oplus\mathrm{Z1^+}\oplus\mathrm{Z1^+}$	$\surd$	1	0	$\times$	-	-
N123.9.1698 $\mathrm{M2^+}\oplus\mathrm{Z1^+}\oplus\mathrm{Z3^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.9.1699 $\mathrm{M2^+}\oplus\mathrm{Z1^+}\oplus\mathrm{Z1^-}$	$\surd$	1	1	$\times$	-	-
N123.9.1700 $\mathrm{M2^+}\oplus\mathrm{Z1^+}\oplus\mathrm{Z3^+}$	$\surd$	1	0	$\times$	-	-
N123.9.1701 $\mathrm{M2^+}\oplus\mathrm{Z1^+}\oplus\mathrm{Z2^+}$	$\surd$	1	0	$\times$	-	-
N123.9.1702 $\mathrm{M2^+}\oplus\mathrm{Z1^+}\oplus\mathrm{Z4^-}$	$\surd$	1	1	$\times$	-	-
N123.9.1703 $\mathrm{M2^+}\oplus\mathrm{Z1^+}\oplus\mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
N123.9.1704 $\mathrm{M2^+}\oplus\mathrm{Z1^+}\oplus\mathrm{Z4^+}$	$\surd$	1	0	$\times$	-	-
N123.9.1705 $\mathrm{M2^+}\oplus\mathrm{Z1^-}\oplus\mathrm{Z1^-}$	$\surd$	1	0	$\times$	-	-
N123.9.1706 $\mathrm{M2^+}\oplus\mathrm{Z1^-}\oplus\mathrm{Z3^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.9.1707 $\mathrm{M2^+}\oplus\mathrm{Z1^-}\oplus\mathrm{Z2^+}$	$\surd$	1	1	$\times$	-	-
N123.9.1708 $\mathrm{M2^+}\oplus\mathrm{Z1^-}\oplus\mathrm{Z4^-}$	$\surd$	1	0	$\times$	-	-
N123.9.1709 $\mathrm{M2^+}\oplus\mathrm{Z1^-}\oplus\mathrm{Z2^-}$	$\surd$	1	0	$\times$	-	-
N123.9.1710 $\mathrm{M2^+}\oplus\mathrm{Z1^-}\oplus\mathrm{Z4^+}$	$\surd$	1	1	$\times$	-	-
N123.9.1711 $\mathrm{M2^+}\oplus\mathrm{Z2^+}\oplus\mathrm{Z2^+}$	$\surd$	1	0	$\times$	-	-
N123.9.1712 $\mathrm{M2^+}\oplus\mathrm{Z2^+}\oplus\mathrm{Z4^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.9.1713 $\mathrm{M2^+}\oplus\mathrm{Z2^+}\oplus\mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
N123.9.1714 $\mathrm{M2^+}\oplus\mathrm{Z2^+}\oplus\mathrm{Z4^+}$	$\surd$	1	0	$\times$	-	-
N123.9.1715 $\mathrm{M2^+}\oplus\mathrm{Z2^-}\oplus\mathrm{Z2^-}$	$\surd$	1	0	$\times$	-	-
N123.9.1716 $\mathrm{M2^+}\oplus\mathrm{Z2^-}\oplus\mathrm{Z4^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.9.1717 $\mathrm{M2^-}\oplus\mathrm{M2^-}\oplus\mathrm{M2^-}$	$\surd$	0	0	$\surd$	-	-
N123.9.1718 $\mathrm{M2^-}\oplus\mathrm{M2^-}\oplus\mathrm{M3^-}$	$\surd$	0	0	$\surd$	-	-
N123.9.1719 $\mathrm{M2^-}\oplus\mathrm{M2^-}\oplus\mathrm{Z1^+}$	$\surd$	1	0	$\times$	-	-
N123.9.1720 $\mathrm{M2^-}\oplus\mathrm{M3^-}\oplus\mathrm{Z1^+}$	$\surd$	1	0	$\times$	-	-
N123.9.1721 $\mathrm{M2^-}\oplus\mathrm{M2^-}\oplus\mathrm{Z1^-}$	$\surd$	1	0	$\times$	-	-
N123.9.1722 $\mathrm{M2^-}\oplus\mathrm{M3^-}\oplus\mathrm{Z1^-}$	$\surd$	1	0	$\times$	-	-
N123.9.1723 $\mathrm{M2^-}\oplus\mathrm{M2^-}\oplus\mathrm{Z2^+}$	$\surd$	1	0	$\times$	-	-
N123.9.1724 $\mathrm{M2^-}\oplus\mathrm{M3^-}\oplus\mathrm{Z2^+}$	$\surd$	1	0	$\times$	-	-
N123.9.1725 $\mathrm{M2^-}\oplus\mathrm{M2^-}\oplus\mathrm{Z2^-}$	$\surd$	1	0	$\times$	-	-
N123.9.1726 $\mathrm{M2^-}\oplus\mathrm{M3^-}\oplus\mathrm{Z2^-}$	$\surd$	1	0	$\times$	-	-
N123.9.1727 $\mathrm{M2^-}\oplus\mathrm{Z1^+}\oplus\mathrm{Z1^+}$	$\surd$	1	0	$\times$	-	-
N123.9.1728 $\mathrm{M2^-}\oplus\mathrm{Z1^+}\oplus\mathrm{Z3^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.9.1729 $\mathrm{M2^-}\oplus\mathrm{Z1^+}\oplus\mathrm{Z1^-}$	$\surd$	1	1	$\times$	-	-
N123.9.1730 $\mathrm{M2^-}\oplus\mathrm{Z1^+}\oplus\mathrm{Z3^+}$	$\surd$	1	0	$\times$	-	-
N123.9.1731 $\mathrm{M2^-}\oplus\mathrm{Z1^+}\oplus\mathrm{Z2^+}$	$\surd$	1	0	$\times$	-	-
N123.9.1732 $\mathrm{M2^-}\oplus\mathrm{Z1^+}\oplus\mathrm{Z4^-}$	$\surd$	1	1	$\times$	-	-
N123.9.1733 $\mathrm{M2^-}\oplus\mathrm{Z1^+}\oplus\mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
N123.9.1734 $\mathrm{M2^-}\oplus\mathrm{Z1^+}\oplus\mathrm{Z4^+}$	$\surd$	1	0	$\times$	-	-
N123.9.1735 $\mathrm{M2^-}\oplus\mathrm{Z1^-}\oplus\mathrm{Z1^-}$	$\surd$	1	0	$\times$	-	-
N123.9.1736 $\mathrm{M2^-}\oplus\mathrm{Z1^-}\oplus\mathrm{Z3^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$

Non-coplanar SSGs with parent space group $P4/mmm$ (No. 123) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N123.9.1737 $\mathrm{M2^-}\oplus\mathrm{Z1^-}\oplus\mathrm{Z2^+}$	$\surd$	1	1	$\times$	-	-
N123.9.1738 $\mathrm{M2^-}\oplus\mathrm{Z1^-}\oplus\mathrm{Z4^-}$	$\surd$	1	0	$\times$	-	-
N123.9.1739 $\mathrm{M2^-}\oplus\mathrm{Z1^-}\oplus\mathrm{Z2^-}$	$\surd$	1	0	$\times$	-	-
N123.9.1740 $\mathrm{M2^-}\oplus\mathrm{Z1^-}\oplus\mathrm{Z4^+}$	$\surd$	1	1	$\times$	-	-
N123.9.1741 $\mathrm{M2^-}\oplus\mathrm{Z2^+}\oplus\mathrm{Z2^+}$	$\surd$	1	0	$\times$	-	-
N123.9.1742 $\mathrm{M2^-}\oplus\mathrm{Z2^+}\oplus\mathrm{Z4^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.9.1743 $\mathrm{M2^-}\oplus\mathrm{Z2^+}\oplus\mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
N123.9.1744 $\mathrm{M2^-}\oplus\mathrm{Z2^+}\oplus\mathrm{Z4^+}$	$\surd$	1	0	$\times$	-	-
N123.9.1745 $\mathrm{M2^-}\oplus\mathrm{Z2^-}\oplus\mathrm{Z2^-}$	$\surd$	1	0	$\times$	-	-
N123.9.1746 $\mathrm{M2^-}\oplus\mathrm{Z2^-}\oplus\mathrm{Z4^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.9.1747 $\mathrm{Z1^+}\oplus\mathrm{Z1^+}\oplus\mathrm{Z1^+}$	$\surd$	0	0	$\surd$	-	-
N123.9.1748 $\mathrm{Z1^+}\oplus\mathrm{Z1^+}\oplus\mathrm{Z3^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u}\oplus\mathrm{A2_u}$
N123.9.1749 $\mathrm{Z1^+}\oplus\mathrm{Z1^+}\oplus\mathrm{Z1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A1_u}$
N123.9.1750 $\mathrm{Z1^+}\oplus\mathrm{Z1^+}\oplus\mathrm{Z3^+}$	$\surd$	0	0	$\surd$	-	-
N123.9.1751 $\mathrm{Z1^+}\oplus\mathrm{Z3^-}\oplus\mathrm{Z1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A2_u}$
N123.9.1752 $\mathrm{Z1^+}\oplus\mathrm{Z1^+}\oplus\mathrm{Z2^+}$	$\surd$	0	0	$\surd$	-	-
N123.9.1753 $\mathrm{Z1^+}\oplus\mathrm{Z1^+}\oplus\mathrm{Z4^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_u}\oplus\mathrm{B2_u}$
N123.9.1754 $\mathrm{Z1^+}\oplus\mathrm{Z3^-}\oplus\mathrm{Z2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u}\oplus\mathrm{B2_u}$
N123.9.1755 $\mathrm{Z1^+}\oplus\mathrm{Z1^+}\oplus\mathrm{Z2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{B1_u}$
N123.9.1756 $\mathrm{Z1^+}\oplus\mathrm{Z1^+}\oplus\mathrm{Z4^+}$	$\surd$	0	0	$\surd$	-	-
N123.9.1757 $\mathrm{Z1^+}\oplus\mathrm{Z3^-}\oplus\mathrm{Z2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{A2_u}$
N123.9.1758 $\mathrm{Z1^+}\oplus\mathrm{Z1^-}\oplus\mathrm{Z1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A1_u}$
N123.9.1759 $\mathrm{Z1^+}\oplus\mathrm{Z1^-}\oplus\mathrm{Z3^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A2_u}$
N123.9.1760 $\mathrm{Z1^+}\oplus\mathrm{Z3^+}\oplus\mathrm{Z3^+}$	$\surd$	0	0	$\surd$	-	-
N123.9.1761 $\mathrm{Z1^+}\oplus\mathrm{Z1^-}\oplus\mathrm{Z2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B1_u}$
N123.9.1762 $\mathrm{Z1^+}\oplus\mathrm{Z1^-}\oplus\mathrm{Z4^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B2_u}$
N123.9.1763 $\mathrm{Z1^+}\oplus\mathrm{Z3^+}\oplus\mathrm{Z2^+}$	$\surd$	0	0	$\surd$	-	-
N123.9.1764 $\mathrm{Z1^+}\oplus\mathrm{Z3^+}\oplus\mathrm{Z4^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{B2_u}$
N123.9.1765 $\mathrm{Z1^+}\oplus\mathrm{Z1^-}\oplus\mathrm{Z2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B1_u}$
N123.9.1766 $\mathrm{Z1^+}\oplus\mathrm{Z1^-}\oplus\mathrm{Z4^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B2_u}$
N123.9.1767 $\mathrm{Z1^+}\oplus\mathrm{Z3^+}\oplus\mathrm{Z2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{B2_u}$
N123.9.1768 $\mathrm{Z1^+}\oplus\mathrm{Z3^+}\oplus\mathrm{Z4^+}$	$\surd$	0	0	$\surd$	-	-
N123.9.1769 $\mathrm{Z1^+}\oplus\mathrm{Z2^+}\oplus\mathrm{Z2^+}$	$\surd$	0	0	$\surd$	-	-
N123.9.1770 $\mathrm{Z1^+}\oplus\mathrm{Z2^+}\oplus\mathrm{Z4^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u}\oplus\mathrm{B2_u}$
N123.9.1771 $\mathrm{Z1^+}\oplus\mathrm{Z4^-}\oplus\mathrm{Z4^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_u}\oplus\mathrm{B2_u}$
N123.9.1772 $\mathrm{Z1^+}\oplus\mathrm{Z2^+}\oplus\mathrm{Z2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B1_u}$
N123.9.1773 $\mathrm{Z1^+}\oplus\mathrm{Z2^+}\oplus\mathrm{Z4^+}$	$\surd$	0	0	$\surd$	-	-
N123.9.1774 $\mathrm{Z1^+}\oplus\mathrm{Z4^-}\oplus\mathrm{Z2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{B2_u}$
N123.9.1775 $\mathrm{Z1^+}\oplus\mathrm{Z4^-}\oplus\mathrm{Z4^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B2_u}$
N123.9.1776 $\mathrm{Z1^+}\oplus\mathrm{Z2^-}\oplus\mathrm{Z2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{B1_u}$
N123.9.1777 $\mathrm{Z1^+}\oplus\mathrm{Z2^-}\oplus\mathrm{Z4^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{A2_u}$
N123.9.1778 $\mathrm{Z1^+}\oplus\mathrm{Z4^+}\oplus\mathrm{Z4^+}$	$\surd$	0	0	$\surd$	-	-
N123.9.1779 $\mathrm{Z1^-}\oplus\mathrm{Z1^-}\oplus\mathrm{Z1^-}$	$\surd$	0	0	$\surd$	-	-
N123.9.1780 $\mathrm{Z1^-}\oplus\mathrm{Z1^-}\oplus\mathrm{Z3^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u}\oplus\mathrm{A2_u}$
N123.9.1781 $\mathrm{Z1^-}\oplus\mathrm{Z1^-}\oplus\mathrm{Z2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{B1_u}$
N123.9.1782 $\mathrm{Z1^-}\oplus\mathrm{Z1^-}\oplus\mathrm{Z4^-}$	$\surd$	0	0	$\surd$	-	-

Non-coplanar SSGs with parent space group $P4/mmm$ (No. 123) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N123.9.1783 $\mathrm{Z1^-}\oplus\mathrm{Z3^+}\oplus\mathrm{Z2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{A2_u}$
N123.9.1784 $\mathrm{Z1^-}\oplus\mathrm{Z1^-}\oplus\mathrm{Z2^-}$	$\surd$	0	0	$\surd$	-	-
N123.9.1785 $\mathrm{Z1^-}\oplus\mathrm{Z1^-}\oplus\mathrm{Z4^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_u}\oplus\mathrm{B2_u}$
N123.9.1786 $\mathrm{Z1^-}\oplus\mathrm{Z3^+}\oplus\mathrm{Z2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u}\oplus\mathrm{B2_u}$
N123.9.1787 $\mathrm{Z1^-}\oplus\mathrm{Z2^+}\oplus\mathrm{Z2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{B1_u}$
N123.9.1788 $\mathrm{Z1^-}\oplus\mathrm{Z2^+}\oplus\mathrm{Z4^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{A2_u}$
N123.9.1789 $\mathrm{Z1^-}\oplus\mathrm{Z4^-}\oplus\mathrm{Z4^-}$	$\surd$	0	0	$\surd$	-	-
N123.9.1790 $\mathrm{Z1^-}\oplus\mathrm{Z2^+}\oplus\mathrm{Z2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B1_u}$
N123.9.1791 $\mathrm{Z1^-}\oplus\mathrm{Z2^+}\oplus\mathrm{Z4^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{B2_u}$
N123.9.1792 $\mathrm{Z1^-}\oplus\mathrm{Z4^-}\oplus\mathrm{Z2^-}$	$\surd$	0	0	$\surd$	-	-
N123.9.1793 $\mathrm{Z1^-}\oplus\mathrm{Z4^-}\oplus\mathrm{Z4^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B2_u}$
N123.9.1794 $\mathrm{Z1^-}\oplus\mathrm{Z2^-}\oplus\mathrm{Z2^-}$	$\surd$	0	0	$\surd$	-	-
N123.9.1795 $\mathrm{Z1^-}\oplus\mathrm{Z2^-}\oplus\mathrm{Z4^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u}\oplus\mathrm{B2_u}$
N123.9.1796 $\mathrm{Z1^-}\oplus\mathrm{Z4^+}\oplus\mathrm{Z4^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_u}\oplus\mathrm{B2_u}$
N123.9.1797 $\mathrm{Z2^+}\oplus\mathrm{Z2^+}\oplus\mathrm{Z2^+}$	$\surd$	0	0	$\surd$	-	-
N123.9.1798 $\mathrm{Z2^+}\oplus\mathrm{Z2^+}\oplus\mathrm{Z4^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u}\oplus\mathrm{A2_u}$
N123.9.1799 $\mathrm{Z2^+}\oplus\mathrm{Z2^+}\oplus\mathrm{Z2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A1_u}$
N123.9.1800 $\mathrm{Z2^+}\oplus\mathrm{Z2^+}\oplus\mathrm{Z4^+}$	$\surd$	0	0	$\surd$	-	-
N123.9.1801 $\mathrm{Z2^+}\oplus\mathrm{Z4^-}\oplus\mathrm{Z2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A2_u}$
N123.9.1802 $\mathrm{Z2^+}\oplus\mathrm{Z2^-}\oplus\mathrm{Z2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A1_u}$
N123.9.1803 $\mathrm{Z2^+}\oplus\mathrm{Z2^-}\oplus\mathrm{Z4^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A2_u}$
N123.9.1804 $\mathrm{Z2^+}\oplus\mathrm{Z4^+}\oplus\mathrm{Z4^+}$	$\surd$	0	0	$\surd$	-	-
N123.9.1805 $\mathrm{Z2^-}\oplus\mathrm{Z2^-}\oplus\mathrm{Z2^-}$	$\surd$	0	0	$\surd$	-	-
N123.9.1806 $\mathrm{Z2^-}\oplus\mathrm{Z2^-}\oplus\mathrm{Z4^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u}\oplus\mathrm{A2_u}$
N123.12.1 $\mathrm{GM1^-}\oplus\mathrm{GM5^+}$	$\surd$	2	2	$\surd$	$4mm$	E
N123.12.2 $\mathrm{GM1^-}\oplus\mathrm{GM5^-}$	$\surd$	0	0	$\surd$	-	-
N123.12.3 $\mathrm{GM1^-}\oplus\mathrm{A5^+}$	$\surd$	1	0	$\times$	-	-
N123.12.4 $\mathrm{GM1^-}\oplus\mathrm{M5^+}$	$\surd$	1	0	$\times$	-	-
N123.12.5 $\mathrm{GM1^-}\oplus\mathrm{M5^-}$	$\surd$	1	0	$\times$	-	-
N123.12.6 $\mathrm{GM1^-}\oplus\mathrm{Z5^+}$	$\surd$	1	0	$\times$	-	-
N123.12.7 $\mathrm{GM2^+}\oplus\mathrm{GM5^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{E_g}$
N123.12.8 $\mathrm{GM2^+}\oplus\mathrm{GM5^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{E_u}$
N123.12.9 $\mathrm{GM2^+}\oplus\mathrm{A5^+}$	$\surd$	1	1	$\times$	-	-
N123.12.10 $\mathrm{GM2^+}\oplus\mathrm{M5^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N123.12.11 $\mathrm{GM2^+}\oplus\mathrm{M5^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N123.12.12 $\mathrm{GM2^+}\oplus\mathrm{Z5^+}$	$\surd$	1	1	$\times$	-	-
N123.12.13 $\mathrm{GM2^-}\oplus\mathrm{GM5^+}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	E
N123.12.14 $\mathrm{GM2^-}\oplus\mathrm{GM5^-}$	$\surd$	0	0	$\surd$	-	-
N123.12.15 $\mathrm{GM2^-}\oplus\mathrm{A5^+}$	$\surd$	1	0	$\times$	-	-
N123.12.16 $\mathrm{GM2^-}\oplus\mathrm{M5^+}$	$\surd$	1	0	$\times$	-	-
N123.12.17 $\mathrm{GM2^-}\oplus\mathrm{M5^-}$	$\surd$	1	0	$\times$	-	-
N123.12.18 $\mathrm{GM2^-}\oplus\mathrm{Z5^+}$	$\surd$	1	0	$\times$	-	-
N123.12.19 $\mathrm{GM3^+}\oplus\mathrm{GM5^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{E_g}$
N123.12.20 $\mathrm{GM3^+}\oplus\mathrm{GM5^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{E_u}$
N123.12.21 $\mathrm{GM3^+}\oplus\mathrm{A5^+}$	$\surd$	1	1	$\times$	-	-
N123.12.22 $\mathrm{GM3^+}\oplus\mathrm{M5^+}$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $P4/mmm$ (No. 123) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N123.12.23 $\mathrm{GM3^+} \oplus \mathrm{M5^-}$	√	1	1	×	-	-
N123.12.24 $\mathrm{GM3^+} \oplus \mathrm{Z5^+}$	√	1	1	×	-	-
N123.12.25 $\mathrm{GM3^-} \oplus \mathrm{GM5^+}$	√	2	2	√	422	E
N123.12.26 $\mathrm{GM3^-} \oplus \mathrm{GM5^-}$	√	0	0	√	-	-
N123.12.27 $\mathrm{GM3^-} \oplus \mathrm{A5^+}$	√	1	0	×	-	-
N123.12.28 $\mathrm{GM3^-} \oplus \mathrm{M5^+}$	√	1	0	×	-	-
N123.12.29 $\mathrm{GM3^-} \oplus \mathrm{M5^-}$	√	1	0	×	-	-
N123.12.30 $\mathrm{GM3^-} \oplus \mathrm{Z5^+}$	√	1	0	×	-	-
N123.12.31 $\mathrm{GM4^+} \oplus \mathrm{GM5^+}$	√	3	3	√	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{E_g}$
N123.12.32 $\mathrm{GM4^+} \oplus \mathrm{GM5^-}$	√	3	3	√	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{E_u}$
N123.12.33 $\mathrm{GM4^+} \oplus \mathrm{A5^+}$	√	1	1	×	-	-
N123.12.34 $\mathrm{GM4^+} \oplus \mathrm{M5^+}$	√	1	1	×	-	-
N123.12.35 $\mathrm{GM4^+} \oplus \mathrm{M5^-}$	√	1	1	×	-	-
N123.12.36 $\mathrm{GM4^+} \oplus \mathrm{Z5^+}$	√	1	1	×	-	-
N123.12.37 $\mathrm{GM4^-} \oplus \mathrm{GM5^+}$	√	2	2	√	$\bar{4}2m$	E
N123.12.38 $\mathrm{GM4^-} \oplus \mathrm{GM5^-}$	√	0	0	√	-	-
N123.12.39 $\mathrm{GM4^-} \oplus \mathrm{A5^+}$	√	1	0	×	-	-
N123.12.40 $\mathrm{GM4^-} \oplus \mathrm{M5^+}$	√	1	0	×	-	-
N123.12.41 $\mathrm{GM4^-} \oplus \mathrm{M5^-}$	√	1	0	×	-	-
N123.12.42 $\mathrm{GM4^-} \oplus \mathrm{Z5^+}$	√	1	0	×	-	-
N123.12.43 $\mathrm{A1^+} \oplus \mathrm{GM5^+}$	√	2	2	√	$4/mmm$	$\mathrm{E_g}$
N123.12.44 $\mathrm{A1^+} \oplus \mathrm{GM5^-}$	√	0	0	√	-	-
N123.12.45 $\mathrm{A1^+} \oplus \mathrm{A5^+}$	√	0	0	√	-	-
N123.12.46 $\mathrm{A1^+} \oplus \mathrm{A5^-}$	√	2	2	√	$4/mmm$	$\mathrm{E_u}$
N123.12.47 $\mathrm{A1^+} \oplus \mathrm{M5^+}$	√	1	0	×	-	-
N123.12.48 $\mathrm{A1^+} \oplus \mathrm{M5^-}$	√	1	0	×	-	-
N123.12.49 $\mathrm{A1^+} \oplus \mathrm{Z5^+}$	√	1	0	×	-	-
N123.12.50 $\mathrm{A1^+} \oplus \mathrm{Z5^-}$	√	1	0	×	-	-
N123.12.51 $\mathrm{A1^-} \oplus \mathrm{GM5^+}$	√	2	2	√	$4/mmm$	$\mathrm{E_g}$
N123.12.52 $\mathrm{A1^-} \oplus \mathrm{GM5^-}$	√	0	0	√	-	-
N123.12.53 $\mathrm{A1^-} \oplus \mathrm{A5^+}$	√	2	2	√	$4/mmm$	$\mathrm{E_u}$
N123.12.54 $\mathrm{A1^-} \oplus \mathrm{A5^-}$	√	0	0	√	-	-
N123.12.55 $\mathrm{A1^-} \oplus \mathrm{M5^+}$	√	1	0	×	-	-
N123.12.56 $\mathrm{A1^-} \oplus \mathrm{M5^-}$	√	1	0	×	-	-
N123.12.57 $\mathrm{A1^-} \oplus \mathrm{Z5^+}$	√	1	0	×	-	-
N123.12.58 $\mathrm{A1^-} \oplus \mathrm{Z5^-}$	√	1	0	×	-	-
N123.12.59 $\mathrm{M1^+} \oplus \mathrm{GM5^+}$	√	2	2	√	$4/mmm$	$\mathrm{E_g}$
N123.12.60 $\mathrm{M1^+} \oplus \mathrm{GM5^-}$	√	0	0	√	-	-
N123.12.61 $\mathrm{M1^+} \oplus \mathrm{A5^+}$	√	1	0	×	-	-
N123.12.62 $\mathrm{M1^+} \oplus \mathrm{M5^+}$	√	0	0	√	-	-
N123.12.63 $\mathrm{M1^+} \oplus \mathrm{M5^-}$	√	2	2	√	$4/mmm$	$\mathrm{E_u}$
N123.12.64 $\mathrm{M1^+} \oplus \mathrm{Z5^+}$	√	1	0	×	-	-
N123.12.65 $\mathrm{M1^-} \oplus \mathrm{GM5^+}$	√	2	2	√	$4/mmm$	$\mathrm{E_g}$
N123.12.66 $\mathrm{M1^-} \oplus \mathrm{GM5^-}$	√	0	0	√	-	-
N123.12.67 $\mathrm{M1^-} \oplus \mathrm{A5^+}$	√	1	0	×	-	-
N123.12.68 $\mathrm{M1^-} \oplus \mathrm{M5^+}$	√	2	2	√	$4/mmm$	$\mathrm{E_u}$

Non-coplanar SSGs with parent space group $P4/mmm$ (No. 123) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N123.12.69 $\mathrm{M1}^{-}\oplus\mathrm{M5}^{-}$	√	0	0	√	-	-
N123.12.70 $\mathrm{M1}^{-}\oplus\mathrm{Z5}^{+}$	√	1	0	×	-	-
N123.12.71 $\mathrm{M2}^{+}\oplus\mathrm{GM5}^{+}$	√	2	2	√	$4/mmm$	$\mathrm{E_g}$
N123.12.72 $\mathrm{M2}^{+}\oplus\mathrm{GM5}^{-}$	√	0	0	√	-	-
N123.12.73 $\mathrm{M2}^{+}\oplus\mathrm{A5}^{+}$	√	1	0	×	-	-
N123.12.74 $\mathrm{M2}^{+}\oplus\mathrm{M5}^{+}$	√	0	0	√	-	-
N123.12.75 $\mathrm{M2}^{+}\oplus\mathrm{M5}^{-}$	√	2	2	√	$4/mmm$	$\mathrm{E_u}$
N123.12.76 $\mathrm{M2}^{+}\oplus\mathrm{Z5}^{+}$	√	1	0	×	-	-
N123.12.77 $\mathrm{M2}^{-}\oplus\mathrm{GM5}^{+}$	√	2	2	√	$4/mmm$	$\mathrm{E_g}$
N123.12.78 $\mathrm{M2}^{-}\oplus\mathrm{GM5}^{-}$	√	0	0	√	-	-
N123.12.79 $\mathrm{M2}^{-}\oplus\mathrm{A5}^{+}$	√	1	0	×	-	-
N123.12.80 $\mathrm{M2}^{-}\oplus\mathrm{M5}^{+}$	√	2	2	√	$4/mmm$	$\mathrm{E_u}$
N123.12.81 $\mathrm{M2}^{-}\oplus\mathrm{M5}^{-}$	√	0	0	√	-	-
N123.12.82 $\mathrm{M2}^{-}\oplus\mathrm{Z5}^{+}$	√	1	0	×	-	-
N123.12.83 $\mathrm{Z1}^{+}\oplus\mathrm{GM5}^{+}$	√	2	2	√	$4/mmm$	$\mathrm{E_g}$
N123.12.84 $\mathrm{Z1}^{+}\oplus\mathrm{GM5}^{-}$	√	0	0	√	-	-
N123.12.85 $\mathrm{Z1}^{+}\oplus\mathrm{A5}^{+}$	√	1	0	×	-	-
N123.12.86 $\mathrm{Z1}^{+}\oplus\mathrm{A5}^{-}$	√	1	0	×	-	-
N123.12.87 $\mathrm{Z1}^{+}\oplus\mathrm{M5}^{+}$	√	1	0	×	-	-
N123.12.88 $\mathrm{Z1}^{+}\oplus\mathrm{M5}^{-}$	√	1	0	×	-	-
N123.12.89 $\mathrm{Z1}^{+}\oplus\mathrm{Z5}^{+}$	√	0	0	√	-	-
N123.12.90 $\mathrm{Z1}^{+}\oplus\mathrm{Z5}^{-}$	√	2	2	√	$4/mmm$	$\mathrm{E_u}$
N123.12.91 $\mathrm{Z1}^{-}\oplus\mathrm{GM5}^{+}$	√	2	2	√	$4/mmm$	$\mathrm{E_g}$
N123.12.92 $\mathrm{Z1}^{-}\oplus\mathrm{GM5}^{-}$	√	0	0	√	-	-
N123.12.93 $\mathrm{Z1}^{-}\oplus\mathrm{A5}^{+}$	√	1	0	×	-	-
N123.12.94 $\mathrm{Z1}^{-}\oplus\mathrm{A5}^{-}$	√	1	0	×	-	-
N123.12.95 $\mathrm{Z1}^{-}\oplus\mathrm{M5}^{+}$	√	1	0	×	-	-
N123.12.96 $\mathrm{Z1}^{-}\oplus\mathrm{M5}^{-}$	√	1	0	×	-	-
N123.12.97 $\mathrm{Z1}^{-}\oplus\mathrm{Z5}^{+}$	√	2	2	√	$4/mmm$	$\mathrm{E_u}$
N123.12.98 $\mathrm{Z1}^{-}\oplus\mathrm{Z5}^{-}$	√	0	0	√	-	-
N123.12.99 $\mathrm{Z2}^{+}\oplus\mathrm{GM5}^{+}$	√	2	2	√	$4/mmm$	$\mathrm{E_g}$
N123.12.100 $\mathrm{Z2}^{+}\oplus\mathrm{GM5}^{-}$	√	0	0	√	-	-
N123.12.101 $\mathrm{Z2}^{+}\oplus\mathrm{A5}^{+}$	√	1	0	×	-	-
N123.12.102 $\mathrm{Z2}^{+}\oplus\mathrm{A5}^{-}$	√	1	0	×	-	-
N123.12.103 $\mathrm{Z2}^{+}\oplus\mathrm{M5}^{+}$	√	1	0	×	-	-
N123.12.104 $\mathrm{Z2}^{+}\oplus\mathrm{M5}^{-}$	√	1	0	×	-	-
N123.12.105 $\mathrm{Z2}^{+}\oplus\mathrm{Z5}^{+}$	√	0	0	√	-	-
N123.12.106 $\mathrm{Z2}^{+}\oplus\mathrm{Z5}^{-}$	√	2	2	√	$4/mmm$	$\mathrm{E_u}$
N123.12.107 $\mathrm{Z2}^{-}\oplus\mathrm{GM5}^{+}$	√	2	2	√	$4/mmm$	$\mathrm{E_g}$
N123.12.108 $\mathrm{Z2}^{-}\oplus\mathrm{GM5}^{-}$	√	0	0	√	-	-
N123.12.109 $\mathrm{Z2}^{-}\oplus\mathrm{A5}^{+}$	√	1	0	×	-	-
N123.12.110 $\mathrm{Z2}^{-}\oplus\mathrm{A5}^{-}$	√	1	0	×	-	-
N123.12.111 $\mathrm{Z2}^{-}\oplus\mathrm{M5}^{+}$	√	1	0	×	-	-
N123.12.112 $\mathrm{Z2}^{-}\oplus\mathrm{M5}^{-}$	√	1	0	×	-	-
N123.12.113 $\mathrm{Z2}^{-}\oplus\mathrm{Z5}^{+}$	√	2	2	√	$4/mmm$	$\mathrm{E_u}$
N123.12.114 $\mathrm{Z2}^{-}\oplus\mathrm{Z5}^{-}$	√	0	0	√	-	-

Non-coplanar SSGs with parent space group $P4/mmm$ (No. 123) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N123.13.1 $\mathrm{GM1^-} \oplus \mathrm{R1^+}$	$\surd$	1	0	$\times$	-	-
N123.13.2 $\mathrm{GM1^-} \oplus \mathrm{R1^-}$	$\surd$	1	0	$\times$	-	-
N123.13.3 $\mathrm{GM1^-} \oplus \mathrm{X1^+}$	$\surd$	1	0	$\times$	-	-
N123.13.4 $\mathrm{GM1^-} \oplus \mathrm{X1^-}$	$\surd$	1	0	$\times$	-	-
N123.13.5 $\mathrm{GM1^-} \oplus \mathrm{X2^+}$	$\surd$	1	0	$\times$	-	-
N123.13.6 $\mathrm{GM1^-} \oplus \mathrm{X2^-}$	$\surd$	1	0	$\times$	-	-
N123.13.7 $\mathrm{GM2^+} \oplus \mathrm{R1^+}$	$\surd$	1	1	$\times$	-	-
N123.13.8 $\mathrm{GM2^+} \oplus \mathrm{R1^-}$	$\surd$	1	1	$\times$	-	-
N123.13.9 $\mathrm{GM2^+} \oplus \mathrm{X1^+}$	$\surd$	1	1	$\times$	-	-
N123.13.10 $\mathrm{GM2^+} \oplus \mathrm{X1^-}$	$\surd$	1	1	$\times$	-	-
N123.13.11 $\mathrm{GM2^+} \oplus \mathrm{X2^+}$	$\surd$	1	1	$\times$	-	-
N123.13.12 $\mathrm{GM2^+} \oplus \mathrm{X2^-}$	$\surd$	1	1	$\times$	-	-
N123.13.13 $\mathrm{GM2^-} \oplus \mathrm{R1^+}$	$\surd$	1	0	$\times$	-	-
N123.13.14 $\mathrm{GM2^-} \oplus \mathrm{R1^-}$	$\surd$	1	0	$\times$	-	-
N123.13.15 $\mathrm{GM2^-} \oplus \mathrm{X1^+}$	$\surd$	1	0	$\times$	-	-
N123.13.16 $\mathrm{GM2^-} \oplus \mathrm{X1^-}$	$\surd$	1	0	$\times$	-	-
N123.13.17 $\mathrm{GM2^-} \oplus \mathrm{X2^+}$	$\surd$	1	0	$\times$	-	-
N123.13.18 $\mathrm{GM2^-} \oplus \mathrm{X2^-}$	$\surd$	1	0	$\times$	-	-
N123.13.19 $\mathrm{GM3^+} \oplus \mathrm{R1^+}$	$\surd$	1	1	$\times$	-	-
N123.13.20 $\mathrm{GM3^+} \oplus \mathrm{R1^-}$	$\surd$	1	1	$\times$	-	-
N123.13.21 $\mathrm{GM3^+} \oplus \mathrm{X1^+}$	$\surd$	1	1	$\times$	-	-
N123.13.22 $\mathrm{GM3^+} \oplus \mathrm{X1^-}$	$\surd$	1	1	$\times$	-	-
N123.13.23 $\mathrm{GM3^+} \oplus \mathrm{X2^+}$	$\surd$	1	1	$\times$	-	-
N123.13.24 $\mathrm{GM3^+} \oplus \mathrm{X2^-}$	$\surd$	1	1	$\times$	-	-
N123.13.25 $\mathrm{GM3^-} \oplus \mathrm{R1^+}$	$\surd$	1	0	$\times$	-	-
N123.13.26 $\mathrm{GM3^-} \oplus \mathrm{R1^-}$	$\surd$	1	0	$\times$	-	-
N123.13.27 $\mathrm{GM3^-} \oplus \mathrm{X1^+}$	$\surd$	1	0	$\times$	-	-
N123.13.28 $\mathrm{GM3^-} \oplus \mathrm{X1^-}$	$\surd$	1	0	$\times$	-	-
N123.13.29 $\mathrm{GM3^-} \oplus \mathrm{X2^+}$	$\surd$	1	0	$\times$	-	-
N123.13.30 $\mathrm{GM3^-} \oplus \mathrm{X2^-}$	$\surd$	1	0	$\times$	-	-
N123.13.31 $\mathrm{GM4^+} \oplus \mathrm{R1^+}$	$\surd$	1	1	$\times$	-	-
N123.13.32 $\mathrm{GM4^+} \oplus \mathrm{R1^-}$	$\surd$	1	1	$\times$	-	-
N123.13.33 $\mathrm{GM4^+} \oplus \mathrm{X1^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_g}$
N123.13.34 $\mathrm{GM4^+} \oplus \mathrm{X1^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_g}$
N123.13.35 $\mathrm{GM4^+} \oplus \mathrm{X2^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_g}$
N123.13.36 $\mathrm{GM4^+} \oplus \mathrm{X2^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_g}$
N123.13.37 $\mathrm{GM4^-} \oplus \mathrm{R1^+}$	$\surd$	1	0	$\times$	-	-
N123.13.38 $\mathrm{GM4^-} \oplus \mathrm{R1^-}$	$\surd$	1	0	$\times$	-	-
N123.13.39 $\mathrm{GM4^-} \oplus \mathrm{X1^+}$	$\surd$	1	0	$\times$	-	-
N123.13.40 $\mathrm{GM4^-} \oplus \mathrm{X1^-}$	$\surd$	1	0	$\times$	-	-
N123.13.41 $\mathrm{GM4^-} \oplus \mathrm{X2^+}$	$\surd$	1	0	$\times$	-	-
N123.13.42 $\mathrm{GM4^-} \oplus \mathrm{X2^-}$	$\surd$	1	0	$\times$	-	-
N123.13.43 $\mathrm{A1^+} \oplus \mathrm{R1^+}$	$\times$	-	-	-	-	-
N123.13.44 $\mathrm{A1^+} \oplus \mathrm{R2^-}$	$\times$	-	-	-	-	-
N123.13.45 $\mathrm{A1^+} \oplus \mathrm{R3^+}$	$\times$	-	-	-	-	-
N123.13.46 $\mathrm{A1^+} \oplus \mathrm{R4^-}$	$\times$	-	-	-	-	-

Non-coplanar SSGs with parent space group $P4/mmm$ (No. 123) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N123.13.47 $\mathrm{A1}^+ \oplus \mathrm{R1}^-$	×	-	-	-	-	-
N123.13.48 $\mathrm{A1}^+ \oplus \mathrm{R2}^+$	×	-	-	-	-	-
N123.13.49 $\mathrm{A1}^+ \oplus \mathrm{R3}^-$	×	-	-	-	-	-
N123.13.50 $\mathrm{A1}^+ \oplus \mathrm{R4}^+$	×	-	-	-	-	-
N123.13.51 $\mathrm{A1}^+ \oplus \mathrm{X1}^+$	×	-	-	-	-	-
N123.13.52 $\mathrm{A1}^+ \oplus \mathrm{X4}^-$	×	-	-	-	-	-
N123.13.53 $\mathrm{A1}^+ \oplus \mathrm{X1}^-$	×	-	-	-	-	-
N123.13.54 $\mathrm{A1}^+ \oplus \mathrm{X4}^+$	×	-	-	-	-	-
N123.13.55 $\mathrm{A1}^+ \oplus \mathrm{X2}^+$	×	-	-	-	-	-
N123.13.56 $\mathrm{A1}^+ \oplus \mathrm{X3}^-$	×	-	-	-	-	-
N123.13.57 $\mathrm{A1}^+ \oplus \mathrm{X2}^-$	×	-	-	-	-	-
N123.13.58 $\mathrm{A1}^+ \oplus \mathrm{X3}^+$	×	-	-	-	-	-
N123.13.59 $\mathrm{A1}^- \oplus \mathrm{R1}^+$	×	-	-	-	-	-
N123.13.60 $\mathrm{A1}^- \oplus \mathrm{R2}^-$	×	-	-	-	-	-
N123.13.61 $\mathrm{A1}^- \oplus \mathrm{R3}^+$	×	-	-	-	-	-
N123.13.62 $\mathrm{A1}^- \oplus \mathrm{R4}^-$	×	-	-	-	-	-
N123.13.63 $\mathrm{A1}^- \oplus \mathrm{R1}^-$	×	-	-	-	-	-
N123.13.64 $\mathrm{A1}^- \oplus \mathrm{R2}^+$	×	-	-	-	-	-
N123.13.65 $\mathrm{A1}^- \oplus \mathrm{R3}^-$	×	-	-	-	-	-
N123.13.66 $\mathrm{A1}^- \oplus \mathrm{R4}^+$	×	-	-	-	-	-
N123.13.67 $\mathrm{A1}^- \oplus \mathrm{X1}^+$	×	-	-	-	-	-
N123.13.68 $\mathrm{A1}^- \oplus \mathrm{X4}^-$	×	-	-	-	-	-
N123.13.69 $\mathrm{A1}^- \oplus \mathrm{X1}^-$	×	-	-	-	-	-
N123.13.70 $\mathrm{A1}^- \oplus \mathrm{X4}^+$	×	-	-	-	-	-
N123.13.71 $\mathrm{A1}^- \oplus \mathrm{X2}^+$	×	-	-	-	-	-
N123.13.72 $\mathrm{A1}^- \oplus \mathrm{X3}^-$	×	-	-	-	-	-
N123.13.73 $\mathrm{A1}^- \oplus \mathrm{X2}^-$	×	-	-	-	-	-
N123.13.74 $\mathrm{A1}^- \oplus \mathrm{X3}^+$	×	-	-	-	-	-
N123.13.75 $\mathrm{M1}^+ \oplus \mathrm{R1}^+$	×	-	-	-	-	-
N123.13.76 $\mathrm{M1}^+ \oplus \mathrm{R3}^+$	×	-	-	-	-	-
N123.13.77 $\mathrm{M1}^+ \oplus \mathrm{R1}^-$	×	-	-	-	-	-
N123.13.78 $\mathrm{M1}^+ \oplus \mathrm{R3}^-$	×	-	-	-	-	-
N123.13.79 $\mathrm{M1}^+ \oplus \mathrm{X1}^+$	×	-	-	-	-	-
N123.13.80 $\mathrm{M1}^+ \oplus \mathrm{X4}^-$	×	-	-	-	-	-
N123.13.81 $\mathrm{M1}^+ \oplus \mathrm{X1}^-$	×	-	-	-	-	-
N123.13.82 $\mathrm{M1}^+ \oplus \mathrm{X4}^+$	×	-	-	-	-	-
N123.13.83 $\mathrm{M1}^+ \oplus \mathrm{X2}^+$	×	-	-	-	-	-
N123.13.84 $\mathrm{M1}^+ \oplus \mathrm{X3}^-$	×	-	-	-	-	-
N123.13.85 $\mathrm{M1}^+ \oplus \mathrm{X2}^-$	×	-	-	-	-	-
N123.13.86 $\mathrm{M1}^+ \oplus \mathrm{X3}^+$	×	-	-	-	-	-
N123.13.87 $\mathrm{M1}^- \oplus \mathrm{R1}^+$	×	-	-	-	-	-
N123.13.88 $\mathrm{M1}^- \oplus \mathrm{R3}^+$	×	-	-	-	-	-
N123.13.89 $\mathrm{M1}^- \oplus \mathrm{R1}^-$	×	-	-	-	-	-
N123.13.90 $\mathrm{M1}^- \oplus \mathrm{R3}^-$	×	-	-	-	-	-
N123.13.91 $\mathrm{M1}^- \oplus \mathrm{X1}^+$	×	-	-	-	-	-
N123.13.92 $\mathrm{M1}^- \oplus \mathrm{X4}^-$	×	-	-	-	-	-

Non-coplanar SSGs with parent space group $P4/mmm$ (No. 123) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N123.13.93 $\mathrm{M1}^{-} \oplus \mathrm{X1}^{-}$	×	-	-	-	-	-
N123.13.94 $\mathrm{M1}^{-} \oplus \mathrm{X4}^{+}$	×	-	-	-	-	-
N123.13.95 $\mathrm{M1}^{-} \oplus \mathrm{X2}^{+}$	×	-	-	-	-	-
N123.13.96 $\mathrm{M1}^{-} \oplus \mathrm{X3}^{-}$	×	-	-	-	-	-
N123.13.97 $\mathrm{M1}^{-} \oplus \mathrm{X2}^{-}$	×	-	-	-	-	-
N123.13.98 $\mathrm{M1}^{-} \oplus \mathrm{X3}^{+}$	×	-	-	-	-	-
N123.13.99 $\mathrm{M2}^{+} \oplus \mathrm{R1}^{+}$	×	-	-	-	-	-
N123.13.100 $\mathrm{M2}^{+} \oplus \mathrm{R3}^{+}$	×	-	-	-	-	-
N123.13.101 $\mathrm{M2}^{+} \oplus \mathrm{R1}^{-}$	×	-	-	-	-	-
N123.13.102 $\mathrm{M2}^{+} \oplus \mathrm{R3}^{-}$	×	-	-	-	-	-
N123.13.103 $\mathrm{M2}^{+} \oplus \mathrm{X1}^{+}$	×	-	-	-	-	-
N123.13.104 $\mathrm{M2}^{+} \oplus \mathrm{X4}^{-}$	×	-	-	-	-	-
N123.13.105 $\mathrm{M2}^{+} \oplus \mathrm{X1}^{-}$	×	-	-	-	-	-
N123.13.106 $\mathrm{M2}^{+} \oplus \mathrm{X4}^{+}$	×	-	-	-	-	-
N123.13.107 $\mathrm{M2}^{+} \oplus \mathrm{X2}^{+}$	×	-	-	-	-	-
N123.13.108 $\mathrm{M2}^{+} \oplus \mathrm{X3}^{-}$	×	-	-	-	-	-
N123.13.109 $\mathrm{M2}^{+} \oplus \mathrm{X2}^{-}$	×	-	-	-	-	-
N123.13.110 $\mathrm{M2}^{+} \oplus \mathrm{X3}^{+}$	×	-	-	-	-	-
N123.13.111 $\mathrm{M2}^{-} \oplus \mathrm{R1}^{+}$	×	-	-	-	-	-
N123.13.112 $\mathrm{M2}^{-} \oplus \mathrm{R3}^{+}$	×	-	-	-	-	-
N123.13.113 $\mathrm{M2}^{-} \oplus \mathrm{R1}^{-}$	×	-	-	-	-	-
N123.13.114 $\mathrm{M2}^{-} \oplus \mathrm{R3}^{-}$	×	-	-	-	-	-
N123.13.115 $\mathrm{M2}^{-} \oplus \mathrm{X1}^{+}$	×	-	-	-	-	-
N123.13.116 $\mathrm{M2}^{-} \oplus \mathrm{X4}^{-}$	×	-	-	-	-	-
N123.13.117 $\mathrm{M2}^{-} \oplus \mathrm{X1}^{-}$	×	-	-	-	-	-
N123.13.118 $\mathrm{M2}^{-} \oplus \mathrm{X4}^{+}$	×	-	-	-	-	-
N123.13.119 $\mathrm{M2}^{-} \oplus \mathrm{X2}^{+}$	×	-	-	-	-	-
N123.13.120 $\mathrm{M2}^{-} \oplus \mathrm{X3}^{-}$	×	-	-	-	-	-
N123.13.121 $\mathrm{M2}^{-} \oplus \mathrm{X2}^{-}$	×	-	-	-	-	-
N123.13.122 $\mathrm{M2}^{-} \oplus \mathrm{X3}^{+}$	×	-	-	-	-	-
N123.13.123 $\mathrm{Z1}^{+} \oplus \mathrm{R1}^{+}$	×	-	-	-	-	-
N123.13.124 $\mathrm{Z1}^{+} \oplus \mathrm{R2}^{-}$	×	-	-	-	-	-
N123.13.125 $\mathrm{Z1}^{+} \oplus \mathrm{R1}^{-}$	×	-	-	-	-	-
N123.13.126 $\mathrm{Z1}^{+} \oplus \mathrm{R2}^{+}$	×	-	-	-	-	-
N123.13.127 $\mathrm{Z1}^{+} \oplus \mathrm{X1}^{+}$	×	-	-	-	-	-
N123.13.128 $\mathrm{Z1}^{+} \oplus \mathrm{X1}^{-}$	×	-	-	-	-	-
N123.13.129 $\mathrm{Z1}^{+} \oplus \mathrm{X2}^{+}$	×	-	-	-	-	-
N123.13.130 $\mathrm{Z1}^{+} \oplus \mathrm{X2}^{-}$	×	-	-	-	-	-
N123.13.131 $\mathrm{Z1}^{-} \oplus \mathrm{R1}^{+}$	×	-	-	-	-	-
N123.13.132 $\mathrm{Z1}^{-} \oplus \mathrm{R2}^{-}$	×	-	-	-	-	-
N123.13.133 $\mathrm{Z1}^{-} \oplus \mathrm{R1}^{-}$	×	-	-	-	-	-
N123.13.134 $\mathrm{Z1}^{-} \oplus \mathrm{R2}^{+}$	×	-	-	-	-	-
N123.13.135 $\mathrm{Z1}^{-} \oplus \mathrm{X1}^{+}$	×	-	-	-	-	-
N123.13.136 $\mathrm{Z1}^{-} \oplus \mathrm{X1}^{-}$	×	-	-	-	-	-
N123.13.137 $\mathrm{Z1}^{-} \oplus \mathrm{X2}^{+}$	×	-	-	-	-	-
N123.13.138 $\mathrm{Z1}^{-} \oplus \mathrm{X2}^{-}$	×	-	-	-	-	-

Non-coplanar SSGs with parent space group $P4/mmm$ (No. 123) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N123.13.139 Z2$^+$ ⊕ R1$^+$	×	-	-	-	-	-
N123.13.140 Z2$^+$ ⊕ R2$^-$	×	-	-	-	-	-
N123.13.141 Z2$^+$ ⊕ R1$^-$	×	-	-	-	-	-
N123.13.142 Z2$^+$ ⊕ R2$^+$	×	-	-	-	-	-
N123.13.143 Z2$^+$ ⊕ X1$^+$	×	-	-	-	-	-
N123.13.144 Z2$^+$ ⊕ X1$^-$	×	-	-	-	-	-
N123.13.145 Z2$^+$ ⊕ X2$^+$	×	-	-	-	-	-
N123.13.146 Z2$^+$ ⊕ X2$^-$	×	-	-	-	-	-
N123.13.147 Z2$^-$ ⊕ R1$^+$	×	-	-	-	-	-
N123.13.148 Z2$^-$ ⊕ R2$^-$	×	-	-	-	-	-
N123.13.149 Z2$^-$ ⊕ R1$^-$	×	-	-	-	-	-
N123.13.150 Z2$^-$ ⊕ R2$^+$	×	-	-	-	-	-
N123.13.151 Z2$^-$ ⊕ X1$^+$	×	-	-	-	-	-
N123.13.152 Z2$^-$ ⊕ X1$^-$	×	-	-	-	-	-
N123.13.153 Z2$^-$ ⊕ X2$^+$	×	-	-	-	-	-
N123.13.154 Z2$^-$ ⊕ X2$^-$	×	-	-	-	-	-
N123.14.1 GM1$^-$ ⊕ LD1	√	1	1	√	$4/mmm$	A2$_{\mathrm{u}}$
N123.14.2 GM1$^-$ ⊕ LD2	√	1	1	√	$4/mmm$	A2$_{\mathrm{u}}$
N123.14.3 GM1$^-$ ⊕ LD3	√	1	1	√	$4/mmm$	A2$_{\mathrm{u}}$
N123.14.4 GM1$^-$ ⊕ LD4	√	1	1	√	$4/mmm$	A2$_{\mathrm{u}}$
N123.14.5 GM1$^-$ ⊕ V1	√	1	1	×	-	-
N123.14.6 GM1$^-$ ⊕ V2	√	1	1	×	-	-
N123.14.7 GM2$^+$ ⊕ LD1	√	1	1	√	$\bar{4}m2$	B1
N123.14.8 GM2$^+$ ⊕ LD2	√	1	1	√	$\bar{4}m2$	B1
N123.14.9 GM2$^+$ ⊕ LD3	√	1	1	√	$\bar{4}m2$	B1
N123.14.10 GM2$^+$ ⊕ LD4	√	1	1	√	$\bar{4}m2$	B1
N123.14.11 GM2$^+$ ⊕ V1	√	1	1	√	$\bar{4}m2$	B1
N123.14.12 GM2$^+$ ⊕ V2	√	1	1	√	$\bar{4}m2$	B1
N123.14.13 GM2$^-$ ⊕ LD1	√	1	1	√	$4/mmm$	A2$_{\mathrm{u}}$
N123.14.14 GM2$^-$ ⊕ LD2	√	1	1	√	$4/mmm$	A2$_{\mathrm{u}}$
N123.14.15 GM2$^-$ ⊕ LD3	√	1	1	√	$4/mmm$	A2$_{\mathrm{u}}$
N123.14.16 GM2$^-$ ⊕ LD4	√	1	1	√	$4/mmm$	A2$_{\mathrm{u}}$
N123.14.17 GM2$^-$ ⊕ V1	√	1	1	×	-	-
N123.14.18 GM2$^-$ ⊕ V2	√	1	1	×	-	-
N123.14.19 GM3$^+$ ⊕ LD1	√	1	1	√	422	A2
N123.14.20 GM3$^+$ ⊕ LD2	√	1	1	√	422	A2
N123.14.21 GM3$^+$ ⊕ LD3	√	1	1	√	422	A2
N123.14.22 GM3$^+$ ⊕ LD4	√	1	1	√	422	A2
N123.14.23 GM3$^+$ ⊕ V1	√	1	1	×	-	-
N123.14.24 GM3$^+$ ⊕ V2	√	1	1	×	-	-
N123.14.25 GM3$^-$ ⊕ LD1	√	1	1	√	$4/mmm$	A2$_{\mathrm{u}}$
N123.14.26 GM3$^-$ ⊕ LD2	√	1	1	√	$4/mmm$	A2$_{\mathrm{u}}$
N123.14.27 GM3$^-$ ⊕ LD3	√	1	1	√	$4/mmm$	A2$_{\mathrm{u}}$
N123.14.28 GM3$^-$ ⊕ LD4	√	1	1	√	$4/mmm$	A2$_{\mathrm{u}}$
N123.14.29 GM3$^-$ ⊕ V1	√	1	1	×	-	-
N123.14.30 GM3$^-$ ⊕ V2	√	1	1	×	-	-

Non-coplanar SSGs with parent space group $P4/mmm$ (No. 123) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N123.14.31 $\mathrm{GM4}^{+}\oplus\mathrm{LD1}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N123.14.32 $\mathrm{GM4}^{+}\oplus\mathrm{LD2}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N123.14.33 $\mathrm{GM4}^{+}\oplus\mathrm{LD3}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N123.14.34 $\mathrm{GM4}^{+}\oplus\mathrm{LD4}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N123.14.35 $\mathrm{GM4}^{+}\oplus\mathrm{V1}$	$\surd$	1	1	$\times$	-	-
N123.14.36 $\mathrm{GM4}^{+}\oplus\mathrm{V2}$	$\surd$	1	1	$\times$	-	-
N123.14.37 $\mathrm{GM4}^{-}\oplus\mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.14.38 $\mathrm{GM4}^{-}\oplus\mathrm{LD2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.14.39 $\mathrm{GM4}^{-}\oplus\mathrm{LD3}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.14.40 $\mathrm{GM4}^{-}\oplus\mathrm{LD4}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.14.41 $\mathrm{GM4}^{-}\oplus\mathrm{V1}$	$\surd$	1	1	$\times$	-	-
N123.14.42 $\mathrm{GM4}^{-}\oplus\mathrm{V2}$	$\surd$	1	1	$\times$	-	-
N123.14.43 $\mathrm{A1}^{+}\oplus\mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.14.44 $\mathrm{A1}^{+}\oplus\mathrm{LD2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.14.45 $\mathrm{A1}^{+}\oplus\mathrm{LD3}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.14.46 $\mathrm{A1}^{+}\oplus\mathrm{LD4}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.14.47 $\mathrm{A1}^{+}\oplus\mathrm{V1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.14.48 $\mathrm{A1}^{+}\oplus\mathrm{V3}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.14.49 $\mathrm{A1}^{+}\oplus\mathrm{V2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.14.50 $\mathrm{A1}^{+}\oplus\mathrm{V4}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.14.51 $\mathrm{A1}^{-}\oplus\mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.14.52 $\mathrm{A1}^{-}\oplus\mathrm{LD2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.14.53 $\mathrm{A1}^{-}\oplus\mathrm{LD3}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.14.54 $\mathrm{A1}^{-}\oplus\mathrm{LD4}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.14.55 $\mathrm{A1}^{-}\oplus\mathrm{V1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.14.56 $\mathrm{A1}^{-}\oplus\mathrm{V3}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.14.57 $\mathrm{A1}^{-}\oplus\mathrm{V2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.14.58 $\mathrm{A1}^{-}\oplus\mathrm{V4}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.14.59 $\mathrm{M1}^{+}\oplus\mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.14.60 $\mathrm{M1}^{+}\oplus\mathrm{LD2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.14.61 $\mathrm{M1}^{+}\oplus\mathrm{LD3}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.14.62 $\mathrm{M1}^{+}\oplus\mathrm{LD4}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.14.63 $\mathrm{M1}^{+}\oplus\mathrm{V1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.14.64 $\mathrm{M1}^{+}\oplus\mathrm{V3}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.14.65 $\mathrm{M1}^{+}\oplus\mathrm{V2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.14.66 $\mathrm{M1}^{+}\oplus\mathrm{V4}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.14.67 $\mathrm{M1}^{-}\oplus\mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.14.68 $\mathrm{M1}^{-}\oplus\mathrm{LD2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.14.69 $\mathrm{M1}^{-}\oplus\mathrm{LD3}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.14.70 $\mathrm{M1}^{-}\oplus\mathrm{LD4}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.14.71 $\mathrm{M1}^{-}\oplus\mathrm{V1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.14.72 $\mathrm{M1}^{-}\oplus\mathrm{V3}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.14.73 $\mathrm{M1}^{-}\oplus\mathrm{V2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.14.74 $\mathrm{M1}^{-}\oplus\mathrm{V4}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.14.75 $\mathrm{M2}^{+}\oplus\mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N123.14.76 $\mathrm{M2}^{+}\oplus\mathrm{LD2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$

Non-coplanar SSGs with parent space group $P4/mmm$ (No. 123) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N123.14.77 M2$^+$ ⊕ LD3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N123.14.78 M2$^+$ ⊕ LD4	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N123.14.79 M2$^+$ ⊕ V1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N123.14.80 M2$^+$ ⊕ V3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N123.14.81 M2$^+$ ⊕ V2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N123.14.82 M2$^+$ ⊕ V4	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N123.14.83 M2$^-$ ⊕ LD1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N123.14.84 M2$^-$ ⊕ LD2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N123.14.85 M2$^-$ ⊕ LD3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N123.14.86 M2$^-$ ⊕ LD4	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N123.14.87 M2$^-$ ⊕ V1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N123.14.88 M2$^-$ ⊕ V3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N123.14.89 M2$^-$ ⊕ V2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N123.14.90 M2$^-$ ⊕ V4	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N123.14.91 Z1$^+$ ⊕ LD1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N123.14.92 Z1$^+$ ⊕ LD2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N123.14.93 Z1$^+$ ⊕ LD3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N123.14.94 Z1$^+$ ⊕ LD4	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N123.14.95 Z1$^+$ ⊕ V1	√	1	1	×	-	-
N123.14.96 Z1$^+$ ⊕ V2	√	1	1	×	-	-
N123.14.97 Z1$^-$ ⊕ LD1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N123.14.98 Z1$^-$ ⊕ LD2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N123.14.99 Z1$^-$ ⊕ LD3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N123.14.100 Z1$^-$ ⊕ LD4	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N123.14.101 Z1$^-$ ⊕ V1	√	1	1	×	-	-
N123.14.102 Z1$^-$ ⊕ V2	√	1	1	×	-	-
N123.14.103 Z2$^+$ ⊕ LD1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N123.14.104 Z2$^+$ ⊕ LD2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N123.14.105 Z2$^+$ ⊕ LD3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N123.14.106 Z2$^+$ ⊕ LD4	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N123.14.107 Z2$^+$ ⊕ V1	√	1	1	×	-	-
N123.14.108 Z2$^+$ ⊕ V2	√	1	1	×	-	-
N123.14.109 Z2$^-$ ⊕ LD1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N123.14.110 Z2$^-$ ⊕ LD2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N123.14.111 Z2$^-$ ⊕ LD3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N123.14.112 Z2$^-$ ⊕ LD4	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N123.14.113 Z2$^-$ ⊕ V1	√	1	1	×	-	-
N123.14.114 Z2$^-$ ⊕ V2	√	1	1	×	-	-

TABLE S370: Collinear SSGs with parent space group $P4/mcc$ (No. 124).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L124.1.1 GM1$^+$	1	$4/mmm$	$\mathrm{A1_g}$
L124.2.1 GM1$^-$	0	-	-
L124.2.2 GM2$^+$	1	$4/mmm$	$\mathrm{B1_g}$
L124.2.3 GM2$^-$	0	-	-

Collinear SSGs with parent space group $P4/mcc$ (No. 124)(continued)

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L124.2.4 $\mathrm{GM3}^+$	1	$4/mmm$	$\mathrm{A2_g}$
L124.2.5 $\mathrm{GM3}^-$	0	-	-
L124.2.6 $\mathrm{GM4}^+$	1	$4/mmm$	$\mathrm{B2_g}$
L124.2.7 $\mathrm{GM4}^-$	0	-	-
L124.2.8 $\mathrm{M1}^+$	0	-	-
L124.2.9 $\mathrm{M1}^-$	0	-	-
L124.2.10 $\mathrm{M2}^+$	0	-	-
L124.2.11 $\mathrm{M2}^-$	0	-	-

TABLE S371: Coplanar SSGs with parent space group $P4/mcc$ (No. 124).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P124.1.1 $\mathrm{GM1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}$
P124.2.1 $\mathrm{GM1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}$
P124.2.2 $\mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}$
P124.2.3 $\mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}$
P124.2.4 $\mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_g}$
P124.2.5 $\mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_u}$
P124.2.6 $\mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_g}$
P124.2.7 $\mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_u}$
P124.2.8 $\mathrm{M1}^+$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P124.2.9 $\mathrm{M1}^-$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P124.2.10 $\mathrm{M2}^+$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P124.2.11 $\mathrm{M2}^-$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P124.3.1 $\mathrm{GM1}^-\oplus\mathrm{GM1}^-$	$\surd$	0	0	$\surd$	-	-
P124.3.2 $\mathrm{GM1}^-\oplus\mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_u}$
P124.3.3 $\mathrm{GM1}^-\oplus\mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
P124.3.4 $\mathrm{GM1}^-\oplus\mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{A2_u}$
P124.3.5 $\mathrm{GM1}^-\oplus\mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
P124.3.6 $\mathrm{GM1}^-\oplus\mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g}\oplus\mathrm{B2_u}$
P124.3.7 $\mathrm{GM1}^-\oplus\mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
P124.3.8 $\mathrm{GM1}^-\oplus\mathrm{M1}^+$	$\surd$	1	1	$\times$	-	-
P124.3.9 $\mathrm{GM1}^-\oplus\mathrm{M1}^-$	$\surd$	1	1	$\times$	-	-
P124.3.10 $\mathrm{GM1}^-\oplus\mathrm{M2}^+$	$\surd$	1	1	$\times$	-	-
P124.3.11 $\mathrm{GM1}^-\oplus\mathrm{M2}^-$	$\surd$	1	1	$\times$	-	-
P124.3.12 $\mathrm{GM2}^+\oplus\mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_g}$
P124.3.13 $\mathrm{GM2}^+\oplus\mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B1_g}$
P124.3.14 $\mathrm{GM2}^+\oplus\mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_g}$
P124.3.15 $\mathrm{GM2}^+\oplus\mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B2_u}$
P124.3.16 $\mathrm{GM2}^+\oplus\mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B2_g}$
P124.3.17 $\mathrm{GM2}^+\oplus\mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_u}$
P124.3.18 $\mathrm{GM2}^+\oplus\mathrm{M1}^+$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
P124.3.19 $\mathrm{GM2}^+\oplus\mathrm{M1}^-$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
P124.3.20 $\mathrm{GM2}^+\oplus\mathrm{M2}^+$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
P124.3.21 $\mathrm{GM2}^+\oplus\mathrm{M2}^-$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
P124.3.22 $\mathrm{GM2}^-\oplus\mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-

Coplanar SSGs with parent space group $P4/mcc$ (No. 124) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P124.3.23 $\mathrm{GM2^-} \oplus \mathrm{GM3^+}$	√	2	2	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_u}$
P124.3.24 $\mathrm{GM2^-} \oplus \mathrm{GM3^-}$	√	0	0	√	-	-
P124.3.25 $\mathrm{GM2^-} \oplus \mathrm{GM4^+}$	√	2	2	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g}$
P124.3.26 $\mathrm{GM2^-} \oplus \mathrm{GM4^-}$	√	0	0	√	-	-
P124.3.27 $\mathrm{GM2^-} \oplus \mathrm{M1^+}$	√	1	1	×	-	-
P124.3.28 $\mathrm{GM2^-} \oplus \mathrm{M1^-}$	√	1	1	×	-	-
P124.3.29 $\mathrm{GM2^-} \oplus \mathrm{M2^+}$	√	1	1	×	-	-
P124.3.30 $\mathrm{GM2^-} \oplus \mathrm{M2^-}$	√	1	1	×	-	-
P124.3.31 $\mathrm{GM3^+} \oplus \mathrm{GM3^+}$	√	2	2	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g}$
P124.3.32 $\mathrm{GM3^+} \oplus \mathrm{GM3^-}$	√	2	2	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g}$
P124.3.33 $\mathrm{GM3^+} \oplus \mathrm{GM4^+}$	√	2	2	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g}$
P124.3.34 $\mathrm{GM3^+} \oplus \mathrm{GM4^-}$	√	2	2	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g}$
P124.3.35 $\mathrm{GM3^+} \oplus \mathrm{M1^+}$	√	1	0	×	-	-
P124.3.36 $\mathrm{GM3^+} \oplus \mathrm{M1^-}$	√	1	0	×	-	-
P124.3.37 $\mathrm{GM3^+} \oplus \mathrm{M2^+}$	√	1	0	×	-	-
P124.3.38 $\mathrm{GM3^+} \oplus \mathrm{M2^-}$	√	1	0	×	-	-
P124.3.39 $\mathrm{GM3^-} \oplus \mathrm{GM3^-}$	√	0	0	√	-	-
P124.3.40 $\mathrm{GM3^-} \oplus \mathrm{GM4^+}$	√	2	2	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_g}$
P124.3.41 $\mathrm{GM3^-} \oplus \mathrm{GM4^-}$	√	0	0	√	-	-
P124.3.42 $\mathrm{GM3^-} \oplus \mathrm{M1^+}$	√	1	1	×	-	-
P124.3.43 $\mathrm{GM3^-} \oplus \mathrm{M1^-}$	√	1	1	×	-	-
P124.3.44 $\mathrm{GM3^-} \oplus \mathrm{M2^+}$	√	1	1	×	-	-
P124.3.45 $\mathrm{GM3^-} \oplus \mathrm{M2^-}$	√	1	1	×	-	-
P124.3.46 $\mathrm{GM4^+} \oplus \mathrm{GM4^+}$	√	2	2	√	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_g}$
P124.3.47 $\mathrm{GM4^+} \oplus \mathrm{GM4^-}$	√	2	2	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g}$
P124.3.48 $\mathrm{GM4^+} \oplus \mathrm{M1^+}$	√	1	0	×	-	-
P124.3.49 $\mathrm{GM4^+} \oplus \mathrm{M1^-}$	√	1	0	×	-	-
P124.3.50 $\mathrm{GM4^+} \oplus \mathrm{M2^+}$	√	1	0	×	-	-
P124.3.51 $\mathrm{GM4^+} \oplus \mathrm{M2^-}$	√	1	0	×	-	-
P124.3.52 $\mathrm{GM4^-} \oplus \mathrm{GM4^-}$	√	0	0	√	-	-
P124.3.53 $\mathrm{GM4^-} \oplus \mathrm{M1^+}$	√	1	1	×	-	-
P124.3.54 $\mathrm{GM4^-} \oplus \mathrm{M1^-}$	√	1	1	×	-	-
P124.3.55 $\mathrm{GM4^-} \oplus \mathrm{M2^+}$	√	1	1	×	-	-
P124.3.56 $\mathrm{GM4^-} \oplus \mathrm{M2^-}$	√	1	1	×	-	-
P124.3.57 $\mathrm{M1^+} \oplus \mathrm{M1^+}$	√	1	0	×	-	-
P124.3.58 $\mathrm{M1^+} \oplus \mathrm{M4^+}$	√	1	0	×	-	-
P124.3.59 $\mathrm{M1^+} \oplus \mathrm{M1^-}$	√	1	1	×	-	-
P124.3.60 $\mathrm{M1^+} \oplus \mathrm{M4^-}$	√	1	1	×	-	-
P124.3.61 $\mathrm{M1^+} \oplus \mathrm{M2^+}$	√	1	0	×	-	-
P124.3.62 $\mathrm{M1^+} \oplus \mathrm{M3^+}$	√	1	0	×	-	-
P124.3.63 $\mathrm{M1^+} \oplus \mathrm{M2^-}$	√	1	1	×	-	-
P124.3.64 $\mathrm{M1^+} \oplus \mathrm{M3^-}$	√	1	1	×	-	-
P124.3.65 $\mathrm{M1^-} \oplus \mathrm{M1^-}$	√	1	0	×	-	-
P124.3.66 $\mathrm{M1^-} \oplus \mathrm{M4^-}$	√	1	0	×	-	-
P124.3.67 $\mathrm{M1^-} \oplus \mathrm{M2^+}$	√	1	1	×	-	-
P124.3.68 $\mathrm{M1^-} \oplus \mathrm{M3^+}$	√	1	1	×	-	-

Coplanar SSGs with parent space group $P4/mcc$ (No. 124) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P124.3.69 $\mathrm{M1}^- \oplus \mathrm{M2}^-$	$\surd$	1	0	$\times$	-	-
P124.3.70 $\mathrm{M1}^- \oplus \mathrm{M3}^-$	$\surd$	1	0	$\times$	-	-
P124.3.71 $\mathrm{M2}^+ \oplus \mathrm{M2}^+$	$\surd$	1	0	$\times$	-	-
P124.3.72 $\mathrm{M2}^+ \oplus \mathrm{M3}^+$	$\surd$	1	0	$\times$	-	-
P124.3.73 $\mathrm{M2}^+ \oplus \mathrm{M2}^-$	$\surd$	1	1	$\times$	-	-
P124.3.74 $\mathrm{M2}^+ \oplus \mathrm{M3}^-$	$\surd$	1	1	$\times$	-	-
P124.3.75 $\mathrm{M2}^- \oplus \mathrm{M2}^-$	$\surd$	1	0	$\times$	-	-
P124.3.76 $\mathrm{M2}^- \oplus \mathrm{M3}^-$	$\surd$	1	0	$\times$	-	-
P124.6.1 $\mathrm{GM5}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_g}$
P124.6.2 $\mathrm{GM5}^-$	$\surd$	0	0	$\surd$	-	-
P124.6.3 A1	$\surd$	1	1	$\times$	-	-
P124.6.4 $\mathrm{M5}^+$	$\surd$	1	0	$\times$	-	-
P124.6.5 $\mathrm{M5}^-$	$\surd$	1	0	$\times$	-	-
P124.6.6 Z1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P124.6.7 Z2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P124.7.1 $\mathrm{X1}^+$	$\times$	-	-	-	-	-
P124.7.2 $\mathrm{X1}^-$	$\times$	-	-	-	-	-
P124.7.3 $\mathrm{X2}^+$	$\times$	-	-	-	-	-
P124.7.4 $\mathrm{X2}^-$	$\times$	-	-	-	-	-
P124.8.1 LD1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P124.8.2 LD2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P124.8.3 V1	$\surd$	1	1	$\times$	-	-

TABLE S372: Non-coplanar SSGs with parent space group $P4/mcc$ (No. 124).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N124.1.1 $\mathrm{GM1}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A1_g}$
N124.2.1 $\mathrm{GM1}^-$	$\surd$	2	2	$\surd$	422	$\mathrm{A1} \oplus \mathrm{A1}$
N124.2.2 $\mathrm{GM2}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{B1_g}$
N124.2.3 $\mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{A1} \oplus \mathrm{A1}$
N124.2.4 $\mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A2_g}$
N124.2.5 $\mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{A1} \oplus \mathrm{A1}$
N124.2.6 $\mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{B2_g}$
N124.2.7 $\mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{A1} \oplus \mathrm{A1}$
N124.2.8 $\mathrm{M1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g}$
N124.2.9 $\mathrm{M1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g}$
N124.2.10 $\mathrm{M2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g}$
N124.2.11 $\mathrm{M2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g}$
N124.3.1 $\mathrm{GM1}^- \oplus \mathrm{GM1}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{A1_u}$
N124.3.2 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{A1} \oplus \mathrm{B1}$
N124.3.3 $\mathrm{GM1}^- \oplus \mathrm{GM2}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{B1_u}$
N124.3.4 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{A1} \oplus \mathrm{A2}$
N124.3.5 $\mathrm{GM1}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{A2_u}$
N124.3.6 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{A1} \oplus \mathrm{A2}$
N124.3.7 $\mathrm{GM1}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{B2_u}$
N124.3.8 $\mathrm{GM1}^- \oplus \mathrm{M1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u}$

Non-coplanar SSGs with parent space group $P4/mcc$ (No. 124) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N124.3.9 $\mathrm{GM1}^- \oplus \mathrm{M1}^-$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u}$
N124.3.10 $\mathrm{GM1}^- \oplus \mathrm{M2}^+$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u}$
N124.3.11 $\mathrm{GM1}^- \oplus \mathrm{M2}^-$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u}$
N124.3.12 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N124.3.13 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	√	2	2	√	422	$\mathrm{A1} \oplus \mathrm{B1}$
N124.3.14 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+$	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g} \oplus \mathrm{A2_g}$
N124.3.15 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^-$	√	2	2	√	$\bar{4}m2$	$\mathrm{A1} \oplus \mathrm{B1}$
N124.3.16 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+$	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B2_g}$
N124.3.17 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^-$	√	2	2	√	$4mm$	$\mathrm{A1} \oplus \mathrm{B1}$
N124.3.18 $\mathrm{GM2}^+ \oplus \mathrm{M1}^+$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g}$
N124.3.19 $\mathrm{GM2}^+ \oplus \mathrm{M1}^-$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g}$
N124.3.20 $\mathrm{GM2}^+ \oplus \mathrm{M2}^+$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g}$
N124.3.21 $\mathrm{GM2}^+ \oplus \mathrm{M2}^-$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g}$
N124.3.22 $\mathrm{GM2}^- \oplus \mathrm{GM2}^-$	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N124.3.23 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+$	√	2	2	√	$\bar{4}m2$	$\mathrm{A1} \oplus \mathrm{B2}$
N124.3.24 $\mathrm{GM2}^- \oplus \mathrm{GM3}^-$	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u} \oplus \mathrm{A2_u}$
N124.3.25 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+$	√	2	2	√	$4mm$	$\mathrm{A1} \oplus \mathrm{B2}$
N124.3.26 $\mathrm{GM2}^- \oplus \mathrm{GM4}^-$	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_u}$
N124.3.27 $\mathrm{GM2}^- \oplus \mathrm{M1}^+$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u}$
N124.3.28 $\mathrm{GM2}^- \oplus \mathrm{M1}^-$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u}$
N124.3.29 $\mathrm{GM2}^- \oplus \mathrm{M2}^+$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u}$
N124.3.30 $\mathrm{GM2}^- \oplus \mathrm{M2}^-$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u}$
N124.3.31 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
N124.3.32 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	√	2	2	√	422	$\mathrm{A1} \oplus \mathrm{A2}$
N124.3.33 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g} \oplus \mathrm{B2_g}$
N124.3.34 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	√	2	2	√	$\bar{4}2m$	$\mathrm{A1} \oplus \mathrm{A2}$
N124.3.35 $\mathrm{GM3}^+ \oplus \mathrm{M1}^+$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g}$
N124.3.36 $\mathrm{GM3}^+ \oplus \mathrm{M1}^-$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g}$
N124.3.37 $\mathrm{GM3}^+ \oplus \mathrm{M2}^+$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g}$
N124.3.38 $\mathrm{GM3}^+ \oplus \mathrm{M2}^-$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g}$
N124.3.39 $\mathrm{GM3}^- \oplus \mathrm{GM3}^-$	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N124.3.40 $\mathrm{GM3}^- \oplus \mathrm{GM4}^+$	√	2	2	√	$\bar{4}2m$	$\mathrm{A1} \oplus \mathrm{B2}$
N124.3.41 $\mathrm{GM3}^- \oplus \mathrm{GM4}^-$	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N124.3.42 $\mathrm{GM3}^- \oplus \mathrm{M1}^+$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_u}$
N124.3.43 $\mathrm{GM3}^- \oplus \mathrm{M1}^-$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_u}$
N124.3.44 $\mathrm{GM3}^- \oplus \mathrm{M2}^+$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_u}$
N124.3.45 $\mathrm{GM3}^- \oplus \mathrm{M2}^-$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_u}$
N124.3.46 $\mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N124.3.47 $\mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	√	2	2	√	422	$\mathrm{A1} \oplus \mathrm{B2}$
N124.3.48 $\mathrm{GM4}^+ \oplus \mathrm{M1}^+$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_g}$
N124.3.49 $\mathrm{GM4}^+ \oplus \mathrm{M1}^-$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_g}$
N124.3.50 $\mathrm{GM4}^+ \oplus \mathrm{M2}^+$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_g}$
N124.3.51 $\mathrm{GM4}^+ \oplus \mathrm{M2}^-$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_g}$
N124.3.52 $\mathrm{GM4}^- \oplus \mathrm{GM4}^-$	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N124.3.53 $\mathrm{GM4}^- \oplus \mathrm{M1}^+$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_u}$
N124.3.54 $\mathrm{GM4}^- \oplus \mathrm{M1}^-$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_u}$

Non-coplanar SSGs with parent space group $P4/mcc$ (No. 124) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N124.3.55 $\mathrm{GM4^-} \oplus \mathrm{M2^+}$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_u}$
N124.3.56 $\mathrm{GM4^-} \oplus \mathrm{M2^-}$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_u}$
N124.3.57 $\mathrm{M1^+} \oplus \mathrm{M1^+}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N124.3.58 $\mathrm{M1^+} \oplus \mathrm{M4^+}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N124.3.59 $\mathrm{M1^+} \oplus \mathrm{M1^-}$	√	1	1	√	422	A1
N124.3.60 $\mathrm{M1^+} \oplus \mathrm{M4^-}$	√	1	1	√	$\bar{4}m2$	A1
N124.3.61 $\mathrm{M1^+} \oplus \mathrm{M2^+}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N124.3.62 $\mathrm{M1^+} \oplus \mathrm{M3^+}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N124.3.63 $\mathrm{M1^+} \oplus \mathrm{M2^-}$	√	1	1	√	$\bar{4}2m$	A1
N124.3.64 $\mathrm{M1^+} \oplus \mathrm{M3^-}$	√	1	1	√	$4mm$	A1
N124.3.65 $\mathrm{M1^-} \oplus \mathrm{M1^-}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N124.3.66 $\mathrm{M1^-} \oplus \mathrm{M4^-}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N124.3.67 $\mathrm{M1^-} \oplus \mathrm{M2^+}$	√	1	1	√	$\bar{4}2m$	A1
N124.3.68 $\mathrm{M1^-} \oplus \mathrm{M3^+}$	√	1	1	√	$4mm$	A1
N124.3.69 $\mathrm{M1^-} \oplus \mathrm{M2^-}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N124.3.70 $\mathrm{M1^-} \oplus \mathrm{M3^-}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N124.3.71 $\mathrm{M2^+} \oplus \mathrm{M2^+}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N124.3.72 $\mathrm{M2^+} \oplus \mathrm{M3^+}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N124.3.73 $\mathrm{M2^+} \oplus \mathrm{M2^-}$	√	1	1	√	422	A1
N124.3.74 $\mathrm{M2^+} \oplus \mathrm{M3^-}$	√	1	1	√	$\bar{4}m2$	A1
N124.3.75 $\mathrm{M2^-} \oplus \mathrm{M2^-}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N124.3.76 $\mathrm{M2^-} \oplus \mathrm{M3^-}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N124.6.1 $\mathrm{GM5^+}$	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{E_g}$
N124.6.2 $\mathrm{GM5^-}$	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{E_u}$
N124.6.3 A1	√	1	1	√	$4mm$	A1
N124.6.4 $\mathrm{M5^+}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N124.6.5 $\mathrm{M5^-}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N124.6.6 Z1	√	1	1	√	$4mm$	A1
N124.6.7 Z2	√	1	1	√	$4mm$	A1
N124.7.1 $\mathrm{X1^+}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N124.7.2 $\mathrm{X1^-}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N124.7.3 $\mathrm{X2^+}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N124.7.4 $\mathrm{X2^-}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N124.8.1 LD1	√	1	1	√	$4mm$	A1
N124.8.2 LD2	√	1	1	√	$4mm$	A1
N124.8.3 V1	√	1	1	√	$4mm$	A1
N124.9.1 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM1^-}$	√	0	0	√	-	-
N124.9.2 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM2^+}$	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N124.9.3 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM2^-}$	√	0	0	√	-	-
N124.9.4 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM3^+}$	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N124.9.5 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM3^-}$	√	0	0	√	-	-
N124.9.6 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM4^+}$	√	3	3	√	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N124.9.7 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM4^-}$	√	0	0	√	-	-
N124.9.8 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{M1^+}$	√	0	0	√	-	-
N124.9.9 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{M1^-}$	√	0	0	√	-	-
N124.9.10 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{M2^+}$	√	0	0	√	-	-

Non-coplanar SSGs with parent space group $P4/mcc$ (No. 124) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N124.9.11 $\mathrm{GM1^-}\oplus\mathrm{GM1^-}\oplus\mathrm{M2^-}$	$\surd$	0	0	$\surd$	-	-
N124.9.12 $\mathrm{GM1^-}\oplus\mathrm{GM2^+}\oplus\mathrm{GM2^+}$	$\surd$	2	2	$\surd$	422	$\mathrm{B1}\oplus\mathrm{B1}$
N124.9.13 $\mathrm{GM1^-}\oplus\mathrm{GM2^+}\oplus\mathrm{GM2^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B1_g}\oplus\mathrm{B1_u}$
N124.9.14 $\mathrm{GM1^-}\oplus\mathrm{GM2^+}\oplus\mathrm{GM3^+}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{B1}\oplus\mathrm{B2}$
N124.9.15 $\mathrm{GM1^-}\oplus\mathrm{GM2^+}\oplus\mathrm{GM3^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_u}\oplus\mathrm{B2_u}$
N124.9.16 $\mathrm{GM1^-}\oplus\mathrm{GM2^+}\oplus\mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{B1}\oplus\mathrm{B2}$
N124.9.17 $\mathrm{GM1^-}\oplus\mathrm{GM2^+}\oplus\mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_u}\oplus\mathrm{A2_u}$
N124.9.18 $\mathrm{GM1^-}\oplus\mathrm{GM2^+}\oplus\mathrm{M1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_u}$
N124.9.19 $\mathrm{GM1^-}\oplus\mathrm{GM2^+}\oplus\mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_u}$
N124.9.20 $\mathrm{GM1^-}\oplus\mathrm{GM2^+}\oplus\mathrm{M2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_u}$
N124.9.21 $\mathrm{GM1^-}\oplus\mathrm{GM2^+}\oplus\mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_u}$
N124.9.22 $\mathrm{GM1^-}\oplus\mathrm{GM2^-}\oplus\mathrm{GM2^-}$	$\surd$	0	0	$\surd$	-	-
N124.9.23 $\mathrm{GM1^-}\oplus\mathrm{GM2^-}\oplus\mathrm{GM3^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{A2_u}\oplus\mathrm{B2_u}$
N124.9.24 $\mathrm{GM1^-}\oplus\mathrm{GM2^-}\oplus\mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
N124.9.25 $\mathrm{GM1^-}\oplus\mathrm{GM2^-}\oplus\mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_u}\oplus\mathrm{B2_g}\oplus\mathrm{B2_u}$
N124.9.26 $\mathrm{GM1^-}\oplus\mathrm{GM2^-}\oplus\mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N124.9.27 $\mathrm{GM1^-}\oplus\mathrm{GM2^-}\oplus\mathrm{M1^+}$	$\surd$	0	0	$\surd$	-	-
N124.9.28 $\mathrm{GM1^-}\oplus\mathrm{GM2^-}\oplus\mathrm{M1^-}$	$\surd$	0	0	$\surd$	-	-
N124.9.29 $\mathrm{GM1^-}\oplus\mathrm{GM2^-}\oplus\mathrm{M2^+}$	$\surd$	0	0	$\surd$	-	-
N124.9.30 $\mathrm{GM1^-}\oplus\mathrm{GM2^-}\oplus\mathrm{M2^-}$	$\surd$	0	0	$\surd$	-	-
N124.9.31 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{GM3^+}$	$\surd$	2	2	$\surd$	422	$\mathrm{A2}\oplus\mathrm{A2}$
N124.9.32 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{GM3^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A2_g}\oplus\mathrm{A2_u}$
N124.9.33 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B2}\oplus\mathrm{A2}$
N124.9.34 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{A2_g}\oplus\mathrm{A2_u}$
N124.9.35 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{M1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{A2_u}$
N124.9.36 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{A2_u}$
N124.9.37 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{M2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{A2_u}$
N124.9.38 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{A2_u}$
N124.9.39 $\mathrm{GM1^-}\oplus\mathrm{GM3^-}\oplus\mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
N124.9.40 $\mathrm{GM1^-}\oplus\mathrm{GM3^-}\oplus\mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{B2_g}\oplus\mathrm{B2_u}$
N124.9.41 $\mathrm{GM1^-}\oplus\mathrm{GM3^-}\oplus\mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N124.9.42 $\mathrm{GM1^-}\oplus\mathrm{GM3^-}\oplus\mathrm{M1^+}$	$\surd$	0	0	$\surd$	-	-
N124.9.43 $\mathrm{GM1^-}\oplus\mathrm{GM3^-}\oplus\mathrm{M1^-}$	$\surd$	0	0	$\surd$	-	-
N124.9.44 $\mathrm{GM1^-}\oplus\mathrm{GM3^-}\oplus\mathrm{M2^+}$	$\surd$	0	0	$\surd$	-	-
N124.9.45 $\mathrm{GM1^-}\oplus\mathrm{GM3^-}\oplus\mathrm{M2^-}$	$\surd$	0	0	$\surd$	-	-
N124.9.46 $\mathrm{GM1^-}\oplus\mathrm{GM4^+}\oplus\mathrm{GM4^+}$	$\surd$	2	2	$\surd$	422	$\mathrm{B2}\oplus\mathrm{B2}$
N124.9.47 $\mathrm{GM1^-}\oplus\mathrm{GM4^+}\oplus\mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B2_g}\oplus\mathrm{B2_u}$
N124.9.48 $\mathrm{GM1^-}\oplus\mathrm{GM4^+}\oplus\mathrm{M1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g}\oplus\mathrm{B2_u}$
N124.9.49 $\mathrm{GM1^-}\oplus\mathrm{GM4^+}\oplus\mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g}\oplus\mathrm{B2_u}$
N124.9.50 $\mathrm{GM1^-}\oplus\mathrm{GM4^+}\oplus\mathrm{M2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g}\oplus\mathrm{B2_u}$
N124.9.51 $\mathrm{GM1^-}\oplus\mathrm{GM4^+}\oplus\mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g}\oplus\mathrm{B2_u}$
N124.9.52 $\mathrm{GM1^-}\oplus\mathrm{GM4^-}\oplus\mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N124.9.53 $\mathrm{GM1^-}\oplus\mathrm{GM4^-}\oplus\mathrm{M1^+}$	$\surd$	0	0	$\surd$	-	-
N124.9.54 $\mathrm{GM1^-}\oplus\mathrm{GM4^-}\oplus\mathrm{M1^-}$	$\surd$	0	0	$\surd$	-	-
N124.9.55 $\mathrm{GM1^-}\oplus\mathrm{GM4^-}\oplus\mathrm{M2^+}$	$\surd$	0	0	$\surd$	-	-
N124.9.56 $\mathrm{GM1^-}\oplus\mathrm{GM4^-}\oplus\mathrm{M2^-}$	$\surd$	0	0	$\surd$	-	-

Non-coplanar SSGs with parent space group $P4/mcc$ (No. 124) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N124.9.57 $\mathrm{GM1}^- \oplus \mathrm{M1}^+ \oplus \mathrm{M1}^+$	$\surd$	1	0	$\times$	-	-
N124.9.58 $\mathrm{GM1}^- \oplus \mathrm{M1}^+ \oplus \mathrm{M4}^+$	$\surd$	1	0	$\times$	-	-
N124.9.59 $\mathrm{GM1}^- \oplus \mathrm{M1}^+ \oplus \mathrm{M1}^-$	$\surd$	1	1	$\times$	-	-
N124.9.60 $\mathrm{GM1}^- \oplus \mathrm{M1}^+ \oplus \mathrm{M4}^-$	$\surd$	1	1	$\times$	-	-
N124.9.61 $\mathrm{GM1}^- \oplus \mathrm{M1}^+ \oplus \mathrm{M2}^+$	$\surd$	1	0	$\times$	-	-
N124.9.62 $\mathrm{GM1}^- \oplus \mathrm{M1}^+ \oplus \mathrm{M3}^+$	$\surd$	1	0	$\times$	-	-
N124.9.63 $\mathrm{GM1}^- \oplus \mathrm{M1}^+ \oplus \mathrm{M2}^-$	$\surd$	1	1	$\times$	-	-
N124.9.64 $\mathrm{GM1}^- \oplus \mathrm{M1}^+ \oplus \mathrm{M3}^-$	$\surd$	1	1	$\times$	-	-
N124.9.65 $\mathrm{GM1}^- \oplus \mathrm{M1}^- \oplus \mathrm{M1}^-$	$\surd$	1	0	$\times$	-	-
N124.9.66 $\mathrm{GM1}^- \oplus \mathrm{M1}^- \oplus \mathrm{M4}^-$	$\surd$	1	0	$\times$	-	-
N124.9.67 $\mathrm{GM1}^- \oplus \mathrm{M1}^- \oplus \mathrm{M2}^+$	$\surd$	1	1	$\times$	-	-
N124.9.68 $\mathrm{GM1}^- \oplus \mathrm{M1}^- \oplus \mathrm{M3}^+$	$\surd$	1	1	$\times$	-	-
N124.9.69 $\mathrm{GM1}^- \oplus \mathrm{M1}^- \oplus \mathrm{M2}^-$	$\surd$	1	0	$\times$	-	-
N124.9.70 $\mathrm{GM1}^- \oplus \mathrm{M1}^- \oplus \mathrm{M3}^-$	$\surd$	1	0	$\times$	-	-
N124.9.71 $\mathrm{GM1}^- \oplus \mathrm{M2}^+ \oplus \mathrm{M2}^+$	$\surd$	1	0	$\times$	-	-
N124.9.72 $\mathrm{GM1}^- \oplus \mathrm{M2}^+ \oplus \mathrm{M3}^+$	$\surd$	1	0	$\times$	-	-
N124.9.73 $\mathrm{GM1}^- \oplus \mathrm{M2}^+ \oplus \mathrm{M2}^-$	$\surd$	1	1	$\times$	-	-
N124.9.74 $\mathrm{GM1}^- \oplus \mathrm{M2}^+ \oplus \mathrm{M3}^-$	$\surd$	1	1	$\times$	-	-
N124.9.75 $\mathrm{GM1}^- \oplus \mathrm{M2}^- \oplus \mathrm{M2}^-$	$\surd$	1	0	$\times$	-	-
N124.9.76 $\mathrm{GM1}^- \oplus \mathrm{M2}^- \oplus \mathrm{M3}^-$	$\surd$	1	0	$\times$	-	-
N124.9.77 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N124.9.78 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B1} \oplus \mathrm{B1}$
N124.9.79 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{A2_g}$
N124.9.80 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{B1} \oplus \mathrm{B1}$
N124.9.81 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B2_g}$
N124.9.82 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{B1} \oplus \mathrm{B1}$
N124.9.83 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{M1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N124.9.84 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{M1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N124.9.85 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{M2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N124.9.86 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{M2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N124.9.87 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{B1_g}$
N124.9.88 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{B1} \oplus \mathrm{A2}$
N124.9.89 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B2_u}$
N124.9.90 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{B1} \oplus \mathrm{A2}$
N124.9.91 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{A2_u}$
N124.9.92 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{M1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g}$
N124.9.93 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{M1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g}$
N124.9.94 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{M2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g}$
N124.9.95 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{M2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g}$
N124.9.96 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
N124.9.97 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B1} \oplus \mathrm{A2}$
N124.9.98 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g} \oplus \mathrm{B2_g}$
N124.9.99 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	422	$\mathrm{B1} \oplus \mathrm{A2}$
N124.9.100 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{M1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g}$
N124.9.101 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{M1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g}$
N124.9.102 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{M2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g}$

Non-coplanar SSGs with parent space group $P4/mcc$ (No. 124) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N124.9.103 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{M2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g}$
N124.9.104 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N124.9.105 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	422	$\mathrm{B1} \oplus \mathrm{B2}$
N124.9.106 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N124.9.107 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{M1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N124.9.108 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{M1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N124.9.109 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{M2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N124.9.110 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{M2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N124.9.111 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N124.9.112 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B1} \oplus \mathrm{B2}$
N124.9.113 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{M1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
N124.9.114 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{M1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
N124.9.115 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{M2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
N124.9.116 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{M2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
N124.9.117 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N124.9.118 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{M1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u}$
N124.9.119 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{M1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u}$
N124.9.120 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{M2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u}$
N124.9.121 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{M2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u}$
N124.9.122 $\mathrm{GM2}^+ \oplus \mathrm{M1}^+ \oplus \mathrm{M1}^+$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N124.9.123 $\mathrm{GM2}^+ \oplus \mathrm{M1}^+ \oplus \mathrm{M4}^+$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N124.9.124 $\mathrm{GM2}^+ \oplus \mathrm{M1}^+ \oplus \mathrm{M1}^-$	$\surd$	1	1	$\surd$	$\bar{4}2m$	$\mathrm{B1}$
N124.9.125 $\mathrm{GM2}^+ \oplus \mathrm{M1}^+ \oplus \mathrm{M4}^-$	$\surd$	1	1	$\surd$	$4mm$	$\mathrm{B1}$
N124.9.126 $\mathrm{GM2}^+ \oplus \mathrm{M1}^+ \oplus \mathrm{M2}^+$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N124.9.127 $\mathrm{GM2}^+ \oplus \mathrm{M1}^+ \oplus \mathrm{M3}^+$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N124.9.128 $\mathrm{GM2}^+ \oplus \mathrm{M1}^+ \oplus \mathrm{M2}^-$	$\surd$	1	1	$\surd$	422	$\mathrm{B1}$
N124.9.129 $\mathrm{GM2}^+ \oplus \mathrm{M1}^+ \oplus \mathrm{M3}^-$	$\surd$	1	1	$\surd$	$\bar{4}m2$	$\mathrm{B1}$
N124.9.130 $\mathrm{GM2}^+ \oplus \mathrm{M1}^- \oplus \mathrm{M1}^-$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N124.9.131 $\mathrm{GM2}^+ \oplus \mathrm{M1}^- \oplus \mathrm{M4}^-$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N124.9.132 $\mathrm{GM2}^+ \oplus \mathrm{M1}^- \oplus \mathrm{M2}^+$	$\surd$	1	1	$\surd$	422	$\mathrm{B1}$
N124.9.133 $\mathrm{GM2}^+ \oplus \mathrm{M1}^- \oplus \mathrm{M3}^+$	$\surd$	1	1	$\surd$	$\bar{4}m2$	$\mathrm{B1}$
N124.9.134 $\mathrm{GM2}^+ \oplus \mathrm{M1}^- \oplus \mathrm{M2}^-$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N124.9.135 $\mathrm{GM2}^+ \oplus \mathrm{M1}^- \oplus \mathrm{M3}^-$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N124.9.136 $\mathrm{GM2}^+ \oplus \mathrm{M2}^+ \oplus \mathrm{M2}^+$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N124.9.137 $\mathrm{GM2}^+ \oplus \mathrm{M2}^+ \oplus \mathrm{M3}^+$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N124.9.138 $\mathrm{GM2}^+ \oplus \mathrm{M2}^+ \oplus \mathrm{M2}^-$	$\surd$	1	1	$\surd$	$\bar{4}2m$	$\mathrm{B1}$
N124.9.139 $\mathrm{GM2}^+ \oplus \mathrm{M2}^+ \oplus \mathrm{M3}^-$	$\surd$	1	1	$\surd$	$4mm$	$\mathrm{B1}$
N124.9.140 $\mathrm{GM2}^+ \oplus \mathrm{M2}^- \oplus \mathrm{M2}^-$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N124.9.141 $\mathrm{GM2}^+ \oplus \mathrm{M2}^- \oplus \mathrm{M3}^-$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N124.9.142 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
N124.9.143 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N124.9.144 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N124.9.145 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$
N124.9.146 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N124.9.147 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{M1}^+$	$\surd$	0	0	$\surd$	-	-
N124.9.148 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{M1}^-$	$\surd$	0	0	$\surd$	-	-

Non-coplanar SSGs with parent space group $P4/mcc$ (No. 124) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N124.9.149 $\mathrm{GM2^-}\oplus\mathrm{GM2^-}\oplus\mathrm{M2^+}$	$\surd$	0	0	$\surd$	-	-
N124.9.150 $\mathrm{GM2^-}\oplus\mathrm{GM2^-}\oplus\mathrm{M2^-}$	$\surd$	0	0	$\surd$	-	-
N124.9.151 $\mathrm{GM2^-}\oplus\mathrm{GM3^+}\oplus\mathrm{GM3^+}$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{A2}\oplus\mathrm{A2}$
N124.9.152 $\mathrm{GM2^-}\oplus\mathrm{GM3^+}\oplus\mathrm{GM3^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A2_g}\oplus\mathrm{B2_u}$
N124.9.153 $\mathrm{GM2^-}\oplus\mathrm{GM3^+}\oplus\mathrm{GM4^+}$	$\surd$	2	2	$\surd$	422	$\mathrm{A2}\oplus\mathrm{B2}$
N124.9.154 $\mathrm{GM2^-}\oplus\mathrm{GM3^+}\oplus\mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{A2_g}\oplus\mathrm{B2_u}$
N124.9.155 $\mathrm{GM2^-}\oplus\mathrm{GM3^+}\oplus\mathrm{M1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{B2_u}$
N124.9.156 $\mathrm{GM2^-}\oplus\mathrm{GM3^+}\oplus\mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{B2_u}$
N124.9.157 $\mathrm{GM2^-}\oplus\mathrm{GM3^+}\oplus\mathrm{M2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{B2_u}$
N124.9.158 $\mathrm{GM2^-}\oplus\mathrm{GM3^+}\oplus\mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{B2_u}$
N124.9.159 $\mathrm{GM2^-}\oplus\mathrm{GM3^-}\oplus\mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
N124.9.160 $\mathrm{GM2^-}\oplus\mathrm{GM3^-}\oplus\mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{A2_u}\oplus\mathrm{B2_g}$
N124.9.161 $\mathrm{GM2^-}\oplus\mathrm{GM3^-}\oplus\mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N124.9.162 $\mathrm{GM2^-}\oplus\mathrm{GM3^-}\oplus\mathrm{M1^+}$	$\surd$	0	0	$\surd$	-	-
N124.9.163 $\mathrm{GM2^-}\oplus\mathrm{GM3^-}\oplus\mathrm{M1^-}$	$\surd$	0	0	$\surd$	-	-
N124.9.164 $\mathrm{GM2^-}\oplus\mathrm{GM3^-}\oplus\mathrm{M2^+}$	$\surd$	0	0	$\surd$	-	-
N124.9.165 $\mathrm{GM2^-}\oplus\mathrm{GM3^-}\oplus\mathrm{M2^-}$	$\surd$	0	0	$\surd$	-	-
N124.9.166 $\mathrm{GM2^-}\oplus\mathrm{GM4^+}\oplus\mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B2}\oplus\mathrm{B2}$
N124.9.167 $\mathrm{GM2^-}\oplus\mathrm{GM4^+}\oplus\mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A2_u}\oplus\mathrm{B2_g}$
N124.9.168 $\mathrm{GM2^-}\oplus\mathrm{GM4^+}\oplus\mathrm{M1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u}\oplus\mathrm{B2_g}$
N124.9.169 $\mathrm{GM2^-}\oplus\mathrm{GM4^+}\oplus\mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u}\oplus\mathrm{B2_g}$
N124.9.170 $\mathrm{GM2^-}\oplus\mathrm{GM4^+}\oplus\mathrm{M2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u}\oplus\mathrm{B2_g}$
N124.9.171 $\mathrm{GM2^-}\oplus\mathrm{GM4^+}\oplus\mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u}\oplus\mathrm{B2_g}$
N124.9.172 $\mathrm{GM2^-}\oplus\mathrm{GM4^-}\oplus\mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N124.9.173 $\mathrm{GM2^-}\oplus\mathrm{GM4^-}\oplus\mathrm{M1^+}$	$\surd$	0	0	$\surd$	-	-
N124.9.174 $\mathrm{GM2^-}\oplus\mathrm{GM4^-}\oplus\mathrm{M1^-}$	$\surd$	0	0	$\surd$	-	-
N124.9.175 $\mathrm{GM2^-}\oplus\mathrm{GM4^-}\oplus\mathrm{M2^+}$	$\surd$	0	0	$\surd$	-	-
N124.9.176 $\mathrm{GM2^-}\oplus\mathrm{GM4^-}\oplus\mathrm{M2^-}$	$\surd$	0	0	$\surd$	-	-
N124.9.177 $\mathrm{GM2^-}\oplus\mathrm{M1^+}\oplus\mathrm{M1^+}$	$\surd$	1	0	$\times$	-	-
N124.9.178 $\mathrm{GM2^-}\oplus\mathrm{M1^+}\oplus\mathrm{M4^+}$	$\surd$	1	0	$\times$	-	-
N124.9.179 $\mathrm{GM2^-}\oplus\mathrm{M1^+}\oplus\mathrm{M1^-}$	$\surd$	1	1	$\times$	-	-
N124.9.180 $\mathrm{GM2^-}\oplus\mathrm{M1^+}\oplus\mathrm{M4^-}$	$\surd$	1	1	$\times$	-	-
N124.9.181 $\mathrm{GM2^-}\oplus\mathrm{M1^+}\oplus\mathrm{M2^+}$	$\surd$	1	0	$\times$	-	-
N124.9.182 $\mathrm{GM2^-}\oplus\mathrm{M1^+}\oplus\mathrm{M3^+}$	$\surd$	1	0	$\times$	-	-
N124.9.183 $\mathrm{GM2^-}\oplus\mathrm{M1^+}\oplus\mathrm{M2^-}$	$\surd$	1	1	$\times$	-	-
N124.9.184 $\mathrm{GM2^-}\oplus\mathrm{M1^+}\oplus\mathrm{M3^-}$	$\surd$	1	1	$\times$	-	-
N124.9.185 $\mathrm{GM2^-}\oplus\mathrm{M1^-}\oplus\mathrm{M1^-}$	$\surd$	1	0	$\times$	-	-
N124.9.186 $\mathrm{GM2^-}\oplus\mathrm{M1^-}\oplus\mathrm{M4^-}$	$\surd$	1	0	$\times$	-	-
N124.9.187 $\mathrm{GM2^-}\oplus\mathrm{M1^-}\oplus\mathrm{M2^+}$	$\surd$	1	1	$\times$	-	-
N124.9.188 $\mathrm{GM2^-}\oplus\mathrm{M1^-}\oplus\mathrm{M3^+}$	$\surd$	1	1	$\times$	-	-
N124.9.189 $\mathrm{GM2^-}\oplus\mathrm{M1^-}\oplus\mathrm{M2^-}$	$\surd$	1	0	$\times$	-	-
N124.9.190 $\mathrm{GM2^-}\oplus\mathrm{M1^-}\oplus\mathrm{M3^-}$	$\surd$	1	0	$\times$	-	-
N124.9.191 $\mathrm{GM2^-}\oplus\mathrm{M2^+}\oplus\mathrm{M2^+}$	$\surd$	1	0	$\times$	-	-
N124.9.192 $\mathrm{GM2^-}\oplus\mathrm{M2^+}\oplus\mathrm{M3^+}$	$\surd$	1	0	$\times$	-	-
N124.9.193 $\mathrm{GM2^-}\oplus\mathrm{M2^+}\oplus\mathrm{M2^-}$	$\surd$	1	1	$\times$	-	-
N124.9.194 $\mathrm{GM2^-}\oplus\mathrm{M2^+}\oplus\mathrm{M3^-}$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $P4/mcc$ (No. 124) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N124.9.195 $\mathrm{GM2^-}\oplus\mathrm{M2^-}\oplus\mathrm{M2^-}$	$\surd$	1	0	$\times$	-	-
N124.9.196 $\mathrm{GM2^-}\oplus\mathrm{M2^-}\oplus\mathrm{M3^-}$	$\surd$	1	0	$\times$	-	-
N124.9.197 $\mathrm{GM3^+}\oplus\mathrm{GM3^+}\oplus\mathrm{GM3^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_g}$
N124.9.198 $\mathrm{GM3^+}\oplus\mathrm{GM3^+}\oplus\mathrm{GM3^-}$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{A2}\oplus\mathrm{A2}$
N124.9.199 $\mathrm{GM3^+}\oplus\mathrm{GM3^+}\oplus\mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{A2_g}\oplus\mathrm{B2_g}$
N124.9.200 $\mathrm{GM3^+}\oplus\mathrm{GM3^+}\oplus\mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{B2}\oplus\mathrm{B2}$
N124.9.201 $\mathrm{GM3^+}\oplus\mathrm{GM3^+}\oplus\mathrm{M1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{A2_g}$
N124.9.202 $\mathrm{GM3^+}\oplus\mathrm{GM3^+}\oplus\mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{A2_g}$
N124.9.203 $\mathrm{GM3^+}\oplus\mathrm{GM3^+}\oplus\mathrm{M2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{A2_g}$
N124.9.204 $\mathrm{GM3^+}\oplus\mathrm{GM3^+}\oplus\mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{A2_g}$
N124.9.205 $\mathrm{GM3^+}\oplus\mathrm{GM3^-}\oplus\mathrm{GM3^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A1_u}\oplus\mathrm{A2_g}$
N124.9.206 $\mathrm{GM3^+}\oplus\mathrm{GM3^-}\oplus\mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{B2}\oplus\mathrm{A2}$
N124.9.207 $\mathrm{GM3^+}\oplus\mathrm{GM3^-}\oplus\mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B1_u}\oplus\mathrm{A2_g}$
N124.9.208 $\mathrm{GM3^+}\oplus\mathrm{GM3^-}\oplus\mathrm{M1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A2_g}$
N124.9.209 $\mathrm{GM3^+}\oplus\mathrm{GM3^-}\oplus\mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A2_g}$
N124.9.210 $\mathrm{GM3^+}\oplus\mathrm{GM3^-}\oplus\mathrm{M2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A2_g}$
N124.9.211 $\mathrm{GM3^+}\oplus\mathrm{GM3^-}\oplus\mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A2_g}$
N124.9.212 $\mathrm{GM3^+}\oplus\mathrm{GM4^+}\oplus\mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{B2_g}\oplus\mathrm{B2_g}$
N124.9.213 $\mathrm{GM3^+}\oplus\mathrm{GM4^+}\oplus\mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{B2}\oplus\mathrm{A2}$
N124.9.214 $\mathrm{GM3^+}\oplus\mathrm{GM4^+}\oplus\mathrm{M1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{B2_g}$
N124.9.215 $\mathrm{GM3^+}\oplus\mathrm{GM4^+}\oplus\mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{B2_g}$
N124.9.216 $\mathrm{GM3^+}\oplus\mathrm{GM4^+}\oplus\mathrm{M2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{B2_g}$
N124.9.217 $\mathrm{GM3^+}\oplus\mathrm{GM4^+}\oplus\mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{B2_g}$
N124.9.218 $\mathrm{GM3^+}\oplus\mathrm{GM4^-}\oplus\mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{B1_u}\oplus\mathrm{A2_g}$
N124.9.219 $\mathrm{GM3^+}\oplus\mathrm{GM4^-}\oplus\mathrm{M1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{A2_g}$
N124.9.220 $\mathrm{GM3^+}\oplus\mathrm{GM4^-}\oplus\mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{A2_g}$
N124.9.221 $\mathrm{GM3^+}\oplus\mathrm{GM4^-}\oplus\mathrm{M2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{A2_g}$
N124.9.222 $\mathrm{GM3^+}\oplus\mathrm{GM4^-}\oplus\mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{A2_g}$
N124.9.223 $\mathrm{GM3^+}\oplus\mathrm{M1^+}\oplus\mathrm{M1^+}$	$\surd$	1	1	$\times$	-	-
N124.9.224 $\mathrm{GM3^+}\oplus\mathrm{M1^+}\oplus\mathrm{M4^+}$	$\surd$	1	1	$\times$	-	-
N124.9.225 $\mathrm{GM3^+}\oplus\mathrm{M1^+}\oplus\mathrm{M1^-}$	$\surd$	1	1	$\times$	-	-
N124.9.226 $\mathrm{GM3^+}\oplus\mathrm{M1^+}\oplus\mathrm{M4^-}$	$\surd$	1	1	$\times$	-	-
N124.9.227 $\mathrm{GM3^+}\oplus\mathrm{M1^+}\oplus\mathrm{M2^+}$	$\surd$	1	1	$\times$	-	-
N124.9.228 $\mathrm{GM3^+}\oplus\mathrm{M1^+}\oplus\mathrm{M3^+}$	$\surd$	1	1	$\times$	-	-
N124.9.229 $\mathrm{GM3^+}\oplus\mathrm{M1^+}\oplus\mathrm{M2^-}$	$\surd$	1	1	$\times$	-	-
N124.9.230 $\mathrm{GM3^+}\oplus\mathrm{M1^+}\oplus\mathrm{M3^-}$	$\surd$	1	1	$\times$	-	-
N124.9.231 $\mathrm{GM3^+}\oplus\mathrm{M1^-}\oplus\mathrm{M1^-}$	$\surd$	1	1	$\times$	-	-
N124.9.232 $\mathrm{GM3^+}\oplus\mathrm{M1^-}\oplus\mathrm{M4^-}$	$\surd$	1	1	$\times$	-	-
N124.9.233 $\mathrm{GM3^+}\oplus\mathrm{M1^-}\oplus\mathrm{M2^+}$	$\surd$	1	1	$\times$	-	-
N124.9.234 $\mathrm{GM3^+}\oplus\mathrm{M1^-}\oplus\mathrm{M3^+}$	$\surd$	1	1	$\times$	-	-
N124.9.235 $\mathrm{GM3^+}\oplus\mathrm{M1^-}\oplus\mathrm{M2^-}$	$\surd$	1	1	$\times$	-	-
N124.9.236 $\mathrm{GM3^+}\oplus\mathrm{M1^-}\oplus\mathrm{M3^-}$	$\surd$	1	1	$\times$	-	-
N124.9.237 $\mathrm{GM3^+}\oplus\mathrm{M2^+}\oplus\mathrm{M2^+}$	$\surd$	1	1	$\times$	-	-
N124.9.238 $\mathrm{GM3^+}\oplus\mathrm{M2^+}\oplus\mathrm{M3^+}$	$\surd$	1	1	$\times$	-	-
N124.9.239 $\mathrm{GM3^+}\oplus\mathrm{M2^+}\oplus\mathrm{M2^-}$	$\surd$	1	1	$\times$	-	-
N124.9.240 $\mathrm{GM3^+}\oplus\mathrm{M2^+}\oplus\mathrm{M3^-}$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $P4/mcc$ (No. 124) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N124.9.241 $\mathrm{GM3^+} \oplus \mathrm{M2^-} \oplus \mathrm{M2^-}$	$\surd$	1	1	$\times$	-	-
N124.9.242 $\mathrm{GM3^+} \oplus \mathrm{M2^-} \oplus \mathrm{M3^-}$	$\surd$	1	1	$\times$	-	-
N124.9.243 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
N124.9.244 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B2_g}$
N124.9.245 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N124.9.246 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{M1^+}$	$\surd$	0	0	$\surd$	-	-
N124.9.247 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{M1^-}$	$\surd$	0	0	$\surd$	-	-
N124.9.248 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{M2^+}$	$\surd$	0	0	$\surd$	-	-
N124.9.249 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{M2^-}$	$\surd$	0	0	$\surd$	-	-
N124.9.250 $\mathrm{GM3^-} \oplus \mathrm{GM4^+} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{B2} \oplus \mathrm{B2}$
N124.9.251 $\mathrm{GM3^-} \oplus \mathrm{GM4^+} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B2_g}$
N124.9.252 $\mathrm{GM3^-} \oplus \mathrm{GM4^+} \oplus \mathrm{M1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_g}$
N124.9.253 $\mathrm{GM3^-} \oplus \mathrm{GM4^+} \oplus \mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_g}$
N124.9.254 $\mathrm{GM3^-} \oplus \mathrm{GM4^+} \oplus \mathrm{M2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_g}$
N124.9.255 $\mathrm{GM3^-} \oplus \mathrm{GM4^+} \oplus \mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_g}$
N124.9.256 $\mathrm{GM3^-} \oplus \mathrm{GM4^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N124.9.257 $\mathrm{GM3^-} \oplus \mathrm{GM4^-} \oplus \mathrm{M1^+}$	$\surd$	0	0	$\surd$	-	-
N124.9.258 $\mathrm{GM3^-} \oplus \mathrm{GM4^-} \oplus \mathrm{M1^-}$	$\surd$	0	0	$\surd$	-	-
N124.9.259 $\mathrm{GM3^-} \oplus \mathrm{GM4^-} \oplus \mathrm{M2^+}$	$\surd$	0	0	$\surd$	-	-
N124.9.260 $\mathrm{GM3^-} \oplus \mathrm{GM4^-} \oplus \mathrm{M2^-}$	$\surd$	0	0	$\surd$	-	-
N124.9.261 $\mathrm{GM3^-} \oplus \mathrm{M1^+} \oplus \mathrm{M1^+}$	$\surd$	1	0	$\times$	-	-
N124.9.262 $\mathrm{GM3^-} \oplus \mathrm{M1^+} \oplus \mathrm{M4^+}$	$\surd$	1	0	$\times$	-	-
N124.9.263 $\mathrm{GM3^-} \oplus \mathrm{M1^+} \oplus \mathrm{M1^-}$	$\surd$	1	1	$\times$	-	-
N124.9.264 $\mathrm{GM3^-} \oplus \mathrm{M1^+} \oplus \mathrm{M4^-}$	$\surd$	1	1	$\times$	-	-
N124.9.265 $\mathrm{GM3^-} \oplus \mathrm{M1^+} \oplus \mathrm{M2^+}$	$\surd$	1	0	$\times$	-	-
N124.9.266 $\mathrm{GM3^-} \oplus \mathrm{M1^+} \oplus \mathrm{M3^+}$	$\surd$	1	0	$\times$	-	-
N124.9.267 $\mathrm{GM3^-} \oplus \mathrm{M1^+} \oplus \mathrm{M2^-}$	$\surd$	1	1	$\times$	-	-
N124.9.268 $\mathrm{GM3^-} \oplus \mathrm{M1^+} \oplus \mathrm{M3^-}$	$\surd$	1	1	$\times$	-	-
N124.9.269 $\mathrm{GM3^-} \oplus \mathrm{M1^-} \oplus \mathrm{M1^-}$	$\surd$	1	0	$\times$	-	-
N124.9.270 $\mathrm{GM3^-} \oplus \mathrm{M1^-} \oplus \mathrm{M4^-}$	$\surd$	1	0	$\times$	-	-
N124.9.271 $\mathrm{GM3^-} \oplus \mathrm{M1^-} \oplus \mathrm{M2^+}$	$\surd$	1	1	$\times$	-	-
N124.9.272 $\mathrm{GM3^-} \oplus \mathrm{M1^-} \oplus \mathrm{M3^+}$	$\surd$	1	1	$\times$	-	-
N124.9.273 $\mathrm{GM3^-} \oplus \mathrm{M1^-} \oplus \mathrm{M2^-}$	$\surd$	1	0	$\times$	-	-
N124.9.274 $\mathrm{GM3^-} \oplus \mathrm{M1^-} \oplus \mathrm{M3^-}$	$\surd$	1	0	$\times$	-	-
N124.9.275 $\mathrm{GM3^-} \oplus \mathrm{M2^+} \oplus \mathrm{M2^+}$	$\surd$	1	0	$\times$	-	-
N124.9.276 $\mathrm{GM3^-} \oplus \mathrm{M2^+} \oplus \mathrm{M3^+}$	$\surd$	1	0	$\times$	-	-
N124.9.277 $\mathrm{GM3^-} \oplus \mathrm{M2^+} \oplus \mathrm{M2^-}$	$\surd$	1	1	$\times$	-	-
N124.9.278 $\mathrm{GM3^-} \oplus \mathrm{M2^+} \oplus \mathrm{M3^-}$	$\surd$	1	1	$\times$	-	-
N124.9.279 $\mathrm{GM3^-} \oplus \mathrm{M2^-} \oplus \mathrm{M2^-}$	$\surd$	1	0	$\times$	-	-
N124.9.280 $\mathrm{GM3^-} \oplus \mathrm{M2^-} \oplus \mathrm{M3^-}$	$\surd$	1	0	$\times$	-	-
N124.9.281 $\mathrm{GM4^+} \oplus \mathrm{GM4^+} \oplus \mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N124.9.282 $\mathrm{GM4^+} \oplus \mathrm{GM4^+} \oplus \mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{A2} \oplus \mathrm{A2}$
N124.9.283 $\mathrm{GM4^+} \oplus \mathrm{GM4^+} \oplus \mathrm{M1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_g}$
N124.9.284 $\mathrm{GM4^+} \oplus \mathrm{GM4^+} \oplus \mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_g}$
N124.9.285 $\mathrm{GM4^+} \oplus \mathrm{GM4^+} \oplus \mathrm{M2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_g}$
N124.9.286 $\mathrm{GM4^+} \oplus \mathrm{GM4^+} \oplus \mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_g}$

Non-coplanar SSGs with parent space group $P4/mcc$ (No. 124) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N124.9.287 $\mathrm{GM4^+} \oplus \mathrm{GM4^-} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{B2_g}$
N124.9.288 $\mathrm{GM4^+} \oplus \mathrm{GM4^-} \oplus \mathrm{M1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g}$
N124.9.289 $\mathrm{GM4^+} \oplus \mathrm{GM4^-} \oplus \mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g}$
N124.9.290 $\mathrm{GM4^+} \oplus \mathrm{GM4^-} \oplus \mathrm{M2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g}$
N124.9.291 $\mathrm{GM4^+} \oplus \mathrm{GM4^-} \oplus \mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g}$
N124.9.292 $\mathrm{GM4^+} \oplus \mathrm{M1^+} \oplus \mathrm{M1^+}$	$\surd$	1	1	$\times$	-	-
N124.9.293 $\mathrm{GM4^+} \oplus \mathrm{M1^+} \oplus \mathrm{M4^+}$	$\surd$	1	1	$\times$	-	-
N124.9.294 $\mathrm{GM4^+} \oplus \mathrm{M1^+} \oplus \mathrm{M1^-}$	$\surd$	1	1	$\times$	-	-
N124.9.295 $\mathrm{GM4^+} \oplus \mathrm{M1^+} \oplus \mathrm{M4^-}$	$\surd$	1	1	$\times$	-	-
N124.9.296 $\mathrm{GM4^+} \oplus \mathrm{M1^+} \oplus \mathrm{M2^+}$	$\surd$	1	1	$\times$	-	-
N124.9.297 $\mathrm{GM4^+} \oplus \mathrm{M1^+} \oplus \mathrm{M3^+}$	$\surd$	1	1	$\times$	-	-
N124.9.298 $\mathrm{GM4^+} \oplus \mathrm{M1^+} \oplus \mathrm{M2^-}$	$\surd$	1	1	$\times$	-	-
N124.9.299 $\mathrm{GM4^+} \oplus \mathrm{M1^+} \oplus \mathrm{M3^-}$	$\surd$	1	1	$\times$	-	-
N124.9.300 $\mathrm{GM4^+} \oplus \mathrm{M1^-} \oplus \mathrm{M1^-}$	$\surd$	1	1	$\times$	-	-
N124.9.301 $\mathrm{GM4^+} \oplus \mathrm{M1^-} \oplus \mathrm{M4^-}$	$\surd$	1	1	$\times$	-	-
N124.9.302 $\mathrm{GM4^+} \oplus \mathrm{M1^-} \oplus \mathrm{M2^+}$	$\surd$	1	1	$\times$	-	-
N124.9.303 $\mathrm{GM4^+} \oplus \mathrm{M1^-} \oplus \mathrm{M3^+}$	$\surd$	1	1	$\times$	-	-
N124.9.304 $\mathrm{GM4^+} \oplus \mathrm{M1^-} \oplus \mathrm{M2^-}$	$\surd$	1	1	$\times$	-	-
N124.9.305 $\mathrm{GM4^+} \oplus \mathrm{M1^-} \oplus \mathrm{M3^-}$	$\surd$	1	1	$\times$	-	-
N124.9.306 $\mathrm{GM4^+} \oplus \mathrm{M2^+} \oplus \mathrm{M2^+}$	$\surd$	1	1	$\times$	-	-
N124.9.307 $\mathrm{GM4^+} \oplus \mathrm{M2^+} \oplus \mathrm{M3^+}$	$\surd$	1	1	$\times$	-	-
N124.9.308 $\mathrm{GM4^+} \oplus \mathrm{M2^+} \oplus \mathrm{M2^-}$	$\surd$	1	1	$\times$	-	-
N124.9.309 $\mathrm{GM4^+} \oplus \mathrm{M2^+} \oplus \mathrm{M3^-}$	$\surd$	1	1	$\times$	-	-
N124.9.310 $\mathrm{GM4^+} \oplus \mathrm{M2^-} \oplus \mathrm{M2^-}$	$\surd$	1	1	$\times$	-	-
N124.9.311 $\mathrm{GM4^+} \oplus \mathrm{M2^-} \oplus \mathrm{M3^-}$	$\surd$	1	1	$\times$	-	-
N124.9.312 $\mathrm{GM4^-} \oplus \mathrm{GM4^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N124.9.313 $\mathrm{GM4^-} \oplus \mathrm{GM4^-} \oplus \mathrm{M1^+}$	$\surd$	0	0	$\surd$	-	-
N124.9.314 $\mathrm{GM4^-} \oplus \mathrm{GM4^-} \oplus \mathrm{M1^-}$	$\surd$	0	0	$\surd$	-	-
N124.9.315 $\mathrm{GM4^-} \oplus \mathrm{GM4^-} \oplus \mathrm{M2^+}$	$\surd$	0	0	$\surd$	-	-
N124.9.316 $\mathrm{GM4^-} \oplus \mathrm{GM4^-} \oplus \mathrm{M2^-}$	$\surd$	0	0	$\surd$	-	-
N124.9.317 $\mathrm{GM4^-} \oplus \mathrm{M1^+} \oplus \mathrm{M1^+}$	$\surd$	1	0	$\times$	-	-
N124.9.318 $\mathrm{GM4^-} \oplus \mathrm{M1^+} \oplus \mathrm{M4^+}$	$\surd$	1	0	$\times$	-	-
N124.9.319 $\mathrm{GM4^-} \oplus \mathrm{M1^+} \oplus \mathrm{M1^-}$	$\surd$	1	1	$\times$	-	-
N124.9.320 $\mathrm{GM4^-} \oplus \mathrm{M1^+} \oplus \mathrm{M4^-}$	$\surd$	1	1	$\times$	-	-
N124.9.321 $\mathrm{GM4^-} \oplus \mathrm{M1^+} \oplus \mathrm{M2^+}$	$\surd$	1	0	$\times$	-	-
N124.9.322 $\mathrm{GM4^-} \oplus \mathrm{M1^+} \oplus \mathrm{M3^+}$	$\surd$	1	0	$\times$	-	-
N124.9.323 $\mathrm{GM4^-} \oplus \mathrm{M1^+} \oplus \mathrm{M2^-}$	$\surd$	1	1	$\times$	-	-
N124.9.324 $\mathrm{GM4^-} \oplus \mathrm{M1^+} \oplus \mathrm{M3^-}$	$\surd$	1	1	$\times$	-	-
N124.9.325 $\mathrm{GM4^-} \oplus \mathrm{M1^-} \oplus \mathrm{M1^-}$	$\surd$	1	0	$\times$	-	-
N124.9.326 $\mathrm{GM4^-} \oplus \mathrm{M1^-} \oplus \mathrm{M4^-}$	$\surd$	1	0	$\times$	-	-
N124.9.327 $\mathrm{GM4^-} \oplus \mathrm{M1^-} \oplus \mathrm{M2^+}$	$\surd$	1	1	$\times$	-	-
N124.9.328 $\mathrm{GM4^-} \oplus \mathrm{M1^-} \oplus \mathrm{M3^+}$	$\surd$	1	1	$\times$	-	-
N124.9.329 $\mathrm{GM4^-} \oplus \mathrm{M1^-} \oplus \mathrm{M2^-}$	$\surd$	1	0	$\times$	-	-
N124.9.330 $\mathrm{GM4^-} \oplus \mathrm{M1^-} \oplus \mathrm{M3^-}$	$\surd$	1	0	$\times$	-	-
N124.9.331 $\mathrm{GM4^-} \oplus \mathrm{M2^+} \oplus \mathrm{M2^+}$	$\surd$	1	0	$\times$	-	-
N124.9.332 $\mathrm{GM4^-} \oplus \mathrm{M2^+} \oplus \mathrm{M3^+}$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $P4/mcc$ (No. 124) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N124.9.333 $\mathrm{GM4^-} \oplus \mathrm{M2^+} \oplus \mathrm{M2^-}$	$\surd$	1	1	$\times$	-	-
N124.9.334 $\mathrm{GM4^-} \oplus \mathrm{M2^+} \oplus \mathrm{M3^-}$	$\surd$	1	1	$\times$	-	-
N124.9.335 $\mathrm{GM4^-} \oplus \mathrm{M2^-} \oplus \mathrm{M2^-}$	$\surd$	1	0	$\times$	-	-
N124.9.336 $\mathrm{GM4^-} \oplus \mathrm{M2^-} \oplus \mathrm{M3^-}$	$\surd$	1	0	$\times$	-	-
N124.9.337 $\mathrm{M1^+} \oplus \mathrm{M1^+} \oplus \mathrm{M1^+}$	$\surd$	0	0	$\surd$	-	-
N124.9.338 $\mathrm{M1^+} \oplus \mathrm{M1^+} \oplus \mathrm{M4^+}$	$\surd$	0	0	$\surd$	-	-
N124.9.339 $\mathrm{M1^+} \oplus \mathrm{M1^+} \oplus \mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u}$
N124.9.340 $\mathrm{M1^+} \oplus \mathrm{M1^+} \oplus \mathrm{M4^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_u} \oplus \mathrm{B2_u}$
N124.9.341 $\mathrm{M1^+} \oplus \mathrm{M4^+} \oplus \mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_u}$
N124.9.342 $\mathrm{M1^+} \oplus \mathrm{M1^+} \oplus \mathrm{M2^+}$	$\surd$	0	0	$\surd$	-	-
N124.9.343 $\mathrm{M1^+} \oplus \mathrm{M1^+} \oplus \mathrm{M3^+}$	$\surd$	0	0	$\surd$	-	-
N124.9.344 $\mathrm{M1^+} \oplus \mathrm{M4^+} \oplus \mathrm{M2^+}$	$\surd$	0	0	$\surd$	-	-
N124.9.345 $\mathrm{M1^+} \oplus \mathrm{M1^+} \oplus \mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N124.9.346 $\mathrm{M1^+} \oplus \mathrm{M1^+} \oplus \mathrm{M3^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u}$
N124.9.347 $\mathrm{M1^+} \oplus \mathrm{M4^+} \oplus \mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_u}$
N124.9.348 $\mathrm{M1^+} \oplus \mathrm{M1^-} \oplus \mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u}$
N124.9.349 $\mathrm{M1^+} \oplus \mathrm{M1^-} \oplus \mathrm{M4^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_u}$
N124.9.350 $\mathrm{M1^+} \oplus \mathrm{M4^-} \oplus \mathrm{M4^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_u} \oplus \mathrm{B2_u}$
N124.9.351 $\mathrm{M1^+} \oplus \mathrm{M1^-} \oplus \mathrm{M2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u}$
N124.9.352 $\mathrm{M1^+} \oplus \mathrm{M1^-} \oplus \mathrm{M3^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u}$
N124.9.353 $\mathrm{M1^+} \oplus \mathrm{M4^-} \oplus \mathrm{M2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_u}$
N124.9.354 $\mathrm{M1^+} \oplus \mathrm{M4^-} \oplus \mathrm{M3^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N124.9.355 $\mathrm{M1^+} \oplus \mathrm{M1^-} \oplus \mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u}$
N124.9.356 $\mathrm{M1^+} \oplus \mathrm{M1^-} \oplus \mathrm{M3^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u}$
N124.9.357 $\mathrm{M1^+} \oplus \mathrm{M4^-} \oplus \mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N124.9.358 $\mathrm{M1^+} \oplus \mathrm{M4^-} \oplus \mathrm{M3^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_u}$
N124.9.359 $\mathrm{M1^+} \oplus \mathrm{M2^+} \oplus \mathrm{M2^+}$	$\surd$	0	0	$\surd$	-	-
N124.9.360 $\mathrm{M1^+} \oplus \mathrm{M2^+} \oplus \mathrm{M3^+}$	$\surd$	0	0	$\surd$	-	-
N124.9.361 $\mathrm{M1^+} \oplus \mathrm{M3^+} \oplus \mathrm{M3^+}$	$\surd$	0	0	$\surd$	-	-
N124.9.362 $\mathrm{M1^+} \oplus \mathrm{M2^+} \oplus \mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u}$
N124.9.363 $\mathrm{M1^+} \oplus \mathrm{M2^+} \oplus \mathrm{M3^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_u}$
N124.9.364 $\mathrm{M1^+} \oplus \mathrm{M3^+} \oplus \mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N124.9.365 $\mathrm{M1^+} \oplus \mathrm{M3^+} \oplus \mathrm{M3^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u}$
N124.9.366 $\mathrm{M1^+} \oplus \mathrm{M2^-} \oplus \mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N124.9.367 $\mathrm{M1^+} \oplus \mathrm{M2^-} \oplus \mathrm{M3^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_u}$
N124.9.368 $\mathrm{M1^+} \oplus \mathrm{M3^-} \oplus \mathrm{M3^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u}$
N124.9.369 $\mathrm{M1^-} \oplus \mathrm{M1^-} \oplus \mathrm{M1^-}$	$\surd$	0	0	$\surd$	-	-
N124.9.370 $\mathrm{M1^-} \oplus \mathrm{M1^-} \oplus \mathrm{M4^-}$	$\surd$	0	0	$\surd$	-	-
N124.9.371 $\mathrm{M1^-} \oplus \mathrm{M1^-} \oplus \mathrm{M2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N124.9.372 $\mathrm{M1^-} \oplus \mathrm{M1^-} \oplus \mathrm{M3^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u}$
N124.9.373 $\mathrm{M1^-} \oplus \mathrm{M4^-} \oplus \mathrm{M2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_u}$
N124.9.374 $\mathrm{M1^-} \oplus \mathrm{M1^-} \oplus \mathrm{M2^-}$	$\surd$	0	0	$\surd$	-	-
N124.9.375 $\mathrm{M1^-} \oplus \mathrm{M1^-} \oplus \mathrm{M3^-}$	$\surd$	0	0	$\surd$	-	-
N124.9.376 $\mathrm{M1^-} \oplus \mathrm{M4^-} \oplus \mathrm{M2^-}$	$\surd$	0	0	$\surd$	-	-
N124.9.377 $\mathrm{M1^-} \oplus \mathrm{M2^+} \oplus \mathrm{M2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N124.9.378 $\mathrm{M1^-} \oplus \mathrm{M2^+} \oplus \mathrm{M3^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_u}$

Non-coplanar SSGs with parent space group $P4/mcc$ (No. 124) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N124.9.379 $\mathrm{M1}^{-} \oplus \mathrm{M3}^{+} \oplus \mathrm{M3}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u}$
N124.9.380 $\mathrm{M1}^{-} \oplus \mathrm{M2}^{+} \oplus \mathrm{M2}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u}$
N124.9.381 $\mathrm{M1}^{-} \oplus \mathrm{M2}^{+} \oplus \mathrm{M3}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N124.9.382 $\mathrm{M1}^{-} \oplus \mathrm{M3}^{+} \oplus \mathrm{M2}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_u}$
N124.9.383 $\mathrm{M1}^{-} \oplus \mathrm{M3}^{+} \oplus \mathrm{M3}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u}$
N124.9.384 $\mathrm{M1}^{-} \oplus \mathrm{M2}^{-} \oplus \mathrm{M2}^{-}$	$\surd$	0	0	$\surd$	-	-
N124.9.385 $\mathrm{M1}^{-} \oplus \mathrm{M2}^{-} \oplus \mathrm{M3}^{-}$	$\surd$	0	0	$\surd$	-	-
N124.9.386 $\mathrm{M1}^{-} \oplus \mathrm{M3}^{-} \oplus \mathrm{M3}^{-}$	$\surd$	0	0	$\surd$	-	-
N124.9.387 $\mathrm{M2}^{+} \oplus \mathrm{M2}^{+} \oplus \mathrm{M2}^{+}$	$\surd$	0	0	$\surd$	-	-
N124.9.388 $\mathrm{M2}^{+} \oplus \mathrm{M2}^{+} \oplus \mathrm{M3}^{+}$	$\surd$	0	0	$\surd$	-	-
N124.9.389 $\mathrm{M2}^{+} \oplus \mathrm{M2}^{+} \oplus \mathrm{M2}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u}$
N124.9.390 $\mathrm{M2}^{+} \oplus \mathrm{M2}^{+} \oplus \mathrm{M3}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_u} \oplus \mathrm{B2_u}$
N124.9.391 $\mathrm{M2}^{+} \oplus \mathrm{M3}^{+} \oplus \mathrm{M2}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_u}$
N124.9.392 $\mathrm{M2}^{+} \oplus \mathrm{M2}^{-} \oplus \mathrm{M2}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u}$
N124.9.393 $\mathrm{M2}^{+} \oplus \mathrm{M2}^{-} \oplus \mathrm{M3}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_u}$
N124.9.394 $\mathrm{M2}^{+} \oplus \mathrm{M3}^{-} \oplus \mathrm{M3}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_u} \oplus \mathrm{B2_u}$
N124.9.395 $\mathrm{M2}^{-} \oplus \mathrm{M2}^{-} \oplus \mathrm{M2}^{-}$	$\surd$	0	0	$\surd$	-	-
N124.9.396 $\mathrm{M2}^{-} \oplus \mathrm{M2}^{-} \oplus \mathrm{M3}^{-}$	$\surd$	0	0	$\surd$	-	-
N124.12.1 $\mathrm{GM1}^{-} \oplus \mathrm{GM5}^{+}$	$\surd$	2	2	$\surd$	$4mm$	E
N124.12.2 $\mathrm{GM1}^{-} \oplus \mathrm{GM5}^{-}$	$\surd$	0	0	$\surd$	-	-
N124.12.3 $\mathrm{GM1}^{-} \oplus \mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N124.12.4 $\mathrm{GM1}^{-} \oplus \mathrm{M5}^{+}$	$\surd$	1	0	$\times$	-	-
N124.12.5 $\mathrm{GM1}^{-} \oplus \mathrm{M5}^{-}$	$\surd$	1	0	$\times$	-	-
N124.12.6 $\mathrm{GM1}^{-} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N124.12.7 $\mathrm{GM1}^{-} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N124.12.8 $\mathrm{GM2}^{+} \oplus \mathrm{GM5}^{+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{E_g}$
N124.12.9 $\mathrm{GM2}^{+} \oplus \mathrm{GM5}^{-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{E_u}$
N124.12.10 $\mathrm{GM2}^{+} \oplus \mathrm{A1}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N124.12.11 $\mathrm{GM2}^{+} \oplus \mathrm{M5}^{+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N124.12.12 $\mathrm{GM2}^{+} \oplus \mathrm{M5}^{-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N124.12.13 $\mathrm{GM2}^{+} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N124.12.14 $\mathrm{GM2}^{+} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N124.12.15 $\mathrm{GM2}^{-} \oplus \mathrm{GM5}^{+}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	E
N124.12.16 $\mathrm{GM2}^{-} \oplus \mathrm{GM5}^{-}$	$\surd$	0	0	$\surd$	-	-
N124.12.17 $\mathrm{GM2}^{-} \oplus \mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N124.12.18 $\mathrm{GM2}^{-} \oplus \mathrm{M5}^{+}$	$\surd$	1	0	$\times$	-	-
N124.12.19 $\mathrm{GM2}^{-} \oplus \mathrm{M5}^{-}$	$\surd$	1	0	$\times$	-	-
N124.12.20 $\mathrm{GM2}^{-} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N124.12.21 $\mathrm{GM2}^{-} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N124.12.22 $\mathrm{GM3}^{+} \oplus \mathrm{GM5}^{+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{E_g}$
N124.12.23 $\mathrm{GM3}^{+} \oplus \mathrm{GM5}^{-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{E_u}$
N124.12.24 $\mathrm{GM3}^{+} \oplus \mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N124.12.25 $\mathrm{GM3}^{+} \oplus \mathrm{M5}^{+}$	$\surd$	1	1	$\times$	-	-
N124.12.26 $\mathrm{GM3}^{+} \oplus \mathrm{M5}^{-}$	$\surd$	1	1	$\times$	-	-
N124.12.27 $\mathrm{GM3}^{+} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	422	A2
N124.12.28 $\mathrm{GM3}^{+} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	422	A2

Non-coplanar SSGs with parent space group $P4/mcc$ (No. 124) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N124.12.29 $\mathrm{GM3^-} \oplus \mathrm{GM5^+}$	$\surd$	2	2	$\surd$	422	E
N124.12.30 $\mathrm{GM3^-} \oplus \mathrm{GM5^-}$	$\surd$	0	0	$\surd$	-	-
N124.12.31 $\mathrm{GM3^-} \oplus \mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N124.12.32 $\mathrm{GM3^-} \oplus \mathrm{M5^+}$	$\surd$	1	0	$\times$	-	-
N124.12.33 $\mathrm{GM3^-} \oplus \mathrm{M5^-}$	$\surd$	1	0	$\times$	-	-
N124.12.34 $\mathrm{GM3^-} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N124.12.35 $\mathrm{GM3^-} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N124.12.36 $\mathrm{GM4^+} \oplus \mathrm{GM5^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{E_g}$
N124.12.37 $\mathrm{GM4^+} \oplus \mathrm{GM5^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{E_u}$
N124.12.38 $\mathrm{GM4^+} \oplus \mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N124.12.39 $\mathrm{GM4^+} \oplus \mathrm{M5^+}$	$\surd$	1	1	$\times$	-	-
N124.12.40 $\mathrm{GM4^+} \oplus \mathrm{M5^-}$	$\surd$	1	1	$\times$	-	-
N124.12.41 $\mathrm{GM4^+} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N124.12.42 $\mathrm{GM4^+} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N124.12.43 $\mathrm{GM4^-} \oplus \mathrm{GM5^+}$	$\surd$	2	2	$\surd$	$\bar{4}2m$	E
N124.12.44 $\mathrm{GM4^-} \oplus \mathrm{GM5^-}$	$\surd$	0	0	$\surd$	-	-
N124.12.45 $\mathrm{GM4^-} \oplus \mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N124.12.46 $\mathrm{GM4^-} \oplus \mathrm{M5^+}$	$\surd$	1	0	$\times$	-	-
N124.12.47 $\mathrm{GM4^-} \oplus \mathrm{M5^-}$	$\surd$	1	0	$\times$	-	-
N124.12.48 $\mathrm{GM4^-} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N124.12.49 $\mathrm{GM4^-} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N124.12.50 $\mathrm{M1^+} \oplus \mathrm{GM5^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_g}$
N124.12.51 $\mathrm{M1^+} \oplus \mathrm{GM5^-}$	$\surd$	0	0	$\surd$	-	-
N124.12.52 $\mathrm{M1^+} \oplus \mathrm{A1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N124.12.53 $\mathrm{M1^+} \oplus \mathrm{A2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N124.12.54 $\mathrm{M1^+} \oplus \mathrm{M5^+}$	$\surd$	0	0	$\surd$	-	-
N124.12.55 $\mathrm{M1^+} \oplus \mathrm{M5^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_u}$
N124.12.56 $\mathrm{M1^+} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N124.12.57 $\mathrm{M1^+} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N124.12.58 $\mathrm{M1^-} \oplus \mathrm{GM5^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_g}$
N124.12.59 $\mathrm{M1^-} \oplus \mathrm{GM5^-}$	$\surd$	0	0	$\surd$	-	-
N124.12.60 $\mathrm{M1^-} \oplus \mathrm{A1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N124.12.61 $\mathrm{M1^-} \oplus \mathrm{A2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N124.12.62 $\mathrm{M1^-} \oplus \mathrm{M5^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_u}$
N124.12.63 $\mathrm{M1^-} \oplus \mathrm{M5^-}$	$\surd$	0	0	$\surd$	-	-
N124.12.64 $\mathrm{M1^-} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N124.12.65 $\mathrm{M1^-} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N124.12.66 $\mathrm{M2^+} \oplus \mathrm{GM5^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_g}$
N124.12.67 $\mathrm{M2^+} \oplus \mathrm{GM5^-}$	$\surd$	0	0	$\surd$	-	-
N124.12.68 $\mathrm{M2^+} \oplus \mathrm{A1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N124.12.69 $\mathrm{M2^+} \oplus \mathrm{A2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N124.12.70 $\mathrm{M2^+} \oplus \mathrm{M5^+}$	$\surd$	0	0	$\surd$	-	-
N124.12.71 $\mathrm{M2^+} \oplus \mathrm{M5^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_u}$
N124.12.72 $\mathrm{M2^+} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N124.12.73 $\mathrm{M2^+} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N124.12.74 $\mathrm{M2^-} \oplus \mathrm{GM5^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_g}$

Non-coplanar SSGs with parent space group $P4/mcc$ (No. 124) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N124.12.75 $\mathrm{M2^-} \oplus \mathrm{GM5^-}$	$\surd$	0	0	$\surd$	-	-
N124.12.76 $\mathrm{M2^-} \oplus \mathrm{A1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N124.12.77 $\mathrm{M2^-} \oplus \mathrm{A2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N124.12.78 $\mathrm{M2^-} \oplus \mathrm{M5^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_u}$
N124.12.79 $\mathrm{M2^-} \oplus \mathrm{M5^-}$	$\surd$	0	0	$\surd$	-	-
N124.12.80 $\mathrm{M2^-} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N124.12.81 $\mathrm{M2^-} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N124.13.1 $\mathrm{GM1^-} \oplus \mathrm{X1^+}$	$\surd$	1	0	$\times$	-	-
N124.13.2 $\mathrm{GM1^-} \oplus \mathrm{X1^-}$	$\surd$	1	0	$\times$	-	-
N124.13.3 $\mathrm{GM1^-} \oplus \mathrm{X2^+}$	$\surd$	1	0	$\times$	-	-
N124.13.4 $\mathrm{GM1^-} \oplus \mathrm{X2^-}$	$\surd$	1	0	$\times$	-	-
N124.13.5 $\mathrm{GM2^+} \oplus \mathrm{X1^+}$	$\surd$	1	1	$\times$	-	-
N124.13.6 $\mathrm{GM2^+} \oplus \mathrm{X1^-}$	$\surd$	1	1	$\times$	-	-
N124.13.7 $\mathrm{GM2^+} \oplus \mathrm{X2^+}$	$\surd$	1	1	$\times$	-	-
N124.13.8 $\mathrm{GM2^+} \oplus \mathrm{X2^-}$	$\surd$	1	1	$\times$	-	-
N124.13.9 $\mathrm{GM2^-} \oplus \mathrm{X1^+}$	$\surd$	1	0	$\times$	-	-
N124.13.10 $\mathrm{GM2^-} \oplus \mathrm{X1^-}$	$\surd$	1	0	$\times$	-	-
N124.13.11 $\mathrm{GM2^-} \oplus \mathrm{X2^+}$	$\surd$	1	0	$\times$	-	-
N124.13.12 $\mathrm{GM2^-} \oplus \mathrm{X2^-}$	$\surd$	1	0	$\times$	-	-
N124.13.13 $\mathrm{GM3^+} \oplus \mathrm{X1^+}$	$\surd$	1	1	$\times$	-	-
N124.13.14 $\mathrm{GM3^+} \oplus \mathrm{X1^-}$	$\surd$	1	1	$\times$	-	-
N124.13.15 $\mathrm{GM3^+} \oplus \mathrm{X2^+}$	$\surd$	1	1	$\times$	-	-
N124.13.16 $\mathrm{GM3^+} \oplus \mathrm{X2^-}$	$\surd$	1	1	$\times$	-	-
N124.13.17 $\mathrm{GM3^-} \oplus \mathrm{X1^+}$	$\surd$	1	0	$\times$	-	-
N124.13.18 $\mathrm{GM3^-} \oplus \mathrm{X1^-}$	$\surd$	1	0	$\times$	-	-
N124.13.19 $\mathrm{GM3^-} \oplus \mathrm{X2^+}$	$\surd$	1	0	$\times$	-	-
N124.13.20 $\mathrm{GM3^-} \oplus \mathrm{X2^-}$	$\surd$	1	0	$\times$	-	-
N124.13.21 $\mathrm{GM4^+} \oplus \mathrm{X1^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_g}$
N124.13.22 $\mathrm{GM4^+} \oplus \mathrm{X1^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_g}$
N124.13.23 $\mathrm{GM4^+} \oplus \mathrm{X2^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_g}$
N124.13.24 $\mathrm{GM4^+} \oplus \mathrm{X2^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_g}$
N124.13.25 $\mathrm{GM4^-} \oplus \mathrm{X1^+}$	$\surd$	1	0	$\times$	-	-
N124.13.26 $\mathrm{GM4^-} \oplus \mathrm{X1^-}$	$\surd$	1	0	$\times$	-	-
N124.13.27 $\mathrm{GM4^-} \oplus \mathrm{X2^+}$	$\surd$	1	0	$\times$	-	-
N124.13.28 $\mathrm{GM4^-} \oplus \mathrm{X2^-}$	$\surd$	1	0	$\times$	-	-
N124.13.29 $\mathrm{M1^+} \oplus \mathrm{X1^+}$	$\times$	-	-	-	-	-
N124.13.30 $\mathrm{M1^+} \oplus \mathrm{X4^-}$	$\times$	-	-	-	-	-
N124.13.31 $\mathrm{M1^+} \oplus \mathrm{X1^-}$	$\times$	-	-	-	-	-
N124.13.32 $\mathrm{M1^+} \oplus \mathrm{X4^+}$	$\times$	-	-	-	-	-
N124.13.33 $\mathrm{M1^+} \oplus \mathrm{X2^+}$	$\times$	-	-	-	-	-
N124.13.34 $\mathrm{M1^+} \oplus \mathrm{X3^-}$	$\times$	-	-	-	-	-
N124.13.35 $\mathrm{M1^+} \oplus \mathrm{X2^-}$	$\times$	-	-	-	-	-
N124.13.36 $\mathrm{M1^+} \oplus \mathrm{X3^+}$	$\times$	-	-	-	-	-
N124.13.37 $\mathrm{M1^-} \oplus \mathrm{X1^+}$	$\times$	-	-	-	-	-
N124.13.38 $\mathrm{M1^-} \oplus \mathrm{X4^-}$	$\times$	-	-	-	-	-
N124.13.39 $\mathrm{M1^-} \oplus \mathrm{X1^-}$	$\times$	-	-	-	-	-

Non-coplanar SSGs with parent space group $P4/mcc$ (No. 124) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N124.13.40 $\mathrm{M1}^{-} \oplus \mathrm{X4}^{+}$	$\times$	-	-	-	-	-
N124.13.41 $\mathrm{M1}^{-} \oplus \mathrm{X2}^{+}$	$\times$	-	-	-	-	-
N124.13.42 $\mathrm{M1}^{-} \oplus \mathrm{X3}^{-}$	$\times$	-	-	-	-	-
N124.13.43 $\mathrm{M1}^{-} \oplus \mathrm{X2}^{-}$	$\times$	-	-	-	-	-
N124.13.44 $\mathrm{M1}^{-} \oplus \mathrm{X3}^{+}$	$\times$	-	-	-	-	-
N124.13.45 $\mathrm{M2}^{+} \oplus \mathrm{X1}^{+}$	$\times$	-	-	-	-	-
N124.13.46 $\mathrm{M2}^{+} \oplus \mathrm{X4}^{-}$	$\times$	-	-	-	-	-
N124.13.47 $\mathrm{M2}^{+} \oplus \mathrm{X1}^{-}$	$\times$	-	-	-	-	-
N124.13.48 $\mathrm{M2}^{+} \oplus \mathrm{X4}^{+}$	$\times$	-	-	-	-	-
N124.13.49 $\mathrm{M2}^{+} \oplus \mathrm{X2}^{+}$	$\times$	-	-	-	-	-
N124.13.50 $\mathrm{M2}^{+} \oplus \mathrm{X3}^{-}$	$\times$	-	-	-	-	-
N124.13.51 $\mathrm{M2}^{+} \oplus \mathrm{X2}^{-}$	$\times$	-	-	-	-	-
N124.13.52 $\mathrm{M2}^{+} \oplus \mathrm{X3}^{+}$	$\times$	-	-	-	-	-
N124.13.53 $\mathrm{M2}^{-} \oplus \mathrm{X1}^{+}$	$\times$	-	-	-	-	-
N124.13.54 $\mathrm{M2}^{-} \oplus \mathrm{X4}^{-}$	$\times$	-	-	-	-	-
N124.13.55 $\mathrm{M2}^{-} \oplus \mathrm{X1}^{-}$	$\times$	-	-	-	-	-
N124.13.56 $\mathrm{M2}^{-} \oplus \mathrm{X4}^{+}$	$\times$	-	-	-	-	-
N124.13.57 $\mathrm{M2}^{-} \oplus \mathrm{X2}^{+}$	$\times$	-	-	-	-	-
N124.13.58 $\mathrm{M2}^{-} \oplus \mathrm{X3}^{-}$	$\times$	-	-	-	-	-
N124.13.59 $\mathrm{M2}^{-} \oplus \mathrm{X2}^{-}$	$\times$	-	-	-	-	-
N124.13.60 $\mathrm{M2}^{-} \oplus \mathrm{X3}^{+}$	$\times$	-	-	-	-	-
N124.14.1 $\mathrm{GM1}^{-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N124.14.2 $\mathrm{GM1}^{-} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N124.14.3 $\mathrm{GM1}^{-} \oplus \mathrm{V1}$	$\surd$	1	1	$\times$	-	-
N124.14.4 $\mathrm{GM2}^{+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N124.14.5 $\mathrm{GM2}^{+} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N124.14.6 $\mathrm{GM2}^{+} \oplus \mathrm{V1}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N124.14.7 $\mathrm{GM2}^{-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N124.14.8 $\mathrm{GM2}^{-} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N124.14.9 $\mathrm{GM2}^{-} \oplus \mathrm{V1}$	$\surd$	1	1	$\times$	-	-
N124.14.10 $\mathrm{GM3}^{+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	422	A2
N124.14.11 $\mathrm{GM3}^{+} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	422	A2
N124.14.12 $\mathrm{GM3}^{+} \oplus \mathrm{V1}$	$\surd$	1	1	$\times$	-	-
N124.14.13 $\mathrm{GM3}^{-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N124.14.14 $\mathrm{GM3}^{-} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N124.14.15 $\mathrm{GM3}^{-} \oplus \mathrm{V1}$	$\surd$	1	1	$\times$	-	-
N124.14.16 $\mathrm{GM4}^{+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N124.14.17 $\mathrm{GM4}^{+} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N124.14.18 $\mathrm{GM4}^{+} \oplus \mathrm{V1}$	$\surd$	1	1	$\times$	-	-
N124.14.19 $\mathrm{GM4}^{-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N124.14.20 $\mathrm{GM4}^{-} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N124.14.21 $\mathrm{GM4}^{-} \oplus \mathrm{V1}$	$\surd$	1	1	$\times$	-	-
N124.14.22 $\mathrm{M1}^{+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N124.14.23 $\mathrm{M1}^{+} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N124.14.24 $\mathrm{M1}^{+} \oplus \mathrm{V1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N124.14.25 $\mathrm{M1}^{+} \oplus \mathrm{V2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$

Non-coplanar SSGs with parent space group $P4/mcc$ (No. 124) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N124.14.26 $\mathrm{M1}^{-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N124.14.27 $\mathrm{M1}^{-} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N124.14.28 $\mathrm{M1}^{-} \oplus \mathrm{V1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N124.14.29 $\mathrm{M1}^{-} \oplus \mathrm{V2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N124.14.30 $\mathrm{M2}^{+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N124.14.31 $\mathrm{M2}^{+} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N124.14.32 $\mathrm{M2}^{+} \oplus \mathrm{V1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N124.14.33 $\mathrm{M2}^{+} \oplus \mathrm{V2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N124.14.34 $\mathrm{M2}^{-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N124.14.35 $\mathrm{M2}^{-} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N124.14.36 $\mathrm{M2}^{-} \oplus \mathrm{V1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N124.14.37 $\mathrm{M2}^{-} \oplus \mathrm{V2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$

TABLE S373: Collinear SSGs with parent space group $P4/nbm$ (No. 125).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L125.1.1 $\mathrm{GM1}^{+}$	1	$4/mmm$	$\mathrm{A1_g}$
L125.2.1 $\mathrm{GM1}^{-}$	0	-	-
L125.2.2 $\mathrm{GM2}^{+}$	1	$4/mmm$	$\mathrm{B1_g}$
L125.2.3 $\mathrm{GM2}^{-}$	0	-	-
L125.2.4 $\mathrm{GM3}^{+}$	1	$4/mmm$	$\mathrm{A2_g}$
L125.2.5 $\mathrm{GM3}^{-}$	0	-	-
L125.2.6 $\mathrm{GM4}^{+}$	1	$4/mmm$	$\mathrm{B2_g}$
L125.2.7 $\mathrm{GM4}^{-}$	0	-	-
L125.2.8 $\mathrm{Z1}^{+}$	0	-	-
L125.2.9 $\mathrm{Z1}^{-}$	0	-	-
L125.2.10 $\mathrm{Z2}^{+}$	0	-	-
L125.2.11 $\mathrm{Z2}^{-}$	0	-	-

TABLE S374: Coplanar SSGs with parent space group $P4/nbm$ (No. 125).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P125.1.1 $\mathrm{GM1}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g}$
P125.2.1 $\mathrm{GM1}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u}$
P125.2.2 $\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g}$
P125.2.3 $\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u}$
P125.2.4 $\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g}$
P125.2.5 $\mathrm{GM3}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_u}$
P125.2.6 $\mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_g}$
P125.2.7 $\mathrm{GM4}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_u}$
P125.2.8 $\mathrm{Z1}^{+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P125.2.9 $\mathrm{Z1}^{-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P125.2.10 $\mathrm{Z2}^{+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P125.2.11 $\mathrm{Z2}^{-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$

Coplanar SSGs with parent space group $P4/nbm$ (No. 125) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P125.3.1 $\mathrm{GM1^-} \oplus \mathrm{GM1^-}$	$\surd$	0	0	$\surd$	-	-
P125.3.2 $\mathrm{GM1^-} \oplus \mathrm{GM2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
P125.3.3 $\mathrm{GM1^-} \oplus \mathrm{GM2^-}$	$\surd$	0	0	$\surd$	-	-
P125.3.4 $\mathrm{GM1^-} \oplus \mathrm{GM3^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u}$
P125.3.5 $\mathrm{GM1^-} \oplus \mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
P125.3.6 $\mathrm{GM1^-} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_u}$
P125.3.7 $\mathrm{GM1^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
P125.3.8 $\mathrm{GM1^-} \oplus \mathrm{Z1^+}$	$\surd$	1	1	$\times$	-	-
P125.3.9 $\mathrm{GM1^-} \oplus \mathrm{Z1^-}$	$\surd$	1	1	$\times$	-	-
P125.3.10 $\mathrm{GM1^-} \oplus \mathrm{Z2^+}$	$\surd$	1	1	$\times$	-	-
P125.3.11 $\mathrm{GM1^-} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
P125.3.12 $\mathrm{GM2^+} \oplus \mathrm{GM2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
P125.3.13 $\mathrm{GM2^+} \oplus \mathrm{GM2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g}$
P125.3.14 $\mathrm{GM2^+} \oplus \mathrm{GM3^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g}$
P125.3.15 $\mathrm{GM2^+} \oplus \mathrm{GM3^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
P125.3.16 $\mathrm{GM2^+} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
P125.3.17 $\mathrm{GM2^+} \oplus \mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u}$
P125.3.18 $\mathrm{GM2^+} \oplus \mathrm{Z1^+}$	$\surd$	1	0	$\times$	-	-
P125.3.19 $\mathrm{GM2^+} \oplus \mathrm{Z1^-}$	$\surd$	1	0	$\times$	-	-
P125.3.20 $\mathrm{GM2^+} \oplus \mathrm{Z2^+}$	$\surd$	1	0	$\times$	-	-
P125.3.21 $\mathrm{GM2^+} \oplus \mathrm{Z2^-}$	$\surd$	1	0	$\times$	-	-
P125.3.22 $\mathrm{GM2^-} \oplus \mathrm{GM2^-}$	$\surd$	0	0	$\surd$	-	-
P125.3.23 $\mathrm{GM2^-} \oplus \mathrm{GM3^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_u}$
P125.3.24 $\mathrm{GM2^-} \oplus \mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
P125.3.25 $\mathrm{GM2^-} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g}$
P125.3.26 $\mathrm{GM2^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
P125.3.27 $\mathrm{GM2^-} \oplus \mathrm{Z1^+}$	$\surd$	1	1	$\times$	-	-
P125.3.28 $\mathrm{GM2^-} \oplus \mathrm{Z1^-}$	$\surd$	1	1	$\times$	-	-
P125.3.29 $\mathrm{GM2^-} \oplus \mathrm{Z2^+}$	$\surd$	1	1	$\times$	-	-
P125.3.30 $\mathrm{GM2^-} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
P125.3.31 $\mathrm{GM3^+} \oplus \mathrm{GM3^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g}$
P125.3.32 $\mathrm{GM3^+} \oplus \mathrm{GM3^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g}$
P125.3.33 $\mathrm{GM3^+} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g}$
P125.3.34 $\mathrm{GM3^+} \oplus \mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g}$
P125.3.35 $\mathrm{GM3^+} \oplus \mathrm{Z1^+}$	$\surd$	1	0	$\times$	-	-
P125.3.36 $\mathrm{GM3^+} \oplus \mathrm{Z1^-}$	$\surd$	1	0	$\times$	-	-
P125.3.37 $\mathrm{GM3^+} \oplus \mathrm{Z2^+}$	$\surd$	1	0	$\times$	-	-
P125.3.38 $\mathrm{GM3^+} \oplus \mathrm{Z2^-}$	$\surd$	1	0	$\times$	-	-
P125.3.39 $\mathrm{GM3^-} \oplus \mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
P125.3.40 $\mathrm{GM3^-} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_g}$
P125.3.41 $\mathrm{GM3^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
P125.3.42 $\mathrm{GM3^-} \oplus \mathrm{Z1^+}$	$\surd$	1	1	$\times$	-	-
P125.3.43 $\mathrm{GM3^-} \oplus \mathrm{Z1^-}$	$\surd$	1	1	$\times$	-	-
P125.3.44 $\mathrm{GM3^-} \oplus \mathrm{Z2^+}$	$\surd$	1	1	$\times$	-	-
P125.3.45 $\mathrm{GM3^-} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
P125.3.46 $\mathrm{GM4^+} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_g}$

Coplanar SSGs with parent space group $P4/nbm$ (No. 125) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P125.3.47 $\mathrm{GM4^+} \oplus \mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g}$
P125.3.48 $\mathrm{GM4^+} \oplus \mathrm{Z1^+}$	$\surd$	1	0	$\times$	-	-
P125.3.49 $\mathrm{GM4^+} \oplus \mathrm{Z1^-}$	$\surd$	1	0	$\times$	-	-
P125.3.50 $\mathrm{GM4^+} \oplus \mathrm{Z2^+}$	$\surd$	1	0	$\times$	-	-
P125.3.51 $\mathrm{GM4^+} \oplus \mathrm{Z2^-}$	$\surd$	1	0	$\times$	-	-
P125.3.52 $\mathrm{GM4^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
P125.3.53 $\mathrm{GM4^-} \oplus \mathrm{Z1^+}$	$\surd$	1	1	$\times$	-	-
P125.3.54 $\mathrm{GM4^-} \oplus \mathrm{Z1^-}$	$\surd$	1	1	$\times$	-	-
P125.3.55 $\mathrm{GM4^-} \oplus \mathrm{Z2^+}$	$\surd$	1	1	$\times$	-	-
P125.3.56 $\mathrm{GM4^-} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
P125.3.57 $\mathrm{Z1^+} \oplus \mathrm{Z1^+}$	$\surd$	1	0	$\times$	-	-
P125.3.58 $\mathrm{Z1^+} \oplus \mathrm{Z3^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P125.3.59 $\mathrm{Z1^+} \oplus \mathrm{Z1^-}$	$\surd$	1	1	$\times$	-	-
P125.3.60 $\mathrm{Z1^+} \oplus \mathrm{Z3^+}$	$\surd$	1	0	$\times$	-	-
P125.3.61 $\mathrm{Z1^+} \oplus \mathrm{Z2^+}$	$\surd$	1	0	$\times$	-	-
P125.3.62 $\mathrm{Z1^+} \oplus \mathrm{Z4^-}$	$\surd$	1	1	$\times$	-	-
P125.3.63 $\mathrm{Z1^+} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
P125.3.64 $\mathrm{Z1^+} \oplus \mathrm{Z4^+}$	$\surd$	1	0	$\times$	-	-
P125.3.65 $\mathrm{Z1^-} \oplus \mathrm{Z1^-}$	$\surd$	1	0	$\times$	-	-
P125.3.66 $\mathrm{Z1^-} \oplus \mathrm{Z3^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P125.3.67 $\mathrm{Z1^-} \oplus \mathrm{Z2^+}$	$\surd$	1	1	$\times$	-	-
P125.3.68 $\mathrm{Z1^-} \oplus \mathrm{Z4^-}$	$\surd$	1	0	$\times$	-	-
P125.3.69 $\mathrm{Z1^-} \oplus \mathrm{Z2^-}$	$\surd$	1	0	$\times$	-	-
P125.3.70 $\mathrm{Z1^-} \oplus \mathrm{Z4^+}$	$\surd$	1	1	$\times$	-	-
P125.3.71 $\mathrm{Z2^+} \oplus \mathrm{Z2^+}$	$\surd$	1	0	$\times$	-	-
P125.3.72 $\mathrm{Z2^+} \oplus \mathrm{Z4^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P125.3.73 $\mathrm{Z2^+} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
P125.3.74 $\mathrm{Z2^+} \oplus \mathrm{Z4^+}$	$\surd$	1	0	$\times$	-	-
P125.3.75 $\mathrm{Z2^-} \oplus \mathrm{Z2^-}$	$\surd$	1	0	$\times$	-	-
P125.3.76 $\mathrm{Z2^-} \oplus \mathrm{Z4^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P125.6.1 $\mathrm{GM5^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_g}$
P125.6.2 $\mathrm{GM5^-}$	$\surd$	0	0	$\surd$	-	-
P125.6.3 A1	$\surd$	1	1	$\times$	-	-
P125.6.4 A3	$\surd$	1	1	$\times$	-	-
P125.6.5 A4	$\surd$	1	1	$\times$	-	-
P125.6.6 M1	$\surd$	1	1	$\times$	-	-
P125.6.7 M2	$\surd$	1	1	$\times$	-	-
P125.6.8 M3	$\surd$	1	1	$\times$	-	-
P125.6.9 M4	$\surd$	1	1	$\times$	-	-
P125.6.10 $\mathrm{Z5^+}$	$\surd$	1	0	$\times$	-	-
P125.8.1 LD1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P125.8.2 LD2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P125.8.3 LD3	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P125.8.4 LD4	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P125.8.5 V2	$\surd$	1	1	$\times$	-	-
P125.8.6 V1	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $P4/nbm$ (No. 125) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation

TABLE S375: Non-coplanar SSGs with parent space group $P4/nbm$ (No. 125).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N125.1.1 GM1$^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A1_g}$
N125.2.1 GM1$^-$	$\surd$	2	2	$\surd$	422	$\mathrm{A1}\oplus\mathrm{A1}$
N125.2.2 GM2$^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{B1_g}$
N125.2.3 GM2$^-$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{A1}\oplus\mathrm{A1}$
N125.2.4 GM3$^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A2_g}$
N125.2.5 GM3$^-$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{A1}\oplus\mathrm{A1}$
N125.2.6 GM4$^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{B2_g}$
N125.2.7 GM4$^-$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{A1}\oplus\mathrm{A1}$
N125.2.8 Z1$^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}$
N125.2.9 Z1$^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}$
N125.2.10 Z2$^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}$
N125.2.11 Z2$^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}$
N125.3.1 GM1$^-\oplus$GM1$^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{A1_u}$
N125.3.2 GM1$^-\oplus$GM2$^+$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{A1}\oplus\mathrm{B1}$
N125.3.3 GM1$^-\oplus$GM2$^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{B1_u}$
N125.3.4 GM1$^-\oplus$GM3$^+$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{A1}\oplus\mathrm{A2}$
N125.3.5 GM1$^-\oplus$GM3$^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{A2_u}$
N125.3.6 GM1$^-\oplus$GM4$^+$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{A1}\oplus\mathrm{A2}$
N125.3.7 GM1$^-\oplus$GM4$^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{B2_u}$
N125.3.8 GM1$^-\oplus$Z1$^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}$
N125.3.9 GM1$^-\oplus$Z1$^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}$
N125.3.10 GM1$^-\oplus$Z2$^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}$
N125.3.11 GM1$^-\oplus$Z2$^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}$
N125.3.12 GM2$^+\oplus$GM2$^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B1_g}$
N125.3.13 GM2$^+\oplus$GM2$^-$	$\surd$	2	2	$\surd$	422	$\mathrm{A1}\oplus\mathrm{B1}$
N125.3.14 GM2$^+\oplus$GM3$^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}\oplus\mathrm{A2_g}$
N125.3.15 GM2$^+\oplus$GM3$^-$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{A1}\oplus\mathrm{B1}$
N125.3.16 GM2$^+\oplus$GM4$^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B2_g}$
N125.3.17 GM2$^+\oplus$GM4$^-$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{A1}\oplus\mathrm{B1}$
N125.3.18 GM2$^+\oplus$Z1$^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}$
N125.3.19 GM2$^+\oplus$Z1$^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}$
N125.3.20 GM2$^+\oplus$Z2$^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}$
N125.3.21 GM2$^+\oplus$Z2$^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}$
N125.3.22 GM2$^-\oplus$GM2$^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}\oplus\mathrm{B1_u}$
N125.3.23 GM2$^-\oplus$GM3$^+$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{A1}\oplus\mathrm{B2}$
N125.3.24 GM2$^-\oplus$GM3$^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}\oplus\mathrm{A2_u}$
N125.3.25 GM2$^-\oplus$GM4$^+$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{A1}\oplus\mathrm{B2}$
N125.3.26 GM2$^-\oplus$GM4$^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}\oplus\mathrm{B2_u}$
N125.3.27 GM2$^-\oplus$Z1$^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}$
N125.3.28 GM2$^-\oplus$Z1$^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}$
N125.3.29 GM2$^-\oplus$Z2$^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}$
N125.3.30 GM2$^-\oplus$Z2$^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}$

Non-coplanar SSGs with parent space group $P4/nbm$ (No. 125) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N125.3.31 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
N125.3.32 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	422	$\mathrm{A1} \oplus \mathrm{A2}$
N125.3.33 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g} \oplus \mathrm{B2_g}$
N125.3.34 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{A1} \oplus \mathrm{A2}$
N125.3.35 $\mathrm{GM3}^+ \oplus \mathrm{Z1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g}$
N125.3.36 $\mathrm{GM3}^+ \oplus \mathrm{Z1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g}$
N125.3.37 $\mathrm{GM3}^+ \oplus \mathrm{Z2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g}$
N125.3.38 $\mathrm{GM3}^+ \oplus \mathrm{Z2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g}$
N125.3.39 $\mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N125.3.40 $\mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{A1} \oplus \mathrm{B2}$
N125.3.41 $\mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N125.3.42 $\mathrm{GM3}^- \oplus \mathrm{Z1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_u}$
N125.3.43 $\mathrm{GM3}^- \oplus \mathrm{Z1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_u}$
N125.3.44 $\mathrm{GM3}^- \oplus \mathrm{Z2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_u}$
N125.3.45 $\mathrm{GM3}^- \oplus \mathrm{Z2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_u}$
N125.3.46 $\mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N125.3.47 $\mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	422	$\mathrm{A1} \oplus \mathrm{B2}$
N125.3.48 $\mathrm{GM4}^+ \oplus \mathrm{Z1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_g}$
N125.3.49 $\mathrm{GM4}^+ \oplus \mathrm{Z1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_g}$
N125.3.50 $\mathrm{GM4}^+ \oplus \mathrm{Z2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_g}$
N125.3.51 $\mathrm{GM4}^+ \oplus \mathrm{Z2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_g}$
N125.3.52 $\mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N125.3.53 $\mathrm{GM4}^- \oplus \mathrm{Z1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_u}$
N125.3.54 $\mathrm{GM4}^- \oplus \mathrm{Z1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_u}$
N125.3.55 $\mathrm{GM4}^- \oplus \mathrm{Z2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_u}$
N125.3.56 $\mathrm{GM4}^- \oplus \mathrm{Z2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_u}$
N125.3.57 $\mathrm{Z1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N125.3.58 $\mathrm{Z1}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\surd$	$4mm$	$\mathrm{A1}$
N125.3.59 $\mathrm{Z1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\surd$	422	$\mathrm{A1}$
N125.3.60 $\mathrm{Z1}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N125.3.61 $\mathrm{Z1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N125.3.62 $\mathrm{Z1}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\surd$	$\bar{4}m2$	$\mathrm{A1}$
N125.3.63 $\mathrm{Z1}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\surd$	$\bar{4}2m$	$\mathrm{A1}$
N125.3.64 $\mathrm{Z1}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N125.3.65 $\mathrm{Z1}^- \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N125.3.66 $\mathrm{Z1}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\surd$	$4mm$	$\mathrm{A1}$
N125.3.67 $\mathrm{Z1}^- \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\surd$	$\bar{4}2m$	$\mathrm{A1}$
N125.3.68 $\mathrm{Z1}^- \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N125.3.69 $\mathrm{Z1}^- \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N125.3.70 $\mathrm{Z1}^- \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\surd$	$\bar{4}m2$	$\mathrm{A1}$
N125.3.71 $\mathrm{Z2}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N125.3.72 $\mathrm{Z2}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\surd$	$4mm$	$\mathrm{A1}$
N125.3.73 $\mathrm{Z2}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\surd$	422	$\mathrm{A1}$
N125.3.74 $\mathrm{Z2}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N125.3.75 $\mathrm{Z2}^- \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N125.3.76 $\mathrm{Z2}^- \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\surd$	$4mm$	$\mathrm{A1}$

Non-coplanar SSGs with parent space group $P4/nbm$ (No. 125) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N125.6.1 GM5$^+$	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{E_g}$
N125.6.2 GM5$^-$	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{E_u}$
N125.6.3 A1	√	1	1	√	$\bar{4}m2$	A1
N125.6.4 A3	√	1	1	√	$4mm$	A1
N125.6.5 A4	√	1	1	√	$4mm$	A1
N125.6.6 M1	√	1	1	√	$\bar{4}m2$	A1
N125.6.7 M2	√	1	1	√	$\bar{4}m2$	A1
N125.6.8 M3	√	1	1	√	$4mm$	A1
N125.6.9 M4	√	1	1	√	$4mm$	A1
N125.6.10 Z5$^+$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N125.8.1 LD1	√	1	1	√	$4mm$	A1
N125.8.2 LD2	√	1	1	√	$4mm$	A1
N125.8.3 LD3	√	1	1	√	$4mm$	A1
N125.8.4 LD4	√	1	1	√	$4mm$	A1
N125.8.5 V2	√	1	1	√	$4mm$	A1
N125.8.6 V1	√	1	1	√	$4mm$	A1
N125.9.1 GM1$^-$ ⊕ GM1$^-$ ⊕ GM1$^-$	√	0	0	√	-	-
N125.9.2 GM1$^-$ ⊕ GM1$^-$ ⊕ GM2$^+$	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N125.9.3 GM1$^-$ ⊕ GM1$^-$ ⊕ GM2$^-$	√	0	0	√	-	-
N125.9.4 GM1$^-$ ⊕ GM1$^-$ ⊕ GM3$^+$	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N125.9.5 GM1$^-$ ⊕ GM1$^-$ ⊕ GM3$^-$	√	0	0	√	-	-
N125.9.6 GM1$^-$ ⊕ GM1$^-$ ⊕ GM4$^+$	√	3	3	√	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N125.9.7 GM1$^-$ ⊕ GM1$^-$ ⊕ GM4$^-$	√	0	0	√	-	-
N125.9.8 GM1$^-$ ⊕ GM1$^-$ ⊕ Z1$^+$	√	0	0	√	-	-
N125.9.9 GM1$^-$ ⊕ GM1$^-$ ⊕ Z1$^-$	√	0	0	√	-	-
N125.9.10 GM1$^-$ ⊕ GM1$^-$ ⊕ Z2$^+$	√	0	0	√	-	-
N125.9.11 GM1$^-$ ⊕ GM1$^-$ ⊕ Z2$^-$	√	0	0	√	-	-
N125.9.12 GM1$^-$ ⊕ GM2$^+$ ⊕ GM2$^+$	√	2	2	√	422	B1 ⊕ B1
N125.9.13 GM1$^-$ ⊕ GM2$^+$ ⊕ GM2$^-$	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N125.9.14 GM1$^-$ ⊕ GM2$^+$ ⊕ GM3$^+$	√	2	2	√	$\bar{4}m2$	B1 ⊕ B2
N125.9.15 GM1$^-$ ⊕ GM2$^+$ ⊕ GM3$^-$	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_u}$
N125.9.16 GM1$^-$ ⊕ GM2$^+$ ⊕ GM4$^+$	√	2	2	√	$4mm$	B1 ⊕ B2
N125.9.17 GM1$^-$ ⊕ GM2$^+$ ⊕ GM4$^-$	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{A2_u}$
N125.9.18 GM1$^-$ ⊕ GM2$^+$ ⊕ Z1$^+$	√	2	2	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N125.9.19 GM1$^-$ ⊕ GM2$^+$ ⊕ Z1$^-$	√	2	2	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N125.9.20 GM1$^-$ ⊕ GM2$^+$ ⊕ Z2$^+$	√	2	2	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N125.9.21 GM1$^-$ ⊕ GM2$^+$ ⊕ Z2$^-$	√	2	2	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N125.9.22 GM1$^-$ ⊕ GM2$^-$ ⊕ GM2$^-$	√	0	0	√	-	-
N125.9.23 GM1$^-$ ⊕ GM2$^-$ ⊕ GM3$^+$	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N125.9.24 GM1$^-$ ⊕ GM2$^-$ ⊕ GM3$^-$	√	0	0	√	-	-
N125.9.25 GM1$^-$ ⊕ GM2$^-$ ⊕ GM4$^+$	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N125.9.26 GM1$^-$ ⊕ GM2$^-$ ⊕ GM4$^-$	√	0	0	√	-	-
N125.9.27 GM1$^-$ ⊕ GM2$^-$ ⊕ Z1$^+$	√	0	0	√	-	-
N125.9.28 GM1$^-$ ⊕ GM2$^-$ ⊕ Z1$^-$	√	0	0	√	-	-
N125.9.29 GM1$^-$ ⊕ GM2$^-$ ⊕ Z2$^+$	√	0	0	√	-	-
N125.9.30 GM1$^-$ ⊕ GM2$^-$ ⊕ Z2$^-$	√	0	0	√	-	-

Non-coplanar SSGs with parent space group $P4/nbm$ (No. 125) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N125.9.31 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{GM3^+}$	√	2	2	√	422	$\mathrm{A2}\oplus\mathrm{A2}$
N125.9.32 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{GM3^-}$	√	3	3	√	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A2_g}\oplus\mathrm{A2_u}$
N125.9.33 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{GM4^+}$	√	2	2	√	$\bar{4}2m$	$\mathrm{B2}\oplus\mathrm{A2}$
N125.9.34 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{GM4^-}$	√	3	3	√	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{A2_g}\oplus\mathrm{A2_u}$
N125.9.35 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{Z1^+}$	√	2	2	√	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{A2_u}$
N125.9.36 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{Z1^-}$	√	2	2	√	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{A2_u}$
N125.9.37 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{Z2^+}$	√	2	2	√	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{A2_u}$
N125.9.38 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{Z2^-}$	√	2	2	√	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{A2_u}$
N125.9.39 $\mathrm{GM1^-}\oplus\mathrm{GM3^-}\oplus\mathrm{GM3^-}$	√	0	0	√	-	-
N125.9.40 $\mathrm{GM1^-}\oplus\mathrm{GM3^-}\oplus\mathrm{GM4^+}$	√	3	3	√	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{B2_g}\oplus\mathrm{B2_u}$
N125.9.41 $\mathrm{GM1^-}\oplus\mathrm{GM3^-}\oplus\mathrm{GM4^-}$	√	0	0	√	-	-
N125.9.42 $\mathrm{GM1^-}\oplus\mathrm{GM3^-}\oplus\mathrm{Z1^+}$	√	0	0	√	-	-
N125.9.43 $\mathrm{GM1^-}\oplus\mathrm{GM3^-}\oplus\mathrm{Z1^-}$	√	0	0	√	-	-
N125.9.44 $\mathrm{GM1^-}\oplus\mathrm{GM3^-}\oplus\mathrm{Z2^+}$	√	0	0	√	-	-
N125.9.45 $\mathrm{GM1^-}\oplus\mathrm{GM3^-}\oplus\mathrm{Z2^-}$	√	0	0	√	-	-
N125.9.46 $\mathrm{GM1^-}\oplus\mathrm{GM4^+}\oplus\mathrm{GM4^+}$	√	2	2	√	422	$\mathrm{B2}\oplus\mathrm{B2}$
N125.9.47 $\mathrm{GM1^-}\oplus\mathrm{GM4^+}\oplus\mathrm{GM4^-}$	√	3	3	√	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B2_g}\oplus\mathrm{B2_u}$
N125.9.48 $\mathrm{GM1^-}\oplus\mathrm{GM4^+}\oplus\mathrm{Z1^+}$	√	2	2	√	$4/mmm$	$\mathrm{B2_g}\oplus\mathrm{B2_u}$
N125.9.49 $\mathrm{GM1^-}\oplus\mathrm{GM4^+}\oplus\mathrm{Z1^-}$	√	2	2	√	$4/mmm$	$\mathrm{B2_g}\oplus\mathrm{B2_u}$
N125.9.50 $\mathrm{GM1^-}\oplus\mathrm{GM4^+}\oplus\mathrm{Z2^+}$	√	2	2	√	$4/mmm$	$\mathrm{B2_g}\oplus\mathrm{B2_u}$
N125.9.51 $\mathrm{GM1^-}\oplus\mathrm{GM4^+}\oplus\mathrm{Z2^-}$	√	2	2	√	$4/mmm$	$\mathrm{B2_g}\oplus\mathrm{B2_u}$
N125.9.52 $\mathrm{GM1^-}\oplus\mathrm{GM4^-}\oplus\mathrm{GM4^-}$	√	0	0	√	-	-
N125.9.53 $\mathrm{GM1^-}\oplus\mathrm{GM4^-}\oplus\mathrm{Z1^+}$	√	0	0	√	-	-
N125.9.54 $\mathrm{GM1^-}\oplus\mathrm{GM4^-}\oplus\mathrm{Z1^-}$	√	0	0	√	-	-
N125.9.55 $\mathrm{GM1^-}\oplus\mathrm{GM4^-}\oplus\mathrm{Z2^+}$	√	0	0	√	-	-
N125.9.56 $\mathrm{GM1^-}\oplus\mathrm{GM4^-}\oplus\mathrm{Z2^-}$	√	0	0	√	-	-
N125.9.57 $\mathrm{GM1^-}\oplus\mathrm{Z1^+}\oplus\mathrm{Z1^+}$	√	1	0	×	-	-
N125.9.58 $\mathrm{GM1^-}\oplus\mathrm{Z1^+}\oplus\mathrm{Z3^-}$	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N125.9.59 $\mathrm{GM1^-}\oplus\mathrm{Z1^+}\oplus\mathrm{Z1^-}$	√	1	1	×	-	-
N125.9.60 $\mathrm{GM1^-}\oplus\mathrm{Z1^+}\oplus\mathrm{Z3^+}$	√	1	0	×	-	-
N125.9.61 $\mathrm{GM1^-}\oplus\mathrm{Z1^+}\oplus\mathrm{Z2^+}$	√	1	0	×	-	-
N125.9.62 $\mathrm{GM1^-}\oplus\mathrm{Z1^+}\oplus\mathrm{Z4^-}$	√	1	1	×	-	-
N125.9.63 $\mathrm{GM1^-}\oplus\mathrm{Z1^+}\oplus\mathrm{Z2^-}$	√	1	1	×	-	-
N125.9.64 $\mathrm{GM1^-}\oplus\mathrm{Z1^+}\oplus\mathrm{Z4^+}$	√	1	0	×	-	-
N125.9.65 $\mathrm{GM1^-}\oplus\mathrm{Z1^-}\oplus\mathrm{Z1^-}$	√	1	0	×	-	-
N125.9.66 $\mathrm{GM1^-}\oplus\mathrm{Z1^-}\oplus\mathrm{Z3^+}$	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N125.9.67 $\mathrm{GM1^-}\oplus\mathrm{Z1^-}\oplus\mathrm{Z2^+}$	√	1	1	×	-	-
N125.9.68 $\mathrm{GM1^-}\oplus\mathrm{Z1^-}\oplus\mathrm{Z4^-}$	√	1	0	×	-	-
N125.9.69 $\mathrm{GM1^-}\oplus\mathrm{Z1^-}\oplus\mathrm{Z2^-}$	√	1	0	×	-	-
N125.9.70 $\mathrm{GM1^-}\oplus\mathrm{Z1^-}\oplus\mathrm{Z4^+}$	√	1	1	×	-	-
N125.9.71 $\mathrm{GM1^-}\oplus\mathrm{Z2^+}\oplus\mathrm{Z2^+}$	√	1	0	×	-	-
N125.9.72 $\mathrm{GM1^-}\oplus\mathrm{Z2^+}\oplus\mathrm{Z4^-}$	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N125.9.73 $\mathrm{GM1^-}\oplus\mathrm{Z2^+}\oplus\mathrm{Z2^-}$	√	1	1	×	-	-
N125.9.74 $\mathrm{GM1^-}\oplus\mathrm{Z2^+}\oplus\mathrm{Z4^+}$	√	1	0	×	-	-
N125.9.75 $\mathrm{GM1^-}\oplus\mathrm{Z2^-}\oplus\mathrm{Z2^-}$	√	1	0	×	-	-
N125.9.76 $\mathrm{GM1^-}\oplus\mathrm{Z2^-}\oplus\mathrm{Z4^+}$	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$

Non-coplanar SSGs with parent space group $P4/nbm$ (No. 125) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N125.9.77 $\mathrm{GM2^+} \oplus \mathrm{GM2^+} \oplus \mathrm{GM2^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N125.9.78 $\mathrm{GM2^+} \oplus \mathrm{GM2^+} \oplus \mathrm{GM2^-}$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B1} \oplus \mathrm{B1}$
N125.9.79 $\mathrm{GM2^+} \oplus \mathrm{GM2^+} \oplus \mathrm{GM3^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{A2_g}$
N125.9.80 $\mathrm{GM2^+} \oplus \mathrm{GM2^+} \oplus \mathrm{GM3^-}$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{B1} \oplus \mathrm{B1}$
N125.9.81 $\mathrm{GM2^+} \oplus \mathrm{GM2^+} \oplus \mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B2_g}$
N125.9.82 $\mathrm{GM2^+} \oplus \mathrm{GM2^+} \oplus \mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{B1} \oplus \mathrm{B1}$
N125.9.83 $\mathrm{GM2^+} \oplus \mathrm{GM2^+} \oplus \mathrm{Z1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N125.9.84 $\mathrm{GM2^+} \oplus \mathrm{GM2^+} \oplus \mathrm{Z1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N125.9.85 $\mathrm{GM2^+} \oplus \mathrm{GM2^+} \oplus \mathrm{Z2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N125.9.86 $\mathrm{GM2^+} \oplus \mathrm{GM2^+} \oplus \mathrm{Z2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N125.9.87 $\mathrm{GM2^+} \oplus \mathrm{GM2^-} \oplus \mathrm{GM2^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{B1_g}$
N125.9.88 $\mathrm{GM2^+} \oplus \mathrm{GM2^-} \oplus \mathrm{GM3^+}$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{B1} \oplus \mathrm{A2}$
N125.9.89 $\mathrm{GM2^+} \oplus \mathrm{GM2^-} \oplus \mathrm{GM3^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B2_u}$
N125.9.90 $\mathrm{GM2^+} \oplus \mathrm{GM2^-} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{B1} \oplus \mathrm{A2}$
N125.9.91 $\mathrm{GM2^+} \oplus \mathrm{GM2^-} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{A2_u}$
N125.9.92 $\mathrm{GM2^+} \oplus \mathrm{GM2^-} \oplus \mathrm{Z1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g}$
N125.9.93 $\mathrm{GM2^+} \oplus \mathrm{GM2^-} \oplus \mathrm{Z1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g}$
N125.9.94 $\mathrm{GM2^+} \oplus \mathrm{GM2^-} \oplus \mathrm{Z2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g}$
N125.9.95 $\mathrm{GM2^+} \oplus \mathrm{GM2^-} \oplus \mathrm{Z2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g}$
N125.9.96 $\mathrm{GM2^+} \oplus \mathrm{GM3^+} \oplus \mathrm{GM3^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
N125.9.97 $\mathrm{GM2^+} \oplus \mathrm{GM3^+} \oplus \mathrm{GM3^-}$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B1} \oplus \mathrm{A2}$
N125.9.98 $\mathrm{GM2^+} \oplus \mathrm{GM3^+} \oplus \mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g} \oplus \mathrm{B2_g}$
N125.9.99 $\mathrm{GM2^+} \oplus \mathrm{GM3^+} \oplus \mathrm{GM4^-}$	$\surd$	2	2	$\surd$	422	$\mathrm{B1} \oplus \mathrm{A2}$
N125.9.100 $\mathrm{GM2^+} \oplus \mathrm{GM3^+} \oplus \mathrm{Z1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g}$
N125.9.101 $\mathrm{GM2^+} \oplus \mathrm{GM3^+} \oplus \mathrm{Z1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g}$
N125.9.102 $\mathrm{GM2^+} \oplus \mathrm{GM3^+} \oplus \mathrm{Z2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g}$
N125.9.103 $\mathrm{GM2^+} \oplus \mathrm{GM3^+} \oplus \mathrm{Z2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g}$
N125.9.104 $\mathrm{GM2^+} \oplus \mathrm{GM3^-} \oplus \mathrm{GM3^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N125.9.105 $\mathrm{GM2^+} \oplus \mathrm{GM3^-} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	422	$\mathrm{B1} \oplus \mathrm{B2}$
N125.9.106 $\mathrm{GM2^+} \oplus \mathrm{GM3^-} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N125.9.107 $\mathrm{GM2^+} \oplus \mathrm{GM3^-} \oplus \mathrm{Z1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N125.9.108 $\mathrm{GM2^+} \oplus \mathrm{GM3^-} \oplus \mathrm{Z1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N125.9.109 $\mathrm{GM2^+} \oplus \mathrm{GM3^-} \oplus \mathrm{Z2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N125.9.110 $\mathrm{GM2^+} \oplus \mathrm{GM3^-} \oplus \mathrm{Z2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N125.9.111 $\mathrm{GM2^+} \oplus \mathrm{GM4^+} \oplus \mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N125.9.112 $\mathrm{GM2^+} \oplus \mathrm{GM4^+} \oplus \mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B1} \oplus \mathrm{B2}$
N125.9.113 $\mathrm{GM2^+} \oplus \mathrm{GM4^+} \oplus \mathrm{Z1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
N125.9.114 $\mathrm{GM2^+} \oplus \mathrm{GM4^+} \oplus \mathrm{Z1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
N125.9.115 $\mathrm{GM2^+} \oplus \mathrm{GM4^+} \oplus \mathrm{Z2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
N125.9.116 $\mathrm{GM2^+} \oplus \mathrm{GM4^+} \oplus \mathrm{Z2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
N125.9.117 $\mathrm{GM2^+} \oplus \mathrm{GM4^-} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N125.9.118 $\mathrm{GM2^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Z1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u}$
N125.9.119 $\mathrm{GM2^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Z1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u}$
N125.9.120 $\mathrm{GM2^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Z2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u}$
N125.9.121 $\mathrm{GM2^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Z2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u}$
N125.9.122 $\mathrm{GM2^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z1^+}$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $P4/nbm$ (No. 125) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N125.9.123 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N125.9.124 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
N125.9.125 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
N125.9.126 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\times$	-	-
N125.9.127 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\times$	-	-
N125.9.128 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\times$	-	-
N125.9.129 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\times$	-	-
N125.9.130 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
N125.9.131 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N125.9.132 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\times$	-	-
N125.9.133 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\times$	-	-
N125.9.134 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\times$	-	-
N125.9.135 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\times$	-	-
N125.9.136 $\mathrm{GM2}^+ \oplus \mathrm{Z2}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\times$	-	-
N125.9.137 $\mathrm{GM2}^+ \oplus \mathrm{Z2}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N125.9.138 $\mathrm{GM2}^+ \oplus \mathrm{Z2}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\times$	-	-
N125.9.139 $\mathrm{GM2}^+ \oplus \mathrm{Z2}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\times$	-	-
N125.9.140 $\mathrm{GM2}^+ \oplus \mathrm{Z2}^- \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\times$	-	-
N125.9.141 $\mathrm{GM2}^+ \oplus \mathrm{Z2}^- \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N125.9.142 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
N125.9.143 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N125.9.144 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N125.9.145 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$
N125.9.146 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N125.9.147 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Z1}^+$	$\surd$	0	0	$\surd$	-	-
N125.9.148 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Z1}^-$	$\surd$	0	0	$\surd$	-	-
N125.9.149 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Z2}^+$	$\surd$	0	0	$\surd$	-	-
N125.9.150 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Z2}^-$	$\surd$	0	0	$\surd$	-	-
N125.9.151 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{A2} \oplus \mathrm{A2}$
N125.9.152 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{B2_u}$
N125.9.153 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	422	$\mathrm{A2} \oplus \mathrm{B2}$
N125.9.154 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g} \oplus \mathrm{B2_u}$
N125.9.155 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Z1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_u}$
N125.9.156 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Z1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_u}$
N125.9.157 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Z2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_u}$
N125.9.158 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Z2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_u}$
N125.9.159 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N125.9.160 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$
N125.9.161 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N125.9.162 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Z1}^+$	$\surd$	0	0	$\surd$	-	-
N125.9.163 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Z1}^-$	$\surd$	0	0	$\surd$	-	-
N125.9.164 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Z2}^+$	$\surd$	0	0	$\surd$	-	-
N125.9.165 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Z2}^-$	$\surd$	0	0	$\surd$	-	-
N125.9.166 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B2} \oplus \mathrm{B2}$
N125.9.167 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$
N125.9.168 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{Z1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g}$

Non-coplanar SSGs with parent space group $P4/nbm$ (No. 125) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N125.9.169 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{Z1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g}$
N125.9.170 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{Z2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g}$
N125.9.171 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{Z2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g}$
N125.9.172 $\mathrm{GM2}^- \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N125.9.173 $\mathrm{GM2}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Z1}^+$	$\surd$	0	0	$\surd$	-	-
N125.9.174 $\mathrm{GM2}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Z1}^-$	$\surd$	0	0	$\surd$	-	-
N125.9.175 $\mathrm{GM2}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Z2}^+$	$\surd$	0	0	$\surd$	-	-
N125.9.176 $\mathrm{GM2}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Z2}^-$	$\surd$	0	0	$\surd$	-	-
N125.9.177 $\mathrm{GM2}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N125.9.178 $\mathrm{GM2}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N125.9.179 $\mathrm{GM2}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
N125.9.180 $\mathrm{GM2}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N125.9.181 $\mathrm{GM2}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N125.9.182 $\mathrm{GM2}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\times$	-	-
N125.9.183 $\mathrm{GM2}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\times$	-	-
N125.9.184 $\mathrm{GM2}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N125.9.185 $\mathrm{GM2}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N125.9.186 $\mathrm{GM2}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N125.9.187 $\mathrm{GM2}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\times$	-	-
N125.9.188 $\mathrm{GM2}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z4}^-$	$\surd$	1	0	$\times$	-	-
N125.9.189 $\mathrm{GM2}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-
N125.9.190 $\mathrm{GM2}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\times$	-	-
N125.9.191 $\mathrm{GM2}^- \oplus \mathrm{Z2}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N125.9.192 $\mathrm{GM2}^- \oplus \mathrm{Z2}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N125.9.193 $\mathrm{GM2}^- \oplus \mathrm{Z2}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\times$	-	-
N125.9.194 $\mathrm{GM2}^- \oplus \mathrm{Z2}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N125.9.195 $\mathrm{GM2}^- \oplus \mathrm{Z2}^- \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-
N125.9.196 $\mathrm{GM2}^- \oplus \mathrm{Z2}^- \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N125.9.197 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
N125.9.198 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{A2} \oplus \mathrm{A2}$
N125.9.199 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{B2_g}$
N125.9.200 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{B2} \oplus \mathrm{B2}$
N125.9.201 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Z1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g}$
N125.9.202 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Z1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g}$
N125.9.203 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Z2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g}$
N125.9.204 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Z2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g}$
N125.9.205 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A2_g}$
N125.9.206 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{B2} \oplus \mathrm{A2}$
N125.9.207 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{A2_g}$
N125.9.208 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Z1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g}$
N125.9.209 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Z1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g}$
N125.9.210 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Z2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g}$
N125.9.211 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Z2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g}$
N125.9.212 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N125.9.213 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{B2} \oplus \mathrm{A2}$
N125.9.214 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{Z1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g}$

Non-coplanar SSGs with parent space group $P4/nbm$ (No. 125) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N125.9.215 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{Z1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g}$
N125.9.216 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{Z2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g}$
N125.9.217 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{Z2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g}$
N125.9.218 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{A2_g}$
N125.9.219 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Z1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g}$
N125.9.220 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Z1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g}$
N125.9.221 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Z2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g}$
N125.9.222 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Z2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g}$
N125.9.223 $\mathrm{GM3^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z1^+}$	$\surd$	1	1	$\times$	-	-
N125.9.224 $\mathrm{GM3^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z3^-}$	$\surd$	1	1	$\surd$	422	A2
N125.9.225 $\mathrm{GM3^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z1^-}$	$\surd$	1	1	$\times$	-	-
N125.9.226 $\mathrm{GM3^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z3^+}$	$\surd$	1	1	$\times$	-	-
N125.9.227 $\mathrm{GM3^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z2^+}$	$\surd$	1	1	$\times$	-	-
N125.9.228 $\mathrm{GM3^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z4^-}$	$\surd$	1	1	$\times$	-	-
N125.9.229 $\mathrm{GM3^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
N125.9.230 $\mathrm{GM3^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z4^+}$	$\surd$	1	1	$\times$	-	-
N125.9.231 $\mathrm{GM3^+} \oplus \mathrm{Z1^-} \oplus \mathrm{Z1^-}$	$\surd$	1	1	$\times$	-	-
N125.9.232 $\mathrm{GM3^+} \oplus \mathrm{Z1^-} \oplus \mathrm{Z3^+}$	$\surd$	1	1	$\surd$	422	A2
N125.9.233 $\mathrm{GM3^+} \oplus \mathrm{Z1^-} \oplus \mathrm{Z2^+}$	$\surd$	1	1	$\times$	-	-
N125.9.234 $\mathrm{GM3^+} \oplus \mathrm{Z1^-} \oplus \mathrm{Z4^-}$	$\surd$	1	1	$\times$	-	-
N125.9.235 $\mathrm{GM3^+} \oplus \mathrm{Z1^-} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
N125.9.236 $\mathrm{GM3^+} \oplus \mathrm{Z1^-} \oplus \mathrm{Z4^+}$	$\surd$	1	1	$\times$	-	-
N125.9.237 $\mathrm{GM3^+} \oplus \mathrm{Z2^+} \oplus \mathrm{Z2^+}$	$\surd$	1	1	$\times$	-	-
N125.9.238 $\mathrm{GM3^+} \oplus \mathrm{Z2^+} \oplus \mathrm{Z4^-}$	$\surd$	1	1	$\surd$	422	A2
N125.9.239 $\mathrm{GM3^+} \oplus \mathrm{Z2^+} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
N125.9.240 $\mathrm{GM3^+} \oplus \mathrm{Z2^+} \oplus \mathrm{Z4^+}$	$\surd$	1	1	$\times$	-	-
N125.9.241 $\mathrm{GM3^+} \oplus \mathrm{Z2^-} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
N125.9.242 $\mathrm{GM3^+} \oplus \mathrm{Z2^-} \oplus \mathrm{Z4^+}$	$\surd$	1	1	$\surd$	422	A2
N125.9.243 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
N125.9.244 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B2_g}$
N125.9.245 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N125.9.246 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{Z1^+}$	$\surd$	0	0	$\surd$	-	-
N125.9.247 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{Z1^-}$	$\surd$	0	0	$\surd$	-	-
N125.9.248 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{Z2^+}$	$\surd$	0	0	$\surd$	-	-
N125.9.249 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{Z2^-}$	$\surd$	0	0	$\surd$	-	-
N125.9.250 $\mathrm{GM3^-} \oplus \mathrm{GM4^+} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{B2} \oplus \mathrm{B2}$
N125.9.251 $\mathrm{GM3^-} \oplus \mathrm{GM4^+} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B2_g}$
N125.9.252 $\mathrm{GM3^-} \oplus \mathrm{GM4^+} \oplus \mathrm{Z1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_g}$
N125.9.253 $\mathrm{GM3^-} \oplus \mathrm{GM4^+} \oplus \mathrm{Z1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_g}$
N125.9.254 $\mathrm{GM3^-} \oplus \mathrm{GM4^+} \oplus \mathrm{Z2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_g}$
N125.9.255 $\mathrm{GM3^-} \oplus \mathrm{GM4^+} \oplus \mathrm{Z2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_g}$
N125.9.256 $\mathrm{GM3^-} \oplus \mathrm{GM4^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N125.9.257 $\mathrm{GM3^-} \oplus \mathrm{GM4^-} \oplus \mathrm{Z1^+}$	$\surd$	0	0	$\surd$	-	-
N125.9.258 $\mathrm{GM3^-} \oplus \mathrm{GM4^-} \oplus \mathrm{Z1^-}$	$\surd$	0	0	$\surd$	-	-
N125.9.259 $\mathrm{GM3^-} \oplus \mathrm{GM4^-} \oplus \mathrm{Z2^+}$	$\surd$	0	0	$\surd$	-	-
N125.9.260 $\mathrm{GM3^-} \oplus \mathrm{GM4^-} \oplus \mathrm{Z2^-}$	$\surd$	0	0	$\surd$	-	-

Non-coplanar SSGs with parent space group $P4/nbm$ (No. 125) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N125.9.261 $\mathrm{GM3^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z1^+}$	$\surd$	1	0	$\times$	-	-
N125.9.262 $\mathrm{GM3^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z3^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N125.9.263 $\mathrm{GM3^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z1^-}$	$\surd$	1	1	$\times$	-	-
N125.9.264 $\mathrm{GM3^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z3^+}$	$\surd$	1	0	$\times$	-	-
N125.9.265 $\mathrm{GM3^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z2^+}$	$\surd$	1	0	$\times$	-	-
N125.9.266 $\mathrm{GM3^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z4^-}$	$\surd$	1	1	$\times$	-	-
N125.9.267 $\mathrm{GM3^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
N125.9.268 $\mathrm{GM3^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z4^+}$	$\surd$	1	0	$\times$	-	-
N125.9.269 $\mathrm{GM3^-} \oplus \mathrm{Z1^-} \oplus \mathrm{Z1^-}$	$\surd$	1	0	$\times$	-	-
N125.9.270 $\mathrm{GM3^-} \oplus \mathrm{Z1^-} \oplus \mathrm{Z3^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N125.9.271 $\mathrm{GM3^-} \oplus \mathrm{Z1^-} \oplus \mathrm{Z2^+}$	$\surd$	1	1	$\times$	-	-
N125.9.272 $\mathrm{GM3^-} \oplus \mathrm{Z1^-} \oplus \mathrm{Z4^-}$	$\surd$	1	0	$\times$	-	-
N125.9.273 $\mathrm{GM3^-} \oplus \mathrm{Z1^-} \oplus \mathrm{Z2^-}$	$\surd$	1	0	$\times$	-	-
N125.9.274 $\mathrm{GM3^-} \oplus \mathrm{Z1^-} \oplus \mathrm{Z4^+}$	$\surd$	1	1	$\times$	-	-
N125.9.275 $\mathrm{GM3^-} \oplus \mathrm{Z2^+} \oplus \mathrm{Z2^+}$	$\surd$	1	0	$\times$	-	-
N125.9.276 $\mathrm{GM3^-} \oplus \mathrm{Z2^+} \oplus \mathrm{Z4^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N125.9.277 $\mathrm{GM3^-} \oplus \mathrm{Z2^+} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
N125.9.278 $\mathrm{GM3^-} \oplus \mathrm{Z2^+} \oplus \mathrm{Z4^+}$	$\surd$	1	0	$\times$	-	-
N125.9.279 $\mathrm{GM3^-} \oplus \mathrm{Z2^-} \oplus \mathrm{Z2^-}$	$\surd$	1	0	$\times$	-	-
N125.9.280 $\mathrm{GM3^-} \oplus \mathrm{Z2^-} \oplus \mathrm{Z4^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N125.9.281 $\mathrm{GM4^+} \oplus \mathrm{GM4^+} \oplus \mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N125.9.282 $\mathrm{GM4^+} \oplus \mathrm{GM4^+} \oplus \mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{A2} \oplus \mathrm{A2}$
N125.9.283 $\mathrm{GM4^+} \oplus \mathrm{GM4^+} \oplus \mathrm{Z1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_g}$
N125.9.284 $\mathrm{GM4^+} \oplus \mathrm{GM4^+} \oplus \mathrm{Z1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_g}$
N125.9.285 $\mathrm{GM4^+} \oplus \mathrm{GM4^+} \oplus \mathrm{Z2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_g}$
N125.9.286 $\mathrm{GM4^+} \oplus \mathrm{GM4^+} \oplus \mathrm{Z2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_g}$
N125.9.287 $\mathrm{GM4^+} \oplus \mathrm{GM4^-} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{B2_g}$
N125.9.288 $\mathrm{GM4^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Z1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g}$
N125.9.289 $\mathrm{GM4^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Z1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g}$
N125.9.290 $\mathrm{GM4^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Z2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g}$
N125.9.291 $\mathrm{GM4^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Z2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g}$
N125.9.292 $\mathrm{GM4^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z1^+}$	$\surd$	1	1	$\times$	-	-
N125.9.293 $\mathrm{GM4^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z3^-}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	$\mathrm{B2}$
N125.9.294 $\mathrm{GM4^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z1^-}$	$\surd$	1	1	$\times$	-	-
N125.9.295 $\mathrm{GM4^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z3^+}$	$\surd$	1	1	$\times$	-	-
N125.9.296 $\mathrm{GM4^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z2^+}$	$\surd$	1	1	$\times$	-	-
N125.9.297 $\mathrm{GM4^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z4^-}$	$\surd$	1	1	$\times$	-	-
N125.9.298 $\mathrm{GM4^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
N125.9.299 $\mathrm{GM4^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z4^+}$	$\surd$	1	1	$\times$	-	-
N125.9.300 $\mathrm{GM4^+} \oplus \mathrm{Z1^-} \oplus \mathrm{Z1^-}$	$\surd$	1	1	$\times$	-	-
N125.9.301 $\mathrm{GM4^+} \oplus \mathrm{Z1^-} \oplus \mathrm{Z3^+}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	$\mathrm{B2}$
N125.9.302 $\mathrm{GM4^+} \oplus \mathrm{Z1^-} \oplus \mathrm{Z2^+}$	$\surd$	1	1	$\times$	-	-
N125.9.303 $\mathrm{GM4^+} \oplus \mathrm{Z1^-} \oplus \mathrm{Z4^-}$	$\surd$	1	1	$\times$	-	-
N125.9.304 $\mathrm{GM4^+} \oplus \mathrm{Z1^-} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
N125.9.305 $\mathrm{GM4^+} \oplus \mathrm{Z1^-} \oplus \mathrm{Z4^+}$	$\surd$	1	1	$\times$	-	-
N125.9.306 $\mathrm{GM4^+} \oplus \mathrm{Z2^+} \oplus \mathrm{Z2^+}$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $P4/nbm$ (No. 125) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N125.9.307 $\mathrm{GM4^+} \oplus \mathrm{Z2^+} \oplus \mathrm{Z4^-}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	$\mathrm{B2}$
N125.9.308 $\mathrm{GM4^+} \oplus \mathrm{Z2^+} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
N125.9.309 $\mathrm{GM4^+} \oplus \mathrm{Z2^+} \oplus \mathrm{Z4^+}$	$\surd$	1	1	$\times$	-	-
N125.9.310 $\mathrm{GM4^+} \oplus \mathrm{Z2^-} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
N125.9.311 $\mathrm{GM4^+} \oplus \mathrm{Z2^-} \oplus \mathrm{Z4^+}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	$\mathrm{B2}$
N125.9.312 $\mathrm{GM4^-} \oplus \mathrm{GM4^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N125.9.313 $\mathrm{GM4^-} \oplus \mathrm{GM4^-} \oplus \mathrm{Z1^+}$	$\surd$	0	0	$\surd$	-	-
N125.9.314 $\mathrm{GM4^-} \oplus \mathrm{GM4^-} \oplus \mathrm{Z1^-}$	$\surd$	0	0	$\surd$	-	-
N125.9.315 $\mathrm{GM4^-} \oplus \mathrm{GM4^-} \oplus \mathrm{Z2^+}$	$\surd$	0	0	$\surd$	-	-
N125.9.316 $\mathrm{GM4^-} \oplus \mathrm{GM4^-} \oplus \mathrm{Z2^-}$	$\surd$	0	0	$\surd$	-	-
N125.9.317 $\mathrm{GM4^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z1^+}$	$\surd$	1	0	$\times$	-	-
N125.9.318 $\mathrm{GM4^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z3^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N125.9.319 $\mathrm{GM4^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z1^-}$	$\surd$	1	1	$\times$	-	-
N125.9.320 $\mathrm{GM4^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z3^+}$	$\surd$	1	0	$\times$	-	-
N125.9.321 $\mathrm{GM4^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z2^+}$	$\surd$	1	0	$\times$	-	-
N125.9.322 $\mathrm{GM4^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z4^-}$	$\surd$	1	1	$\times$	-	-
N125.9.323 $\mathrm{GM4^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
N125.9.324 $\mathrm{GM4^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z4^+}$	$\surd$	1	0	$\times$	-	-
N125.9.325 $\mathrm{GM4^-} \oplus \mathrm{Z1^-} \oplus \mathrm{Z1^-}$	$\surd$	1	0	$\times$	-	-
N125.9.326 $\mathrm{GM4^-} \oplus \mathrm{Z1^-} \oplus \mathrm{Z3^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N125.9.327 $\mathrm{GM4^-} \oplus \mathrm{Z1^-} \oplus \mathrm{Z2^+}$	$\surd$	1	1	$\times$	-	-
N125.9.328 $\mathrm{GM4^-} \oplus \mathrm{Z1^-} \oplus \mathrm{Z4^-}$	$\surd$	1	0	$\times$	-	-
N125.9.329 $\mathrm{GM4^-} \oplus \mathrm{Z1^-} \oplus \mathrm{Z2^-}$	$\surd$	1	0	$\times$	-	-
N125.9.330 $\mathrm{GM4^-} \oplus \mathrm{Z1^-} \oplus \mathrm{Z4^+}$	$\surd$	1	1	$\times$	-	-
N125.9.331 $\mathrm{GM4^-} \oplus \mathrm{Z2^+} \oplus \mathrm{Z2^+}$	$\surd$	1	0	$\times$	-	-
N125.9.332 $\mathrm{GM4^-} \oplus \mathrm{Z2^+} \oplus \mathrm{Z4^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N125.9.333 $\mathrm{GM4^-} \oplus \mathrm{Z2^+} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
N125.9.334 $\mathrm{GM4^-} \oplus \mathrm{Z2^+} \oplus \mathrm{Z4^+}$	$\surd$	1	0	$\times$	-	-
N125.9.335 $\mathrm{GM4^-} \oplus \mathrm{Z2^-} \oplus \mathrm{Z2^-}$	$\surd$	1	0	$\times$	-	-
N125.9.336 $\mathrm{GM4^-} \oplus \mathrm{Z2^-} \oplus \mathrm{Z4^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N125.9.337 $\mathrm{Z1^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z1^+}$	$\surd$	0	0	$\surd$	-	-
N125.9.338 $\mathrm{Z1^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z3^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u}$
N125.9.339 $\mathrm{Z1^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u}$
N125.9.340 $\mathrm{Z1^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z3^+}$	$\surd$	0	0	$\surd$	-	-
N125.9.341 $\mathrm{Z1^+} \oplus \mathrm{Z3^-} \oplus \mathrm{Z1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u}$
N125.9.342 $\mathrm{Z1^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z2^+}$	$\surd$	0	0	$\surd$	-	-
N125.9.343 $\mathrm{Z1^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z4^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_u} \oplus \mathrm{B2_u}$
N125.9.344 $\mathrm{Z1^+} \oplus \mathrm{Z3^-} \oplus \mathrm{Z2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_u}$
N125.9.345 $\mathrm{Z1^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N125.9.346 $\mathrm{Z1^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z4^+}$	$\surd$	0	0	$\surd$	-	-
N125.9.347 $\mathrm{Z1^+} \oplus \mathrm{Z3^-} \oplus \mathrm{Z2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_u}$
N125.9.348 $\mathrm{Z1^+} \oplus \mathrm{Z1^-} \oplus \mathrm{Z1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u}$
N125.9.349 $\mathrm{Z1^+} \oplus \mathrm{Z1^-} \oplus \mathrm{Z3^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u}$
N125.9.350 $\mathrm{Z1^+} \oplus \mathrm{Z3^+} \oplus \mathrm{Z3^+}$	$\surd$	0	0	$\surd$	-	-
N125.9.351 $\mathrm{Z1^+} \oplus \mathrm{Z1^-} \oplus \mathrm{Z2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u}$
N125.9.352 $\mathrm{Z1^+} \oplus \mathrm{Z1^-} \oplus \mathrm{Z4^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_u}$

Non-coplanar SSGs with parent space group $P4/nbm$ (No. 125) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N125.9.353 $\mathrm{Z1}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z2}^+$	$\surd$	0	0	$\surd$	-	-
N125.9.354 $\mathrm{Z1}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z4}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N125.9.355 $\mathrm{Z1}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u}$
N125.9.356 $\mathrm{Z1}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_u}$
N125.9.357 $\mathrm{Z1}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N125.9.358 $\mathrm{Z1}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z4}^+$	$\surd$	0	0	$\surd$	-	-
N125.9.359 $\mathrm{Z1}^+ \oplus \mathrm{Z2}^+ \oplus \mathrm{Z2}^+$	$\surd$	0	0	$\surd$	-	-
N125.9.360 $\mathrm{Z1}^+ \oplus \mathrm{Z2}^+ \oplus \mathrm{Z4}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_u}$
N125.9.361 $\mathrm{Z1}^+ \oplus \mathrm{Z4}^- \oplus \mathrm{Z4}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_u} \oplus \mathrm{B2_u}$
N125.9.362 $\mathrm{Z1}^+ \oplus \mathrm{Z2}^+ \oplus \mathrm{Z2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u}$
N125.9.363 $\mathrm{Z1}^+ \oplus \mathrm{Z2}^+ \oplus \mathrm{Z4}^+$	$\surd$	0	0	$\surd$	-	-
N125.9.364 $\mathrm{Z1}^+ \oplus \mathrm{Z4}^- \oplus \mathrm{Z2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N125.9.365 $\mathrm{Z1}^+ \oplus \mathrm{Z4}^- \oplus \mathrm{Z4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_u}$
N125.9.366 $\mathrm{Z1}^+ \oplus \mathrm{Z2}^- \oplus \mathrm{Z2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N125.9.367 $\mathrm{Z1}^+ \oplus \mathrm{Z2}^- \oplus \mathrm{Z4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_u}$
N125.9.368 $\mathrm{Z1}^+ \oplus \mathrm{Z4}^+ \oplus \mathrm{Z4}^+$	$\surd$	0	0	$\surd$	-	-
N125.9.369 $\mathrm{Z1}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z1}^-$	$\surd$	0	0	$\surd$	-	-
N125.9.370 $\mathrm{Z1}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z3}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u}$
N125.9.371 $\mathrm{Z1}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N125.9.372 $\mathrm{Z1}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z4}^-$	$\surd$	0	0	$\surd$	-	-
N125.9.373 $\mathrm{Z1}^- \oplus \mathrm{Z3}^+ \oplus \mathrm{Z2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_u}$
N125.9.374 $\mathrm{Z1}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z2}^-$	$\surd$	0	0	$\surd$	-	-
N125.9.375 $\mathrm{Z1}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_u} \oplus \mathrm{B2_u}$
N125.9.376 $\mathrm{Z1}^- \oplus \mathrm{Z3}^+ \oplus \mathrm{Z2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_u}$
N125.9.377 $\mathrm{Z1}^- \oplus \mathrm{Z2}^+ \oplus \mathrm{Z2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N125.9.378 $\mathrm{Z1}^- \oplus \mathrm{Z2}^+ \oplus \mathrm{Z4}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_u}$
N125.9.379 $\mathrm{Z1}^- \oplus \mathrm{Z4}^- \oplus \mathrm{Z4}^-$	$\surd$	0	0	$\surd$	-	-
N125.9.380 $\mathrm{Z1}^- \oplus \mathrm{Z2}^+ \oplus \mathrm{Z2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u}$
N125.9.381 $\mathrm{Z1}^- \oplus \mathrm{Z2}^+ \oplus \mathrm{Z4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N125.9.382 $\mathrm{Z1}^- \oplus \mathrm{Z4}^- \oplus \mathrm{Z2}^-$	$\surd$	0	0	$\surd$	-	-
N125.9.383 $\mathrm{Z1}^- \oplus \mathrm{Z4}^- \oplus \mathrm{Z4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_u}$
N125.9.384 $\mathrm{Z1}^- \oplus \mathrm{Z2}^- \oplus \mathrm{Z2}^-$	$\surd$	0	0	$\surd$	-	-
N125.9.385 $\mathrm{Z1}^- \oplus \mathrm{Z2}^- \oplus \mathrm{Z4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_u}$
N125.9.386 $\mathrm{Z1}^- \oplus \mathrm{Z4}^+ \oplus \mathrm{Z4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_u} \oplus \mathrm{B2_u}$
N125.9.387 $\mathrm{Z2}^+ \oplus \mathrm{Z2}^+ \oplus \mathrm{Z2}^+$	$\surd$	0	0	$\surd$	-	-
N125.9.388 $\mathrm{Z2}^+ \oplus \mathrm{Z2}^+ \oplus \mathrm{Z4}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u}$
N125.9.389 $\mathrm{Z2}^+ \oplus \mathrm{Z2}^+ \oplus \mathrm{Z2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u}$
N125.9.390 $\mathrm{Z2}^+ \oplus \mathrm{Z2}^+ \oplus \mathrm{Z4}^+$	$\surd$	0	0	$\surd$	-	-
N125.9.391 $\mathrm{Z2}^+ \oplus \mathrm{Z4}^- \oplus \mathrm{Z2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u}$
N125.9.392 $\mathrm{Z2}^+ \oplus \mathrm{Z2}^- \oplus \mathrm{Z2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u}$
N125.9.393 $\mathrm{Z2}^+ \oplus \mathrm{Z2}^- \oplus \mathrm{Z4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u}$
N125.9.394 $\mathrm{Z2}^+ \oplus \mathrm{Z4}^+ \oplus \mathrm{Z4}^+$	$\surd$	0	0	$\surd$	-	-
N125.9.395 $\mathrm{Z2}^- \oplus \mathrm{Z2}^- \oplus \mathrm{Z2}^-$	$\surd$	0	0	$\surd$	-	-
N125.9.396 $\mathrm{Z2}^- \oplus \mathrm{Z2}^- \oplus \mathrm{Z4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u}$
N125.12.1 $\mathrm{GM1}^- \oplus \mathrm{GM5}^+$	$\surd$	2	2	$\surd$	$4mm$	E
N125.12.2 $\mathrm{GM1}^- \oplus \mathrm{GM5}^-$	$\surd$	0	0	$\surd$	-	-

Non-coplanar SSGs with parent space group $P4/nbm$ (No. 125) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N125.12.3 GM1$^-$ ⊕ A1	√	1	1	×	-	-
N125.12.4 GM1$^-$ ⊕ A3	√	1	1	×	-	-
N125.12.5 GM1$^-$ ⊕ A4	√	1	1	×	-	-
N125.12.6 GM1$^-$ ⊕ M1	√	1	1	×	-	-
N125.12.7 GM1$^-$ ⊕ M2	√	1	1	×	-	-
N125.12.8 GM1$^-$ ⊕ M3	√	1	1	×	-	-
N125.12.9 GM1$^-$ ⊕ M4	√	1	1	×	-	-
N125.12.10 GM1$^-$ ⊕ Z5$^+$	√	1	0	×	-	-
N125.12.11 GM2$^+$ ⊕ GM5$^+$	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{E_g}$
N125.12.12 GM2$^+$ ⊕ GM5$^-$	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{E_u}$
N125.12.13 GM2$^+$ ⊕ A1	√	1	1	×	-	-
N125.12.14 GM2$^+$ ⊕ A3	√	1	1	√	$\bar{4}m2$	B1
N125.12.15 GM2$^+$ ⊕ A4	√	1	1	√	$\bar{4}m2$	B1
N125.12.16 GM2$^+$ ⊕ M1	√	1	1	√	$4mm$	B1
N125.12.17 GM2$^+$ ⊕ M2	√	1	1	√	$4mm$	B1
N125.12.18 GM2$^+$ ⊕ M3	√	1	1	√	$\bar{4}m2$	B1
N125.12.19 GM2$^+$ ⊕ M4	√	1	1	√	$\bar{4}m2$	B1
N125.12.20 GM2$^+$ ⊕ Z5$^+$	√	1	1	×	-	-
N125.12.21 GM2$^-$ ⊕ GM5$^+$	√	2	2	√	$\bar{4}m2$	E
N125.12.22 GM2$^-$ ⊕ GM5$^-$	√	0	0	√	-	-
N125.12.23 GM2$^-$ ⊕ A1	√	1	1	×	-	-
N125.12.24 GM2$^-$ ⊕ A3	√	1	1	×	-	-
N125.12.25 GM2$^-$ ⊕ A4	√	1	1	×	-	-
N125.12.26 GM2$^-$ ⊕ M1	√	1	1	×	-	-
N125.12.27 GM2$^-$ ⊕ M2	√	1	1	×	-	-
N125.12.28 GM2$^-$ ⊕ M3	√	1	1	×	-	-
N125.12.29 GM2$^-$ ⊕ M4	√	1	1	×	-	-
N125.12.30 GM2$^-$ ⊕ Z5$^+$	√	1	0	×	-	-
N125.12.31 GM3$^+$ ⊕ GM5$^+$	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{E_g}$
N125.12.32 GM3$^+$ ⊕ GM5$^-$	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{E_u}$
N125.12.33 GM3$^+$ ⊕ A1	√	1	1	×	-	-
N125.12.34 GM3$^+$ ⊕ A3	√	1	1	×	-	-
N125.12.35 GM3$^+$ ⊕ A4	√	1	1	×	-	-
N125.12.36 GM3$^+$ ⊕ M1	√	1	1	×	-	-
N125.12.37 GM3$^+$ ⊕ M2	√	1	1	×	-	-
N125.12.38 GM3$^+$ ⊕ M3	√	1	1	×	-	-
N125.12.39 GM3$^+$ ⊕ M4	√	1	1	×	-	-
N125.12.40 GM3$^+$ ⊕ Z5$^+$	√	1	1	×	-	-
N125.12.41 GM3$^-$ ⊕ GM5$^+$	√	2	2	√	422	E
N125.12.42 GM3$^-$ ⊕ GM5$^-$	√	0	0	√	-	-
N125.12.43 GM3$^-$ ⊕ A1	√	1	1	×	-	-
N125.12.44 GM3$^-$ ⊕ A3	√	1	1	×	-	-
N125.12.45 GM3$^-$ ⊕ A4	√	1	1	×	-	-
N125.12.46 GM3$^-$ ⊕ M1	√	1	1	×	-	-
N125.12.47 GM3$^-$ ⊕ M2	√	1	1	×	-	-
N125.12.48 GM3$^-$ ⊕ M3	√	1	1	×	-	-

Non-coplanar SSGs with parent space group $P4/nbm$ (No. 125) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N125.12.49 $\mathrm{GM3^-} \oplus \mathrm{M4}$	$\surd$	1	1	$\times$	-	-
N125.12.50 $\mathrm{GM3^-} \oplus \mathrm{Z5^+}$	$\surd$	1	0	$\times$	-	-
N125.12.51 $\mathrm{GM4^+} \oplus \mathrm{GM5^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{E_g}$
N125.12.52 $\mathrm{GM4^+} \oplus \mathrm{GM5^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{E_u}$
N125.12.53 $\mathrm{GM4^+} \oplus \mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N125.12.54 $\mathrm{GM4^+} \oplus \mathrm{A3}$	$\surd$	1	1	$\times$	-	-
N125.12.55 $\mathrm{GM4^+} \oplus \mathrm{A4}$	$\surd$	1	1	$\times$	-	-
N125.12.56 $\mathrm{GM4^+} \oplus \mathrm{M1}$	$\surd$	1	1	$\times$	-	-
N125.12.57 $\mathrm{GM4^+} \oplus \mathrm{M2}$	$\surd$	1	1	$\times$	-	-
N125.12.58 $\mathrm{GM4^+} \oplus \mathrm{M3}$	$\surd$	1	1	$\times$	-	-
N125.12.59 $\mathrm{GM4^+} \oplus \mathrm{M4}$	$\surd$	1	1	$\times$	-	-
N125.12.60 $\mathrm{GM4^+} \oplus \mathrm{Z5^+}$	$\surd$	1	1	$\times$	-	-
N125.12.61 $\mathrm{GM4^-} \oplus \mathrm{GM5^+}$	$\surd$	2	2	$\surd$	$\bar{4}2m$	E
N125.12.62 $\mathrm{GM4^-} \oplus \mathrm{GM5^-}$	$\surd$	0	0	$\surd$	-	-
N125.12.63 $\mathrm{GM4^-} \oplus \mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N125.12.64 $\mathrm{GM4^-} \oplus \mathrm{A3}$	$\surd$	1	1	$\times$	-	-
N125.12.65 $\mathrm{GM4^-} \oplus \mathrm{A4}$	$\surd$	1	1	$\times$	-	-
N125.12.66 $\mathrm{GM4^-} \oplus \mathrm{M1}$	$\surd$	1	1	$\times$	-	-
N125.12.67 $\mathrm{GM4^-} \oplus \mathrm{M2}$	$\surd$	1	1	$\times$	-	-
N125.12.68 $\mathrm{GM4^-} \oplus \mathrm{M3}$	$\surd$	1	1	$\times$	-	-
N125.12.69 $\mathrm{GM4^-} \oplus \mathrm{M4}$	$\surd$	1	1	$\times$	-	-
N125.12.70 $\mathrm{GM4^-} \oplus \mathrm{Z5^+}$	$\surd$	1	0	$\times$	-	-
N125.12.71 $\mathrm{Z1^+} \oplus \mathrm{GM5^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_g}$
N125.12.72 $\mathrm{Z1^+} \oplus \mathrm{GM5^-}$	$\surd$	0	0	$\surd$	-	-
N125.12.73 $\mathrm{Z1^+} \oplus \mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N125.12.74 $\mathrm{Z1^+} \oplus \mathrm{A2}$	$\surd$	1	1	$\times$	-	-
N125.12.75 $\mathrm{Z1^+} \oplus \mathrm{A3}$	$\surd$	1	1	$\times$	-	-
N125.12.76 $\mathrm{Z1^+} \oplus \mathrm{A4}$	$\surd$	1	1	$\times$	-	-
N125.12.77 $\mathrm{Z1^+} \oplus \mathrm{M1}$	$\surd$	1	1	$\times$	-	-
N125.12.78 $\mathrm{Z1^+} \oplus \mathrm{M2}$	$\surd$	1	1	$\times$	-	-
N125.12.79 $\mathrm{Z1^+} \oplus \mathrm{M3}$	$\surd$	1	1	$\times$	-	-
N125.12.80 $\mathrm{Z1^+} \oplus \mathrm{M4}$	$\surd$	1	1	$\times$	-	-
N125.12.81 $\mathrm{Z1^+} \oplus \mathrm{Z5^+}$	$\surd$	0	0	$\surd$	-	-
N125.12.82 $\mathrm{Z1^+} \oplus \mathrm{Z5^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_u}$
N125.12.83 $\mathrm{Z1^-} \oplus \mathrm{GM5^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_g}$
N125.12.84 $\mathrm{Z1^-} \oplus \mathrm{GM5^-}$	$\surd$	0	0	$\surd$	-	-
N125.12.85 $\mathrm{Z1^-} \oplus \mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N125.12.86 $\mathrm{Z1^-} \oplus \mathrm{A2}$	$\surd$	1	1	$\times$	-	-
N125.12.87 $\mathrm{Z1^-} \oplus \mathrm{A3}$	$\surd$	1	1	$\times$	-	-
N125.12.88 $\mathrm{Z1^-} \oplus \mathrm{A4}$	$\surd$	1	1	$\times$	-	-
N125.12.89 $\mathrm{Z1^-} \oplus \mathrm{M1}$	$\surd$	1	1	$\times$	-	-
N125.12.90 $\mathrm{Z1^-} \oplus \mathrm{M2}$	$\surd$	1	1	$\times$	-	-
N125.12.91 $\mathrm{Z1^-} \oplus \mathrm{M3}$	$\surd$	1	1	$\times$	-	-
N125.12.92 $\mathrm{Z1^-} \oplus \mathrm{M4}$	$\surd$	1	1	$\times$	-	-
N125.12.93 $\mathrm{Z1^-} \oplus \mathrm{Z5^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_u}$
N125.12.94 $\mathrm{Z1^-} \oplus \mathrm{Z5^-}$	$\surd$	0	0	$\surd$	-	-

Non-coplanar SSGs with parent space group $P4/nbm$ (No. 125) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N125.12.95 Z2$^+$ ⊕ GM5$^+$	√	2	2	√	$4/mmm$	$\mathrm{E_g}$
N125.12.96 Z2$^+$ ⊕ GM5$^-$	√	0	0	√	-	-
N125.12.97 Z2$^+$ ⊕ A1	√	1	1	×	-	-
N125.12.98 Z2$^+$ ⊕ A2	√	1	1	×	-	-
N125.12.99 Z2$^+$ ⊕ A3	√	1	1	×	-	-
N125.12.100 Z2$^+$ ⊕ A4	√	1	1	×	-	-
N125.12.101 Z2$^+$ ⊕ M1	√	1	1	×	-	-
N125.12.102 Z2$^+$ ⊕ M2	√	1	1	×	-	-
N125.12.103 Z2$^+$ ⊕ M3	√	1	1	×	-	-
N125.12.104 Z2$^+$ ⊕ M4	√	1	1	×	-	-
N125.12.105 Z2$^+$ ⊕ Z5$^+$	√	0	0	√	-	-
N125.12.106 Z2$^+$ ⊕ Z5$^-$	√	2	2	√	$4/mmm$	$\mathrm{E_u}$
N125.12.107 Z2$^-$ ⊕ GM5$^+$	√	2	2	√	$4/mmm$	$\mathrm{E_g}$
N125.12.108 Z2$^-$ ⊕ GM5$^-$	√	0	0	√	-	-
N125.12.109 Z2$^-$ ⊕ A1	√	1	1	×	-	-
N125.12.110 Z2$^-$ ⊕ A2	√	1	1	×	-	-
N125.12.111 Z2$^-$ ⊕ A3	√	1	1	×	-	-
N125.12.112 Z2$^-$ ⊕ A4	√	1	1	×	-	-
N125.12.113 Z2$^-$ ⊕ M1	√	1	1	×	-	-
N125.12.114 Z2$^-$ ⊕ M2	√	1	1	×	-	-
N125.12.115 Z2$^-$ ⊕ M3	√	1	1	×	-	-
N125.12.116 Z2$^-$ ⊕ M4	√	1	1	×	-	-
N125.12.117 Z2$^-$ ⊕ Z5$^+$	√	2	2	√	$4/mmm$	$\mathrm{E_u}$
N125.12.118 Z2$^-$ ⊕ Z5$^-$	√	0	0	√	-	-
N125.14.1 GM1$^-$ ⊕ LD1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N125.14.2 GM1$^-$ ⊕ LD2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N125.14.3 GM1$^-$ ⊕ LD3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N125.14.4 GM1$^-$ ⊕ LD4	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N125.14.5 GM1$^-$ ⊕ V2	√	1	1	×	-	-
N125.14.6 GM1$^-$ ⊕ V1	√	1	1	×	-	-
N125.14.7 GM2$^+$ ⊕ LD1	√	1	1	√	$\bar{4}m2$	B1
N125.14.8 GM2$^+$ ⊕ LD2	√	1	1	√	$\bar{4}m2$	B1
N125.14.9 GM2$^+$ ⊕ LD3	√	1	1	√	$\bar{4}m2$	B1
N125.14.10 GM2$^+$ ⊕ LD4	√	1	1	√	$\bar{4}m2$	B1
N125.14.11 GM2$^+$ ⊕ V2	√	1	1	√	$\bar{4}m2$	B1
N125.14.12 GM2$^+$ ⊕ V1	√	1	1	√	$\bar{4}m2$	B1
N125.14.13 GM2$^-$ ⊕ LD1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N125.14.14 GM2$^-$ ⊕ LD2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N125.14.15 GM2$^-$ ⊕ LD3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N125.14.16 GM2$^-$ ⊕ LD4	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N125.14.17 GM2$^-$ ⊕ V2	√	1	1	×	-	-
N125.14.18 GM2$^-$ ⊕ V1	√	1	1	×	-	-
N125.14.19 GM3$^+$ ⊕ LD1	√	1	1	√	422	A2
N125.14.20 GM3$^+$ ⊕ LD2	√	1	1	√	422	A2
N125.14.21 GM3$^+$ ⊕ LD3	√	1	1	√	422	A2
N125.14.22 GM3$^+$ ⊕ LD4	√	1	1	√	422	A2

Non-coplanar SSGs with parent space group $P4/nbm$ (No. 125) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N125.14.23 GM3$^+$ ⊕ V2	√	1	1	×	-	-
N125.14.24 GM3$^+$ ⊕ V1	√	1	1	×	-	-
N125.14.25 GM3$^-$ ⊕ LD1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N125.14.26 GM3$^-$ ⊕ LD2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N125.14.27 GM3$^-$ ⊕ LD3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N125.14.28 GM3$^-$ ⊕ LD4	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N125.14.29 GM3$^-$ ⊕ V2	√	1	1	×	-	-
N125.14.30 GM3$^-$ ⊕ V1	√	1	1	×	-	-
N125.14.31 GM4$^+$ ⊕ LD1	√	1	1	√	$\bar{4}2m$	B2
N125.14.32 GM4$^+$ ⊕ LD2	√	1	1	√	$\bar{4}2m$	B2
N125.14.33 GM4$^+$ ⊕ LD3	√	1	1	√	$\bar{4}2m$	B2
N125.14.34 GM4$^+$ ⊕ LD4	√	1	1	√	$\bar{4}2m$	B2
N125.14.35 GM4$^+$ ⊕ V2	√	1	1	×	-	-
N125.14.36 GM4$^+$ ⊕ V1	√	1	1	×	-	-
N125.14.37 GM4$^-$ ⊕ LD1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N125.14.38 GM4$^-$ ⊕ LD2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N125.14.39 GM4$^-$ ⊕ LD3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N125.14.40 GM4$^-$ ⊕ LD4	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N125.14.41 GM4$^-$ ⊕ V2	√	1	1	×	-	-
N125.14.42 GM4$^-$ ⊕ V1	√	1	1	×	-	-
N125.14.43 Z1$^+$ ⊕ LD1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N125.14.44 Z1$^+$ ⊕ LD2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N125.14.45 Z1$^+$ ⊕ LD3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N125.14.46 Z1$^+$ ⊕ LD4	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N125.14.47 Z1$^+$ ⊕ V2	√	1	1	×	-	-
N125.14.48 Z1$^+$ ⊕ V1	√	1	1	×	-	-
N125.14.49 Z1$^-$ ⊕ LD1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N125.14.50 Z1$^-$ ⊕ LD2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N125.14.51 Z1$^-$ ⊕ LD3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N125.14.52 Z1$^-$ ⊕ LD4	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N125.14.53 Z1$^-$ ⊕ V2	√	1	1	×	-	-
N125.14.54 Z1$^-$ ⊕ V1	√	1	1	×	-	-
N125.14.55 Z2$^+$ ⊕ LD1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N125.14.56 Z2$^+$ ⊕ LD2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N125.14.57 Z2$^+$ ⊕ LD3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N125.14.58 Z2$^+$ ⊕ LD4	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N125.14.59 Z2$^+$ ⊕ V2	√	1	1	×	-	-
N125.14.60 Z2$^+$ ⊕ V1	√	1	1	×	-	-
N125.14.61 Z2$^-$ ⊕ LD1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N125.14.62 Z2$^-$ ⊕ LD2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N125.14.63 Z2$^-$ ⊕ LD3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N125.14.64 Z2$^-$ ⊕ LD4	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N125.14.65 Z2$^-$ ⊕ V2	√	1	1	×	-	-
N125.14.66 Z2$^-$ ⊕ V1	√	1	1	×	-	-

TABLE S376: Collinear SSGs with parent space group $P4/nnc$ (No. 126).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L126.1.1 $\mathrm{GM1}^{+}$	1	$4/mmm$	$\mathrm{A1_g}$
L126.2.1 $\mathrm{GM1}^{-}$	0	-	-
L126.2.2 $\mathrm{GM2}^{+}$	1	$4/mmm$	$\mathrm{B1_g}$
L126.2.3 $\mathrm{GM2}^{-}$	0	-	-
L126.2.4 $\mathrm{GM3}^{+}$	1	$4/mmm$	$\mathrm{A2_g}$
L126.2.5 $\mathrm{GM3}^{-}$	0	-	-
L126.2.6 $\mathrm{GM4}^{+}$	1	$4/mmm$	$\mathrm{B2_g}$
L126.2.7 $\mathrm{GM4}^{-}$	0	-	-

TABLE S377: Coplanar SSGs with parent space group $P4/nnc$ (No. 126).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P126.1.1 $\mathrm{GM1}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}$
P126.2.1 $\mathrm{GM1}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}$
P126.2.2 $\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}$
P126.2.3 $\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}$
P126.2.4 $\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_g}$
P126.2.5 $\mathrm{GM3}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_u}$
P126.2.6 $\mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_g}$
P126.2.7 $\mathrm{GM4}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_u}$
P126.3.1 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}$	$\surd$	0	0	$\surd$	-	-
P126.3.2 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_u}$
P126.3.3 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
P126.3.4 $\mathrm{GM1}^{-}\oplus\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{A2_u}$
P126.3.5 $\mathrm{GM1}^{-}\oplus\mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
P126.3.6 $\mathrm{GM1}^{-}\oplus\mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g}\oplus\mathrm{B2_u}$
P126.3.7 $\mathrm{GM1}^{-}\oplus\mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
P126.3.8 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_g}$
P126.3.9 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B1_g}$
P126.3.10 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_g}$
P126.3.11 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B2_u}$
P126.3.12 $\mathrm{GM2}^{+}\oplus\mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B2_g}$
P126.3.13 $\mathrm{GM2}^{+}\oplus\mathrm{GM4}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_u}$
P126.3.14 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
P126.3.15 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{B2_u}$
P126.3.16 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
P126.3.17 $\mathrm{GM2}^{-}\oplus\mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u}\oplus\mathrm{B2_g}$
P126.3.18 $\mathrm{GM2}^{-}\oplus\mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
P126.3.19 $\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{A2_g}$
P126.3.20 $\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A2_g}$
P126.3.21 $\mathrm{GM3}^{+}\oplus\mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{B2_g}$
P126.3.22 $\mathrm{GM3}^{+}\oplus\mathrm{GM4}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{A2_g}$
P126.3.23 $\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
P126.3.24 $\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{B2_g}$
P126.3.25 $\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
P126.3.26 $\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g}\oplus\mathrm{B2_g}$

Coplanar SSGs with parent space group $P4/nnc$ (No. 126) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P126.3.27 $\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B2_g}$
P126.3.28 $\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
P126.6.1 $\mathrm{GM5}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_g}$
P126.6.2 $\mathrm{GM5}^{-}$	$\surd$	0	0	$\surd$	-	-
P126.6.3 A1	$\surd$	1	1	$\times$	-	-
P126.6.4 A3	$\surd$	1	1	$\times$	-	-
P126.6.5 M1	$\surd$	1	1	$\times$	-	-
P126.6.6 M2	$\surd$	1	1	$\times$	-	-
P126.6.7 M3	$\surd$	1	1	$\times$	-	-
P126.6.8 M4	$\surd$	1	1	$\times$	-	-
P126.6.9 Z1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P126.6.10 Z2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P126.8.1 LD1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P126.8.2 LD2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P126.8.3 V1	$\surd$	1	1	$\times$	-	-

TABLE S378: Non-coplanar SSGs with parent space group $P4/nnc$ (No. 126).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N126.1.1 $\mathrm{GM1}^{+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A1_g}$
N126.2.1 $\mathrm{GM1}^{-}$	$\surd$	2	2	$\surd$	422	$\mathrm{A1}\oplus\mathrm{A1}$
N126.2.2 $\mathrm{GM2}^{+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{B1_g}$
N126.2.3 $\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{A1}\oplus\mathrm{A1}$
N126.2.4 $\mathrm{GM3}^{+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A2_g}$
N126.2.5 $\mathrm{GM3}^{-}$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{A1}\oplus\mathrm{A1}$
N126.2.6 $\mathrm{GM4}^{+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{B2_g}$
N126.2.7 $\mathrm{GM4}^{-}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{A1}\oplus\mathrm{A1}$
N126.3.1 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{A1_u}$
N126.3.2 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{A1}\oplus\mathrm{B1}$
N126.3.3 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{B1_u}$
N126.3.4 $\mathrm{GM1}^{-}\oplus\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{A1}\oplus\mathrm{A2}$
N126.3.5 $\mathrm{GM1}^{-}\oplus\mathrm{GM3}^{-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{A2_u}$
N126.3.6 $\mathrm{GM1}^{-}\oplus\mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{A1}\oplus\mathrm{A2}$
N126.3.7 $\mathrm{GM1}^{-}\oplus\mathrm{GM4}^{-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{B2_u}$
N126.3.8 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B1_g}$
N126.3.9 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	422	$\mathrm{A1}\oplus\mathrm{B1}$
N126.3.10 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}\oplus\mathrm{A2_g}$
N126.3.11 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{-}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{A1}\oplus\mathrm{B1}$
N126.3.12 $\mathrm{GM2}^{+}\oplus\mathrm{GM4}^{+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B2_g}$
N126.3.13 $\mathrm{GM2}^{+}\oplus\mathrm{GM4}^{-}$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{A1}\oplus\mathrm{B1}$
N126.3.14 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}\oplus\mathrm{B1_u}$
N126.3.15 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{A1}\oplus\mathrm{B2}$
N126.3.16 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}\oplus\mathrm{A2_u}$
N126.3.17 $\mathrm{GM2}^{-}\oplus\mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{A1}\oplus\mathrm{B2}$
N126.3.18 $\mathrm{GM2}^{-}\oplus\mathrm{GM4}^{-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}\oplus\mathrm{B2_u}$
N126.3.19 $\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_g}$

Non-coplanar SSGs with parent space group $P4/nnc$ (No. 126) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N126.3.20 $\mathrm{GM3^+} \oplus \mathrm{GM3^-}$	√	2	2	√	422	$\mathrm{A1} \oplus \mathrm{A2}$
N126.3.21 $\mathrm{GM3^+} \oplus \mathrm{GM4^+}$	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g} \oplus \mathrm{B2_g}$
N126.3.22 $\mathrm{GM3^+} \oplus \mathrm{GM4^-}$	√	2	2	√	$\bar{4}2m$	$\mathrm{A1} \oplus \mathrm{A2}$
N126.3.23 $\mathrm{GM3^-} \oplus \mathrm{GM3^-}$	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N126.3.24 $\mathrm{GM3^-} \oplus \mathrm{GM4^+}$	√	2	2	√	$\bar{4}2m$	$\mathrm{A1} \oplus \mathrm{B2}$
N126.3.25 $\mathrm{GM3^-} \oplus \mathrm{GM4^-}$	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N126.3.26 $\mathrm{GM4^+} \oplus \mathrm{GM4^+}$	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N126.3.27 $\mathrm{GM4^+} \oplus \mathrm{GM4^-}$	√	2	2	√	422	$\mathrm{A1} \oplus \mathrm{B2}$
N126.3.28 $\mathrm{GM4^-} \oplus \mathrm{GM4^-}$	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N126.6.1 $\mathrm{GM5^+}$	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{E_g}$
N126.6.2 $\mathrm{GM5^-}$	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{E_u}$
N126.6.3 A1	√	1	1	√	$\bar{4}2m$	A1
N126.6.4 A3	√	1	1	√	$4mm$	A1
N126.6.5 M1	√	1	1	√	$\bar{4}m2$	A1
N126.6.6 M2	√	1	1	√	$\bar{4}m2$	A1
N126.6.7 M3	√	1	1	√	$4mm$	A1
N126.6.8 M4	√	1	1	√	$4mm$	A1
N126.6.9 Z1	√	1	1	√	$4mm$	A1
N126.6.10 Z2	√	1	1	√	$4mm$	A1
N126.8.1 LD1	√	1	1	√	$4mm$	A1
N126.8.2 LD2	√	1	1	√	$4mm$	A1
N126.8.3 V1	√	1	1	√	$4mm$	A1
N126.9.1 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM1^-}$	√	0	0	√	-	-
N126.9.2 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM2^+}$	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N126.9.3 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM2^-}$	√	0	0	√	-	-
N126.9.4 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM3^+}$	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N126.9.5 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM3^-}$	√	0	0	√	-	-
N126.9.6 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM4^+}$	√	3	3	√	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N126.9.7 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM4^-}$	√	0	0	√	-	-
N126.9.8 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{GM2^+}$	√	2	2	√	422	$\mathrm{B1} \oplus \mathrm{B1}$
N126.9.9 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{GM2^-}$	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N126.9.10 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{GM3^+}$	√	2	2	√	$\bar{4}m2$	$\mathrm{B1} \oplus \mathrm{B2}$
N126.9.11 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{GM3^-}$	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_u}$
N126.9.12 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{GM4^+}$	√	2	2	√	$4mm$	$\mathrm{B1} \oplus \mathrm{B2}$
N126.9.13 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{GM4^-}$	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{A2_u}$
N126.9.14 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{GM2^-}$	√	0	0	√	-	-
N126.9.15 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{GM3^+}$	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N126.9.16 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{GM3^-}$	√	0	0	√	-	-
N126.9.17 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{GM4^+}$	√	3	3	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N126.9.18 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{GM4^-}$	√	0	0	√	-	-
N126.9.19 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{GM3^+}$	√	2	2	√	422	$\mathrm{A2} \oplus \mathrm{A2}$
N126.9.20 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{GM3^-}$	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
N126.9.21 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{GM4^+}$	√	2	2	√	$\bar{4}2m$	$\mathrm{B2} \oplus \mathrm{A2}$
N126.9.22 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{GM4^-}$	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
N126.9.23 $\mathrm{GM1^-} \oplus \mathrm{GM3^-} \oplus \mathrm{GM3^-}$	√	0	0	√	-	-
N126.9.24 $\mathrm{GM1^-} \oplus \mathrm{GM3^-} \oplus \mathrm{GM4^+}$	√	3	3	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$

Non-coplanar SSGs with parent space group $P4/nnc$ (No. 126) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N126.9.25 $\mathrm{GM1^-}\oplus\mathrm{GM3^-}\oplus\mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N126.9.26 $\mathrm{GM1^-}\oplus\mathrm{GM4^+}\oplus\mathrm{GM4^+}$	$\surd$	2	2	$\surd$	422	$\mathrm{B2}\oplus\mathrm{B2}$
N126.9.27 $\mathrm{GM1^-}\oplus\mathrm{GM4^+}\oplus\mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B2_g}\oplus\mathrm{B2_u}$
N126.9.28 $\mathrm{GM1^-}\oplus\mathrm{GM4^-}\oplus\mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N126.9.29 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{GM2^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B1_g}$
N126.9.30 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{GM2^-}$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B1}\oplus\mathrm{B1}$
N126.9.31 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{GM3^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_g}\oplus\mathrm{A2_g}$
N126.9.32 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{GM3^-}$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{B1}\oplus\mathrm{B1}$
N126.9.33 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B2_g}$
N126.9.34 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{B1}\oplus\mathrm{B1}$
N126.9.35 $\mathrm{GM2^+}\oplus\mathrm{GM2^-}\oplus\mathrm{GM2^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A1_u}\oplus\mathrm{B1_g}$
N126.9.36 $\mathrm{GM2^+}\oplus\mathrm{GM2^-}\oplus\mathrm{GM3^+}$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{B1}\oplus\mathrm{A2}$
N126.9.37 $\mathrm{GM2^+}\oplus\mathrm{GM2^-}\oplus\mathrm{GM3^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B1_g}\oplus\mathrm{B2_u}$
N126.9.38 $\mathrm{GM2^+}\oplus\mathrm{GM2^-}\oplus\mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{B1}\oplus\mathrm{A2}$
N126.9.39 $\mathrm{GM2^+}\oplus\mathrm{GM2^-}\oplus\mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B1_g}\oplus\mathrm{A2_u}$
N126.9.40 $\mathrm{GM2^+}\oplus\mathrm{GM3^+}\oplus\mathrm{GM3^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_g}$
N126.9.41 $\mathrm{GM2^+}\oplus\mathrm{GM3^+}\oplus\mathrm{GM3^-}$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B1}\oplus\mathrm{A2}$
N126.9.42 $\mathrm{GM2^+}\oplus\mathrm{GM3^+}\oplus\mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_g}\oplus\mathrm{B2_g}$
N126.9.43 $\mathrm{GM2^+}\oplus\mathrm{GM3^+}\oplus\mathrm{GM4^-}$	$\surd$	2	2	$\surd$	422	$\mathrm{B1}\oplus\mathrm{A2}$
N126.9.44 $\mathrm{GM2^+}\oplus\mathrm{GM3^-}\oplus\mathrm{GM3^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B2_u}\oplus\mathrm{B2_u}$
N126.9.45 $\mathrm{GM2^+}\oplus\mathrm{GM3^-}\oplus\mathrm{GM4^+}$	$\surd$	2	2	$\surd$	422	$\mathrm{B1}\oplus\mathrm{B2}$
N126.9.46 $\mathrm{GM2^+}\oplus\mathrm{GM3^-}\oplus\mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_u}\oplus\mathrm{B2_u}$
N126.9.47 $\mathrm{GM2^+}\oplus\mathrm{GM4^+}\oplus\mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B2_g}\oplus\mathrm{B2_g}$
N126.9.48 $\mathrm{GM2^+}\oplus\mathrm{GM4^+}\oplus\mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B1}\oplus\mathrm{B2}$
N126.9.49 $\mathrm{GM2^+}\oplus\mathrm{GM4^-}\oplus\mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_u}\oplus\mathrm{A2_u}$
N126.9.50 $\mathrm{GM2^-}\oplus\mathrm{GM2^-}\oplus\mathrm{GM2^-}$	$\surd$	0	0	$\surd$	-	-
N126.9.51 $\mathrm{GM2^-}\oplus\mathrm{GM2^-}\oplus\mathrm{GM3^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{B2_u}\oplus\mathrm{B2_u}$
N126.9.52 $\mathrm{GM2^-}\oplus\mathrm{GM2^-}\oplus\mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
N126.9.53 $\mathrm{GM2^-}\oplus\mathrm{GM2^-}\oplus\mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_u}\oplus\mathrm{A2_u}\oplus\mathrm{B2_g}$
N126.9.54 $\mathrm{GM2^-}\oplus\mathrm{GM2^-}\oplus\mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N126.9.55 $\mathrm{GM2^-}\oplus\mathrm{GM3^+}\oplus\mathrm{GM3^+}$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{A2}\oplus\mathrm{A2}$
N126.9.56 $\mathrm{GM2^-}\oplus\mathrm{GM3^+}\oplus\mathrm{GM3^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A2_g}\oplus\mathrm{B2_u}$
N126.9.57 $\mathrm{GM2^-}\oplus\mathrm{GM3^+}\oplus\mathrm{GM4^+}$	$\surd$	2	2	$\surd$	422	$\mathrm{A2}\oplus\mathrm{B2}$
N126.9.58 $\mathrm{GM2^-}\oplus\mathrm{GM3^+}\oplus\mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{A2_g}\oplus\mathrm{B2_u}$
N126.9.59 $\mathrm{GM2^-}\oplus\mathrm{GM3^-}\oplus\mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
N126.9.60 $\mathrm{GM2^-}\oplus\mathrm{GM3^-}\oplus\mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{A2_u}\oplus\mathrm{B2_g}$
N126.9.61 $\mathrm{GM2^-}\oplus\mathrm{GM3^-}\oplus\mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N126.9.62 $\mathrm{GM2^-}\oplus\mathrm{GM4^+}\oplus\mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B2}\oplus\mathrm{B2}$
N126.9.63 $\mathrm{GM2^-}\oplus\mathrm{GM4^+}\oplus\mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A2_u}\oplus\mathrm{B2_g}$
N126.9.64 $\mathrm{GM2^-}\oplus\mathrm{GM4^-}\oplus\mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N126.9.65 $\mathrm{GM3^+}\oplus\mathrm{GM3^+}\oplus\mathrm{GM3^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_g}$
N126.9.66 $\mathrm{GM3^+}\oplus\mathrm{GM3^+}\oplus\mathrm{GM3^-}$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{A2}\oplus\mathrm{A2}$
N126.9.67 $\mathrm{GM3^+}\oplus\mathrm{GM3^+}\oplus\mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{A2_g}\oplus\mathrm{B2_g}$
N126.9.68 $\mathrm{GM3^+}\oplus\mathrm{GM3^+}\oplus\mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{B2}\oplus\mathrm{B2}$
N126.9.69 $\mathrm{GM3^+}\oplus\mathrm{GM3^-}\oplus\mathrm{GM3^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A1_u}\oplus\mathrm{A2_g}$
N126.9.70 $\mathrm{GM3^+}\oplus\mathrm{GM3^-}\oplus\mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{B2}\oplus\mathrm{A2}$

Non-coplanar SSGs with parent space group $P4/nnc$ (No. 126) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N126.9.71 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{A2_g}$
N126.9.72 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N126.9.73 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{B2} \oplus \mathrm{A2}$
N126.9.74 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{A2_g}$
N126.9.75 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
N126.9.76 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B2_g}$
N126.9.77 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N126.9.78 $\mathrm{GM3^-} \oplus \mathrm{GM4^+} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{B2} \oplus \mathrm{B2}$
N126.9.79 $\mathrm{GM3^-} \oplus \mathrm{GM4^+} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B2_g}$
N126.9.80 $\mathrm{GM3^-} \oplus \mathrm{GM4^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N126.9.81 $\mathrm{GM4^+} \oplus \mathrm{GM4^+} \oplus \mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N126.9.82 $\mathrm{GM4^+} \oplus \mathrm{GM4^+} \oplus \mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{A2} \oplus \mathrm{A2}$
N126.9.83 $\mathrm{GM4^+} \oplus \mathrm{GM4^-} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{B2_g}$
N126.9.84 $\mathrm{GM4^-} \oplus \mathrm{GM4^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N126.12.1 $\mathrm{GM1^-} \oplus \mathrm{GM5^+}$	$\surd$	2	2	$\surd$	$4mm$	E
N126.12.2 $\mathrm{GM1^-} \oplus \mathrm{GM5^-}$	$\surd$	0	0	$\surd$	-	-
N126.12.3 $\mathrm{GM1^-} \oplus \mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N126.12.4 $\mathrm{GM1^-} \oplus \mathrm{A3}$	$\surd$	1	1	$\times$	-	-
N126.12.5 $\mathrm{GM1^-} \oplus \mathrm{M1}$	$\surd$	1	1	$\times$	-	-
N126.12.6 $\mathrm{GM1^-} \oplus \mathrm{M2}$	$\surd$	1	1	$\times$	-	-
N126.12.7 $\mathrm{GM1^-} \oplus \mathrm{M3}$	$\surd$	1	1	$\times$	-	-
N126.12.8 $\mathrm{GM1^-} \oplus \mathrm{M4}$	$\surd$	1	1	$\times$	-	-
N126.12.9 $\mathrm{GM1^-} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N126.12.10 $\mathrm{GM1^-} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N126.12.11 $\mathrm{GM2^+} \oplus \mathrm{GM5^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{E_g}$
N126.12.12 $\mathrm{GM2^+} \oplus \mathrm{GM5^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{E_u}$
N126.12.13 $\mathrm{GM2^+} \oplus \mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N126.12.14 $\mathrm{GM2^+} \oplus \mathrm{A3}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N126.12.15 $\mathrm{GM2^+} \oplus \mathrm{M1}$	$\surd$	1	1	$\surd$	$4mm$	B1
N126.12.16 $\mathrm{GM2^+} \oplus \mathrm{M2}$	$\surd$	1	1	$\surd$	$4mm$	B1
N126.12.17 $\mathrm{GM2^+} \oplus \mathrm{M3}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N126.12.18 $\mathrm{GM2^+} \oplus \mathrm{M4}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N126.12.19 $\mathrm{GM2^+} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N126.12.20 $\mathrm{GM2^+} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N126.12.21 $\mathrm{GM2^-} \oplus \mathrm{GM5^+}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	E
N126.12.22 $\mathrm{GM2^-} \oplus \mathrm{GM5^-}$	$\surd$	0	0	$\surd$	-	-
N126.12.23 $\mathrm{GM2^-} \oplus \mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N126.12.24 $\mathrm{GM2^-} \oplus \mathrm{A3}$	$\surd$	1	1	$\times$	-	-
N126.12.25 $\mathrm{GM2^-} \oplus \mathrm{M1}$	$\surd$	1	1	$\times$	-	-
N126.12.26 $\mathrm{GM2^-} \oplus \mathrm{M2}$	$\surd$	1	1	$\times$	-	-
N126.12.27 $\mathrm{GM2^-} \oplus \mathrm{M3}$	$\surd$	1	1	$\times$	-	-
N126.12.28 $\mathrm{GM2^-} \oplus \mathrm{M4}$	$\surd$	1	1	$\times$	-	-
N126.12.29 $\mathrm{GM2^-} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N126.12.30 $\mathrm{GM2^-} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N126.12.31 $\mathrm{GM3^+} \oplus \mathrm{GM5^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{E_g}$
N126.12.32 $\mathrm{GM3^+} \oplus \mathrm{GM5^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{E_u}$

Non-coplanar SSGs with parent space group $P4/nnc$ (No. 126) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N126.12.33 $\mathrm{GM3^+} \oplus \mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N126.12.34 $\mathrm{GM3^+} \oplus \mathrm{A3}$	$\surd$	1	1	$\times$	-	-
N126.12.35 $\mathrm{GM3^+} \oplus \mathrm{M1}$	$\surd$	1	1	$\times$	-	-
N126.12.36 $\mathrm{GM3^+} \oplus \mathrm{M2}$	$\surd$	1	1	$\times$	-	-
N126.12.37 $\mathrm{GM3^+} \oplus \mathrm{M3}$	$\surd$	1	1	$\times$	-	-
N126.12.38 $\mathrm{GM3^+} \oplus \mathrm{M4}$	$\surd$	1	1	$\times$	-	-
N126.12.39 $\mathrm{GM3^+} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	422	A2
N126.12.40 $\mathrm{GM3^+} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	422	A2
N126.12.41 $\mathrm{GM3^-} \oplus \mathrm{GM5^+}$	$\surd$	2	2	$\surd$	422	E
N126.12.42 $\mathrm{GM3^-} \oplus \mathrm{GM5^-}$	$\surd$	0	0	$\surd$	-	-
N126.12.43 $\mathrm{GM3^-} \oplus \mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N126.12.44 $\mathrm{GM3^-} \oplus \mathrm{A3}$	$\surd$	1	1	$\times$	-	-
N126.12.45 $\mathrm{GM3^-} \oplus \mathrm{M1}$	$\surd$	1	1	$\times$	-	-
N126.12.46 $\mathrm{GM3^-} \oplus \mathrm{M2}$	$\surd$	1	1	$\times$	-	-
N126.12.47 $\mathrm{GM3^-} \oplus \mathrm{M3}$	$\surd$	1	1	$\times$	-	-
N126.12.48 $\mathrm{GM3^-} \oplus \mathrm{M4}$	$\surd$	1	1	$\times$	-	-
N126.12.49 $\mathrm{GM3^-} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N126.12.50 $\mathrm{GM3^-} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N126.12.51 $\mathrm{GM4^+} \oplus \mathrm{GM5^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{E_g}$
N126.12.52 $\mathrm{GM4^+} \oplus \mathrm{GM5^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{E_u}$
N126.12.53 $\mathrm{GM4^+} \oplus \mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N126.12.54 $\mathrm{GM4^+} \oplus \mathrm{A3}$	$\surd$	1	1	$\times$	-	-
N126.12.55 $\mathrm{GM4^+} \oplus \mathrm{M1}$	$\surd$	1	1	$\times$	-	-
N126.12.56 $\mathrm{GM4^+} \oplus \mathrm{M2}$	$\surd$	1	1	$\times$	-	-
N126.12.57 $\mathrm{GM4^+} \oplus \mathrm{M3}$	$\surd$	1	1	$\times$	-	-
N126.12.58 $\mathrm{GM4^+} \oplus \mathrm{M4}$	$\surd$	1	1	$\times$	-	-
N126.12.59 $\mathrm{GM4^+} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N126.12.60 $\mathrm{GM4^+} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N126.12.61 $\mathrm{GM4^-} \oplus \mathrm{GM5^+}$	$\surd$	2	2	$\surd$	$\bar{4}2m$	E
N126.12.62 $\mathrm{GM4^-} \oplus \mathrm{GM5^-}$	$\surd$	0	0	$\surd$	-	-
N126.12.63 $\mathrm{GM4^-} \oplus \mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N126.12.64 $\mathrm{GM4^-} \oplus \mathrm{A3}$	$\surd$	1	1	$\times$	-	-
N126.12.65 $\mathrm{GM4^-} \oplus \mathrm{M1}$	$\surd$	1	1	$\times$	-	-
N126.12.66 $\mathrm{GM4^-} \oplus \mathrm{M2}$	$\surd$	1	1	$\times$	-	-
N126.12.67 $\mathrm{GM4^-} \oplus \mathrm{M3}$	$\surd$	1	1	$\times$	-	-
N126.12.68 $\mathrm{GM4^-} \oplus \mathrm{M4}$	$\surd$	1	1	$\times$	-	-
N126.12.69 $\mathrm{GM4^-} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N126.12.70 $\mathrm{GM4^-} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N126.14.1 $\mathrm{GM1^-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N126.14.2 $\mathrm{GM1^-} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N126.14.3 $\mathrm{GM1^-} \oplus \mathrm{V1}$	$\surd$	1	1	$\times$	-	-
N126.14.4 $\mathrm{GM2^+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N126.14.5 $\mathrm{GM2^+} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N126.14.6 $\mathrm{GM2^+} \oplus \mathrm{V1}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N126.14.7 $\mathrm{GM2^-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N126.14.8 $\mathrm{GM2^-} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$

Non-coplanar SSGs with parent space group $P4/nnc$ (No. 126) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N126.14.9 GM2$^-$ $\oplus$ V1	$\surd$	1	1	$\times$	-	-
N126.14.10 GM3$^+$ $\oplus$ LD1	$\surd$	1	1	$\surd$	422	A2
N126.14.11 GM3$^+$ $\oplus$ LD2	$\surd$	1	1	$\surd$	422	A2
N126.14.12 GM3$^+$ $\oplus$ V1	$\surd$	1	1	$\times$	-	-
N126.14.13 GM3$^-$ $\oplus$ LD1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N126.14.14 GM3$^-$ $\oplus$ LD2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N126.14.15 GM3$^-$ $\oplus$ V1	$\surd$	1	1	$\times$	-	-
N126.14.16 GM4$^+$ $\oplus$ LD1	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N126.14.17 GM4$^+$ $\oplus$ LD2	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N126.14.18 GM4$^+$ $\oplus$ V1	$\surd$	1	1	$\times$	-	-
N126.14.19 GM4$^-$ $\oplus$ LD1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N126.14.20 GM4$^-$ $\oplus$ LD2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N126.14.21 GM4$^-$ $\oplus$ V1	$\surd$	1	1	$\times$	-	-

TABLE S379: Collinear SSGs with parent space group $P4/mbm$ (No. 127).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L127.1.1 GM1$^+$	1	$4/mmm$	$\mathrm{A1_g}$
L127.2.1 GM1$^-$	0	-	-
L127.2.2 GM2$^+$	1	$4/mmm$	$\mathrm{B1_g}$
L127.2.3 GM2$^-$	0	-	-
L127.2.4 GM3$^+$	1	$4/mmm$	$\mathrm{A2_g}$
L127.2.5 GM3$^-$	0	-	-
L127.2.6 GM4$^+$	1	$4/mmm$	$\mathrm{B2_g}$
L127.2.7 GM4$^-$	0	-	-
L127.2.8 Z1$^+$	0	-	-
L127.2.9 Z1$^-$	0	-	-
L127.2.10 Z2$^+$	0	-	-
L127.2.11 Z2$^-$	0	-	-

TABLE S380: Coplanar SSGs with parent space group $P4/mbm$ (No. 127).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P127.1.1 GM1$^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g}$
P127.2.1 GM1$^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u}$
P127.2.2 GM2$^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g}$
P127.2.3 GM2$^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u}$
P127.2.4 GM3$^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g}$
P127.2.5 GM3$^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_u}$
P127.2.6 GM4$^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_g}$
P127.2.7 GM4$^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_u}$
P127.2.8 Z1$^+$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P127.2.9 Z1$^-$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P127.2.10 Z2$^+$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P127.2.11 Z2$^-$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$

Coplanar SSGs with parent space group $P4/mbm$ (No. 127) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P127.3.1 $\mathrm{GM1}^- \oplus \mathrm{GM1}^-$	$\surd$	0	0	$\surd$	-	-
P127.3.2 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
P127.3.3 $\mathrm{GM1}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
P127.3.4 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u}$
P127.3.5 $\mathrm{GM1}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
P127.3.6 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_u}$
P127.3.7 $\mathrm{GM1}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
P127.3.8 $\mathrm{GM1}^- \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\times$	-	-
P127.3.9 $\mathrm{GM1}^- \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
P127.3.10 $\mathrm{GM1}^- \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\times$	-	-
P127.3.11 $\mathrm{GM1}^- \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\times$	-	-
P127.3.12 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
P127.3.13 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g}$
P127.3.14 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g}$
P127.3.15 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
P127.3.16 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
P127.3.17 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u}$
P127.3.18 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
P127.3.19 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
P127.3.20 $\mathrm{GM2}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
P127.3.21 $\mathrm{GM2}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-
P127.3.22 $\mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
P127.3.23 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_u}$
P127.3.24 $\mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
P127.3.25 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g}$
P127.3.26 $\mathrm{GM2}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
P127.3.27 $\mathrm{GM2}^- \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\times$	-	-
P127.3.28 $\mathrm{GM2}^- \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
P127.3.29 $\mathrm{GM2}^- \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\times$	-	-
P127.3.30 $\mathrm{GM2}^- \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\times$	-	-
P127.3.31 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g}$
P127.3.32 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g}$
P127.3.33 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g}$
P127.3.34 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g}$
P127.3.35 $\mathrm{GM3}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
P127.3.36 $\mathrm{GM3}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
P127.3.37 $\mathrm{GM3}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
P127.3.38 $\mathrm{GM3}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-
P127.3.39 $\mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
P127.3.40 $\mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_g}$
P127.3.41 $\mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
P127.3.42 $\mathrm{GM3}^- \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\times$	-	-
P127.3.43 $\mathrm{GM3}^- \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
P127.3.44 $\mathrm{GM3}^- \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\times$	-	-
P127.3.45 $\mathrm{GM3}^- \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\times$	-	-
P127.3.46 $\mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_g}$

Coplanar SSGs with parent space group $P4/mbm$ (No. 127) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P127.3.47 $\mathrm{GM4^+} \oplus \mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g}$
P127.3.48 $\mathrm{GM4^+} \oplus \mathrm{Z1^+}$	$\surd$	1	0	$\times$	-	-
P127.3.49 $\mathrm{GM4^+} \oplus \mathrm{Z1^-}$	$\surd$	1	0	$\times$	-	-
P127.3.50 $\mathrm{GM4^+} \oplus \mathrm{Z2^+}$	$\surd$	1	0	$\times$	-	-
P127.3.51 $\mathrm{GM4^+} \oplus \mathrm{Z2^-}$	$\surd$	1	0	$\times$	-	-
P127.3.52 $\mathrm{GM4^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
P127.3.53 $\mathrm{GM4^-} \oplus \mathrm{Z1^+}$	$\surd$	1	1	$\times$	-	-
P127.3.54 $\mathrm{GM4^-} \oplus \mathrm{Z1^-}$	$\surd$	1	1	$\times$	-	-
P127.3.55 $\mathrm{GM4^-} \oplus \mathrm{Z2^+}$	$\surd$	1	1	$\times$	-	-
P127.3.56 $\mathrm{GM4^-} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
P127.3.57 $\mathrm{Z1^+} \oplus \mathrm{Z1^+}$	$\surd$	1	0	$\times$	-	-
P127.3.58 $\mathrm{Z1^+} \oplus \mathrm{Z3^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P127.3.59 $\mathrm{Z1^+} \oplus \mathrm{Z1^-}$	$\surd$	1	1	$\times$	-	-
P127.3.60 $\mathrm{Z1^+} \oplus \mathrm{Z3^+}$	$\surd$	1	0	$\times$	-	-
P127.3.61 $\mathrm{Z1^+} \oplus \mathrm{Z2^+}$	$\surd$	1	0	$\times$	-	-
P127.3.62 $\mathrm{Z1^+} \oplus \mathrm{Z4^-}$	$\surd$	1	1	$\times$	-	-
P127.3.63 $\mathrm{Z1^+} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
P127.3.64 $\mathrm{Z1^+} \oplus \mathrm{Z4^+}$	$\surd$	1	0	$\times$	-	-
P127.3.65 $\mathrm{Z1^-} \oplus \mathrm{Z1^-}$	$\surd$	1	0	$\times$	-	-
P127.3.66 $\mathrm{Z1^-} \oplus \mathrm{Z3^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P127.3.67 $\mathrm{Z1^-} \oplus \mathrm{Z2^+}$	$\surd$	1	1	$\times$	-	-
P127.3.68 $\mathrm{Z1^-} \oplus \mathrm{Z4^-}$	$\surd$	1	0	$\times$	-	-
P127.3.69 $\mathrm{Z1^-} \oplus \mathrm{Z2^-}$	$\surd$	1	0	$\times$	-	-
P127.3.70 $\mathrm{Z1^-} \oplus \mathrm{Z4^+}$	$\surd$	1	1	$\times$	-	-
P127.3.71 $\mathrm{Z2^+} \oplus \mathrm{Z2^+}$	$\surd$	1	0	$\times$	-	-
P127.3.72 $\mathrm{Z2^+} \oplus \mathrm{Z4^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P127.3.73 $\mathrm{Z2^+} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
P127.3.74 $\mathrm{Z2^+} \oplus \mathrm{Z4^+}$	$\surd$	1	0	$\times$	-	-
P127.3.75 $\mathrm{Z2^-} \oplus \mathrm{Z2^-}$	$\surd$	1	0	$\times$	-	-
P127.3.76 $\mathrm{Z2^-} \oplus \mathrm{Z4^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P127.4.1 $\mathrm{M1^+M4^+}$	$\surd$	1	0	$\times$	-	-
P127.4.2 $\mathrm{M1^-M4^-}$	$\surd$	1	0	$\times$	-	-
P127.4.3 $\mathrm{M2^+M3^+}$	$\surd$	1	0	$\times$	-	-
P127.4.4 $\mathrm{M2^-M3^-}$	$\surd$	1	0	$\times$	-	-
P127.4.5 $\mathrm{A1^+A4^+}$	$\surd$	1	0	$\times$	-	-
P127.4.6 $\mathrm{A1^-A4^-}$	$\surd$	1	0	$\times$	-	-
P127.6.1 $\mathrm{GM5^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_g}$
P127.6.2 $\mathrm{GM5^-}$	$\surd$	0	0	$\surd$	-	-
P127.6.3 $\mathrm{A5^+}$	$\surd$	1	0	$\times$	-	-
P127.6.4 $\mathrm{M5^+}$	$\surd$	1	0	$\times$	-	-
P127.6.5 $\mathrm{M5^-}$	$\surd$	1	0	$\times$	-	-
P127.6.6 $\mathrm{Z5^+}$	$\surd$	1	0	$\times$	-	-
P127.8.1 LD1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P127.8.2 LD2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P127.8.3 LD3	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P127.8.4 LD4	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$

Non-coplanar SSGs with parent space group $P4/mbm$ (No. 127) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation

TABLE S381: Non-coplanar SSGs with parent space group $P4/mbm$ (No. 127).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N127.1.1 GM1$^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A1_g}$
N127.2.1 GM1$^-$	$\surd$	2	2	$\surd$	422	$\mathrm{A1}\oplus\mathrm{A1}$
N127.2.2 GM2$^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{B1_g}$
N127.2.3 GM2$^-$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{A1}\oplus\mathrm{A1}$
N127.2.4 GM3$^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A2_g}$
N127.2.5 GM3$^-$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{A1}\oplus\mathrm{A1}$
N127.2.6 GM4$^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{B2_g}$
N127.2.7 GM4$^-$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{A1}\oplus\mathrm{A1}$
N127.2.8 Z1$^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}$
N127.2.9 Z1$^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}$
N127.2.10 Z2$^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}$
N127.2.11 Z2$^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}$
N127.3.1 GM1$^-\oplus$GM1$^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{A1_u}$
N127.3.2 GM1$^-\oplus$GM2$^+$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{A1}\oplus\mathrm{B1}$
N127.3.3 GM1$^-\oplus$GM2$^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{B1_u}$
N127.3.4 GM1$^-\oplus$GM3$^+$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{A1}\oplus\mathrm{A2}$
N127.3.5 GM1$^-\oplus$GM3$^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{A2_u}$
N127.3.6 GM1$^-\oplus$GM4$^+$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{A1}\oplus\mathrm{A2}$
N127.3.7 GM1$^-\oplus$GM4$^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{B2_u}$
N127.3.8 GM1$^-\oplus$Z1$^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}$
N127.3.9 GM1$^-\oplus$Z1$^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}$
N127.3.10 GM1$^-\oplus$Z2$^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}$
N127.3.11 GM1$^-\oplus$Z2$^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}$
N127.3.12 GM2$^+\oplus$GM2$^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B1_g}$
N127.3.13 GM2$^+\oplus$GM2$^-$	$\surd$	2	2	$\surd$	422	$\mathrm{A1}\oplus\mathrm{B1}$
N127.3.14 GM2$^+\oplus$GM3$^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}\oplus\mathrm{A2_g}$
N127.3.15 GM2$^+\oplus$GM3$^-$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{A1}\oplus\mathrm{B1}$
N127.3.16 GM2$^+\oplus$GM4$^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B2_g}$
N127.3.17 GM2$^+\oplus$GM4$^-$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{A1}\oplus\mathrm{B1}$
N127.3.18 GM2$^+\oplus$Z1$^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}$
N127.3.19 GM2$^+\oplus$Z1$^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}$
N127.3.20 GM2$^+\oplus$Z2$^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}$
N127.3.21 GM2$^+\oplus$Z2$^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}$
N127.3.22 GM2$^-\oplus$GM2$^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}\oplus\mathrm{B1_u}$
N127.3.23 GM2$^-\oplus$GM3$^+$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{A1}\oplus\mathrm{B2}$
N127.3.24 GM2$^-\oplus$GM3$^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}\oplus\mathrm{A2_u}$
N127.3.25 GM2$^-\oplus$GM4$^+$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{A1}\oplus\mathrm{B2}$
N127.3.26 GM2$^-\oplus$GM4$^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}\oplus\mathrm{B2_u}$
N127.3.27 GM2$^-\oplus$Z1$^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}$
N127.3.28 GM2$^-\oplus$Z1$^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}$
N127.3.29 GM2$^-\oplus$Z2$^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}$
N127.3.30 GM2$^-\oplus$Z2$^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}$

Non-coplanar SSGs with parent space group $P4/mbm$ (No. 127) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N127.3.31 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
N127.3.32 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	√	2	2	√	422	$\mathrm{A1} \oplus \mathrm{A2}$
N127.3.33 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g} \oplus \mathrm{B2_g}$
N127.3.34 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	√	2	2	√	$\bar{4}2m$	$\mathrm{A1} \oplus \mathrm{A2}$
N127.3.35 $\mathrm{GM3}^+ \oplus \mathrm{Z1}^+$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g}$
N127.3.36 $\mathrm{GM3}^+ \oplus \mathrm{Z1}^-$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g}$
N127.3.37 $\mathrm{GM3}^+ \oplus \mathrm{Z2}^+$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g}$
N127.3.38 $\mathrm{GM3}^+ \oplus \mathrm{Z2}^-$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g}$
N127.3.39 $\mathrm{GM3}^- \oplus \mathrm{GM3}^-$	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N127.3.40 $\mathrm{GM3}^- \oplus \mathrm{GM4}^+$	√	2	2	√	$\bar{4}2m$	$\mathrm{A1} \oplus \mathrm{B2}$
N127.3.41 $\mathrm{GM3}^- \oplus \mathrm{GM4}^-$	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N127.3.42 $\mathrm{GM3}^- \oplus \mathrm{Z1}^+$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_u}$
N127.3.43 $\mathrm{GM3}^- \oplus \mathrm{Z1}^-$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_u}$
N127.3.44 $\mathrm{GM3}^- \oplus \mathrm{Z2}^+$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_u}$
N127.3.45 $\mathrm{GM3}^- \oplus \mathrm{Z2}^-$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_u}$
N127.3.46 $\mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N127.3.47 $\mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	√	2	2	√	422	$\mathrm{A1} \oplus \mathrm{B2}$
N127.3.48 $\mathrm{GM4}^+ \oplus \mathrm{Z1}^+$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_g}$
N127.3.49 $\mathrm{GM4}^+ \oplus \mathrm{Z1}^-$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_g}$
N127.3.50 $\mathrm{GM4}^+ \oplus \mathrm{Z2}^+$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_g}$
N127.3.51 $\mathrm{GM4}^+ \oplus \mathrm{Z2}^-$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_g}$
N127.3.52 $\mathrm{GM4}^- \oplus \mathrm{GM4}^-$	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N127.3.53 $\mathrm{GM4}^- \oplus \mathrm{Z1}^+$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_u}$
N127.3.54 $\mathrm{GM4}^- \oplus \mathrm{Z1}^-$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_u}$
N127.3.55 $\mathrm{GM4}^- \oplus \mathrm{Z2}^+$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_u}$
N127.3.56 $\mathrm{GM4}^- \oplus \mathrm{Z2}^-$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_u}$
N127.3.57 $\mathrm{Z1}^+ \oplus \mathrm{Z1}^+$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N127.3.58 $\mathrm{Z1}^+ \oplus \mathrm{Z3}^-$	√	1	1	√	$4mm$	A1
N127.3.59 $\mathrm{Z1}^+ \oplus \mathrm{Z1}^-$	√	1	1	√	422	A1
N127.3.60 $\mathrm{Z1}^+ \oplus \mathrm{Z3}^+$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N127.3.61 $\mathrm{Z1}^+ \oplus \mathrm{Z2}^+$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N127.3.62 $\mathrm{Z1}^+ \oplus \mathrm{Z4}^-$	√	1	1	√	$\bar{4}m2$	A1
N127.3.63 $\mathrm{Z1}^+ \oplus \mathrm{Z2}^-$	√	1	1	√	$\bar{4}2m$	A1
N127.3.64 $\mathrm{Z1}^+ \oplus \mathrm{Z4}^+$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N127.3.65 $\mathrm{Z1}^- \oplus \mathrm{Z1}^-$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N127.3.66 $\mathrm{Z1}^- \oplus \mathrm{Z3}^+$	√	1	1	√	$4mm$	A1
N127.3.67 $\mathrm{Z1}^- \oplus \mathrm{Z2}^+$	√	1	1	√	$\bar{4}2m$	A1
N127.3.68 $\mathrm{Z1}^- \oplus \mathrm{Z4}^-$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N127.3.69 $\mathrm{Z1}^- \oplus \mathrm{Z2}^-$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N127.3.70 $\mathrm{Z1}^- \oplus \mathrm{Z4}^+$	√	1	1	√	$\bar{4}m2$	A1
N127.3.71 $\mathrm{Z2}^+ \oplus \mathrm{Z2}^+$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N127.3.72 $\mathrm{Z2}^+ \oplus \mathrm{Z4}^-$	√	1	1	√	$4mm$	A1
N127.3.73 $\mathrm{Z2}^+ \oplus \mathrm{Z2}^-$	√	1	1	√	422	A1
N127.3.74 $\mathrm{Z2}^+ \oplus \mathrm{Z4}^+$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N127.3.75 $\mathrm{Z2}^- \oplus \mathrm{Z2}^-$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N127.3.76 $\mathrm{Z2}^- \oplus \mathrm{Z4}^+$	√	1	1	√	$4mm$	A1

Non-coplanar SSGs with parent space group $P4/mbm$ (No. 127) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N127.4.1 $\mathrm{M1^+M4^+}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N127.4.2 $\mathrm{M1^-M4^-}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N127.4.3 $\mathrm{M2^+M3^+}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N127.4.4 $\mathrm{M2^-M3^-}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N127.4.5 $\mathrm{A1^+A4^+}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N127.4.6 $\mathrm{A1^-A4^-}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N127.6.1 $\mathrm{GM5^+}$	√	3	3	√	$4/mmm$	$\mathrm{A1_g \oplus E_g}$
N127.6.2 $\mathrm{GM5^-}$	√	3	3	√	$4/mmm$	$\mathrm{A1_g \oplus E_u}$
N127.6.3 $\mathrm{A5^+}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N127.6.4 $\mathrm{M5^+}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N127.6.5 $\mathrm{M5^-}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N127.6.6 $\mathrm{Z5^+}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N127.8.1 LD1	√	1	1	√	$4mm$	A1
N127.8.2 LD2	√	1	1	√	$4mm$	A1
N127.8.3 LD3	√	1	1	√	$4mm$	A1
N127.8.4 LD4	√	1	1	√	$4mm$	A1
N127.9.1 $\mathrm{GM1^- \oplus GM1^- \oplus GM1^-}$	√	0	0	√	-	-
N127.9.2 $\mathrm{GM1^- \oplus GM1^- \oplus GM2^+}$	√	3	3	√	$4/mmm$	$\mathrm{B1_g \oplus B1_u \oplus B1_u}$
N127.9.3 $\mathrm{GM1^- \oplus GM1^- \oplus GM2^-}$	√	0	0	√	-	-
N127.9.4 $\mathrm{GM1^- \oplus GM1^- \oplus GM3^+}$	√	3	3	√	$4/mmm$	$\mathrm{A2_g \oplus A2_u \oplus A2_u}$
N127.9.5 $\mathrm{GM1^- \oplus GM1^- \oplus GM3^-}$	√	0	0	√	-	-
N127.9.6 $\mathrm{GM1^- \oplus GM1^- \oplus GM4^+}$	√	3	3	√	$4/mmm$	$\mathrm{B2_g \oplus B2_u \oplus B2_u}$
N127.9.7 $\mathrm{GM1^- \oplus GM1^- \oplus GM4^-}$	√	0	0	√	-	-
N127.9.8 $\mathrm{GM1^- \oplus GM1^- \oplus Z1^+}$	√	0	0	√	-	-
N127.9.9 $\mathrm{GM1^- \oplus GM1^- \oplus Z1^-}$	√	0	0	√	-	-
N127.9.10 $\mathrm{GM1^- \oplus GM1^- \oplus Z2^+}$	√	0	0	√	-	-
N127.9.11 $\mathrm{GM1^- \oplus GM1^- \oplus Z2^-}$	√	0	0	√	-	-
N127.9.12 $\mathrm{GM1^- \oplus GM2^+ \oplus GM2^+}$	√	2	2	√	422	$\mathrm{B1 \oplus B1}$
N127.9.13 $\mathrm{GM1^- \oplus GM2^+ \oplus GM2^-}$	√	3	3	√	$4/mmm$	$\mathrm{A1_u \oplus B1_g \oplus B1_u}$
N127.9.14 $\mathrm{GM1^- \oplus GM2^+ \oplus GM3^+}$	√	2	2	√	$\bar{4}m2$	$\mathrm{B1 \oplus B2}$
N127.9.15 $\mathrm{GM1^- \oplus GM2^+ \oplus GM3^-}$	√	3	3	√	$4/mmm$	$\mathrm{B1_g \oplus B1_u \oplus B2_u}$
N127.9.16 $\mathrm{GM1^- \oplus GM2^+ \oplus GM4^+}$	√	2	2	√	$4mm$	$\mathrm{B1 \oplus B2}$
N127.9.17 $\mathrm{GM1^- \oplus GM2^+ \oplus GM4^-}$	√	3	3	√	$4/mmm$	$\mathrm{B1_g \oplus B1_u \oplus A2_u}$
N127.9.18 $\mathrm{GM1^- \oplus GM2^+ \oplus Z1^+}$	√	2	2	√	$4/mmm$	$\mathrm{B1_g \oplus B1_u}$
N127.9.19 $\mathrm{GM1^- \oplus GM2^+ \oplus Z1^-}$	√	2	2	√	$4/mmm$	$\mathrm{B1_g \oplus B1_u}$
N127.9.20 $\mathrm{GM1^- \oplus GM2^+ \oplus Z2^+}$	√	2	2	√	$4/mmm$	$\mathrm{B1_g \oplus B1_u}$
N127.9.21 $\mathrm{GM1^- \oplus GM2^+ \oplus Z2^-}$	√	2	2	√	$4/mmm$	$\mathrm{B1_g \oplus B1_u}$
N127.9.22 $\mathrm{GM1^- \oplus GM2^- \oplus GM2^-}$	√	0	0	√	-	-
N127.9.23 $\mathrm{GM1^- \oplus GM2^- \oplus GM3^+}$	√	3	3	√	$4/mmm$	$\mathrm{A2_g \oplus A2_u \oplus B2_u}$
N127.9.24 $\mathrm{GM1^- \oplus GM2^- \oplus GM3^-}$	√	0	0	√	-	-
N127.9.25 $\mathrm{GM1^- \oplus GM2^- \oplus GM4^+}$	√	3	3	√	$4/mmm$	$\mathrm{A2_u \oplus B2_g \oplus B2_u}$
N127.9.26 $\mathrm{GM1^- \oplus GM2^- \oplus GM4^-}$	√	0	0	√	-	-
N127.9.27 $\mathrm{GM1^- \oplus GM2^- \oplus Z1^+}$	√	0	0	√	-	-
N127.9.28 $\mathrm{GM1^- \oplus GM2^- \oplus Z1^-}$	√	0	0	√	-	-
N127.9.29 $\mathrm{GM1^- \oplus GM2^- \oplus Z2^+}$	√	0	0	√	-	-
N127.9.30 $\mathrm{GM1^- \oplus GM2^- \oplus Z2^-}$	√	0	0	√	-	-

Non-coplanar SSGs with parent space group $P4/mbm$ (No. 127) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N127.9.31 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	422	$\mathrm{A2} \oplus \mathrm{A2}$
N127.9.32 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
N127.9.33 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B2} \oplus \mathrm{A2}$
N127.9.34 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
N127.9.35 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Z1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u}$
N127.9.36 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Z1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u}$
N127.9.37 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Z2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u}$
N127.9.38 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Z2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u}$
N127.9.39 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N127.9.40 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N127.9.41 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N127.9.42 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Z1}^+$	$\surd$	0	0	$\surd$	-	-
N127.9.43 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Z1}^-$	$\surd$	0	0	$\surd$	-	-
N127.9.44 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Z2}^+$	$\surd$	0	0	$\surd$	-	-
N127.9.45 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Z2}^-$	$\surd$	0	0	$\surd$	-	-
N127.9.46 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	422	$\mathrm{B2} \oplus \mathrm{B2}$
N127.9.47 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N127.9.48 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{Z1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_u}$
N127.9.49 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{Z1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_u}$
N127.9.50 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{Z2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_u}$
N127.9.51 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{Z2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_u}$
N127.9.52 $\mathrm{GM1}^- \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N127.9.53 $\mathrm{GM1}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Z1}^+$	$\surd$	0	0	$\surd$	-	-
N127.9.54 $\mathrm{GM1}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Z1}^-$	$\surd$	0	0	$\surd$	-	-
N127.9.55 $\mathrm{GM1}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Z2}^+$	$\surd$	0	0	$\surd$	-	-
N127.9.56 $\mathrm{GM1}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Z2}^-$	$\surd$	0	0	$\surd$	-	-
N127.9.57 $\mathrm{GM1}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N127.9.58 $\mathrm{GM1}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N127.9.59 $\mathrm{GM1}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
N127.9.60 $\mathrm{GM1}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N127.9.61 $\mathrm{GM1}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N127.9.62 $\mathrm{GM1}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\times$	-	-
N127.9.63 $\mathrm{GM1}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\times$	-	-
N127.9.64 $\mathrm{GM1}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N127.9.65 $\mathrm{GM1}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N127.9.66 $\mathrm{GM1}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N127.9.67 $\mathrm{GM1}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\times$	-	-
N127.9.68 $\mathrm{GM1}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z4}^-$	$\surd$	1	0	$\times$	-	-
N127.9.69 $\mathrm{GM1}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-
N127.9.70 $\mathrm{GM1}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\times$	-	-
N127.9.71 $\mathrm{GM1}^- \oplus \mathrm{Z2}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N127.9.72 $\mathrm{GM1}^- \oplus \mathrm{Z2}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N127.9.73 $\mathrm{GM1}^- \oplus \mathrm{Z2}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\times$	-	-
N127.9.74 $\mathrm{GM1}^- \oplus \mathrm{Z2}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N127.9.75 $\mathrm{GM1}^- \oplus \mathrm{Z2}^- \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-
N127.9.76 $\mathrm{GM1}^- \oplus \mathrm{Z2}^- \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$

Non-coplanar SSGs with parent space group $P4/mbm$ (No. 127) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N127.9.77 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{GM2^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B1_g}$
N127.9.78 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{GM2^-}$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B1}\oplus\mathrm{B1}$
N127.9.79 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{GM3^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_g}\oplus\mathrm{A2_g}$
N127.9.80 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{GM3^-}$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{B1}\oplus\mathrm{B1}$
N127.9.81 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B2_g}$
N127.9.82 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{B1}\oplus\mathrm{B1}$
N127.9.83 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{Z1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_g}$
N127.9.84 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{Z1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_g}$
N127.9.85 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{Z2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_g}$
N127.9.86 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{Z2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_g}$
N127.9.87 $\mathrm{GM2^+}\oplus\mathrm{GM2^-}\oplus\mathrm{GM2^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A1_u}\oplus\mathrm{B1_g}$
N127.9.88 $\mathrm{GM2^+}\oplus\mathrm{GM2^-}\oplus\mathrm{GM3^+}$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{B1}\oplus\mathrm{A2}$
N127.9.89 $\mathrm{GM2^+}\oplus\mathrm{GM2^-}\oplus\mathrm{GM3^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B1_g}\oplus\mathrm{B2_u}$
N127.9.90 $\mathrm{GM2^+}\oplus\mathrm{GM2^-}\oplus\mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{B1}\oplus\mathrm{A2}$
N127.9.91 $\mathrm{GM2^+}\oplus\mathrm{GM2^-}\oplus\mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B1_g}\oplus\mathrm{A2_u}$
N127.9.92 $\mathrm{GM2^+}\oplus\mathrm{GM2^-}\oplus\mathrm{Z1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B1_g}$
N127.9.93 $\mathrm{GM2^+}\oplus\mathrm{GM2^-}\oplus\mathrm{Z1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B1_g}$
N127.9.94 $\mathrm{GM2^+}\oplus\mathrm{GM2^-}\oplus\mathrm{Z2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B1_g}$
N127.9.95 $\mathrm{GM2^+}\oplus\mathrm{GM2^-}\oplus\mathrm{Z2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B1_g}$
N127.9.96 $\mathrm{GM2^+}\oplus\mathrm{GM3^+}\oplus\mathrm{GM3^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_g}$
N127.9.97 $\mathrm{GM2^+}\oplus\mathrm{GM3^+}\oplus\mathrm{GM3^-}$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B1}\oplus\mathrm{A2}$
N127.9.98 $\mathrm{GM2^+}\oplus\mathrm{GM3^+}\oplus\mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_g}\oplus\mathrm{B2_g}$
N127.9.99 $\mathrm{GM2^+}\oplus\mathrm{GM3^+}\oplus\mathrm{GM4^-}$	$\surd$	2	2	$\surd$	422	$\mathrm{B1}\oplus\mathrm{A2}$
N127.9.100 $\mathrm{GM2^+}\oplus\mathrm{GM3^+}\oplus\mathrm{Z1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_g}$
N127.9.101 $\mathrm{GM2^+}\oplus\mathrm{GM3^+}\oplus\mathrm{Z1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_g}$
N127.9.102 $\mathrm{GM2^+}\oplus\mathrm{GM3^+}\oplus\mathrm{Z2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_g}$
N127.9.103 $\mathrm{GM2^+}\oplus\mathrm{GM3^+}\oplus\mathrm{Z2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_g}$
N127.9.104 $\mathrm{GM2^+}\oplus\mathrm{GM3^-}\oplus\mathrm{GM3^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B2_u}\oplus\mathrm{B2_u}$
N127.9.105 $\mathrm{GM2^+}\oplus\mathrm{GM3^-}\oplus\mathrm{GM4^+}$	$\surd$	2	2	$\surd$	422	$\mathrm{B1}\oplus\mathrm{B2}$
N127.9.106 $\mathrm{GM2^+}\oplus\mathrm{GM3^-}\oplus\mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_u}\oplus\mathrm{B2_u}$
N127.9.107 $\mathrm{GM2^+}\oplus\mathrm{GM3^-}\oplus\mathrm{Z1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B2_u}$
N127.9.108 $\mathrm{GM2^+}\oplus\mathrm{GM3^-}\oplus\mathrm{Z1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B2_u}$
N127.9.109 $\mathrm{GM2^+}\oplus\mathrm{GM3^-}\oplus\mathrm{Z2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B2_u}$
N127.9.110 $\mathrm{GM2^+}\oplus\mathrm{GM3^-}\oplus\mathrm{Z2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B2_u}$
N127.9.111 $\mathrm{GM2^+}\oplus\mathrm{GM4^+}\oplus\mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B2_g}\oplus\mathrm{B2_g}$
N127.9.112 $\mathrm{GM2^+}\oplus\mathrm{GM4^+}\oplus\mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B1}\oplus\mathrm{B2}$
N127.9.113 $\mathrm{GM2^+}\oplus\mathrm{GM4^+}\oplus\mathrm{Z1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B2_g}$
N127.9.114 $\mathrm{GM2^+}\oplus\mathrm{GM4^+}\oplus\mathrm{Z1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B2_g}$
N127.9.115 $\mathrm{GM2^+}\oplus\mathrm{GM4^+}\oplus\mathrm{Z2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B2_g}$
N127.9.116 $\mathrm{GM2^+}\oplus\mathrm{GM4^+}\oplus\mathrm{Z2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B2_g}$
N127.9.117 $\mathrm{GM2^+}\oplus\mathrm{GM4^-}\oplus\mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_u}\oplus\mathrm{A2_u}$
N127.9.118 $\mathrm{GM2^+}\oplus\mathrm{GM4^-}\oplus\mathrm{Z1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_u}$
N127.9.119 $\mathrm{GM2^+}\oplus\mathrm{GM4^-}\oplus\mathrm{Z1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_u}$
N127.9.120 $\mathrm{GM2^+}\oplus\mathrm{GM4^-}\oplus\mathrm{Z2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_u}$
N127.9.121 $\mathrm{GM2^+}\oplus\mathrm{GM4^-}\oplus\mathrm{Z2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_u}$
N127.9.122 $\mathrm{GM2^+}\oplus\mathrm{Z1^+}\oplus\mathrm{Z1^+}$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $P4/mbm$ (No. 127) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N127.9.123 $\mathrm{GM2^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z3^-}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N127.9.124 $\mathrm{GM2^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z1^-}$	$\surd$	1	1	$\times$	-	-
N127.9.125 $\mathrm{GM2^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z3^+}$	$\surd$	1	1	$\times$	-	-
N127.9.126 $\mathrm{GM2^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z2^+}$	$\surd$	1	1	$\times$	-	-
N127.9.127 $\mathrm{GM2^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z4^-}$	$\surd$	1	1	$\times$	-	-
N127.9.128 $\mathrm{GM2^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
N127.9.129 $\mathrm{GM2^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z4^+}$	$\surd$	1	1	$\times$	-	-
N127.9.130 $\mathrm{GM2^+} \oplus \mathrm{Z1^-} \oplus \mathrm{Z1^-}$	$\surd$	1	1	$\times$	-	-
N127.9.131 $\mathrm{GM2^+} \oplus \mathrm{Z1^-} \oplus \mathrm{Z3^+}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N127.9.132 $\mathrm{GM2^+} \oplus \mathrm{Z1^-} \oplus \mathrm{Z2^+}$	$\surd$	1	1	$\times$	-	-
N127.9.133 $\mathrm{GM2^+} \oplus \mathrm{Z1^-} \oplus \mathrm{Z4^-}$	$\surd$	1	1	$\times$	-	-
N127.9.134 $\mathrm{GM2^+} \oplus \mathrm{Z1^-} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
N127.9.135 $\mathrm{GM2^+} \oplus \mathrm{Z1^-} \oplus \mathrm{Z4^+}$	$\surd$	1	1	$\times$	-	-
N127.9.136 $\mathrm{GM2^+} \oplus \mathrm{Z2^+} \oplus \mathrm{Z2^+}$	$\surd$	1	1	$\times$	-	-
N127.9.137 $\mathrm{GM2^+} \oplus \mathrm{Z2^+} \oplus \mathrm{Z4^-}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N127.9.138 $\mathrm{GM2^+} \oplus \mathrm{Z2^+} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
N127.9.139 $\mathrm{GM2^+} \oplus \mathrm{Z2^+} \oplus \mathrm{Z4^+}$	$\surd$	1	1	$\times$	-	-
N127.9.140 $\mathrm{GM2^+} \oplus \mathrm{Z2^-} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
N127.9.141 $\mathrm{GM2^+} \oplus \mathrm{Z2^-} \oplus \mathrm{Z4^+}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N127.9.142 $\mathrm{GM2^-} \oplus \mathrm{GM2^-} \oplus \mathrm{GM2^-}$	$\surd$	0	0	$\surd$	-	-
N127.9.143 $\mathrm{GM2^-} \oplus \mathrm{GM2^-} \oplus \mathrm{GM3^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N127.9.144 $\mathrm{GM2^-} \oplus \mathrm{GM2^-} \oplus \mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
N127.9.145 $\mathrm{GM2^-} \oplus \mathrm{GM2^-} \oplus \mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$
N127.9.146 $\mathrm{GM2^-} \oplus \mathrm{GM2^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N127.9.147 $\mathrm{GM2^-} \oplus \mathrm{GM2^-} \oplus \mathrm{Z1^+}$	$\surd$	0	0	$\surd$	-	-
N127.9.148 $\mathrm{GM2^-} \oplus \mathrm{GM2^-} \oplus \mathrm{Z1^-}$	$\surd$	0	0	$\surd$	-	-
N127.9.149 $\mathrm{GM2^-} \oplus \mathrm{GM2^-} \oplus \mathrm{Z2^+}$	$\surd$	0	0	$\surd$	-	-
N127.9.150 $\mathrm{GM2^-} \oplus \mathrm{GM2^-} \oplus \mathrm{Z2^-}$	$\surd$	0	0	$\surd$	-	-
N127.9.151 $\mathrm{GM2^-} \oplus \mathrm{GM3^+} \oplus \mathrm{GM3^+}$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{A2} \oplus \mathrm{A2}$
N127.9.152 $\mathrm{GM2^-} \oplus \mathrm{GM3^+} \oplus \mathrm{GM3^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{B2_u}$
N127.9.153 $\mathrm{GM2^-} \oplus \mathrm{GM3^+} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	422	$\mathrm{A2} \oplus \mathrm{B2}$
N127.9.154 $\mathrm{GM2^-} \oplus \mathrm{GM3^+} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g} \oplus \mathrm{B2_u}$
N127.9.155 $\mathrm{GM2^-} \oplus \mathrm{GM3^+} \oplus \mathrm{Z1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_u}$
N127.9.156 $\mathrm{GM2^-} \oplus \mathrm{GM3^+} \oplus \mathrm{Z1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_u}$
N127.9.157 $\mathrm{GM2^-} \oplus \mathrm{GM3^+} \oplus \mathrm{Z2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_u}$
N127.9.158 $\mathrm{GM2^-} \oplus \mathrm{GM3^+} \oplus \mathrm{Z2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_u}$
N127.9.159 $\mathrm{GM2^-} \oplus \mathrm{GM3^-} \oplus \mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
N127.9.160 $\mathrm{GM2^-} \oplus \mathrm{GM3^-} \oplus \mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$
N127.9.161 $\mathrm{GM2^-} \oplus \mathrm{GM3^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N127.9.162 $\mathrm{GM2^-} \oplus \mathrm{GM3^-} \oplus \mathrm{Z1^+}$	$\surd$	0	0	$\surd$	-	-
N127.9.163 $\mathrm{GM2^-} \oplus \mathrm{GM3^-} \oplus \mathrm{Z1^-}$	$\surd$	0	0	$\surd$	-	-
N127.9.164 $\mathrm{GM2^-} \oplus \mathrm{GM3^-} \oplus \mathrm{Z2^+}$	$\surd$	0	0	$\surd$	-	-
N127.9.165 $\mathrm{GM2^-} \oplus \mathrm{GM3^-} \oplus \mathrm{Z2^-}$	$\surd$	0	0	$\surd$	-	-
N127.9.166 $\mathrm{GM2^-} \oplus \mathrm{GM4^+} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B2} \oplus \mathrm{B2}$
N127.9.167 $\mathrm{GM2^-} \oplus \mathrm{GM4^+} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$
N127.9.168 $\mathrm{GM2^-} \oplus \mathrm{GM4^+} \oplus \mathrm{Z1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g}$

Non-coplanar SSGs with parent space group $P4/mbm$ (No. 127) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N127.9.169 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{Z1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g}$
N127.9.170 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{Z2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g}$
N127.9.171 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{Z2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g}$
N127.9.172 $\mathrm{GM2}^- \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N127.9.173 $\mathrm{GM2}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Z1}^+$	$\surd$	0	0	$\surd$	-	-
N127.9.174 $\mathrm{GM2}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Z1}^-$	$\surd$	0	0	$\surd$	-	-
N127.9.175 $\mathrm{GM2}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Z2}^+$	$\surd$	0	0	$\surd$	-	-
N127.9.176 $\mathrm{GM2}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Z2}^-$	$\surd$	0	0	$\surd$	-	-
N127.9.177 $\mathrm{GM2}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N127.9.178 $\mathrm{GM2}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N127.9.179 $\mathrm{GM2}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
N127.9.180 $\mathrm{GM2}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N127.9.181 $\mathrm{GM2}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N127.9.182 $\mathrm{GM2}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\times$	-	-
N127.9.183 $\mathrm{GM2}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\times$	-	-
N127.9.184 $\mathrm{GM2}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N127.9.185 $\mathrm{GM2}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N127.9.186 $\mathrm{GM2}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N127.9.187 $\mathrm{GM2}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\times$	-	-
N127.9.188 $\mathrm{GM2}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z4}^-$	$\surd$	1	0	$\times$	-	-
N127.9.189 $\mathrm{GM2}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-
N127.9.190 $\mathrm{GM2}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\times$	-	-
N127.9.191 $\mathrm{GM2}^- \oplus \mathrm{Z2}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N127.9.192 $\mathrm{GM2}^- \oplus \mathrm{Z2}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N127.9.193 $\mathrm{GM2}^- \oplus \mathrm{Z2}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\times$	-	-
N127.9.194 $\mathrm{GM2}^- \oplus \mathrm{Z2}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N127.9.195 $\mathrm{GM2}^- \oplus \mathrm{Z2}^- \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-
N127.9.196 $\mathrm{GM2}^- \oplus \mathrm{Z2}^- \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N127.9.197 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
N127.9.198 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{A2} \oplus \mathrm{A2}$
N127.9.199 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{B2_g}$
N127.9.200 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{B2} \oplus \mathrm{B2}$
N127.9.201 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Z1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g}$
N127.9.202 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Z1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g}$
N127.9.203 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Z2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g}$
N127.9.204 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{Z2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g}$
N127.9.205 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A2_g}$
N127.9.206 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{B2} \oplus \mathrm{A2}$
N127.9.207 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{A2_g}$
N127.9.208 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Z1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g}$
N127.9.209 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Z1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g}$
N127.9.210 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Z2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g}$
N127.9.211 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{Z2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g}$
N127.9.212 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N127.9.213 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{B2} \oplus \mathrm{A2}$
N127.9.214 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{Z1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g}$

Non-coplanar SSGs with parent space group $P4/mbm$ (No. 127) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N127.9.215 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{Z1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g}$
N127.9.216 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{Z2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g}$
N127.9.217 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{Z2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g}$
N127.9.218 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{A2_g}$
N127.9.219 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Z1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g}$
N127.9.220 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Z1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g}$
N127.9.221 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Z2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g}$
N127.9.222 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Z2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g}$
N127.9.223 $\mathrm{GM3^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z1^+}$	$\surd$	1	1	$\times$	-	-
N127.9.224 $\mathrm{GM3^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z3^-}$	$\surd$	1	1	$\surd$	422	A2
N127.9.225 $\mathrm{GM3^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z1^-}$	$\surd$	1	1	$\times$	-	-
N127.9.226 $\mathrm{GM3^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z3^+}$	$\surd$	1	1	$\times$	-	-
N127.9.227 $\mathrm{GM3^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z2^+}$	$\surd$	1	1	$\times$	-	-
N127.9.228 $\mathrm{GM3^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z4^-}$	$\surd$	1	1	$\times$	-	-
N127.9.229 $\mathrm{GM3^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
N127.9.230 $\mathrm{GM3^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z4^+}$	$\surd$	1	1	$\times$	-	-
N127.9.231 $\mathrm{GM3^+} \oplus \mathrm{Z1^-} \oplus \mathrm{Z1^-}$	$\surd$	1	1	$\times$	-	-
N127.9.232 $\mathrm{GM3^+} \oplus \mathrm{Z1^-} \oplus \mathrm{Z3^+}$	$\surd$	1	1	$\surd$	422	A2
N127.9.233 $\mathrm{GM3^+} \oplus \mathrm{Z1^-} \oplus \mathrm{Z2^+}$	$\surd$	1	1	$\times$	-	-
N127.9.234 $\mathrm{GM3^+} \oplus \mathrm{Z1^-} \oplus \mathrm{Z4^-}$	$\surd$	1	1	$\times$	-	-
N127.9.235 $\mathrm{GM3^+} \oplus \mathrm{Z1^-} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
N127.9.236 $\mathrm{GM3^+} \oplus \mathrm{Z1^-} \oplus \mathrm{Z4^+}$	$\surd$	1	1	$\times$	-	-
N127.9.237 $\mathrm{GM3^+} \oplus \mathrm{Z2^+} \oplus \mathrm{Z2^+}$	$\surd$	1	1	$\times$	-	-
N127.9.238 $\mathrm{GM3^+} \oplus \mathrm{Z2^+} \oplus \mathrm{Z4^-}$	$\surd$	1	1	$\surd$	422	A2
N127.9.239 $\mathrm{GM3^+} \oplus \mathrm{Z2^+} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
N127.9.240 $\mathrm{GM3^+} \oplus \mathrm{Z2^+} \oplus \mathrm{Z4^+}$	$\surd$	1	1	$\times$	-	-
N127.9.241 $\mathrm{GM3^+} \oplus \mathrm{Z2^-} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
N127.9.242 $\mathrm{GM3^+} \oplus \mathrm{Z2^-} \oplus \mathrm{Z4^+}$	$\surd$	1	1	$\surd$	422	A2
N127.9.243 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
N127.9.244 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B2_g}$
N127.9.245 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N127.9.246 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{Z1^+}$	$\surd$	0	0	$\surd$	-	-
N127.9.247 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{Z1^-}$	$\surd$	0	0	$\surd$	-	-
N127.9.248 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{Z2^+}$	$\surd$	0	0	$\surd$	-	-
N127.9.249 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{Z2^-}$	$\surd$	0	0	$\surd$	-	-
N127.9.250 $\mathrm{GM3^-} \oplus \mathrm{GM4^+} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{B2} \oplus \mathrm{B2}$
N127.9.251 $\mathrm{GM3^-} \oplus \mathrm{GM4^+} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B2_g}$
N127.9.252 $\mathrm{GM3^-} \oplus \mathrm{GM4^+} \oplus \mathrm{Z1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_g}$
N127.9.253 $\mathrm{GM3^-} \oplus \mathrm{GM4^+} \oplus \mathrm{Z1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_g}$
N127.9.254 $\mathrm{GM3^-} \oplus \mathrm{GM4^+} \oplus \mathrm{Z2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_g}$
N127.9.255 $\mathrm{GM3^-} \oplus \mathrm{GM4^+} \oplus \mathrm{Z2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_g}$
N127.9.256 $\mathrm{GM3^-} \oplus \mathrm{GM4^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N127.9.257 $\mathrm{GM3^-} \oplus \mathrm{GM4^-} \oplus \mathrm{Z1^+}$	$\surd$	0	0	$\surd$	-	-
N127.9.258 $\mathrm{GM3^-} \oplus \mathrm{GM4^-} \oplus \mathrm{Z1^-}$	$\surd$	0	0	$\surd$	-	-
N127.9.259 $\mathrm{GM3^-} \oplus \mathrm{GM4^-} \oplus \mathrm{Z2^+}$	$\surd$	0	0	$\surd$	-	-
N127.9.260 $\mathrm{GM3^-} \oplus \mathrm{GM4^-} \oplus \mathrm{Z2^-}$	$\surd$	0	0	$\surd$	-	-

Non-coplanar SSGs with parent space group $P4/mbm$ (No. 127) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N127.9.261 $\mathrm{GM3^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z1^+}$	$\surd$	1	0	$\times$	-	-
N127.9.262 $\mathrm{GM3^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z3^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N127.9.263 $\mathrm{GM3^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z1^-}$	$\surd$	1	1	$\times$	-	-
N127.9.264 $\mathrm{GM3^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z3^+}$	$\surd$	1	0	$\times$	-	-
N127.9.265 $\mathrm{GM3^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z2^+}$	$\surd$	1	0	$\times$	-	-
N127.9.266 $\mathrm{GM3^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z4^-}$	$\surd$	1	1	$\times$	-	-
N127.9.267 $\mathrm{GM3^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
N127.9.268 $\mathrm{GM3^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z4^+}$	$\surd$	1	0	$\times$	-	-
N127.9.269 $\mathrm{GM3^-} \oplus \mathrm{Z1^-} \oplus \mathrm{Z1^-}$	$\surd$	1	0	$\times$	-	-
N127.9.270 $\mathrm{GM3^-} \oplus \mathrm{Z1^-} \oplus \mathrm{Z3^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N127.9.271 $\mathrm{GM3^-} \oplus \mathrm{Z1^-} \oplus \mathrm{Z2^+}$	$\surd$	1	1	$\times$	-	-
N127.9.272 $\mathrm{GM3^-} \oplus \mathrm{Z1^-} \oplus \mathrm{Z4^-}$	$\surd$	1	0	$\times$	-	-
N127.9.273 $\mathrm{GM3^-} \oplus \mathrm{Z1^-} \oplus \mathrm{Z2^-}$	$\surd$	1	0	$\times$	-	-
N127.9.274 $\mathrm{GM3^-} \oplus \mathrm{Z1^-} \oplus \mathrm{Z4^+}$	$\surd$	1	1	$\times$	-	-
N127.9.275 $\mathrm{GM3^-} \oplus \mathrm{Z2^+} \oplus \mathrm{Z2^+}$	$\surd$	1	0	$\times$	-	-
N127.9.276 $\mathrm{GM3^-} \oplus \mathrm{Z2^+} \oplus \mathrm{Z4^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N127.9.277 $\mathrm{GM3^-} \oplus \mathrm{Z2^+} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
N127.9.278 $\mathrm{GM3^-} \oplus \mathrm{Z2^+} \oplus \mathrm{Z4^+}$	$\surd$	1	0	$\times$	-	-
N127.9.279 $\mathrm{GM3^-} \oplus \mathrm{Z2^-} \oplus \mathrm{Z2^-}$	$\surd$	1	0	$\times$	-	-
N127.9.280 $\mathrm{GM3^-} \oplus \mathrm{Z2^-} \oplus \mathrm{Z4^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N127.9.281 $\mathrm{GM4^+} \oplus \mathrm{GM4^+} \oplus \mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N127.9.282 $\mathrm{GM4^+} \oplus \mathrm{GM4^+} \oplus \mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{A2} \oplus \mathrm{A2}$
N127.9.283 $\mathrm{GM4^+} \oplus \mathrm{GM4^+} \oplus \mathrm{Z1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_g}$
N127.9.284 $\mathrm{GM4^+} \oplus \mathrm{GM4^+} \oplus \mathrm{Z1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_g}$
N127.9.285 $\mathrm{GM4^+} \oplus \mathrm{GM4^+} \oplus \mathrm{Z2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_g}$
N127.9.286 $\mathrm{GM4^+} \oplus \mathrm{GM4^+} \oplus \mathrm{Z2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_g}$
N127.9.287 $\mathrm{GM4^+} \oplus \mathrm{GM4^-} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{B2_g}$
N127.9.288 $\mathrm{GM4^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Z1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g}$
N127.9.289 $\mathrm{GM4^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Z1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g}$
N127.9.290 $\mathrm{GM4^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Z2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g}$
N127.9.291 $\mathrm{GM4^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Z2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g}$
N127.9.292 $\mathrm{GM4^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z1^+}$	$\surd$	1	1	$\times$	-	-
N127.9.293 $\mathrm{GM4^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z3^-}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	$\mathrm{B2}$
N127.9.294 $\mathrm{GM4^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z1^-}$	$\surd$	1	1	$\times$	-	-
N127.9.295 $\mathrm{GM4^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z3^+}$	$\surd$	1	1	$\times$	-	-
N127.9.296 $\mathrm{GM4^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z2^+}$	$\surd$	1	1	$\times$	-	-
N127.9.297 $\mathrm{GM4^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z4^-}$	$\surd$	1	1	$\times$	-	-
N127.9.298 $\mathrm{GM4^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
N127.9.299 $\mathrm{GM4^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z4^+}$	$\surd$	1	1	$\times$	-	-
N127.9.300 $\mathrm{GM4^+} \oplus \mathrm{Z1^-} \oplus \mathrm{Z1^-}$	$\surd$	1	1	$\times$	-	-
N127.9.301 $\mathrm{GM4^+} \oplus \mathrm{Z1^-} \oplus \mathrm{Z3^+}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	$\mathrm{B2}$
N127.9.302 $\mathrm{GM4^+} \oplus \mathrm{Z1^-} \oplus \mathrm{Z2^+}$	$\surd$	1	1	$\times$	-	-
N127.9.303 $\mathrm{GM4^+} \oplus \mathrm{Z1^-} \oplus \mathrm{Z4^-}$	$\surd$	1	1	$\times$	-	-
N127.9.304 $\mathrm{GM4^+} \oplus \mathrm{Z1^-} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
N127.9.305 $\mathrm{GM4^+} \oplus \mathrm{Z1^-} \oplus \mathrm{Z4^+}$	$\surd$	1	1	$\times$	-	-
N127.9.306 $\mathrm{GM4^+} \oplus \mathrm{Z2^+} \oplus \mathrm{Z2^+}$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $P4/mbm$ (No. 127) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N127.9.307 $\mathrm{GM4^+} \oplus \mathrm{Z2^+} \oplus \mathrm{Z4^-}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	$\mathrm{B2}$
N127.9.308 $\mathrm{GM4^+} \oplus \mathrm{Z2^+} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
N127.9.309 $\mathrm{GM4^+} \oplus \mathrm{Z2^+} \oplus \mathrm{Z4^+}$	$\surd$	1	1	$\times$	-	-
N127.9.310 $\mathrm{GM4^+} \oplus \mathrm{Z2^-} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
N127.9.311 $\mathrm{GM4^+} \oplus \mathrm{Z2^-} \oplus \mathrm{Z4^+}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	$\mathrm{B2}$
N127.9.312 $\mathrm{GM4^-} \oplus \mathrm{GM4^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N127.9.313 $\mathrm{GM4^-} \oplus \mathrm{GM4^-} \oplus \mathrm{Z1^+}$	$\surd$	0	0	$\surd$	-	-
N127.9.314 $\mathrm{GM4^-} \oplus \mathrm{GM4^-} \oplus \mathrm{Z1^-}$	$\surd$	0	0	$\surd$	-	-
N127.9.315 $\mathrm{GM4^-} \oplus \mathrm{GM4^-} \oplus \mathrm{Z2^+}$	$\surd$	0	0	$\surd$	-	-
N127.9.316 $\mathrm{GM4^-} \oplus \mathrm{GM4^-} \oplus \mathrm{Z2^-}$	$\surd$	0	0	$\surd$	-	-
N127.9.317 $\mathrm{GM4^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z1^+}$	$\surd$	1	0	$\times$	-	-
N127.9.318 $\mathrm{GM4^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z3^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N127.9.319 $\mathrm{GM4^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z1^-}$	$\surd$	1	1	$\times$	-	-
N127.9.320 $\mathrm{GM4^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z3^+}$	$\surd$	1	0	$\times$	-	-
N127.9.321 $\mathrm{GM4^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z2^+}$	$\surd$	1	0	$\times$	-	-
N127.9.322 $\mathrm{GM4^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z4^-}$	$\surd$	1	1	$\times$	-	-
N127.9.323 $\mathrm{GM4^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
N127.9.324 $\mathrm{GM4^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z4^+}$	$\surd$	1	0	$\times$	-	-
N127.9.325 $\mathrm{GM4^-} \oplus \mathrm{Z1^-} \oplus \mathrm{Z1^-}$	$\surd$	1	0	$\times$	-	-
N127.9.326 $\mathrm{GM4^-} \oplus \mathrm{Z1^-} \oplus \mathrm{Z3^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N127.9.327 $\mathrm{GM4^-} \oplus \mathrm{Z1^-} \oplus \mathrm{Z2^+}$	$\surd$	1	1	$\times$	-	-
N127.9.328 $\mathrm{GM4^-} \oplus \mathrm{Z1^-} \oplus \mathrm{Z4^-}$	$\surd$	1	0	$\times$	-	-
N127.9.329 $\mathrm{GM4^-} \oplus \mathrm{Z1^-} \oplus \mathrm{Z2^-}$	$\surd$	1	0	$\times$	-	-
N127.9.330 $\mathrm{GM4^-} \oplus \mathrm{Z1^-} \oplus \mathrm{Z4^+}$	$\surd$	1	1	$\times$	-	-
N127.9.331 $\mathrm{GM4^-} \oplus \mathrm{Z2^+} \oplus \mathrm{Z2^+}$	$\surd$	1	0	$\times$	-	-
N127.9.332 $\mathrm{GM4^-} \oplus \mathrm{Z2^+} \oplus \mathrm{Z4^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N127.9.333 $\mathrm{GM4^-} \oplus \mathrm{Z2^+} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
N127.9.334 $\mathrm{GM4^-} \oplus \mathrm{Z2^+} \oplus \mathrm{Z4^+}$	$\surd$	1	0	$\times$	-	-
N127.9.335 $\mathrm{GM4^-} \oplus \mathrm{Z2^-} \oplus \mathrm{Z2^-}$	$\surd$	1	0	$\times$	-	-
N127.9.336 $\mathrm{GM4^-} \oplus \mathrm{Z2^-} \oplus \mathrm{Z4^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N127.9.337 $\mathrm{Z1^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z1^+}$	$\surd$	0	0	$\surd$	-	-
N127.9.338 $\mathrm{Z1^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z3^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u}$
N127.9.339 $\mathrm{Z1^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u}$
N127.9.340 $\mathrm{Z1^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z3^+}$	$\surd$	0	0	$\surd$	-	-
N127.9.341 $\mathrm{Z1^+} \oplus \mathrm{Z3^-} \oplus \mathrm{Z1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u}$
N127.9.342 $\mathrm{Z1^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z2^+}$	$\surd$	0	0	$\surd$	-	-
N127.9.343 $\mathrm{Z1^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z4^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_u} \oplus \mathrm{B2_u}$
N127.9.344 $\mathrm{Z1^+} \oplus \mathrm{Z3^-} \oplus \mathrm{Z2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_u}$
N127.9.345 $\mathrm{Z1^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N127.9.346 $\mathrm{Z1^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z4^+}$	$\surd$	0	0	$\surd$	-	-
N127.9.347 $\mathrm{Z1^+} \oplus \mathrm{Z3^-} \oplus \mathrm{Z2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_u}$
N127.9.348 $\mathrm{Z1^+} \oplus \mathrm{Z1^-} \oplus \mathrm{Z1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u}$
N127.9.349 $\mathrm{Z1^+} \oplus \mathrm{Z1^-} \oplus \mathrm{Z3^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u}$
N127.9.350 $\mathrm{Z1^+} \oplus \mathrm{Z3^+} \oplus \mathrm{Z3^+}$	$\surd$	0	0	$\surd$	-	-
N127.9.351 $\mathrm{Z1^+} \oplus \mathrm{Z1^-} \oplus \mathrm{Z2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u}$
N127.9.352 $\mathrm{Z1^+} \oplus \mathrm{Z1^-} \oplus \mathrm{Z4^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_u}$

Non-coplanar SSGs with parent space group $P4/mbm$ (No. 127) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N127.9.353 $\mathrm{Z1}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z2}^+$	$\surd$	0	0	$\surd$	-	-
N127.9.354 $\mathrm{Z1}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z4}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N127.9.355 $\mathrm{Z1}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u}$
N127.9.356 $\mathrm{Z1}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_u}$
N127.9.357 $\mathrm{Z1}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N127.9.358 $\mathrm{Z1}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z4}^+$	$\surd$	0	0	$\surd$	-	-
N127.9.359 $\mathrm{Z1}^+ \oplus \mathrm{Z2}^+ \oplus \mathrm{Z2}^+$	$\surd$	0	0	$\surd$	-	-
N127.9.360 $\mathrm{Z1}^+ \oplus \mathrm{Z2}^+ \oplus \mathrm{Z4}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_u}$
N127.9.361 $\mathrm{Z1}^+ \oplus \mathrm{Z4}^- \oplus \mathrm{Z4}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_u} \oplus \mathrm{B2_u}$
N127.9.362 $\mathrm{Z1}^+ \oplus \mathrm{Z2}^+ \oplus \mathrm{Z2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u}$
N127.9.363 $\mathrm{Z1}^+ \oplus \mathrm{Z2}^+ \oplus \mathrm{Z4}^+$	$\surd$	0	0	$\surd$	-	-
N127.9.364 $\mathrm{Z1}^+ \oplus \mathrm{Z4}^- \oplus \mathrm{Z2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N127.9.365 $\mathrm{Z1}^+ \oplus \mathrm{Z4}^- \oplus \mathrm{Z4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_u}$
N127.9.366 $\mathrm{Z1}^+ \oplus \mathrm{Z2}^- \oplus \mathrm{Z2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N127.9.367 $\mathrm{Z1}^+ \oplus \mathrm{Z2}^- \oplus \mathrm{Z4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_u}$
N127.9.368 $\mathrm{Z1}^+ \oplus \mathrm{Z4}^+ \oplus \mathrm{Z4}^+$	$\surd$	0	0	$\surd$	-	-
N127.9.369 $\mathrm{Z1}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z1}^-$	$\surd$	0	0	$\surd$	-	-
N127.9.370 $\mathrm{Z1}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z3}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u}$
N127.9.371 $\mathrm{Z1}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N127.9.372 $\mathrm{Z1}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z4}^-$	$\surd$	0	0	$\surd$	-	-
N127.9.373 $\mathrm{Z1}^- \oplus \mathrm{Z3}^+ \oplus \mathrm{Z2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_u}$
N127.9.374 $\mathrm{Z1}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z2}^-$	$\surd$	0	0	$\surd$	-	-
N127.9.375 $\mathrm{Z1}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_u} \oplus \mathrm{B2_u}$
N127.9.376 $\mathrm{Z1}^- \oplus \mathrm{Z3}^+ \oplus \mathrm{Z2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_u}$
N127.9.377 $\mathrm{Z1}^- \oplus \mathrm{Z2}^+ \oplus \mathrm{Z2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N127.9.378 $\mathrm{Z1}^- \oplus \mathrm{Z2}^+ \oplus \mathrm{Z4}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_u}$
N127.9.379 $\mathrm{Z1}^- \oplus \mathrm{Z4}^- \oplus \mathrm{Z4}^-$	$\surd$	0	0	$\surd$	-	-
N127.9.380 $\mathrm{Z1}^- \oplus \mathrm{Z2}^+ \oplus \mathrm{Z2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u}$
N127.9.381 $\mathrm{Z1}^- \oplus \mathrm{Z2}^+ \oplus \mathrm{Z4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N127.9.382 $\mathrm{Z1}^- \oplus \mathrm{Z4}^- \oplus \mathrm{Z2}^-$	$\surd$	0	0	$\surd$	-	-
N127.9.383 $\mathrm{Z1}^- \oplus \mathrm{Z4}^- \oplus \mathrm{Z4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_u}$
N127.9.384 $\mathrm{Z1}^- \oplus \mathrm{Z2}^- \oplus \mathrm{Z2}^-$	$\surd$	0	0	$\surd$	-	-
N127.9.385 $\mathrm{Z1}^- \oplus \mathrm{Z2}^- \oplus \mathrm{Z4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_u}$
N127.9.386 $\mathrm{Z1}^- \oplus \mathrm{Z4}^+ \oplus \mathrm{Z4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_u} \oplus \mathrm{B2_u}$
N127.9.387 $\mathrm{Z2}^+ \oplus \mathrm{Z2}^+ \oplus \mathrm{Z2}^+$	$\surd$	0	0	$\surd$	-	-
N127.9.388 $\mathrm{Z2}^+ \oplus \mathrm{Z2}^+ \oplus \mathrm{Z4}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u}$
N127.9.389 $\mathrm{Z2}^+ \oplus \mathrm{Z2}^+ \oplus \mathrm{Z2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u}$
N127.9.390 $\mathrm{Z2}^+ \oplus \mathrm{Z2}^+ \oplus \mathrm{Z4}^+$	$\surd$	0	0	$\surd$	-	-
N127.9.391 $\mathrm{Z2}^+ \oplus \mathrm{Z4}^- \oplus \mathrm{Z2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u}$
N127.9.392 $\mathrm{Z2}^+ \oplus \mathrm{Z2}^- \oplus \mathrm{Z2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u}$
N127.9.393 $\mathrm{Z2}^+ \oplus \mathrm{Z2}^- \oplus \mathrm{Z4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u}$
N127.9.394 $\mathrm{Z2}^+ \oplus \mathrm{Z4}^+ \oplus \mathrm{Z4}^+$	$\surd$	0	0	$\surd$	-	-
N127.9.395 $\mathrm{Z2}^- \oplus \mathrm{Z2}^- \oplus \mathrm{Z2}^-$	$\surd$	0	0	$\surd$	-	-
N127.9.396 $\mathrm{Z2}^- \oplus \mathrm{Z2}^- \oplus \mathrm{Z4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u}$
N127.10.1 $\mathrm{GM1}^- \oplus \mathrm{M1}^+\mathrm{M4}^+$	$\surd$	1	0	$\times$	-	-
N127.10.2 $\mathrm{GM1}^- \oplus \mathrm{M1}^-\mathrm{M4}^-$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $P4/mbm$ (No. 127) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N127.10.3 $\mathrm{GM1^-} \oplus \mathrm{M2^+M3^+}$	$\surd$	1	0	$\times$	-	-
N127.10.4 $\mathrm{GM1^-} \oplus \mathrm{M2^-M3^-}$	$\surd$	1	0	$\times$	-	-
N127.10.5 $\mathrm{GM1^-} \oplus \mathrm{A1^+A4^+}$	$\surd$	1	0	$\times$	-	-
N127.10.6 $\mathrm{GM1^-} \oplus \mathrm{A1^-A4^-}$	$\surd$	1	0	$\times$	-	-
N127.10.7 $\mathrm{GM2^+} \oplus \mathrm{M1^+M4^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N127.10.8 $\mathrm{GM2^+} \oplus \mathrm{M1^-M4^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N127.10.9 $\mathrm{GM2^+} \oplus \mathrm{M2^+M3^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N127.10.10 $\mathrm{GM2^+} \oplus \mathrm{M2^-M3^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N127.10.11 $\mathrm{GM2^+} \oplus \mathrm{A1^+A4^+}$	$\surd$	1	1	$\times$	-	-
N127.10.12 $\mathrm{GM2^+} \oplus \mathrm{A1^-A4^-}$	$\surd$	1	1	$\times$	-	-
N127.10.13 $\mathrm{GM2^-} \oplus \mathrm{M1^+M4^+}$	$\surd$	1	0	$\times$	-	-
N127.10.14 $\mathrm{GM2^-} \oplus \mathrm{M1^-M4^-}$	$\surd$	1	0	$\times$	-	-
N127.10.15 $\mathrm{GM2^-} \oplus \mathrm{M2^+M3^+}$	$\surd$	1	0	$\times$	-	-
N127.10.16 $\mathrm{GM2^-} \oplus \mathrm{M2^-M3^-}$	$\surd$	1	0	$\times$	-	-
N127.10.17 $\mathrm{GM2^-} \oplus \mathrm{A1^+A4^+}$	$\surd$	1	0	$\times$	-	-
N127.10.18 $\mathrm{GM2^-} \oplus \mathrm{A1^-A4^-}$	$\surd$	1	0	$\times$	-	-
N127.10.19 $\mathrm{GM3^+} \oplus \mathrm{M1^+M4^+}$	$\surd$	1	1	$\times$	-	-
N127.10.20 $\mathrm{GM3^+} \oplus \mathrm{M1^-M4^-}$	$\surd$	1	1	$\times$	-	-
N127.10.21 $\mathrm{GM3^+} \oplus \mathrm{M2^+M3^+}$	$\surd$	1	1	$\times$	-	-
N127.10.22 $\mathrm{GM3^+} \oplus \mathrm{M2^-M3^-}$	$\surd$	1	1	$\times$	-	-
N127.10.23 $\mathrm{GM3^+} \oplus \mathrm{A1^+A4^+}$	$\surd$	1	1	$\times$	-	-
N127.10.24 $\mathrm{GM3^+} \oplus \mathrm{A1^-A4^-}$	$\surd$	1	1	$\times$	-	-
N127.10.25 $\mathrm{GM3^-} \oplus \mathrm{M1^+M4^+}$	$\surd$	1	0	$\times$	-	-
N127.10.26 $\mathrm{GM3^-} \oplus \mathrm{M1^-M4^-}$	$\surd$	1	0	$\times$	-	-
N127.10.27 $\mathrm{GM3^-} \oplus \mathrm{M2^+M3^+}$	$\surd$	1	0	$\times$	-	-
N127.10.28 $\mathrm{GM3^-} \oplus \mathrm{M2^-M3^-}$	$\surd$	1	0	$\times$	-	-
N127.10.29 $\mathrm{GM3^-} \oplus \mathrm{A1^+A4^+}$	$\surd$	1	0	$\times$	-	-
N127.10.30 $\mathrm{GM3^-} \oplus \mathrm{A1^-A4^-}$	$\surd$	1	0	$\times$	-	-
N127.10.31 $\mathrm{GM4^+} \oplus \mathrm{M1^+M4^+}$	$\surd$	1	1	$\times$	-	-
N127.10.32 $\mathrm{GM4^+} \oplus \mathrm{M1^-M4^-}$	$\surd$	1	1	$\times$	-	-
N127.10.33 $\mathrm{GM4^+} \oplus \mathrm{M2^+M3^+}$	$\surd$	1	1	$\times$	-	-
N127.10.34 $\mathrm{GM4^+} \oplus \mathrm{M2^-M3^-}$	$\surd$	1	1	$\times$	-	-
N127.10.35 $\mathrm{GM4^+} \oplus \mathrm{A1^+A4^+}$	$\surd$	1	1	$\times$	-	-
N127.10.36 $\mathrm{GM4^+} \oplus \mathrm{A1^-A4^-}$	$\surd$	1	1	$\times$	-	-
N127.10.37 $\mathrm{GM4^-} \oplus \mathrm{M1^+M4^+}$	$\surd$	1	0	$\times$	-	-
N127.10.38 $\mathrm{GM4^-} \oplus \mathrm{M1^-M4^-}$	$\surd$	1	0	$\times$	-	-
N127.10.39 $\mathrm{GM4^-} \oplus \mathrm{M2^+M3^+}$	$\surd$	1	0	$\times$	-	-
N127.10.40 $\mathrm{GM4^-} \oplus \mathrm{M2^-M3^-}$	$\surd$	1	0	$\times$	-	-
N127.10.41 $\mathrm{GM4^-} \oplus \mathrm{A1^+A4^+}$	$\surd$	1	0	$\times$	-	-
N127.10.42 $\mathrm{GM4^-} \oplus \mathrm{A1^-A4^-}$	$\surd$	1	0	$\times$	-	-
N127.10.43 $\mathrm{Z1^+} \oplus \mathrm{M1^+M4^+}$	$\surd$	1	0	$\times$	-	-
N127.10.44 $\mathrm{Z1^+} \oplus \mathrm{M1^-M4^-}$	$\surd$	1	0	$\times$	-	-
N127.10.45 $\mathrm{Z1^+} \oplus \mathrm{M2^+M3^+}$	$\surd$	1	0	$\times$	-	-
N127.10.46 $\mathrm{Z1^+} \oplus \mathrm{M2^-M3^-}$	$\surd$	1	0	$\times$	-	-
N127.10.47 $\mathrm{Z1^+} \oplus \mathrm{A1^+A4^+}$	$\surd$	1	0	$\times$	-	-
N127.10.48 $\mathrm{Z1^+} \oplus \mathrm{A2^-A3^-}$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $P4/mbm$ (No. 127) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N127.10.49 $\mathrm{Z1^+} \oplus \mathrm{A1^-A4^-}$	$\surd$	1	0	$\times$	-	-
N127.10.50 $\mathrm{Z1^+} \oplus \mathrm{A2^+A3^+}$	$\surd$	1	0	$\times$	-	-
N127.10.51 $\mathrm{Z1^-} \oplus \mathrm{M1^+M4^+}$	$\surd$	1	0	$\times$	-	-
N127.10.52 $\mathrm{Z1^-} \oplus \mathrm{M1^-M4^-}$	$\surd$	1	0	$\times$	-	-
N127.10.53 $\mathrm{Z1^-} \oplus \mathrm{M2^+M3^+}$	$\surd$	1	0	$\times$	-	-
N127.10.54 $\mathrm{Z1^-} \oplus \mathrm{M2^-M3^-}$	$\surd$	1	0	$\times$	-	-
N127.10.55 $\mathrm{Z1^-} \oplus \mathrm{A1^+A4^+}$	$\surd$	1	0	$\times$	-	-
N127.10.56 $\mathrm{Z1^-} \oplus \mathrm{A2^-A3^-}$	$\surd$	1	0	$\times$	-	-
N127.10.57 $\mathrm{Z1^-} \oplus \mathrm{A1^-A4^-}$	$\surd$	1	0	$\times$	-	-
N127.10.58 $\mathrm{Z1^-} \oplus \mathrm{A2^+A3^+}$	$\surd$	1	0	$\times$	-	-
N127.10.59 $\mathrm{Z2^+} \oplus \mathrm{M1^+M4^+}$	$\surd$	1	0	$\times$	-	-
N127.10.60 $\mathrm{Z2^+} \oplus \mathrm{M1^-M4^-}$	$\surd$	1	0	$\times$	-	-
N127.10.61 $\mathrm{Z2^+} \oplus \mathrm{M2^+M3^+}$	$\surd$	1	0	$\times$	-	-
N127.10.62 $\mathrm{Z2^+} \oplus \mathrm{M2^-M3^-}$	$\surd$	1	0	$\times$	-	-
N127.10.63 $\mathrm{Z2^+} \oplus \mathrm{A1^+A4^+}$	$\surd$	1	0	$\times$	-	-
N127.10.64 $\mathrm{Z2^+} \oplus \mathrm{A2^-A3^-}$	$\surd$	1	0	$\times$	-	-
N127.10.65 $\mathrm{Z2^+} \oplus \mathrm{A1^-A4^-}$	$\surd$	1	0	$\times$	-	-
N127.10.66 $\mathrm{Z2^+} \oplus \mathrm{A2^+A3^+}$	$\surd$	1	0	$\times$	-	-
N127.10.67 $\mathrm{Z2^-} \oplus \mathrm{M1^+M4^+}$	$\surd$	1	0	$\times$	-	-
N127.10.68 $\mathrm{Z2^-} \oplus \mathrm{M1^-M4^-}$	$\surd$	1	0	$\times$	-	-
N127.10.69 $\mathrm{Z2^-} \oplus \mathrm{M2^+M3^+}$	$\surd$	1	0	$\times$	-	-
N127.10.70 $\mathrm{Z2^-} \oplus \mathrm{M2^-M3^-}$	$\surd$	1	0	$\times$	-	-
N127.10.71 $\mathrm{Z2^-} \oplus \mathrm{A1^+A4^+}$	$\surd$	1	0	$\times$	-	-
N127.10.72 $\mathrm{Z2^-} \oplus \mathrm{A2^-A3^-}$	$\surd$	1	0	$\times$	-	-
N127.10.73 $\mathrm{Z2^-} \oplus \mathrm{A1^-A4^-}$	$\surd$	1	0	$\times$	-	-
N127.10.74 $\mathrm{Z2^-} \oplus \mathrm{A2^+A3^+}$	$\surd$	1	0	$\times$	-	-
N127.12.1 $\mathrm{GM1^-} \oplus \mathrm{GM5^+}$	$\surd$	2	2	$\surd$	$4mm$	E
N127.12.2 $\mathrm{GM1^-} \oplus \mathrm{GM5^-}$	$\surd$	0	0	$\surd$	-	-
N127.12.3 $\mathrm{GM1^-} \oplus \mathrm{A5^+}$	$\surd$	1	0	$\times$	-	-
N127.12.4 $\mathrm{GM1^-} \oplus \mathrm{M5^+}$	$\surd$	1	0	$\times$	-	-
N127.12.5 $\mathrm{GM1^-} \oplus \mathrm{M5^-}$	$\surd$	1	0	$\times$	-	-
N127.12.6 $\mathrm{GM1^-} \oplus \mathrm{Z5^+}$	$\surd$	1	0	$\times$	-	-
N127.12.7 $\mathrm{GM2^+} \oplus \mathrm{GM5^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{E_g}$
N127.12.8 $\mathrm{GM2^+} \oplus \mathrm{GM5^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{E_u}$
N127.12.9 $\mathrm{GM2^+} \oplus \mathrm{A5^+}$	$\surd$	1	1	$\times$	-	-
N127.12.10 $\mathrm{GM2^+} \oplus \mathrm{M5^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N127.12.11 $\mathrm{GM2^+} \oplus \mathrm{M5^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N127.12.12 $\mathrm{GM2^+} \oplus \mathrm{Z5^+}$	$\surd$	1	1	$\times$	-	-
N127.12.13 $\mathrm{GM2^-} \oplus \mathrm{GM5^+}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	E
N127.12.14 $\mathrm{GM2^-} \oplus \mathrm{GM5^-}$	$\surd$	0	0	$\surd$	-	-
N127.12.15 $\mathrm{GM2^-} \oplus \mathrm{A5^+}$	$\surd$	1	0	$\times$	-	-
N127.12.16 $\mathrm{GM2^-} \oplus \mathrm{M5^+}$	$\surd$	1	0	$\times$	-	-
N127.12.17 $\mathrm{GM2^-} \oplus \mathrm{M5^-}$	$\surd$	1	0	$\times$	-	-
N127.12.18 $\mathrm{GM2^-} \oplus \mathrm{Z5^+}$	$\surd$	1	0	$\times$	-	-
N127.12.19 $\mathrm{GM3^+} \oplus \mathrm{GM5^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{E_g}$
N127.12.20 $\mathrm{GM3^+} \oplus \mathrm{GM5^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{E_u}$

Non-coplanar SSGs with parent space group $P4/mbm$ (No. 127) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N127.12.21 $\mathrm{GM3^+} \oplus \mathrm{A5^+}$	$\surd$	1	1	$\times$	-	-
N127.12.22 $\mathrm{GM3^+} \oplus \mathrm{M5^+}$	$\surd$	1	1	$\times$	-	-
N127.12.23 $\mathrm{GM3^+} \oplus \mathrm{M5^-}$	$\surd$	1	1	$\times$	-	-
N127.12.24 $\mathrm{GM3^+} \oplus \mathrm{Z5^+}$	$\surd$	1	1	$\times$	-	-
N127.12.25 $\mathrm{GM3^-} \oplus \mathrm{GM5^+}$	$\surd$	2	2	$\surd$	422	E
N127.12.26 $\mathrm{GM3^-} \oplus \mathrm{GM5^-}$	$\surd$	0	0	$\surd$	-	-
N127.12.27 $\mathrm{GM3^-} \oplus \mathrm{A5^+}$	$\surd$	1	0	$\times$	-	-
N127.12.28 $\mathrm{GM3^-} \oplus \mathrm{M5^+}$	$\surd$	1	0	$\times$	-	-
N127.12.29 $\mathrm{GM3^-} \oplus \mathrm{M5^-}$	$\surd$	1	0	$\times$	-	-
N127.12.30 $\mathrm{GM3^-} \oplus \mathrm{Z5^+}$	$\surd$	1	0	$\times$	-	-
N127.12.31 $\mathrm{GM4^+} \oplus \mathrm{GM5^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{E_g}$
N127.12.32 $\mathrm{GM4^+} \oplus \mathrm{GM5^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{E_u}$
N127.12.33 $\mathrm{GM4^+} \oplus \mathrm{A5^+}$	$\surd$	1	1	$\times$	-	-
N127.12.34 $\mathrm{GM4^+} \oplus \mathrm{M5^+}$	$\surd$	1	1	$\times$	-	-
N127.12.35 $\mathrm{GM4^+} \oplus \mathrm{M5^-}$	$\surd$	1	1	$\times$	-	-
N127.12.36 $\mathrm{GM4^+} \oplus \mathrm{Z5^+}$	$\surd$	1	1	$\times$	-	-
N127.12.37 $\mathrm{GM4^-} \oplus \mathrm{GM5^+}$	$\surd$	2	2	$\surd$	$\bar{4}2m$	E
N127.12.38 $\mathrm{GM4^-} \oplus \mathrm{GM5^-}$	$\surd$	0	0	$\surd$	-	-
N127.12.39 $\mathrm{GM4^-} \oplus \mathrm{A5^+}$	$\surd$	1	0	$\times$	-	-
N127.12.40 $\mathrm{GM4^-} \oplus \mathrm{M5^+}$	$\surd$	1	0	$\times$	-	-
N127.12.41 $\mathrm{GM4^-} \oplus \mathrm{M5^-}$	$\surd$	1	0	$\times$	-	-
N127.12.42 $\mathrm{GM4^-} \oplus \mathrm{Z5^+}$	$\surd$	1	0	$\times$	-	-
N127.12.43 $\mathrm{Z1^+} \oplus \mathrm{GM5^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_g}$
N127.12.44 $\mathrm{Z1^+} \oplus \mathrm{GM5^-}$	$\surd$	0	0	$\surd$	-	-
N127.12.45 $\mathrm{Z1^+} \oplus \mathrm{A5^+}$	$\surd$	1	0	$\times$	-	-
N127.12.46 $\mathrm{Z1^+} \oplus \mathrm{A5^-}$	$\surd$	1	0	$\times$	-	-
N127.12.47 $\mathrm{Z1^+} \oplus \mathrm{M5^+}$	$\surd$	1	0	$\times$	-	-
N127.12.48 $\mathrm{Z1^+} \oplus \mathrm{M5^-}$	$\surd$	1	0	$\times$	-	-
N127.12.49 $\mathrm{Z1^+} \oplus \mathrm{Z5^+}$	$\surd$	0	0	$\surd$	-	-
N127.12.50 $\mathrm{Z1^+} \oplus \mathrm{Z5^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_u}$
N127.12.51 $\mathrm{Z1^-} \oplus \mathrm{GM5^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_g}$
N127.12.52 $\mathrm{Z1^-} \oplus \mathrm{GM5^-}$	$\surd$	0	0	$\surd$	-	-
N127.12.53 $\mathrm{Z1^-} \oplus \mathrm{A5^+}$	$\surd$	1	0	$\times$	-	-
N127.12.54 $\mathrm{Z1^-} \oplus \mathrm{A5^-}$	$\surd$	1	0	$\times$	-	-
N127.12.55 $\mathrm{Z1^-} \oplus \mathrm{M5^+}$	$\surd$	1	0	$\times$	-	-
N127.12.56 $\mathrm{Z1^-} \oplus \mathrm{M5^-}$	$\surd$	1	0	$\times$	-	-
N127.12.57 $\mathrm{Z1^-} \oplus \mathrm{Z5^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_u}$
N127.12.58 $\mathrm{Z1^-} \oplus \mathrm{Z5^-}$	$\surd$	0	0	$\surd$	-	-
N127.12.59 $\mathrm{Z2^+} \oplus \mathrm{GM5^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_g}$
N127.12.60 $\mathrm{Z2^+} \oplus \mathrm{GM5^-}$	$\surd$	0	0	$\surd$	-	-
N127.12.61 $\mathrm{Z2^+} \oplus \mathrm{A5^+}$	$\surd$	1	0	$\times$	-	-
N127.12.62 $\mathrm{Z2^+} \oplus \mathrm{A5^-}$	$\surd$	1	0	$\times$	-	-
N127.12.63 $\mathrm{Z2^+} \oplus \mathrm{M5^+}$	$\surd$	1	0	$\times$	-	-
N127.12.64 $\mathrm{Z2^+} \oplus \mathrm{M5^-}$	$\surd$	1	0	$\times$	-	-
N127.12.65 $\mathrm{Z2^+} \oplus \mathrm{Z5^+}$	$\surd$	0	0	$\surd$	-	-
N127.12.66 $\mathrm{Z2^+} \oplus \mathrm{Z5^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_u}$

Non-coplanar SSGs with parent space group $P4/mbm$ (No. 127) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N127.12.67 $\mathrm{Z2}^{-} \oplus \mathrm{GM5}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_g}$
N127.12.68 $\mathrm{Z2}^{-} \oplus \mathrm{GM5}^{-}$	$\surd$	0	0	$\surd$	-	-
N127.12.69 $\mathrm{Z2}^{-} \oplus \mathrm{A5}^{+}$	$\surd$	1	0	$\times$	-	-
N127.12.70 $\mathrm{Z2}^{-} \oplus \mathrm{A5}^{-}$	$\surd$	1	0	$\times$	-	-
N127.12.71 $\mathrm{Z2}^{-} \oplus \mathrm{M5}^{+}$	$\surd$	1	0	$\times$	-	-
N127.12.72 $\mathrm{Z2}^{-} \oplus \mathrm{M5}^{-}$	$\surd$	1	0	$\times$	-	-
N127.12.73 $\mathrm{Z2}^{-} \oplus \mathrm{Z5}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_u}$
N127.12.74 $\mathrm{Z2}^{-} \oplus \mathrm{Z5}^{-}$	$\surd$	0	0	$\surd$	-	-
N127.14.1 $\mathrm{GM1}^{-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N127.14.2 $\mathrm{GM1}^{-} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N127.14.3 $\mathrm{GM1}^{-} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N127.14.4 $\mathrm{GM1}^{-} \oplus \mathrm{LD4}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N127.14.5 $\mathrm{GM2}^{+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N127.14.6 $\mathrm{GM2}^{+} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N127.14.7 $\mathrm{GM2}^{+} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N127.14.8 $\mathrm{GM2}^{+} \oplus \mathrm{LD4}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N127.14.9 $\mathrm{GM2}^{-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N127.14.10 $\mathrm{GM2}^{-} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N127.14.11 $\mathrm{GM2}^{-} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N127.14.12 $\mathrm{GM2}^{-} \oplus \mathrm{LD4}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N127.14.13 $\mathrm{GM3}^{+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	422	A2
N127.14.14 $\mathrm{GM3}^{+} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	422	A2
N127.14.15 $\mathrm{GM3}^{+} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	422	A2
N127.14.16 $\mathrm{GM3}^{+} \oplus \mathrm{LD4}$	$\surd$	1	1	$\surd$	422	A2
N127.14.17 $\mathrm{GM3}^{-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N127.14.18 $\mathrm{GM3}^{-} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N127.14.19 $\mathrm{GM3}^{-} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N127.14.20 $\mathrm{GM3}^{-} \oplus \mathrm{LD4}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N127.14.21 $\mathrm{GM4}^{+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N127.14.22 $\mathrm{GM4}^{+} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N127.14.23 $\mathrm{GM4}^{+} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N127.14.24 $\mathrm{GM4}^{+} \oplus \mathrm{LD4}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N127.14.25 $\mathrm{GM4}^{-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N127.14.26 $\mathrm{GM4}^{-} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N127.14.27 $\mathrm{GM4}^{-} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N127.14.28 $\mathrm{GM4}^{-} \oplus \mathrm{LD4}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N127.14.29 $\mathrm{Z1}^{+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N127.14.30 $\mathrm{Z1}^{+} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N127.14.31 $\mathrm{Z1}^{+} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N127.14.32 $\mathrm{Z1}^{+} \oplus \mathrm{LD4}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N127.14.33 $\mathrm{Z1}^{-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N127.14.34 $\mathrm{Z1}^{-} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N127.14.35 $\mathrm{Z1}^{-} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N127.14.36 $\mathrm{Z1}^{-} \oplus \mathrm{LD4}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N127.14.37 $\mathrm{Z2}^{+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N127.14.38 $\mathrm{Z2}^{+} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$

Non-coplanar SSGs with parent space group $P4/mbm$ (No. 127) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N127.14.39 $\mathrm{Z2}^+ \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N127.14.40 $\mathrm{Z2}^+ \oplus \mathrm{LD4}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N127.14.41 $\mathrm{Z2}^- \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N127.14.42 $\mathrm{Z2}^- \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N127.14.43 $\mathrm{Z2}^- \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N127.14.44 $\mathrm{Z2}^- \oplus \mathrm{LD4}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$

TABLE S382: Collinear SSGs with parent space group $P4/mnc$ (No. 128).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L128.1.1 $\mathrm{GM1}^+$	1	$4/mmm$	$\mathrm{A1_g}$
L128.2.1 $\mathrm{GM1}^-$	0	-	-
L128.2.2 $\mathrm{GM2}^+$	1	$4/mmm$	$\mathrm{B1_g}$
L128.2.3 $\mathrm{GM2}^-$	0	-	-
L128.2.4 $\mathrm{GM3}^+$	1	$4/mmm$	$\mathrm{A2_g}$
L128.2.5 $\mathrm{GM3}^-$	0	-	-
L128.2.6 $\mathrm{GM4}^+$	1	$4/mmm$	$\mathrm{B2_g}$
L128.2.7 $\mathrm{GM4}^-$	0	-	-

TABLE S383: Coplanar SSGs with parent space group $P4/mnc$ (No. 128).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P128.1.1 $\mathrm{GM1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g}$
P128.2.1 $\mathrm{GM1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u}$
P128.2.2 $\mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g}$
P128.2.3 $\mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u}$
P128.2.4 $\mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g}$
P128.2.5 $\mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_u}$
P128.2.6 $\mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_g}$
P128.2.7 $\mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_u}$
P128.3.1 $\mathrm{GM1}^- \oplus \mathrm{GM1}^-$	$\surd$	0	0	$\surd$	-	-
P128.3.2 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
P128.3.3 $\mathrm{GM1}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
P128.3.4 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u}$
P128.3.5 $\mathrm{GM1}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
P128.3.6 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_u}$
P128.3.7 $\mathrm{GM1}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
P128.3.8 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
P128.3.9 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g}$
P128.3.10 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g}$
P128.3.11 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
P128.3.12 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
P128.3.13 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u}$
P128.3.14 $\mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
P128.3.15 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_u}$

Coplanar SSGs with parent space group $P4/mnc$ (No. 128) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P128.3.16 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
P128.3.17 $\mathrm{GM2}^{-}\oplus\mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u}\oplus\mathrm{B2_g}$
P128.3.18 $\mathrm{GM2}^{-}\oplus\mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
P128.3.19 $\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{A2_g}$
P128.3.20 $\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A2_g}$
P128.3.21 $\mathrm{GM3}^{+}\oplus\mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{B2_g}$
P128.3.22 $\mathrm{GM3}^{+}\oplus\mathrm{GM4}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{A2_g}$
P128.3.23 $\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
P128.3.24 $\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{B2_g}$
P128.3.25 $\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
P128.3.26 $\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g}\oplus\mathrm{B2_g}$
P128.3.27 $\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B2_g}$
P128.3.28 $\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
P128.4.1 $\mathrm{M1}^{+}\mathrm{M4}^{+}$	$\surd$	1	0	$\times$	-	-
P128.4.2 $\mathrm{M1}^{-}\mathrm{M4}^{-}$	$\surd$	1	0	$\times$	-	-
P128.4.3 $\mathrm{M2}^{+}\mathrm{M3}^{+}$	$\surd$	1	0	$\times$	-	-
P128.4.4 $\mathrm{M2}^{-}\mathrm{M3}^{-}$	$\surd$	1	0	$\times$	-	-
P128.6.1 $\mathrm{GM5}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_g}$
P128.6.2 $\mathrm{GM5}^{-}$	$\surd$	0	0	$\surd$	-	-
P128.6.3 A1	$\surd$	1	1	$\times$	-	-
P128.6.4 $\mathrm{M5}^{+}$	$\surd$	1	0	$\times$	-	-
P128.6.5 $\mathrm{M5}^{-}$	$\surd$	1	0	$\times$	-	-
P128.6.6 Z1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P128.6.7 Z2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P128.8.1 LD1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P128.8.2 LD2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$

TABLE S384: Non-coplanar SSGs with parent space group $P4/mnc$ (No. 128).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N128.1.1 $\mathrm{GM1}^{+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A1_g}$
N128.2.1 $\mathrm{GM1}^{-}$	$\surd$	2	2	$\surd$	422	$\mathrm{A1}\oplus\mathrm{A1}$
N128.2.2 $\mathrm{GM2}^{+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{B1_g}$
N128.2.3 $\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{A1}\oplus\mathrm{A1}$
N128.2.4 $\mathrm{GM3}^{+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A2_g}$
N128.2.5 $\mathrm{GM3}^{-}$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{A1}\oplus\mathrm{A1}$
N128.2.6 $\mathrm{GM4}^{+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{B2_g}$
N128.2.7 $\mathrm{GM4}^{-}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{A1}\oplus\mathrm{A1}$
N128.3.1 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{A1_u}$
N128.3.2 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{A1}\oplus\mathrm{B1}$
N128.3.3 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{B1_u}$
N128.3.4 $\mathrm{GM1}^{-}\oplus\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{A1}\oplus\mathrm{A2}$
N128.3.5 $\mathrm{GM1}^{-}\oplus\mathrm{GM3}^{-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{A2_u}$
N128.3.6 $\mathrm{GM1}^{-}\oplus\mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{A1}\oplus\mathrm{A2}$
N128.3.7 $\mathrm{GM1}^{-}\oplus\mathrm{GM4}^{-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{B2_u}$
N128.3.8 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B1_g}$

Non-coplanar SSGs with parent space group $P4/mnc$ (No. 128) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N128.3.9 $\mathrm{GM2^+} \oplus \mathrm{GM2^-}$	√	2	2	√	422	$\mathrm{A1} \oplus \mathrm{B1}$
N128.3.10 $\mathrm{GM2^+} \oplus \mathrm{GM3^+}$	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g} \oplus \mathrm{A2_g}$
N128.3.11 $\mathrm{GM2^+} \oplus \mathrm{GM3^-}$	√	2	2	√	$\bar{4}m2$	$\mathrm{A1} \oplus \mathrm{B1}$
N128.3.12 $\mathrm{GM2^+} \oplus \mathrm{GM4^+}$	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B2_g}$
N128.3.13 $\mathrm{GM2^+} \oplus \mathrm{GM4^-}$	√	2	2	√	$4mm$	$\mathrm{A1} \oplus \mathrm{B1}$
N128.3.14 $\mathrm{GM2^-} \oplus \mathrm{GM2^-}$	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N128.3.15 $\mathrm{GM2^-} \oplus \mathrm{GM3^+}$	√	2	2	√	$\bar{4}m2$	$\mathrm{A1} \oplus \mathrm{B2}$
N128.3.16 $\mathrm{GM2^-} \oplus \mathrm{GM3^-}$	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u} \oplus \mathrm{A2_u}$
N128.3.17 $\mathrm{GM2^-} \oplus \mathrm{GM4^+}$	√	2	2	√	$4mm$	$\mathrm{A1} \oplus \mathrm{B2}$
N128.3.18 $\mathrm{GM2^-} \oplus \mathrm{GM4^-}$	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_u}$
N128.3.19 $\mathrm{GM3^+} \oplus \mathrm{GM3^+}$	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
N128.3.20 $\mathrm{GM3^+} \oplus \mathrm{GM3^-}$	√	2	2	√	422	$\mathrm{A1} \oplus \mathrm{A2}$
N128.3.21 $\mathrm{GM3^+} \oplus \mathrm{GM4^+}$	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g} \oplus \mathrm{B2_g}$
N128.3.22 $\mathrm{GM3^+} \oplus \mathrm{GM4^-}$	√	2	2	√	$\bar{4}2m$	$\mathrm{A1} \oplus \mathrm{A2}$
N128.3.23 $\mathrm{GM3^-} \oplus \mathrm{GM3^-}$	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N128.3.24 $\mathrm{GM3^-} \oplus \mathrm{GM4^+}$	√	2	2	√	$\bar{4}2m$	$\mathrm{A1} \oplus \mathrm{B2}$
N128.3.25 $\mathrm{GM3^-} \oplus \mathrm{GM4^-}$	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N128.3.26 $\mathrm{GM4^+} \oplus \mathrm{GM4^+}$	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N128.3.27 $\mathrm{GM4^+} \oplus \mathrm{GM4^-}$	√	2	2	√	422	$\mathrm{A1} \oplus \mathrm{B2}$
N128.3.28 $\mathrm{GM4^-} \oplus \mathrm{GM4^-}$	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N128.4.1 $\mathrm{M1^+M4^+}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N128.4.2 $\mathrm{M1^-M4^-}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N128.4.3 $\mathrm{M2^+M3^+}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N128.4.4 $\mathrm{M2^-M3^-}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N128.6.1 $\mathrm{GM5^+}$	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{E_g}$
N128.6.2 $\mathrm{GM5^-}$	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{E_u}$
N128.6.3 A1	√	1	1	√	$\bar{4}2m$	A1
N128.6.4 $\mathrm{M5^+}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N128.6.5 $\mathrm{M5^-}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N128.6.6 Z1	√	1	1	√	$4mm$	A1
N128.6.7 Z2	√	1	1	√	$4mm$	A1
N128.8.1 LD1	√	1	1	√	$4mm$	A1
N128.8.2 LD2	√	1	1	√	$4mm$	A1
N128.9.1 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM1^-}$	√	0	0	√	-	-
N128.9.2 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM2^+}$	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N128.9.3 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM2^-}$	√	0	0	√	-	-
N128.9.4 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM3^+}$	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N128.9.5 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM3^-}$	√	0	0	√	-	-
N128.9.6 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM4^+}$	√	3	3	√	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N128.9.7 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM4^-}$	√	0	0	√	-	-
N128.9.8 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{GM2^+}$	√	2	2	√	422	$\mathrm{B1} \oplus \mathrm{B1}$
N128.9.9 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{GM2^-}$	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N128.9.10 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{GM3^+}$	√	2	2	√	$\bar{4}m2$	$\mathrm{B1} \oplus \mathrm{B2}$
N128.9.11 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{GM3^-}$	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_u}$
N128.9.12 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{GM4^+}$	√	2	2	√	$4mm$	$\mathrm{B1} \oplus \mathrm{B2}$
N128.9.13 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{GM4^-}$	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{A2_u}$

Non-coplanar SSGs with parent space group $P4/mnc$ (No. 128) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N128.9.14 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
N128.9.15 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N128.9.16 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N128.9.17 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N128.9.18 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N128.9.19 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	422	$\mathrm{A2} \oplus \mathrm{A2}$
N128.9.20 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
N128.9.21 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B2} \oplus \mathrm{A2}$
N128.9.22 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
N128.9.23 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N128.9.24 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N128.9.25 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N128.9.26 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	422	$\mathrm{B2} \oplus \mathrm{B2}$
N128.9.27 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N128.9.28 $\mathrm{GM1}^- \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N128.9.29 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N128.9.30 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B1} \oplus \mathrm{B1}$
N128.9.31 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{A2_g}$
N128.9.32 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{B1} \oplus \mathrm{B1}$
N128.9.33 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B2_g}$
N128.9.34 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{B1} \oplus \mathrm{B1}$
N128.9.35 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{B1_g}$
N128.9.36 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{B1} \oplus \mathrm{A2}$
N128.9.37 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B2_u}$
N128.9.38 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{B1} \oplus \mathrm{A2}$
N128.9.39 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{A2_u}$
N128.9.40 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
N128.9.41 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B1} \oplus \mathrm{A2}$
N128.9.42 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g} \oplus \mathrm{B2_g}$
N128.9.43 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	422	$\mathrm{B1} \oplus \mathrm{A2}$
N128.9.44 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N128.9.45 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	422	$\mathrm{B1} \oplus \mathrm{B2}$
N128.9.46 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N128.9.47 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N128.9.48 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B1} \oplus \mathrm{B2}$
N128.9.49 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N128.9.50 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
N128.9.51 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N128.9.52 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N128.9.53 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$
N128.9.54 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N128.9.55 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{A2} \oplus \mathrm{A2}$
N128.9.56 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{B2_u}$
N128.9.57 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	422	$\mathrm{A2} \oplus \mathrm{B2}$
N128.9.58 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g} \oplus \mathrm{B2_u}$
N128.9.59 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-

Non-coplanar SSGs with parent space group $P4/mnc$ (No. 128) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N128.9.60 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{A2_u}\oplus\mathrm{B2_g}$
N128.9.61 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
N128.9.62 $\mathrm{GM2}^{-}\oplus\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B2}\oplus\mathrm{B2}$
N128.9.63 $\mathrm{GM2}^{-}\oplus\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A2_u}\oplus\mathrm{B2_g}$
N128.9.64 $\mathrm{GM2}^{-}\oplus\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
N128.9.65 $\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_g}$
N128.9.66 $\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{-}$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{A2}\oplus\mathrm{A2}$
N128.9.67 $\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{+}\oplus\mathrm{GM4}^{+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{A2_g}\oplus\mathrm{B2_g}$
N128.9.68 $\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{+}\oplus\mathrm{GM4}^{-}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{B2}\oplus\mathrm{B2}$
N128.9.69 $\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A1_u}\oplus\mathrm{A2_g}$
N128.9.70 $\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{B2}\oplus\mathrm{A2}$
N128.9.71 $\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B1_u}\oplus\mathrm{A2_g}$
N128.9.72 $\mathrm{GM3}^{+}\oplus\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{B2_g}\oplus\mathrm{B2_g}$
N128.9.73 $\mathrm{GM3}^{+}\oplus\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{-}$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{B2}\oplus\mathrm{A2}$
N128.9.74 $\mathrm{GM3}^{+}\oplus\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{B1_u}\oplus\mathrm{A2_g}$
N128.9.75 $\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
N128.9.76 $\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{B1_u}\oplus\mathrm{B2_g}$
N128.9.77 $\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
N128.9.78 $\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{B2}\oplus\mathrm{B2}$
N128.9.79 $\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B1_u}\oplus\mathrm{B2_g}$
N128.9.80 $\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
N128.9.81 $\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B2_g}\oplus\mathrm{B2_g}\oplus\mathrm{B2_g}$
N128.9.82 $\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{-}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{A2}\oplus\mathrm{A2}$
N128.9.83 $\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A1_u}\oplus\mathrm{B2_g}$
N128.9.84 $\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
N128.10.1 $\mathrm{GM1}^{-}\oplus\mathrm{M1}^{+}\mathrm{M4}^{+}$	$\surd$	1	0	$\times$	-	-
N128.10.2 $\mathrm{GM1}^{-}\oplus\mathrm{M1}^{-}\mathrm{M4}^{-}$	$\surd$	1	0	$\times$	-	-
N128.10.3 $\mathrm{GM1}^{-}\oplus\mathrm{M2}^{+}\mathrm{M3}^{+}$	$\surd$	1	0	$\times$	-	-
N128.10.4 $\mathrm{GM1}^{-}\oplus\mathrm{M2}^{-}\mathrm{M3}^{-}$	$\surd$	1	0	$\times$	-	-
N128.10.5 $\mathrm{GM2}^{+}\oplus\mathrm{M1}^{+}\mathrm{M4}^{+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N128.10.6 $\mathrm{GM2}^{+}\oplus\mathrm{M1}^{-}\mathrm{M4}^{-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N128.10.7 $\mathrm{GM2}^{+}\oplus\mathrm{M2}^{+}\mathrm{M3}^{+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N128.10.8 $\mathrm{GM2}^{+}\oplus\mathrm{M2}^{-}\mathrm{M3}^{-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N128.10.9 $\mathrm{GM2}^{-}\oplus\mathrm{M1}^{+}\mathrm{M4}^{+}$	$\surd$	1	0	$\times$	-	-
N128.10.10 $\mathrm{GM2}^{-}\oplus\mathrm{M1}^{-}\mathrm{M4}^{-}$	$\surd$	1	0	$\times$	-	-
N128.10.11 $\mathrm{GM2}^{-}\oplus\mathrm{M2}^{+}\mathrm{M3}^{+}$	$\surd$	1	0	$\times$	-	-
N128.10.12 $\mathrm{GM2}^{-}\oplus\mathrm{M2}^{-}\mathrm{M3}^{-}$	$\surd$	1	0	$\times$	-	-
N128.10.13 $\mathrm{GM3}^{+}\oplus\mathrm{M1}^{+}\mathrm{M4}^{+}$	$\surd$	1	1	$\times$	-	-
N128.10.14 $\mathrm{GM3}^{+}\oplus\mathrm{M1}^{-}\mathrm{M4}^{-}$	$\surd$	1	1	$\times$	-	-
N128.10.15 $\mathrm{GM3}^{+}\oplus\mathrm{M2}^{+}\mathrm{M3}^{+}$	$\surd$	1	1	$\times$	-	-
N128.10.16 $\mathrm{GM3}^{+}\oplus\mathrm{M2}^{-}\mathrm{M3}^{-}$	$\surd$	1	1	$\times$	-	-
N128.10.17 $\mathrm{GM3}^{-}\oplus\mathrm{M1}^{+}\mathrm{M4}^{+}$	$\surd$	1	0	$\times$	-	-
N128.10.18 $\mathrm{GM3}^{-}\oplus\mathrm{M1}^{-}\mathrm{M4}^{-}$	$\surd$	1	0	$\times$	-	-
N128.10.19 $\mathrm{GM3}^{-}\oplus\mathrm{M2}^{+}\mathrm{M3}^{+}$	$\surd$	1	0	$\times$	-	-
N128.10.20 $\mathrm{GM3}^{-}\oplus\mathrm{M2}^{-}\mathrm{M3}^{-}$	$\surd$	1	0	$\times$	-	-
N128.10.21 $\mathrm{GM4}^{+}\oplus\mathrm{M1}^{+}\mathrm{M4}^{+}$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $P4/mnc$ (No. 128) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N128.10.22 $\mathrm{GM4^+} \oplus \mathrm{M1^-M4^-}$	$\surd$	1	1	$\times$	-	-
N128.10.23 $\mathrm{GM4^+} \oplus \mathrm{M2^+M3^+}$	$\surd$	1	1	$\times$	-	-
N128.10.24 $\mathrm{GM4^+} \oplus \mathrm{M2^-M3^-}$	$\surd$	1	1	$\times$	-	-
N128.10.25 $\mathrm{GM4^-} \oplus \mathrm{M1^+M4^+}$	$\surd$	1	0	$\times$	-	-
N128.10.26 $\mathrm{GM4^-} \oplus \mathrm{M1^-M4^-}$	$\surd$	1	0	$\times$	-	-
N128.10.27 $\mathrm{GM4^-} \oplus \mathrm{M2^+M3^+}$	$\surd$	1	0	$\times$	-	-
N128.10.28 $\mathrm{GM4^-} \oplus \mathrm{M2^-M3^-}$	$\surd$	1	0	$\times$	-	-
N128.12.1 $\mathrm{GM1^-} \oplus \mathrm{GM5^+}$	$\surd$	2	2	$\surd$	$4mm$	E
N128.12.2 $\mathrm{GM1^-} \oplus \mathrm{GM5^-}$	$\surd$	0	0	$\surd$	-	-
N128.12.3 $\mathrm{GM1^-} \oplus \mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N128.12.4 $\mathrm{GM1^-} \oplus \mathrm{M5^+}$	$\surd$	1	0	$\times$	-	-
N128.12.5 $\mathrm{GM1^-} \oplus \mathrm{M5^-}$	$\surd$	1	0	$\times$	-	-
N128.12.6 $\mathrm{GM1^-} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N128.12.7 $\mathrm{GM1^-} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N128.12.8 $\mathrm{GM2^+} \oplus \mathrm{GM5^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{E_g}$
N128.12.9 $\mathrm{GM2^+} \oplus \mathrm{GM5^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{E_u}$
N128.12.10 $\mathrm{GM2^+} \oplus \mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N128.12.11 $\mathrm{GM2^+} \oplus \mathrm{M5^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N128.12.12 $\mathrm{GM2^+} \oplus \mathrm{M5^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N128.12.13 $\mathrm{GM2^+} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N128.12.14 $\mathrm{GM2^+} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N128.12.15 $\mathrm{GM2^-} \oplus \mathrm{GM5^+}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	E
N128.12.16 $\mathrm{GM2^-} \oplus \mathrm{GM5^-}$	$\surd$	0	0	$\surd$	-	-
N128.12.17 $\mathrm{GM2^-} \oplus \mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N128.12.18 $\mathrm{GM2^-} \oplus \mathrm{M5^+}$	$\surd$	1	0	$\times$	-	-
N128.12.19 $\mathrm{GM2^-} \oplus \mathrm{M5^-}$	$\surd$	1	0	$\times$	-	-
N128.12.20 $\mathrm{GM2^-} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N128.12.21 $\mathrm{GM2^-} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N128.12.22 $\mathrm{GM3^+} \oplus \mathrm{GM5^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{E_g}$
N128.12.23 $\mathrm{GM3^+} \oplus \mathrm{GM5^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{E_u}$
N128.12.24 $\mathrm{GM3^+} \oplus \mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N128.12.25 $\mathrm{GM3^+} \oplus \mathrm{M5^+}$	$\surd$	1	1	$\times$	-	-
N128.12.26 $\mathrm{GM3^+} \oplus \mathrm{M5^-}$	$\surd$	1	1	$\times$	-	-
N128.12.27 $\mathrm{GM3^+} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	422	A2
N128.12.28 $\mathrm{GM3^+} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	422	A2
N128.12.29 $\mathrm{GM3^-} \oplus \mathrm{GM5^+}$	$\surd$	2	2	$\surd$	422	E
N128.12.30 $\mathrm{GM3^-} \oplus \mathrm{GM5^-}$	$\surd$	0	0	$\surd$	-	-
N128.12.31 $\mathrm{GM3^-} \oplus \mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N128.12.32 $\mathrm{GM3^-} \oplus \mathrm{M5^+}$	$\surd$	1	0	$\times$	-	-
N128.12.33 $\mathrm{GM3^-} \oplus \mathrm{M5^-}$	$\surd$	1	0	$\times$	-	-
N128.12.34 $\mathrm{GM3^-} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N128.12.35 $\mathrm{GM3^-} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N128.12.36 $\mathrm{GM4^+} \oplus \mathrm{GM5^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{E_g}$
N128.12.37 $\mathrm{GM4^+} \oplus \mathrm{GM5^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{E_u}$
N128.12.38 $\mathrm{GM4^+} \oplus \mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N128.12.39 $\mathrm{GM4^+} \oplus \mathrm{M5^+}$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $P4/mnc$ (No. 128) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N128.12.40 $\mathrm{GM4}^{+}\oplus\mathrm{M5}^{-}$	$\surd$	1	1	$\times$	-	-
N128.12.41 $\mathrm{GM4}^{+}\oplus\mathrm{Z1}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N128.12.42 $\mathrm{GM4}^{+}\oplus\mathrm{Z2}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N128.12.43 $\mathrm{GM4}^{-}\oplus\mathrm{GM5}^{+}$	$\surd$	2	2	$\surd$	$\bar{4}2m$	E
N128.12.44 $\mathrm{GM4}^{-}\oplus\mathrm{GM5}^{-}$	$\surd$	0	0	$\surd$	-	-
N128.12.45 $\mathrm{GM4}^{-}\oplus\mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N128.12.46 $\mathrm{GM4}^{-}\oplus\mathrm{M5}^{+}$	$\surd$	1	0	$\times$	-	-
N128.12.47 $\mathrm{GM4}^{-}\oplus\mathrm{M5}^{-}$	$\surd$	1	0	$\times$	-	-
N128.12.48 $\mathrm{GM4}^{-}\oplus\mathrm{Z1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N128.12.49 $\mathrm{GM4}^{-}\oplus\mathrm{Z2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N128.14.1 $\mathrm{GM1}^{-}\oplus\mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N128.14.2 $\mathrm{GM1}^{-}\oplus\mathrm{LD2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N128.14.3 $\mathrm{GM2}^{+}\oplus\mathrm{LD1}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N128.14.4 $\mathrm{GM2}^{+}\oplus\mathrm{LD2}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N128.14.5 $\mathrm{GM2}^{-}\oplus\mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N128.14.6 $\mathrm{GM2}^{-}\oplus\mathrm{LD2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N128.14.7 $\mathrm{GM3}^{+}\oplus\mathrm{LD1}$	$\surd$	1	1	$\surd$	422	A2
N128.14.8 $\mathrm{GM3}^{+}\oplus\mathrm{LD2}$	$\surd$	1	1	$\surd$	422	A2
N128.14.9 $\mathrm{GM3}^{-}\oplus\mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N128.14.10 $\mathrm{GM3}^{-}\oplus\mathrm{LD2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N128.14.11 $\mathrm{GM4}^{+}\oplus\mathrm{LD1}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N128.14.12 $\mathrm{GM4}^{+}\oplus\mathrm{LD2}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N128.14.13 $\mathrm{GM4}^{-}\oplus\mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N128.14.14 $\mathrm{GM4}^{-}\oplus\mathrm{LD2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$

TABLE S385: Collinear SSGs with parent space group $P4/nmm$ (No. 129).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L129.1.1 $\mathrm{GM1}^{+}$	1	$4/mmm$	$\mathrm{A1_g}$
L129.2.1 $\mathrm{GM1}^{-}$	0	-	-
L129.2.2 $\mathrm{GM2}^{+}$	1	$4/mmm$	$\mathrm{B1_g}$
L129.2.3 $\mathrm{GM2}^{-}$	0	-	-
L129.2.4 $\mathrm{GM3}^{+}$	1	$4/mmm$	$\mathrm{A2_g}$
L129.2.5 $\mathrm{GM3}^{-}$	0	-	-
L129.2.6 $\mathrm{GM4}^{+}$	1	$4/mmm$	$\mathrm{B2_g}$
L129.2.7 $\mathrm{GM4}^{-}$	0	-	-
L129.2.8 $\mathrm{Z1}^{+}$	0	-	-
L129.2.9 $\mathrm{Z1}^{-}$	0	-	-
L129.2.10 $\mathrm{Z2}^{+}$	0	-	-
L129.2.11 $\mathrm{Z2}^{-}$	0	-	-

TABLE S386: Coplanar SSGs with parent space group $P4/nmm$ (No. 129).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P129.1.1 $\mathrm{GM1}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}$

Coplanar SSGs with parent space group $P4/nmm$ (No. 129) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P129.2.1 $\mathrm{GM1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u}$
P129.2.2 $\mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g}$
P129.2.3 $\mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u}$
P129.2.4 $\mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g}$
P129.2.5 $\mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_u}$
P129.2.6 $\mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_g}$
P129.2.7 $\mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_u}$
P129.2.8 $\mathrm{Z1}^+$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P129.2.9 $\mathrm{Z1}^-$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P129.2.10 $\mathrm{Z2}^+$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P129.2.11 $\mathrm{Z2}^-$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P129.3.1 $\mathrm{GM1}^- \oplus \mathrm{GM1}^-$	$\surd$	0	0	$\surd$	-	-
P129.3.2 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
P129.3.3 $\mathrm{GM1}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
P129.3.4 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u}$
P129.3.5 $\mathrm{GM1}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
P129.3.6 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_u}$
P129.3.7 $\mathrm{GM1}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
P129.3.8 $\mathrm{GM1}^- \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\times$	-	-
P129.3.9 $\mathrm{GM1}^- \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
P129.3.10 $\mathrm{GM1}^- \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\times$	-	-
P129.3.11 $\mathrm{GM1}^- \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\times$	-	-
P129.3.12 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
P129.3.13 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g}$
P129.3.14 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g}$
P129.3.15 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
P129.3.16 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
P129.3.17 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u}$
P129.3.18 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
P129.3.19 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
P129.3.20 $\mathrm{GM2}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
P129.3.21 $\mathrm{GM2}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-
P129.3.22 $\mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
P129.3.23 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_u}$
P129.3.24 $\mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
P129.3.25 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g}$
P129.3.26 $\mathrm{GM2}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
P129.3.27 $\mathrm{GM2}^- \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\times$	-	-
P129.3.28 $\mathrm{GM2}^- \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
P129.3.29 $\mathrm{GM2}^- \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\times$	-	-
P129.3.30 $\mathrm{GM2}^- \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\times$	-	-
P129.3.31 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g}$
P129.3.32 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g}$
P129.3.33 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g}$
P129.3.34 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g}$
P129.3.35 $\mathrm{GM3}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-

Coplanar SSGs with parent space group $P4/nmm$ (No. 129) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P129.3.36 $\mathrm{GM3^+} \oplus \mathrm{Z1^-}$	$\surd$	1	0	$\times$	-	-
P129.3.37 $\mathrm{GM3^+} \oplus \mathrm{Z2^+}$	$\surd$	1	0	$\times$	-	-
P129.3.38 $\mathrm{GM3^+} \oplus \mathrm{Z2^-}$	$\surd$	1	0	$\times$	-	-
P129.3.39 $\mathrm{GM3^-} \oplus \mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
P129.3.40 $\mathrm{GM3^-} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_g}$
P129.3.41 $\mathrm{GM3^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
P129.3.42 $\mathrm{GM3^-} \oplus \mathrm{Z1^+}$	$\surd$	1	1	$\times$	-	-
P129.3.43 $\mathrm{GM3^-} \oplus \mathrm{Z1^-}$	$\surd$	1	1	$\times$	-	-
P129.3.44 $\mathrm{GM3^-} \oplus \mathrm{Z2^+}$	$\surd$	1	1	$\times$	-	-
P129.3.45 $\mathrm{GM3^-} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
P129.3.46 $\mathrm{GM4^+} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_g}$
P129.3.47 $\mathrm{GM4^+} \oplus \mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g}$
P129.3.48 $\mathrm{GM4^+} \oplus \mathrm{Z1^+}$	$\surd$	1	0	$\times$	-	-
P129.3.49 $\mathrm{GM4^+} \oplus \mathrm{Z1^-}$	$\surd$	1	0	$\times$	-	-
P129.3.50 $\mathrm{GM4^+} \oplus \mathrm{Z2^+}$	$\surd$	1	0	$\times$	-	-
P129.3.51 $\mathrm{GM4^+} \oplus \mathrm{Z2^-}$	$\surd$	1	0	$\times$	-	-
P129.3.52 $\mathrm{GM4^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
P129.3.53 $\mathrm{GM4^-} \oplus \mathrm{Z1^+}$	$\surd$	1	1	$\times$	-	-
P129.3.54 $\mathrm{GM4^-} \oplus \mathrm{Z1^-}$	$\surd$	1	1	$\times$	-	-
P129.3.55 $\mathrm{GM4^-} \oplus \mathrm{Z2^+}$	$\surd$	1	1	$\times$	-	-
P129.3.56 $\mathrm{GM4^-} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
P129.3.57 $\mathrm{Z1^+} \oplus \mathrm{Z1^+}$	$\surd$	1	0	$\times$	-	-
P129.3.58 $\mathrm{Z1^+} \oplus \mathrm{Z3^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P129.3.59 $\mathrm{Z1^+} \oplus \mathrm{Z1^-}$	$\surd$	1	1	$\times$	-	-
P129.3.60 $\mathrm{Z1^+} \oplus \mathrm{Z3^+}$	$\surd$	1	0	$\times$	-	-
P129.3.61 $\mathrm{Z1^+} \oplus \mathrm{Z2^+}$	$\surd$	1	0	$\times$	-	-
P129.3.62 $\mathrm{Z1^+} \oplus \mathrm{Z4^-}$	$\surd$	1	1	$\times$	-	-
P129.3.63 $\mathrm{Z1^+} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
P129.3.64 $\mathrm{Z1^+} \oplus \mathrm{Z4^+}$	$\surd$	1	0	$\times$	-	-
P129.3.65 $\mathrm{Z1^-} \oplus \mathrm{Z1^-}$	$\surd$	1	0	$\times$	-	-
P129.3.66 $\mathrm{Z1^-} \oplus \mathrm{Z3^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P129.3.67 $\mathrm{Z1^-} \oplus \mathrm{Z2^+}$	$\surd$	1	1	$\times$	-	-
P129.3.68 $\mathrm{Z1^-} \oplus \mathrm{Z4^-}$	$\surd$	1	0	$\times$	-	-
P129.3.69 $\mathrm{Z1^-} \oplus \mathrm{Z2^-}$	$\surd$	1	0	$\times$	-	-
P129.3.70 $\mathrm{Z1^-} \oplus \mathrm{Z4^+}$	$\surd$	1	1	$\times$	-	-
P129.3.71 $\mathrm{Z2^+} \oplus \mathrm{Z2^+}$	$\surd$	1	0	$\times$	-	-
P129.3.72 $\mathrm{Z2^+} \oplus \mathrm{Z4^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P129.3.73 $\mathrm{Z2^+} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
P129.3.74 $\mathrm{Z2^+} \oplus \mathrm{Z4^+}$	$\surd$	1	0	$\times$	-	-
P129.3.75 $\mathrm{Z2^-} \oplus \mathrm{Z2^-}$	$\surd$	1	0	$\times$	-	-
P129.3.76 $\mathrm{Z2^-} \oplus \mathrm{Z4^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P129.6.1 $\mathrm{GM5^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_g}$
P129.6.2 $\mathrm{GM5^-}$	$\surd$	0	0	$\surd$	-	-
P129.6.3 A1	$\surd$	1	1	$\times$	-	-
P129.6.4 A3	$\surd$	1	1	$\times$	-	-
P129.6.5 A4	$\surd$	1	1	$\times$	-	-

Coplanar SSGs with parent space group $P4/nmm$ (No. 129) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P129.6.6 M1	$\surd$	1	1	$\times$	-	-
P129.6.7 M2	$\surd$	1	1	$\times$	-	-
P129.6.8 M3	$\surd$	1	1	$\times$	-	-
P129.6.9 M4	$\surd$	1	1	$\times$	-	-
P129.6.10 $\mathrm{Z5}^{+}$	$\surd$	1	0	$\times$	-	-
P129.8.1 LD1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P129.8.2 LD2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P129.8.3 LD3	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P129.8.4 LD4	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$

TABLE S387: Non-coplanar SSGs with parent space group $P4/nmm$ (No. 129).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N129.1.1 $\mathrm{GM1}^{+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A1_g}$
N129.2.1 $\mathrm{GM1}^{-}$	$\surd$	2	2	$\surd$	422	$\mathrm{A1}\oplus\mathrm{A1}$
N129.2.2 $\mathrm{GM2}^{+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{B1_g}$
N129.2.3 $\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{A1}\oplus\mathrm{A1}$
N129.2.4 $\mathrm{GM3}^{+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A2_g}$
N129.2.5 $\mathrm{GM3}^{-}$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{A1}\oplus\mathrm{A1}$
N129.2.6 $\mathrm{GM4}^{+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{B2_g}$
N129.2.7 $\mathrm{GM4}^{-}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{A1}\oplus\mathrm{A1}$
N129.2.8 $\mathrm{Z1}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}$
N129.2.9 $\mathrm{Z1}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}$
N129.2.10 $\mathrm{Z2}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}$
N129.2.11 $\mathrm{Z2}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}$
N129.3.1 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{A1_u}$
N129.3.2 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{A1}\oplus\mathrm{B1}$
N129.3.3 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{B1_u}$
N129.3.4 $\mathrm{GM1}^{-}\oplus\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{A1}\oplus\mathrm{A2}$
N129.3.5 $\mathrm{GM1}^{-}\oplus\mathrm{GM3}^{-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{A2_u}$
N129.3.6 $\mathrm{GM1}^{-}\oplus\mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{A1}\oplus\mathrm{A2}$
N129.3.7 $\mathrm{GM1}^{-}\oplus\mathrm{GM4}^{-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{B2_u}$
N129.3.8 $\mathrm{GM1}^{-}\oplus\mathrm{Z1}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}$
N129.3.9 $\mathrm{GM1}^{-}\oplus\mathrm{Z1}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}$
N129.3.10 $\mathrm{GM1}^{-}\oplus\mathrm{Z2}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}$
N129.3.11 $\mathrm{GM1}^{-}\oplus\mathrm{Z2}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}$
N129.3.12 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B1_g}$
N129.3.13 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	422	$\mathrm{A1}\oplus\mathrm{B1}$
N129.3.14 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}\oplus\mathrm{A2_g}$
N129.3.15 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{-}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{A1}\oplus\mathrm{B1}$
N129.3.16 $\mathrm{GM2}^{+}\oplus\mathrm{GM4}^{+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B2_g}$
N129.3.17 $\mathrm{GM2}^{+}\oplus\mathrm{GM4}^{-}$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{A1}\oplus\mathrm{B1}$
N129.3.18 $\mathrm{GM2}^{+}\oplus\mathrm{Z1}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}$
N129.3.19 $\mathrm{GM2}^{+}\oplus\mathrm{Z1}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}$
N129.3.20 $\mathrm{GM2}^{+}\oplus\mathrm{Z2}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}$
N129.3.21 $\mathrm{GM2}^{+}\oplus\mathrm{Z2}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}$

Non-coplanar SSGs with parent space group $P4/nmm$ (No. 129) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N129.3.22 $\mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N129.3.23 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{A1} \oplus \mathrm{B2}$
N129.3.24 $\mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u} \oplus \mathrm{A2_u}$
N129.3.25 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{A1} \oplus \mathrm{B2}$
N129.3.26 $\mathrm{GM2}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_u}$
N129.3.27 $\mathrm{GM2}^- \oplus \mathrm{Z1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u}$
N129.3.28 $\mathrm{GM2}^- \oplus \mathrm{Z1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u}$
N129.3.29 $\mathrm{GM2}^- \oplus \mathrm{Z2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u}$
N129.3.30 $\mathrm{GM2}^- \oplus \mathrm{Z2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u}$
N129.3.31 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
N129.3.32 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	422	$\mathrm{A1} \oplus \mathrm{A2}$
N129.3.33 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g} \oplus \mathrm{B2_g}$
N129.3.34 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{A1} \oplus \mathrm{A2}$
N129.3.35 $\mathrm{GM3}^+ \oplus \mathrm{Z1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g}$
N129.3.36 $\mathrm{GM3}^+ \oplus \mathrm{Z1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g}$
N129.3.37 $\mathrm{GM3}^+ \oplus \mathrm{Z2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g}$
N129.3.38 $\mathrm{GM3}^+ \oplus \mathrm{Z2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g}$
N129.3.39 $\mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N129.3.40 $\mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{A1} \oplus \mathrm{B2}$
N129.3.41 $\mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N129.3.42 $\mathrm{GM3}^- \oplus \mathrm{Z1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_u}$
N129.3.43 $\mathrm{GM3}^- \oplus \mathrm{Z1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_u}$
N129.3.44 $\mathrm{GM3}^- \oplus \mathrm{Z2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_u}$
N129.3.45 $\mathrm{GM3}^- \oplus \mathrm{Z2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_u}$
N129.3.46 $\mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N129.3.47 $\mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	422	$\mathrm{A1} \oplus \mathrm{B2}$
N129.3.48 $\mathrm{GM4}^+ \oplus \mathrm{Z1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_g}$
N129.3.49 $\mathrm{GM4}^+ \oplus \mathrm{Z1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_g}$
N129.3.50 $\mathrm{GM4}^+ \oplus \mathrm{Z2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_g}$
N129.3.51 $\mathrm{GM4}^+ \oplus \mathrm{Z2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_g}$
N129.3.52 $\mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N129.3.53 $\mathrm{GM4}^- \oplus \mathrm{Z1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_u}$
N129.3.54 $\mathrm{GM4}^- \oplus \mathrm{Z1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_u}$
N129.3.55 $\mathrm{GM4}^- \oplus \mathrm{Z2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_u}$
N129.3.56 $\mathrm{GM4}^- \oplus \mathrm{Z2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_u}$
N129.3.57 $\mathrm{Z1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N129.3.58 $\mathrm{Z1}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\surd$	$4mm$	A1
N129.3.59 $\mathrm{Z1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\surd$	422	A1
N129.3.60 $\mathrm{Z1}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N129.3.61 $\mathrm{Z1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N129.3.62 $\mathrm{Z1}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\surd$	$\bar{4}m2$	A1
N129.3.63 $\mathrm{Z1}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\surd$	$\bar{4}2m$	A1
N129.3.64 $\mathrm{Z1}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N129.3.65 $\mathrm{Z1}^- \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N129.3.66 $\mathrm{Z1}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\surd$	$4mm$	A1
N129.3.67 $\mathrm{Z1}^- \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\surd$	$\bar{4}2m$	A1

Non-coplanar SSGs with parent space group $P4/nmm$ (No. 129) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N129.3.68 $\mathrm{Z1}^- \oplus \mathrm{Z4}^-$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N129.3.69 $\mathrm{Z1}^- \oplus \mathrm{Z2}^-$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N129.3.70 $\mathrm{Z1}^- \oplus \mathrm{Z4}^+$	√	1	1	√	$\bar{4}m2$	A1
N129.3.71 $\mathrm{Z2}^+ \oplus \mathrm{Z2}^+$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N129.3.72 $\mathrm{Z2}^+ \oplus \mathrm{Z4}^-$	√	1	1	√	$4mm$	A1
N129.3.73 $\mathrm{Z2}^+ \oplus \mathrm{Z2}^-$	√	1	1	√	422	A1
N129.3.74 $\mathrm{Z2}^+ \oplus \mathrm{Z4}^+$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N129.3.75 $\mathrm{Z2}^- \oplus \mathrm{Z2}^-$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N129.3.76 $\mathrm{Z2}^- \oplus \mathrm{Z4}^+$	√	1	1	√	$4mm$	A1
N129.6.1 $\mathrm{GM5}^+$	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{E_g}$
N129.6.2 $\mathrm{GM5}^-$	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{E_u}$
N129.6.3 A1	√	1	1	√	422	A1
N129.6.4 A3	√	1	1	√	$\bar{4}2m$	A1
N129.6.5 A4	√	1	1	√	$\bar{4}2m$	A1
N129.6.6 M1	√	1	1	√	422	A1
N129.6.7 M2	√	1	1	√	422	A1
N129.6.8 M3	√	1	1	√	$\bar{4}2m$	A1
N129.6.9 M4	√	1	1	√	$\bar{4}2m$	A1
N129.6.10 $\mathrm{Z5}^+$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N129.8.1 LD1	√	1	1	√	$4mm$	A1
N129.8.2 LD2	√	1	1	√	$4mm$	A1
N129.8.3 LD3	√	1	1	√	$4mm$	A1
N129.8.4 LD4	√	1	1	√	$4mm$	A1
N129.9.1 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{GM1}^-$	√	0	0	√	-	-
N129.9.2 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{GM2}^+$	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N129.9.3 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{GM2}^-$	√	0	0	√	-	-
N129.9.4 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{GM3}^+$	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N129.9.5 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{GM3}^-$	√	0	0	√	-	-
N129.9.6 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{GM4}^+$	√	3	3	√	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N129.9.7 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{GM4}^-$	√	0	0	√	-	-
N129.9.8 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{Z1}^+$	√	0	0	√	-	-
N129.9.9 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{Z1}^-$	√	0	0	√	-	-
N129.9.10 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{Z2}^+$	√	0	0	√	-	-
N129.9.11 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{Z2}^-$	√	0	0	√	-	-
N129.9.12 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	√	2	2	√	422	$\mathrm{B1} \oplus \mathrm{B1}$
N129.9.13 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N129.9.14 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM3}^+$	√	2	2	√	$\bar{4}m2$	$\mathrm{B1} \oplus \mathrm{B2}$
N129.9.15 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM3}^-$	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_u}$
N129.9.16 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM4}^+$	√	2	2	√	$4mm$	$\mathrm{B1} \oplus \mathrm{B2}$
N129.9.17 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM4}^-$	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{A2_u}$
N129.9.18 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{Z1}^+$	√	2	2	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N129.9.19 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{Z1}^-$	√	2	2	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N129.9.20 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{Z2}^+$	√	2	2	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N129.9.21 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{Z2}^-$	√	2	2	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N129.9.22 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	√	0	0	√	-	-
N129.9.23 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^+$	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$

Non-coplanar SSGs with parent space group $P4/nmm$ (No. 129) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N129.9.24 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N129.9.25 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N129.9.26 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N129.9.27 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Z1}^+$	$\surd$	0	0	$\surd$	-	-
N129.9.28 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Z1}^-$	$\surd$	0	0	$\surd$	-	-
N129.9.29 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Z2}^+$	$\surd$	0	0	$\surd$	-	-
N129.9.30 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Z2}^-$	$\surd$	0	0	$\surd$	-	-
N129.9.31 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	422	$\mathrm{A2} \oplus \mathrm{A2}$
N129.9.32 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
N129.9.33 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B2} \oplus \mathrm{A2}$
N129.9.34 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
N129.9.35 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Z1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u}$
N129.9.36 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Z1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u}$
N129.9.37 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Z2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u}$
N129.9.38 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Z2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u}$
N129.9.39 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N129.9.40 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N129.9.41 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N129.9.42 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Z1}^+$	$\surd$	0	0	$\surd$	-	-
N129.9.43 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Z1}^-$	$\surd$	0	0	$\surd$	-	-
N129.9.44 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Z2}^+$	$\surd$	0	0	$\surd$	-	-
N129.9.45 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{Z2}^-$	$\surd$	0	0	$\surd$	-	-
N129.9.46 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	422	$\mathrm{B2} \oplus \mathrm{B2}$
N129.9.47 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N129.9.48 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{Z1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_u}$
N129.9.49 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{Z1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_u}$
N129.9.50 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{Z2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_u}$
N129.9.51 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{Z2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_u}$
N129.9.52 $\mathrm{GM1}^- \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N129.9.53 $\mathrm{GM1}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Z1}^+$	$\surd$	0	0	$\surd$	-	-
N129.9.54 $\mathrm{GM1}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Z1}^-$	$\surd$	0	0	$\surd$	-	-
N129.9.55 $\mathrm{GM1}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Z2}^+$	$\surd$	0	0	$\surd$	-	-
N129.9.56 $\mathrm{GM1}^- \oplus \mathrm{GM4}^- \oplus \mathrm{Z2}^-$	$\surd$	0	0	$\surd$	-	-
N129.9.57 $\mathrm{GM1}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	0	$\times$	-	-
N129.9.58 $\mathrm{GM1}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N129.9.59 $\mathrm{GM1}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
N129.9.60 $\mathrm{GM1}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	0	$\times$	-	-
N129.9.61 $\mathrm{GM1}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	0	$\times$	-	-
N129.9.62 $\mathrm{GM1}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\times$	-	-
N129.9.63 $\mathrm{GM1}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\times$	-	-
N129.9.64 $\mathrm{GM1}^- \oplus \mathrm{Z1}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	0	$\times$	-	-
N129.9.65 $\mathrm{GM1}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z1}^-$	$\surd$	1	0	$\times$	-	-
N129.9.66 $\mathrm{GM1}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N129.9.67 $\mathrm{GM1}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\times$	-	-
N129.9.68 $\mathrm{GM1}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z4}^-$	$\surd$	1	0	$\times$	-	-
N129.9.69 $\mathrm{GM1}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z2}^-$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $P4/nmm$ (No. 129) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N129.9.70 $\mathrm{GM1^-}\oplus\mathrm{Z1^-}\oplus\mathrm{Z4^+}$	$\surd$	1	1	$\times$	-	-
N129.9.71 $\mathrm{GM1^-}\oplus\mathrm{Z2^+}\oplus\mathrm{Z2^+}$	$\surd$	1	0	$\times$	-	-
N129.9.72 $\mathrm{GM1^-}\oplus\mathrm{Z2^+}\oplus\mathrm{Z4^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N129.9.73 $\mathrm{GM1^-}\oplus\mathrm{Z2^+}\oplus\mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
N129.9.74 $\mathrm{GM1^-}\oplus\mathrm{Z2^+}\oplus\mathrm{Z4^+}$	$\surd$	1	0	$\times$	-	-
N129.9.75 $\mathrm{GM1^-}\oplus\mathrm{Z2^-}\oplus\mathrm{Z2^-}$	$\surd$	1	0	$\times$	-	-
N129.9.76 $\mathrm{GM1^-}\oplus\mathrm{Z2^-}\oplus\mathrm{Z4^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N129.9.77 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{GM2^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B1_g}$
N129.9.78 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{GM2^-}$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B1}\oplus\mathrm{B1}$
N129.9.79 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{GM3^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_g}\oplus\mathrm{A2_g}$
N129.9.80 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{GM3^-}$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{B1}\oplus\mathrm{B1}$
N129.9.81 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B2_g}$
N129.9.82 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{B1}\oplus\mathrm{B1}$
N129.9.83 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{Z1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_g}$
N129.9.84 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{Z1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_g}$
N129.9.85 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{Z2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_g}$
N129.9.86 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{Z2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_g}$
N129.9.87 $\mathrm{GM2^+}\oplus\mathrm{GM2^-}\oplus\mathrm{GM2^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A1_u}\oplus\mathrm{B1_g}$
N129.9.88 $\mathrm{GM2^+}\oplus\mathrm{GM2^-}\oplus\mathrm{GM3^+}$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{B1}\oplus\mathrm{A2}$
N129.9.89 $\mathrm{GM2^+}\oplus\mathrm{GM2^-}\oplus\mathrm{GM3^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B1_g}\oplus\mathrm{B2_u}$
N129.9.90 $\mathrm{GM2^+}\oplus\mathrm{GM2^-}\oplus\mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{B1}\oplus\mathrm{A2}$
N129.9.91 $\mathrm{GM2^+}\oplus\mathrm{GM2^-}\oplus\mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B1_g}\oplus\mathrm{A2_u}$
N129.9.92 $\mathrm{GM2^+}\oplus\mathrm{GM2^-}\oplus\mathrm{Z1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B1_g}$
N129.9.93 $\mathrm{GM2^+}\oplus\mathrm{GM2^-}\oplus\mathrm{Z1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B1_g}$
N129.9.94 $\mathrm{GM2^+}\oplus\mathrm{GM2^-}\oplus\mathrm{Z2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B1_g}$
N129.9.95 $\mathrm{GM2^+}\oplus\mathrm{GM2^-}\oplus\mathrm{Z2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B1_g}$
N129.9.96 $\mathrm{GM2^+}\oplus\mathrm{GM3^+}\oplus\mathrm{GM3^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_g}$
N129.9.97 $\mathrm{GM2^+}\oplus\mathrm{GM3^+}\oplus\mathrm{GM3^-}$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B1}\oplus\mathrm{A2}$
N129.9.98 $\mathrm{GM2^+}\oplus\mathrm{GM3^+}\oplus\mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_g}\oplus\mathrm{B2_g}$
N129.9.99 $\mathrm{GM2^+}\oplus\mathrm{GM3^+}\oplus\mathrm{GM4^-}$	$\surd$	2	2	$\surd$	422	$\mathrm{B1}\oplus\mathrm{A2}$
N129.9.100 $\mathrm{GM2^+}\oplus\mathrm{GM3^+}\oplus\mathrm{Z1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_g}$
N129.9.101 $\mathrm{GM2^+}\oplus\mathrm{GM3^+}\oplus\mathrm{Z1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_g}$
N129.9.102 $\mathrm{GM2^+}\oplus\mathrm{GM3^+}\oplus\mathrm{Z2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_g}$
N129.9.103 $\mathrm{GM2^+}\oplus\mathrm{GM3^+}\oplus\mathrm{Z2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_g}$
N129.9.104 $\mathrm{GM2^+}\oplus\mathrm{GM3^-}\oplus\mathrm{GM3^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B2_u}\oplus\mathrm{B2_u}$
N129.9.105 $\mathrm{GM2^+}\oplus\mathrm{GM3^-}\oplus\mathrm{GM4^+}$	$\surd$	2	2	$\surd$	422	$\mathrm{B1}\oplus\mathrm{B2}$
N129.9.106 $\mathrm{GM2^+}\oplus\mathrm{GM3^-}\oplus\mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_u}\oplus\mathrm{B2_u}$
N129.9.107 $\mathrm{GM2^+}\oplus\mathrm{GM3^-}\oplus\mathrm{Z1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B2_u}$
N129.9.108 $\mathrm{GM2^+}\oplus\mathrm{GM3^-}\oplus\mathrm{Z1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B2_u}$
N129.9.109 $\mathrm{GM2^+}\oplus\mathrm{GM3^-}\oplus\mathrm{Z2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B2_u}$
N129.9.110 $\mathrm{GM2^+}\oplus\mathrm{GM3^-}\oplus\mathrm{Z2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B2_u}$
N129.9.111 $\mathrm{GM2^+}\oplus\mathrm{GM4^+}\oplus\mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B2_g}\oplus\mathrm{B2_g}$
N129.9.112 $\mathrm{GM2^+}\oplus\mathrm{GM4^+}\oplus\mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B1}\oplus\mathrm{B2}$
N129.9.113 $\mathrm{GM2^+}\oplus\mathrm{GM4^+}\oplus\mathrm{Z1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B2_g}$
N129.9.114 $\mathrm{GM2^+}\oplus\mathrm{GM4^+}\oplus\mathrm{Z1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B2_g}$
N129.9.115 $\mathrm{GM2^+}\oplus\mathrm{GM4^+}\oplus\mathrm{Z2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B2_g}$

Non-coplanar SSGs with parent space group $P4/nmm$ (No. 129) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N129.9.116 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{Z2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
N129.9.117 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N129.9.118 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{Z1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u}$
N129.9.119 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{Z1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u}$
N129.9.120 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{Z2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u}$
N129.9.121 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{Z2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u}$
N129.9.122 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^+$	$\surd$	1	1	$\times$	-	-
N129.9.123 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^-$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N129.9.124 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
N129.9.125 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\times$	-	-
N129.9.126 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\times$	-	-
N129.9.127 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\times$	-	-
N129.9.128 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\times$	-	-
N129.9.129 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\times$	-	-
N129.9.130 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z1}^-$	$\surd$	1	1	$\times$	-	-
N129.9.131 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z3}^+$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N129.9.132 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\times$	-	-
N129.9.133 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\times$	-	-
N129.9.134 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\times$	-	-
N129.9.135 $\mathrm{GM2}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\times$	-	-
N129.9.136 $\mathrm{GM2}^+ \oplus \mathrm{Z2}^+ \oplus \mathrm{Z2}^+$	$\surd$	1	1	$\times$	-	-
N129.9.137 $\mathrm{GM2}^+ \oplus \mathrm{Z2}^+ \oplus \mathrm{Z4}^-$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N129.9.138 $\mathrm{GM2}^+ \oplus \mathrm{Z2}^+ \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\times$	-	-
N129.9.139 $\mathrm{GM2}^+ \oplus \mathrm{Z2}^+ \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\times$	-	-
N129.9.140 $\mathrm{GM2}^+ \oplus \mathrm{Z2}^- \oplus \mathrm{Z2}^-$	$\surd$	1	1	$\times$	-	-
N129.9.141 $\mathrm{GM2}^+ \oplus \mathrm{Z2}^- \oplus \mathrm{Z4}^+$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N129.9.142 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
N129.9.143 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N129.9.144 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N129.9.145 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$
N129.9.146 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N129.9.147 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Z1}^+$	$\surd$	0	0	$\surd$	-	-
N129.9.148 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Z1}^-$	$\surd$	0	0	$\surd$	-	-
N129.9.149 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Z2}^+$	$\surd$	0	0	$\surd$	-	-
N129.9.150 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{Z2}^-$	$\surd$	0	0	$\surd$	-	-
N129.9.151 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{A2} \oplus \mathrm{A2}$
N129.9.152 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{B2_u}$
N129.9.153 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	422	$\mathrm{A2} \oplus \mathrm{B2}$
N129.9.154 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g} \oplus \mathrm{B2_u}$
N129.9.155 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Z1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_u}$
N129.9.156 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Z1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_u}$
N129.9.157 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Z2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_u}$
N129.9.158 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{Z2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_u}$
N129.9.159 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N129.9.160 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$
N129.9.161 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-

Non-coplanar SSGs with parent space group $P4/nmm$ (No. 129) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N129.9.162 $\mathrm{GM2^-} \oplus \mathrm{GM3^-} \oplus \mathrm{Z1^+}$	$\surd$	0	0	$\surd$	-	-
N129.9.163 $\mathrm{GM2^-} \oplus \mathrm{GM3^-} \oplus \mathrm{Z1^-}$	$\surd$	0	0	$\surd$	-	-
N129.9.164 $\mathrm{GM2^-} \oplus \mathrm{GM3^-} \oplus \mathrm{Z2^+}$	$\surd$	0	0	$\surd$	-	-
N129.9.165 $\mathrm{GM2^-} \oplus \mathrm{GM3^-} \oplus \mathrm{Z2^-}$	$\surd$	0	0	$\surd$	-	-
N129.9.166 $\mathrm{GM2^-} \oplus \mathrm{GM4^+} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B2} \oplus \mathrm{B2}$
N129.9.167 $\mathrm{GM2^-} \oplus \mathrm{GM4^+} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$
N129.9.168 $\mathrm{GM2^-} \oplus \mathrm{GM4^+} \oplus \mathrm{Z1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g}$
N129.9.169 $\mathrm{GM2^-} \oplus \mathrm{GM4^+} \oplus \mathrm{Z1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g}$
N129.9.170 $\mathrm{GM2^-} \oplus \mathrm{GM4^+} \oplus \mathrm{Z2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g}$
N129.9.171 $\mathrm{GM2^-} \oplus \mathrm{GM4^+} \oplus \mathrm{Z2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g}$
N129.9.172 $\mathrm{GM2^-} \oplus \mathrm{GM4^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N129.9.173 $\mathrm{GM2^-} \oplus \mathrm{GM4^-} \oplus \mathrm{Z1^+}$	$\surd$	0	0	$\surd$	-	-
N129.9.174 $\mathrm{GM2^-} \oplus \mathrm{GM4^-} \oplus \mathrm{Z1^-}$	$\surd$	0	0	$\surd$	-	-
N129.9.175 $\mathrm{GM2^-} \oplus \mathrm{GM4^-} \oplus \mathrm{Z2^+}$	$\surd$	0	0	$\surd$	-	-
N129.9.176 $\mathrm{GM2^-} \oplus \mathrm{GM4^-} \oplus \mathrm{Z2^-}$	$\surd$	0	0	$\surd$	-	-
N129.9.177 $\mathrm{GM2^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z1^+}$	$\surd$	1	0	$\times$	-	-
N129.9.178 $\mathrm{GM2^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z3^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N129.9.179 $\mathrm{GM2^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z1^-}$	$\surd$	1	1	$\times$	-	-
N129.9.180 $\mathrm{GM2^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z3^+}$	$\surd$	1	0	$\times$	-	-
N129.9.181 $\mathrm{GM2^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z2^+}$	$\surd$	1	0	$\times$	-	-
N129.9.182 $\mathrm{GM2^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z4^-}$	$\surd$	1	1	$\times$	-	-
N129.9.183 $\mathrm{GM2^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
N129.9.184 $\mathrm{GM2^-} \oplus \mathrm{Z1^+} \oplus \mathrm{Z4^+}$	$\surd$	1	0	$\times$	-	-
N129.9.185 $\mathrm{GM2^-} \oplus \mathrm{Z1^-} \oplus \mathrm{Z1^-}$	$\surd$	1	0	$\times$	-	-
N129.9.186 $\mathrm{GM2^-} \oplus \mathrm{Z1^-} \oplus \mathrm{Z3^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N129.9.187 $\mathrm{GM2^-} \oplus \mathrm{Z1^-} \oplus \mathrm{Z2^+}$	$\surd$	1	1	$\times$	-	-
N129.9.188 $\mathrm{GM2^-} \oplus \mathrm{Z1^-} \oplus \mathrm{Z4^-}$	$\surd$	1	0	$\times$	-	-
N129.9.189 $\mathrm{GM2^-} \oplus \mathrm{Z1^-} \oplus \mathrm{Z2^-}$	$\surd$	1	0	$\times$	-	-
N129.9.190 $\mathrm{GM2^-} \oplus \mathrm{Z1^-} \oplus \mathrm{Z4^+}$	$\surd$	1	1	$\times$	-	-
N129.9.191 $\mathrm{GM2^-} \oplus \mathrm{Z2^+} \oplus \mathrm{Z2^+}$	$\surd$	1	0	$\times$	-	-
N129.9.192 $\mathrm{GM2^-} \oplus \mathrm{Z2^+} \oplus \mathrm{Z4^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N129.9.193 $\mathrm{GM2^-} \oplus \mathrm{Z2^+} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
N129.9.194 $\mathrm{GM2^-} \oplus \mathrm{Z2^+} \oplus \mathrm{Z4^+}$	$\surd$	1	0	$\times$	-	-
N129.9.195 $\mathrm{GM2^-} \oplus \mathrm{Z2^-} \oplus \mathrm{Z2^-}$	$\surd$	1	0	$\times$	-	-
N129.9.196 $\mathrm{GM2^-} \oplus \mathrm{Z2^-} \oplus \mathrm{Z4^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N129.9.197 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{GM3^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
N129.9.198 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{GM3^-}$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{A2} \oplus \mathrm{A2}$
N129.9.199 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{B2_g}$
N129.9.200 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{B2} \oplus \mathrm{B2}$
N129.9.201 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{Z1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g}$
N129.9.202 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{Z1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g}$
N129.9.203 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{Z2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g}$
N129.9.204 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{Z2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g}$
N129.9.205 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{GM3^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A2_g}$
N129.9.206 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{B2} \oplus \mathrm{A2}$
N129.9.207 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{A2_g}$

Non-coplanar SSGs with parent space group $P4/nmm$ (No. 129) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N129.9.208 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{Z1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g}$
N129.9.209 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{Z1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g}$
N129.9.210 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{Z2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g}$
N129.9.211 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{Z2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g}$
N129.9.212 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N129.9.213 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{B2} \oplus \mathrm{A2}$
N129.9.214 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{Z1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g}$
N129.9.215 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{Z1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g}$
N129.9.216 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{Z2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g}$
N129.9.217 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{Z2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g}$
N129.9.218 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{A2_g}$
N129.9.219 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Z1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g}$
N129.9.220 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Z1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g}$
N129.9.221 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Z2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g}$
N129.9.222 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{Z2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g}$
N129.9.223 $\mathrm{GM3^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z1^+}$	$\surd$	1	1	$\times$	-	-
N129.9.224 $\mathrm{GM3^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z3^-}$	$\surd$	1	1	$\surd$	422	A2
N129.9.225 $\mathrm{GM3^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z1^-}$	$\surd$	1	1	$\times$	-	-
N129.9.226 $\mathrm{GM3^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z3^+}$	$\surd$	1	1	$\times$	-	-
N129.9.227 $\mathrm{GM3^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z2^+}$	$\surd$	1	1	$\times$	-	-
N129.9.228 $\mathrm{GM3^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z4^-}$	$\surd$	1	1	$\times$	-	-
N129.9.229 $\mathrm{GM3^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
N129.9.230 $\mathrm{GM3^+} \oplus \mathrm{Z1^+} \oplus \mathrm{Z4^+}$	$\surd$	1	1	$\times$	-	-
N129.9.231 $\mathrm{GM3^+} \oplus \mathrm{Z1^-} \oplus \mathrm{Z1^-}$	$\surd$	1	1	$\times$	-	-
N129.9.232 $\mathrm{GM3^+} \oplus \mathrm{Z1^-} \oplus \mathrm{Z3^+}$	$\surd$	1	1	$\surd$	422	A2
N129.9.233 $\mathrm{GM3^+} \oplus \mathrm{Z1^-} \oplus \mathrm{Z2^+}$	$\surd$	1	1	$\times$	-	-
N129.9.234 $\mathrm{GM3^+} \oplus \mathrm{Z1^-} \oplus \mathrm{Z4^-}$	$\surd$	1	1	$\times$	-	-
N129.9.235 $\mathrm{GM3^+} \oplus \mathrm{Z1^-} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
N129.9.236 $\mathrm{GM3^+} \oplus \mathrm{Z1^-} \oplus \mathrm{Z4^+}$	$\surd$	1	1	$\times$	-	-
N129.9.237 $\mathrm{GM3^+} \oplus \mathrm{Z2^+} \oplus \mathrm{Z2^+}$	$\surd$	1	1	$\times$	-	-
N129.9.238 $\mathrm{GM3^+} \oplus \mathrm{Z2^+} \oplus \mathrm{Z4^-}$	$\surd$	1	1	$\surd$	422	A2
N129.9.239 $\mathrm{GM3^+} \oplus \mathrm{Z2^+} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
N129.9.240 $\mathrm{GM3^+} \oplus \mathrm{Z2^+} \oplus \mathrm{Z4^+}$	$\surd$	1	1	$\times$	-	-
N129.9.241 $\mathrm{GM3^+} \oplus \mathrm{Z2^-} \oplus \mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
N129.9.242 $\mathrm{GM3^+} \oplus \mathrm{Z2^-} \oplus \mathrm{Z4^+}$	$\surd$	1	1	$\surd$	422	A2
N129.9.243 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
N129.9.244 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B2_g}$
N129.9.245 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N129.9.246 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{Z1^+}$	$\surd$	0	0	$\surd$	-	-
N129.9.247 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{Z1^-}$	$\surd$	0	0	$\surd$	-	-
N129.9.248 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{Z2^+}$	$\surd$	0	0	$\surd$	-	-
N129.9.249 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{Z2^-}$	$\surd$	0	0	$\surd$	-	-
N129.9.250 $\mathrm{GM3^-} \oplus \mathrm{GM4^+} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{B2} \oplus \mathrm{B2}$
N129.9.251 $\mathrm{GM3^-} \oplus \mathrm{GM4^+} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B2_g}$
N129.9.252 $\mathrm{GM3^-} \oplus \mathrm{GM4^+} \oplus \mathrm{Z1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_g}$
N129.9.253 $\mathrm{GM3^-} \oplus \mathrm{GM4^+} \oplus \mathrm{Z1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_g}$

Non-coplanar SSGs with parent space group $P4/nmm$ (No. 129) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N129.9.254 $\mathrm{GM3^-}\oplus\mathrm{GM4^+}\oplus\mathrm{Z2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{B2_g}$
N129.9.255 $\mathrm{GM3^-}\oplus\mathrm{GM4^+}\oplus\mathrm{Z2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{B2_g}$
N129.9.256 $\mathrm{GM3^-}\oplus\mathrm{GM4^-}\oplus\mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N129.9.257 $\mathrm{GM3^-}\oplus\mathrm{GM4^-}\oplus\mathrm{Z1^+}$	$\surd$	0	0	$\surd$	-	-
N129.9.258 $\mathrm{GM3^-}\oplus\mathrm{GM4^-}\oplus\mathrm{Z1^-}$	$\surd$	0	0	$\surd$	-	-
N129.9.259 $\mathrm{GM3^-}\oplus\mathrm{GM4^-}\oplus\mathrm{Z2^+}$	$\surd$	0	0	$\surd$	-	-
N129.9.260 $\mathrm{GM3^-}\oplus\mathrm{GM4^-}\oplus\mathrm{Z2^-}$	$\surd$	0	0	$\surd$	-	-
N129.9.261 $\mathrm{GM3^-}\oplus\mathrm{Z1^+}\oplus\mathrm{Z1^+}$	$\surd$	1	0	$\times$	-	-
N129.9.262 $\mathrm{GM3^-}\oplus\mathrm{Z1^+}\oplus\mathrm{Z3^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N129.9.263 $\mathrm{GM3^-}\oplus\mathrm{Z1^+}\oplus\mathrm{Z1^-}$	$\surd$	1	1	$\times$	-	-
N129.9.264 $\mathrm{GM3^-}\oplus\mathrm{Z1^+}\oplus\mathrm{Z3^+}$	$\surd$	1	0	$\times$	-	-
N129.9.265 $\mathrm{GM3^-}\oplus\mathrm{Z1^+}\oplus\mathrm{Z2^+}$	$\surd$	1	0	$\times$	-	-
N129.9.266 $\mathrm{GM3^-}\oplus\mathrm{Z1^+}\oplus\mathrm{Z4^-}$	$\surd$	1	1	$\times$	-	-
N129.9.267 $\mathrm{GM3^-}\oplus\mathrm{Z1^+}\oplus\mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
N129.9.268 $\mathrm{GM3^-}\oplus\mathrm{Z1^+}\oplus\mathrm{Z4^+}$	$\surd$	1	0	$\times$	-	-
N129.9.269 $\mathrm{GM3^-}\oplus\mathrm{Z1^-}\oplus\mathrm{Z1^-}$	$\surd$	1	0	$\times$	-	-
N129.9.270 $\mathrm{GM3^-}\oplus\mathrm{Z1^-}\oplus\mathrm{Z3^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N129.9.271 $\mathrm{GM3^-}\oplus\mathrm{Z1^-}\oplus\mathrm{Z2^+}$	$\surd$	1	1	$\times$	-	-
N129.9.272 $\mathrm{GM3^-}\oplus\mathrm{Z1^-}\oplus\mathrm{Z4^-}$	$\surd$	1	0	$\times$	-	-
N129.9.273 $\mathrm{GM3^-}\oplus\mathrm{Z1^-}\oplus\mathrm{Z2^-}$	$\surd$	1	0	$\times$	-	-
N129.9.274 $\mathrm{GM3^-}\oplus\mathrm{Z1^-}\oplus\mathrm{Z4^+}$	$\surd$	1	1	$\times$	-	-
N129.9.275 $\mathrm{GM3^-}\oplus\mathrm{Z2^+}\oplus\mathrm{Z2^+}$	$\surd$	1	0	$\times$	-	-
N129.9.276 $\mathrm{GM3^-}\oplus\mathrm{Z2^+}\oplus\mathrm{Z4^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N129.9.277 $\mathrm{GM3^-}\oplus\mathrm{Z2^+}\oplus\mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
N129.9.278 $\mathrm{GM3^-}\oplus\mathrm{Z2^+}\oplus\mathrm{Z4^+}$	$\surd$	1	0	$\times$	-	-
N129.9.279 $\mathrm{GM3^-}\oplus\mathrm{Z2^-}\oplus\mathrm{Z2^-}$	$\surd$	1	0	$\times$	-	-
N129.9.280 $\mathrm{GM3^-}\oplus\mathrm{Z2^-}\oplus\mathrm{Z4^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N129.9.281 $\mathrm{GM4^+}\oplus\mathrm{GM4^+}\oplus\mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B2_g}\oplus\mathrm{B2_g}\oplus\mathrm{B2_g}$
N129.9.282 $\mathrm{GM4^+}\oplus\mathrm{GM4^+}\oplus\mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{A2}\oplus\mathrm{A2}$
N129.9.283 $\mathrm{GM4^+}\oplus\mathrm{GM4^+}\oplus\mathrm{Z1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g}\oplus\mathrm{B2_g}$
N129.9.284 $\mathrm{GM4^+}\oplus\mathrm{GM4^+}\oplus\mathrm{Z1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g}\oplus\mathrm{B2_g}$
N129.9.285 $\mathrm{GM4^+}\oplus\mathrm{GM4^+}\oplus\mathrm{Z2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g}\oplus\mathrm{B2_g}$
N129.9.286 $\mathrm{GM4^+}\oplus\mathrm{GM4^+}\oplus\mathrm{Z2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g}\oplus\mathrm{B2_g}$
N129.9.287 $\mathrm{GM4^+}\oplus\mathrm{GM4^-}\oplus\mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A1_u}\oplus\mathrm{B2_g}$
N129.9.288 $\mathrm{GM4^+}\oplus\mathrm{GM4^-}\oplus\mathrm{Z1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B2_g}$
N129.9.289 $\mathrm{GM4^+}\oplus\mathrm{GM4^-}\oplus\mathrm{Z1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B2_g}$
N129.9.290 $\mathrm{GM4^+}\oplus\mathrm{GM4^-}\oplus\mathrm{Z2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B2_g}$
N129.9.291 $\mathrm{GM4^+}\oplus\mathrm{GM4^-}\oplus\mathrm{Z2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B2_g}$
N129.9.292 $\mathrm{GM4^+}\oplus\mathrm{Z1^+}\oplus\mathrm{Z1^+}$	$\surd$	1	1	$\times$	-	-
N129.9.293 $\mathrm{GM4^+}\oplus\mathrm{Z1^+}\oplus\mathrm{Z3^-}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	$\mathrm{B2}$
N129.9.294 $\mathrm{GM4^+}\oplus\mathrm{Z1^+}\oplus\mathrm{Z1^-}$	$\surd$	1	1	$\times$	-	-
N129.9.295 $\mathrm{GM4^+}\oplus\mathrm{Z1^+}\oplus\mathrm{Z3^+}$	$\surd$	1	1	$\times$	-	-
N129.9.296 $\mathrm{GM4^+}\oplus\mathrm{Z1^+}\oplus\mathrm{Z2^+}$	$\surd$	1	1	$\times$	-	-
N129.9.297 $\mathrm{GM4^+}\oplus\mathrm{Z1^+}\oplus\mathrm{Z4^-}$	$\surd$	1	1	$\times$	-	-
N129.9.298 $\mathrm{GM4^+}\oplus\mathrm{Z1^+}\oplus\mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
N129.9.299 $\mathrm{GM4^+}\oplus\mathrm{Z1^+}\oplus\mathrm{Z4^+}$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $P4/nmm$ (No. 129) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N129.9.300 $\mathrm{GM4^+}\oplus\mathrm{Z1^-}\oplus\mathrm{Z1^-}$	$\surd$	1	1	$\times$	-	-
N129.9.301 $\mathrm{GM4^+}\oplus\mathrm{Z1^-}\oplus\mathrm{Z3^+}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	$\mathrm{B2}$
N129.9.302 $\mathrm{GM4^+}\oplus\mathrm{Z1^-}\oplus\mathrm{Z2^+}$	$\surd$	1	1	$\times$	-	-
N129.9.303 $\mathrm{GM4^+}\oplus\mathrm{Z1^-}\oplus\mathrm{Z4^-}$	$\surd$	1	1	$\times$	-	-
N129.9.304 $\mathrm{GM4^+}\oplus\mathrm{Z1^-}\oplus\mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
N129.9.305 $\mathrm{GM4^+}\oplus\mathrm{Z1^-}\oplus\mathrm{Z4^+}$	$\surd$	1	1	$\times$	-	-
N129.9.306 $\mathrm{GM4^+}\oplus\mathrm{Z2^+}\oplus\mathrm{Z2^+}$	$\surd$	1	1	$\times$	-	-
N129.9.307 $\mathrm{GM4^+}\oplus\mathrm{Z2^+}\oplus\mathrm{Z4^-}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	$\mathrm{B2}$
N129.9.308 $\mathrm{GM4^+}\oplus\mathrm{Z2^+}\oplus\mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
N129.9.309 $\mathrm{GM4^+}\oplus\mathrm{Z2^+}\oplus\mathrm{Z4^+}$	$\surd$	1	1	$\times$	-	-
N129.9.310 $\mathrm{GM4^+}\oplus\mathrm{Z2^-}\oplus\mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
N129.9.311 $\mathrm{GM4^+}\oplus\mathrm{Z2^-}\oplus\mathrm{Z4^+}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	$\mathrm{B2}$
N129.9.312 $\mathrm{GM4^-}\oplus\mathrm{GM4^-}\oplus\mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N129.9.313 $\mathrm{GM4^-}\oplus\mathrm{GM4^-}\oplus\mathrm{Z1^+}$	$\surd$	0	0	$\surd$	-	-
N129.9.314 $\mathrm{GM4^-}\oplus\mathrm{GM4^-}\oplus\mathrm{Z1^-}$	$\surd$	0	0	$\surd$	-	-
N129.9.315 $\mathrm{GM4^-}\oplus\mathrm{GM4^-}\oplus\mathrm{Z2^+}$	$\surd$	0	0	$\surd$	-	-
N129.9.316 $\mathrm{GM4^-}\oplus\mathrm{GM4^-}\oplus\mathrm{Z2^-}$	$\surd$	0	0	$\surd$	-	-
N129.9.317 $\mathrm{GM4^-}\oplus\mathrm{Z1^+}\oplus\mathrm{Z1^+}$	$\surd$	1	0	$\times$	-	-
N129.9.318 $\mathrm{GM4^-}\oplus\mathrm{Z1^+}\oplus\mathrm{Z3^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N129.9.319 $\mathrm{GM4^-}\oplus\mathrm{Z1^+}\oplus\mathrm{Z1^-}$	$\surd$	1	1	$\times$	-	-
N129.9.320 $\mathrm{GM4^-}\oplus\mathrm{Z1^+}\oplus\mathrm{Z3^+}$	$\surd$	1	0	$\times$	-	-
N129.9.321 $\mathrm{GM4^-}\oplus\mathrm{Z1^+}\oplus\mathrm{Z2^+}$	$\surd$	1	0	$\times$	-	-
N129.9.322 $\mathrm{GM4^-}\oplus\mathrm{Z1^+}\oplus\mathrm{Z4^-}$	$\surd$	1	1	$\times$	-	-
N129.9.323 $\mathrm{GM4^-}\oplus\mathrm{Z1^+}\oplus\mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
N129.9.324 $\mathrm{GM4^-}\oplus\mathrm{Z1^+}\oplus\mathrm{Z4^+}$	$\surd$	1	0	$\times$	-	-
N129.9.325 $\mathrm{GM4^-}\oplus\mathrm{Z1^-}\oplus\mathrm{Z1^-}$	$\surd$	1	0	$\times$	-	-
N129.9.326 $\mathrm{GM4^-}\oplus\mathrm{Z1^-}\oplus\mathrm{Z3^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N129.9.327 $\mathrm{GM4^-}\oplus\mathrm{Z1^-}\oplus\mathrm{Z2^+}$	$\surd$	1	1	$\times$	-	-
N129.9.328 $\mathrm{GM4^-}\oplus\mathrm{Z1^-}\oplus\mathrm{Z4^-}$	$\surd$	1	0	$\times$	-	-
N129.9.329 $\mathrm{GM4^-}\oplus\mathrm{Z1^-}\oplus\mathrm{Z2^-}$	$\surd$	1	0	$\times$	-	-
N129.9.330 $\mathrm{GM4^-}\oplus\mathrm{Z1^-}\oplus\mathrm{Z4^+}$	$\surd$	1	1	$\times$	-	-
N129.9.331 $\mathrm{GM4^-}\oplus\mathrm{Z2^+}\oplus\mathrm{Z2^+}$	$\surd$	1	0	$\times$	-	-
N129.9.332 $\mathrm{GM4^-}\oplus\mathrm{Z2^+}\oplus\mathrm{Z4^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N129.9.333 $\mathrm{GM4^-}\oplus\mathrm{Z2^+}\oplus\mathrm{Z2^-}$	$\surd$	1	1	$\times$	-	-
N129.9.334 $\mathrm{GM4^-}\oplus\mathrm{Z2^+}\oplus\mathrm{Z4^+}$	$\surd$	1	0	$\times$	-	-
N129.9.335 $\mathrm{GM4^-}\oplus\mathrm{Z2^-}\oplus\mathrm{Z2^-}$	$\surd$	1	0	$\times$	-	-
N129.9.336 $\mathrm{GM4^-}\oplus\mathrm{Z2^-}\oplus\mathrm{Z4^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N129.9.337 $\mathrm{Z1^+}\oplus\mathrm{Z1^+}\oplus\mathrm{Z1^+}$	$\surd$	0	0	$\surd$	-	-
N129.9.338 $\mathrm{Z1^+}\oplus\mathrm{Z1^+}\oplus\mathrm{Z3^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u}\oplus\mathrm{A2_u}$
N129.9.339 $\mathrm{Z1^+}\oplus\mathrm{Z1^+}\oplus\mathrm{Z1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A1_u}$
N129.9.340 $\mathrm{Z1^+}\oplus\mathrm{Z1^+}\oplus\mathrm{Z3^+}$	$\surd$	0	0	$\surd$	-	-
N129.9.341 $\mathrm{Z1^+}\oplus\mathrm{Z3^-}\oplus\mathrm{Z1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A2_u}$
N129.9.342 $\mathrm{Z1^+}\oplus\mathrm{Z1^+}\oplus\mathrm{Z2^+}$	$\surd$	0	0	$\surd$	-	-
N129.9.343 $\mathrm{Z1^+}\oplus\mathrm{Z1^+}\oplus\mathrm{Z4^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_u}\oplus\mathrm{B2_u}$
N129.9.344 $\mathrm{Z1^+}\oplus\mathrm{Z3^-}\oplus\mathrm{Z2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u}\oplus\mathrm{B2_u}$
N129.9.345 $\mathrm{Z1^+}\oplus\mathrm{Z1^+}\oplus\mathrm{Z2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{B1_u}$

Non-coplanar SSGs with parent space group $P4/nmm$ (No. 129) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N129.9.346 $\mathrm{Z1}^+ \oplus \mathrm{Z1}^+ \oplus \mathrm{Z4}^+$	$\surd$	0	0	$\surd$	-	-
N129.9.347 $\mathrm{Z1}^+ \oplus \mathrm{Z3}^- \oplus \mathrm{Z2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_u}$
N129.9.348 $\mathrm{Z1}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u}$
N129.9.349 $\mathrm{Z1}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z3}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u}$
N129.9.350 $\mathrm{Z1}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z3}^+$	$\surd$	0	0	$\surd$	-	-
N129.9.351 $\mathrm{Z1}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u}$
N129.9.352 $\mathrm{Z1}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z4}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_u}$
N129.9.353 $\mathrm{Z1}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z2}^+$	$\surd$	0	0	$\surd$	-	-
N129.9.354 $\mathrm{Z1}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z4}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N129.9.355 $\mathrm{Z1}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u}$
N129.9.356 $\mathrm{Z1}^+ \oplus \mathrm{Z1}^- \oplus \mathrm{Z4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_u}$
N129.9.357 $\mathrm{Z1}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N129.9.358 $\mathrm{Z1}^+ \oplus \mathrm{Z3}^+ \oplus \mathrm{Z4}^+$	$\surd$	0	0	$\surd$	-	-
N129.9.359 $\mathrm{Z1}^+ \oplus \mathrm{Z2}^+ \oplus \mathrm{Z2}^+$	$\surd$	0	0	$\surd$	-	-
N129.9.360 $\mathrm{Z1}^+ \oplus \mathrm{Z2}^+ \oplus \mathrm{Z4}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_u}$
N129.9.361 $\mathrm{Z1}^+ \oplus \mathrm{Z4}^- \oplus \mathrm{Z4}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_u} \oplus \mathrm{B2_u}$
N129.9.362 $\mathrm{Z1}^+ \oplus \mathrm{Z2}^+ \oplus \mathrm{Z2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u}$
N129.9.363 $\mathrm{Z1}^+ \oplus \mathrm{Z2}^+ \oplus \mathrm{Z4}^+$	$\surd$	0	0	$\surd$	-	-
N129.9.364 $\mathrm{Z1}^+ \oplus \mathrm{Z4}^- \oplus \mathrm{Z2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N129.9.365 $\mathrm{Z1}^+ \oplus \mathrm{Z4}^- \oplus \mathrm{Z4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_u}$
N129.9.366 $\mathrm{Z1}^+ \oplus \mathrm{Z2}^- \oplus \mathrm{Z2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N129.9.367 $\mathrm{Z1}^+ \oplus \mathrm{Z2}^- \oplus \mathrm{Z4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_u}$
N129.9.368 $\mathrm{Z1}^+ \oplus \mathrm{Z4}^+ \oplus \mathrm{Z4}^+$	$\surd$	0	0	$\surd$	-	-
N129.9.369 $\mathrm{Z1}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z1}^-$	$\surd$	0	0	$\surd$	-	-
N129.9.370 $\mathrm{Z1}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z3}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u}$
N129.9.371 $\mathrm{Z1}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N129.9.372 $\mathrm{Z1}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z4}^-$	$\surd$	0	0	$\surd$	-	-
N129.9.373 $\mathrm{Z1}^- \oplus \mathrm{Z3}^+ \oplus \mathrm{Z2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_u}$
N129.9.374 $\mathrm{Z1}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z2}^-$	$\surd$	0	0	$\surd$	-	-
N129.9.375 $\mathrm{Z1}^- \oplus \mathrm{Z1}^- \oplus \mathrm{Z4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_u} \oplus \mathrm{B2_u}$
N129.9.376 $\mathrm{Z1}^- \oplus \mathrm{Z3}^+ \oplus \mathrm{Z2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_u}$
N129.9.377 $\mathrm{Z1}^- \oplus \mathrm{Z2}^+ \oplus \mathrm{Z2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N129.9.378 $\mathrm{Z1}^- \oplus \mathrm{Z2}^+ \oplus \mathrm{Z4}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_u}$
N129.9.379 $\mathrm{Z1}^- \oplus \mathrm{Z4}^- \oplus \mathrm{Z4}^-$	$\surd$	0	0	$\surd$	-	-
N129.9.380 $\mathrm{Z1}^- \oplus \mathrm{Z2}^+ \oplus \mathrm{Z2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u}$
N129.9.381 $\mathrm{Z1}^- \oplus \mathrm{Z2}^+ \oplus \mathrm{Z4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N129.9.382 $\mathrm{Z1}^- \oplus \mathrm{Z4}^- \oplus \mathrm{Z2}^-$	$\surd$	0	0	$\surd$	-	-
N129.9.383 $\mathrm{Z1}^- \oplus \mathrm{Z4}^- \oplus \mathrm{Z4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_u}$
N129.9.384 $\mathrm{Z1}^- \oplus \mathrm{Z2}^- \oplus \mathrm{Z2}^-$	$\surd$	0	0	$\surd$	-	-
N129.9.385 $\mathrm{Z1}^- \oplus \mathrm{Z2}^- \oplus \mathrm{Z4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_u}$
N129.9.386 $\mathrm{Z1}^- \oplus \mathrm{Z4}^+ \oplus \mathrm{Z4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_u} \oplus \mathrm{B2_u}$
N129.9.387 $\mathrm{Z2}^+ \oplus \mathrm{Z2}^+ \oplus \mathrm{Z2}^+$	$\surd$	0	0	$\surd$	-	-
N129.9.388 $\mathrm{Z2}^+ \oplus \mathrm{Z2}^+ \oplus \mathrm{Z4}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u}$
N129.9.389 $\mathrm{Z2}^+ \oplus \mathrm{Z2}^+ \oplus \mathrm{Z2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u}$
N129.9.390 $\mathrm{Z2}^+ \oplus \mathrm{Z2}^+ \oplus \mathrm{Z4}^+$	$\surd$	0	0	$\surd$	-	-
N129.9.391 $\mathrm{Z2}^+ \oplus \mathrm{Z4}^- \oplus \mathrm{Z2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u}$

Non-coplanar SSGs with parent space group $P4/nmm$ (No. 129) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N129.9.392 $\mathrm{Z2}^+ \oplus \mathrm{Z2}^- \oplus \mathrm{Z2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u}$
N129.9.393 $\mathrm{Z2}^+ \oplus \mathrm{Z2}^- \oplus \mathrm{Z4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u}$
N129.9.394 $\mathrm{Z2}^+ \oplus \mathrm{Z4}^+ \oplus \mathrm{Z4}^+$	$\surd$	0	0	$\surd$	-	-
N129.9.395 $\mathrm{Z2}^- \oplus \mathrm{Z2}^- \oplus \mathrm{Z2}^-$	$\surd$	0	0	$\surd$	-	-
N129.9.396 $\mathrm{Z2}^- \oplus \mathrm{Z2}^- \oplus \mathrm{Z4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u}$
N129.12.1 $\mathrm{GM1}^- \oplus \mathrm{GM5}^+$	$\surd$	2	2	$\surd$	$4mm$	E
N129.12.2 $\mathrm{GM1}^- \oplus \mathrm{GM5}^-$	$\surd$	0	0	$\surd$	-	-
N129.12.3 $\mathrm{GM1}^- \oplus \mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N129.12.4 $\mathrm{GM1}^- \oplus \mathrm{A3}$	$\surd$	1	1	$\times$	-	-
N129.12.5 $\mathrm{GM1}^- \oplus \mathrm{A4}$	$\surd$	1	1	$\times$	-	-
N129.12.6 $\mathrm{GM1}^- \oplus \mathrm{M1}$	$\surd$	1	1	$\times$	-	-
N129.12.7 $\mathrm{GM1}^- \oplus \mathrm{M2}$	$\surd$	1	1	$\times$	-	-
N129.12.8 $\mathrm{GM1}^- \oplus \mathrm{M3}$	$\surd$	1	1	$\times$	-	-
N129.12.9 $\mathrm{GM1}^- \oplus \mathrm{M4}$	$\surd$	1	1	$\times$	-	-
N129.12.10 $\mathrm{GM1}^- \oplus \mathrm{Z5}^+$	$\surd$	1	0	$\times$	-	-
N129.12.11 $\mathrm{GM2}^+ \oplus \mathrm{GM5}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{E_g}$
N129.12.12 $\mathrm{GM2}^+ \oplus \mathrm{GM5}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{E_u}$
N129.12.13 $\mathrm{GM2}^+ \oplus \mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N129.12.14 $\mathrm{GM2}^+ \oplus \mathrm{A3}$	$\surd$	1	1	$\times$	-	-
N129.12.15 $\mathrm{GM2}^+ \oplus \mathrm{A4}$	$\surd$	1	1	$\times$	-	-
N129.12.16 $\mathrm{GM2}^+ \oplus \mathrm{M1}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	B1
N129.12.17 $\mathrm{GM2}^+ \oplus \mathrm{M2}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	B1
N129.12.18 $\mathrm{GM2}^+ \oplus \mathrm{M3}$	$\surd$	1	1	$\surd$	422	B1
N129.12.19 $\mathrm{GM2}^+ \oplus \mathrm{M4}$	$\surd$	1	1	$\surd$	422	B1
N129.12.20 $\mathrm{GM2}^+ \oplus \mathrm{Z5}^+$	$\surd$	1	1	$\times$	-	-
N129.12.21 $\mathrm{GM2}^- \oplus \mathrm{GM5}^+$	$\surd$	2	2	$\surd$	$\bar{4}m2$	E
N129.12.22 $\mathrm{GM2}^- \oplus \mathrm{GM5}^-$	$\surd$	0	0	$\surd$	-	-
N129.12.23 $\mathrm{GM2}^- \oplus \mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N129.12.24 $\mathrm{GM2}^- \oplus \mathrm{A3}$	$\surd$	1	1	$\times$	-	-
N129.12.25 $\mathrm{GM2}^- \oplus \mathrm{A4}$	$\surd$	1	1	$\times$	-	-
N129.12.26 $\mathrm{GM2}^- \oplus \mathrm{M1}$	$\surd$	1	1	$\times$	-	-
N129.12.27 $\mathrm{GM2}^- \oplus \mathrm{M2}$	$\surd$	1	1	$\times$	-	-
N129.12.28 $\mathrm{GM2}^- \oplus \mathrm{M3}$	$\surd$	1	1	$\times$	-	-
N129.12.29 $\mathrm{GM2}^- \oplus \mathrm{M4}$	$\surd$	1	1	$\times$	-	-
N129.12.30 $\mathrm{GM2}^- \oplus \mathrm{Z5}^+$	$\surd$	1	0	$\times$	-	-
N129.12.31 $\mathrm{GM3}^+ \oplus \mathrm{GM5}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{E_g}$
N129.12.32 $\mathrm{GM3}^+ \oplus \mathrm{GM5}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{E_u}$
N129.12.33 $\mathrm{GM3}^+ \oplus \mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N129.12.34 $\mathrm{GM3}^+ \oplus \mathrm{A3}$	$\surd$	1	1	$\times$	-	-
N129.12.35 $\mathrm{GM3}^+ \oplus \mathrm{A4}$	$\surd$	1	1	$\times$	-	-
N129.12.36 $\mathrm{GM3}^+ \oplus \mathrm{M1}$	$\surd$	1	1	$\times$	-	-
N129.12.37 $\mathrm{GM3}^+ \oplus \mathrm{M2}$	$\surd$	1	1	$\times$	-	-
N129.12.38 $\mathrm{GM3}^+ \oplus \mathrm{M3}$	$\surd$	1	1	$\times$	-	-
N129.12.39 $\mathrm{GM3}^+ \oplus \mathrm{M4}$	$\surd$	1	1	$\times$	-	-
N129.12.40 $\mathrm{GM3}^+ \oplus \mathrm{Z5}^+$	$\surd$	1	1	$\times$	-	-
N129.12.41 $\mathrm{GM3}^- \oplus \mathrm{GM5}^+$	$\surd$	2	2	$\surd$	422	E

Non-coplanar SSGs with parent space group $P4/nmm$ (No. 129) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N129.12.42 $\mathrm{GM3^-} \oplus \mathrm{GM5^-}$	$\surd$	0	0	$\surd$	-	-
N129.12.43 $\mathrm{GM3^-} \oplus \mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N129.12.44 $\mathrm{GM3^-} \oplus \mathrm{A3}$	$\surd$	1	1	$\times$	-	-
N129.12.45 $\mathrm{GM3^-} \oplus \mathrm{A4}$	$\surd$	1	1	$\times$	-	-
N129.12.46 $\mathrm{GM3^-} \oplus \mathrm{M1}$	$\surd$	1	1	$\times$	-	-
N129.12.47 $\mathrm{GM3^-} \oplus \mathrm{M2}$	$\surd$	1	1	$\times$	-	-
N129.12.48 $\mathrm{GM3^-} \oplus \mathrm{M3}$	$\surd$	1	1	$\times$	-	-
N129.12.49 $\mathrm{GM3^-} \oplus \mathrm{M4}$	$\surd$	1	1	$\times$	-	-
N129.12.50 $\mathrm{GM3^-} \oplus \mathrm{Z5^+}$	$\surd$	1	0	$\times$	-	-
N129.12.51 $\mathrm{GM4^+} \oplus \mathrm{GM5^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{E_g}$
N129.12.52 $\mathrm{GM4^+} \oplus \mathrm{GM5^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{E_u}$
N129.12.53 $\mathrm{GM4^+} \oplus \mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N129.12.54 $\mathrm{GM4^+} \oplus \mathrm{A3}$	$\surd$	1	1	$\times$	-	-
N129.12.55 $\mathrm{GM4^+} \oplus \mathrm{A4}$	$\surd$	1	1	$\times$	-	-
N129.12.56 $\mathrm{GM4^+} \oplus \mathrm{M1}$	$\surd$	1	1	$\times$	-	-
N129.12.57 $\mathrm{GM4^+} \oplus \mathrm{M2}$	$\surd$	1	1	$\times$	-	-
N129.12.58 $\mathrm{GM4^+} \oplus \mathrm{M3}$	$\surd$	1	1	$\times$	-	-
N129.12.59 $\mathrm{GM4^+} \oplus \mathrm{M4}$	$\surd$	1	1	$\times$	-	-
N129.12.60 $\mathrm{GM4^+} \oplus \mathrm{Z5^+}$	$\surd$	1	1	$\times$	-	-
N129.12.61 $\mathrm{GM4^-} \oplus \mathrm{GM5^+}$	$\surd$	2	2	$\surd$	$\bar{4}2m$	E
N129.12.62 $\mathrm{GM4^-} \oplus \mathrm{GM5^-}$	$\surd$	0	0	$\surd$	-	-
N129.12.63 $\mathrm{GM4^-} \oplus \mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N129.12.64 $\mathrm{GM4^-} \oplus \mathrm{A3}$	$\surd$	1	1	$\times$	-	-
N129.12.65 $\mathrm{GM4^-} \oplus \mathrm{A4}$	$\surd$	1	1	$\times$	-	-
N129.12.66 $\mathrm{GM4^-} \oplus \mathrm{M1}$	$\surd$	1	1	$\times$	-	-
N129.12.67 $\mathrm{GM4^-} \oplus \mathrm{M2}$	$\surd$	1	1	$\times$	-	-
N129.12.68 $\mathrm{GM4^-} \oplus \mathrm{M3}$	$\surd$	1	1	$\times$	-	-
N129.12.69 $\mathrm{GM4^-} \oplus \mathrm{M4}$	$\surd$	1	1	$\times$	-	-
N129.12.70 $\mathrm{GM4^-} \oplus \mathrm{Z5^+}$	$\surd$	1	0	$\times$	-	-
N129.12.71 $\mathrm{Z1^+} \oplus \mathrm{GM5^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_g}$
N129.12.72 $\mathrm{Z1^+} \oplus \mathrm{GM5^-}$	$\surd$	0	0	$\surd$	-	-
N129.12.73 $\mathrm{Z1^+} \oplus \mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N129.12.74 $\mathrm{Z1^+} \oplus \mathrm{A2}$	$\surd$	1	1	$\times$	-	-
N129.12.75 $\mathrm{Z1^+} \oplus \mathrm{A3}$	$\surd$	1	1	$\times$	-	-
N129.12.76 $\mathrm{Z1^+} \oplus \mathrm{A4}$	$\surd$	1	1	$\times$	-	-
N129.12.77 $\mathrm{Z1^+} \oplus \mathrm{M1}$	$\surd$	1	1	$\times$	-	-
N129.12.78 $\mathrm{Z1^+} \oplus \mathrm{M2}$	$\surd$	1	1	$\times$	-	-
N129.12.79 $\mathrm{Z1^+} \oplus \mathrm{M3}$	$\surd$	1	1	$\times$	-	-
N129.12.80 $\mathrm{Z1^+} \oplus \mathrm{M4}$	$\surd$	1	1	$\times$	-	-
N129.12.81 $\mathrm{Z1^+} \oplus \mathrm{Z5^+}$	$\surd$	0	0	$\surd$	-	-
N129.12.82 $\mathrm{Z1^+} \oplus \mathrm{Z5^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_u}$
N129.12.83 $\mathrm{Z1^-} \oplus \mathrm{GM5^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_g}$
N129.12.84 $\mathrm{Z1^-} \oplus \mathrm{GM5^-}$	$\surd$	0	0	$\surd$	-	-
N129.12.85 $\mathrm{Z1^-} \oplus \mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N129.12.86 $\mathrm{Z1^-} \oplus \mathrm{A2}$	$\surd$	1	1	$\times$	-	-
N129.12.87 $\mathrm{Z1^-} \oplus \mathrm{A3}$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $P4/nmm$ (No. 129) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N129.12.88 $\mathrm{Z1^-}\oplus\mathrm{A4}$	$\surd$	1	1	$\times$	-	-
N129.12.89 $\mathrm{Z1^-}\oplus\mathrm{M1}$	$\surd$	1	1	$\times$	-	-
N129.12.90 $\mathrm{Z1^-}\oplus\mathrm{M2}$	$\surd$	1	1	$\times$	-	-
N129.12.91 $\mathrm{Z1^-}\oplus\mathrm{M3}$	$\surd$	1	1	$\times$	-	-
N129.12.92 $\mathrm{Z1^-}\oplus\mathrm{M4}$	$\surd$	1	1	$\times$	-	-
N129.12.93 $\mathrm{Z1^-}\oplus\mathrm{Z5^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_u}$
N129.12.94 $\mathrm{Z1^-}\oplus\mathrm{Z5^-}$	$\surd$	0	0	$\surd$	-	-
N129.12.95 $\mathrm{Z2^+}\oplus\mathrm{GM5^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_g}$
N129.12.96 $\mathrm{Z2^+}\oplus\mathrm{GM5^-}$	$\surd$	0	0	$\surd$	-	-
N129.12.97 $\mathrm{Z2^+}\oplus\mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N129.12.98 $\mathrm{Z2^+}\oplus\mathrm{A2}$	$\surd$	1	1	$\times$	-	-
N129.12.99 $\mathrm{Z2^+}\oplus\mathrm{A3}$	$\surd$	1	1	$\times$	-	-
N129.12.100 $\mathrm{Z2^+}\oplus\mathrm{A4}$	$\surd$	1	1	$\times$	-	-
N129.12.101 $\mathrm{Z2^+}\oplus\mathrm{M1}$	$\surd$	1	1	$\times$	-	-
N129.12.102 $\mathrm{Z2^+}\oplus\mathrm{M2}$	$\surd$	1	1	$\times$	-	-
N129.12.103 $\mathrm{Z2^+}\oplus\mathrm{M3}$	$\surd$	1	1	$\times$	-	-
N129.12.104 $\mathrm{Z2^+}\oplus\mathrm{M4}$	$\surd$	1	1	$\times$	-	-
N129.12.105 $\mathrm{Z2^+}\oplus\mathrm{Z5^+}$	$\surd$	0	0	$\surd$	-	-
N129.12.106 $\mathrm{Z2^+}\oplus\mathrm{Z5^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_u}$
N129.12.107 $\mathrm{Z2^-}\oplus\mathrm{GM5^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_g}$
N129.12.108 $\mathrm{Z2^-}\oplus\mathrm{GM5^-}$	$\surd$	0	0	$\surd$	-	-
N129.12.109 $\mathrm{Z2^-}\oplus\mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N129.12.110 $\mathrm{Z2^-}\oplus\mathrm{A2}$	$\surd$	1	1	$\times$	-	-
N129.12.111 $\mathrm{Z2^-}\oplus\mathrm{A3}$	$\surd$	1	1	$\times$	-	-
N129.12.112 $\mathrm{Z2^-}\oplus\mathrm{A4}$	$\surd$	1	1	$\times$	-	-
N129.12.113 $\mathrm{Z2^-}\oplus\mathrm{M1}$	$\surd$	1	1	$\times$	-	-
N129.12.114 $\mathrm{Z2^-}\oplus\mathrm{M2}$	$\surd$	1	1	$\times$	-	-
N129.12.115 $\mathrm{Z2^-}\oplus\mathrm{M3}$	$\surd$	1	1	$\times$	-	-
N129.12.116 $\mathrm{Z2^-}\oplus\mathrm{M4}$	$\surd$	1	1	$\times$	-	-
N129.12.117 $\mathrm{Z2^-}\oplus\mathrm{Z5^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_u}$
N129.12.118 $\mathrm{Z2^-}\oplus\mathrm{Z5^-}$	$\surd$	0	0	$\surd$	-	-
N129.14.1 $\mathrm{GM1^-}\oplus\mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N129.14.2 $\mathrm{GM1^-}\oplus\mathrm{LD2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N129.14.3 $\mathrm{GM1^-}\oplus\mathrm{LD3}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N129.14.4 $\mathrm{GM1^-}\oplus\mathrm{LD4}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N129.14.5 $\mathrm{GM2^+}\oplus\mathrm{LD1}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N129.14.6 $\mathrm{GM2^+}\oplus\mathrm{LD2}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N129.14.7 $\mathrm{GM2^+}\oplus\mathrm{LD3}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N129.14.8 $\mathrm{GM2^+}\oplus\mathrm{LD4}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N129.14.9 $\mathrm{GM2^-}\oplus\mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N129.14.10 $\mathrm{GM2^-}\oplus\mathrm{LD2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N129.14.11 $\mathrm{GM2^-}\oplus\mathrm{LD3}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N129.14.12 $\mathrm{GM2^-}\oplus\mathrm{LD4}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N129.14.13 $\mathrm{GM3^+}\oplus\mathrm{LD1}$	$\surd$	1	1	$\surd$	422	A2
N129.14.14 $\mathrm{GM3^+}\oplus\mathrm{LD2}$	$\surd$	1	1	$\surd$	422	A2
N129.14.15 $\mathrm{GM3^+}\oplus\mathrm{LD3}$	$\surd$	1	1	$\surd$	422	A2

Non-coplanar SSGs with parent space group $P4/nmm$ (No. 129) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N129.14.16 GM3$^+$ ⊕ LD4	√	1	1	√	422	A2
N129.14.17 GM3$^-$ ⊕ LD1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N129.14.18 GM3$^-$ ⊕ LD2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N129.14.19 GM3$^-$ ⊕ LD3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N129.14.20 GM3$^-$ ⊕ LD4	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N129.14.21 GM4$^+$ ⊕ LD1	√	1	1	√	$\bar{4}2m$	B2
N129.14.22 GM4$^+$ ⊕ LD2	√	1	1	√	$\bar{4}2m$	B2
N129.14.23 GM4$^+$ ⊕ LD3	√	1	1	√	$\bar{4}2m$	B2
N129.14.24 GM4$^+$ ⊕ LD4	√	1	1	√	$\bar{4}2m$	B2
N129.14.25 GM4$^-$ ⊕ LD1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N129.14.26 GM4$^-$ ⊕ LD2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N129.14.27 GM4$^-$ ⊕ LD3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N129.14.28 GM4$^-$ ⊕ LD4	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N129.14.29 Z1$^+$ ⊕ LD1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N129.14.30 Z1$^+$ ⊕ LD2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N129.14.31 Z1$^+$ ⊕ LD3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N129.14.32 Z1$^+$ ⊕ LD4	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N129.14.33 Z1$^-$ ⊕ LD1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N129.14.34 Z1$^-$ ⊕ LD2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N129.14.35 Z1$^-$ ⊕ LD3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N129.14.36 Z1$^-$ ⊕ LD4	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N129.14.37 Z2$^+$ ⊕ LD1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N129.14.38 Z2$^+$ ⊕ LD2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N129.14.39 Z2$^+$ ⊕ LD3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N129.14.40 Z2$^+$ ⊕ LD4	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N129.14.41 Z2$^-$ ⊕ LD1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N129.14.42 Z2$^-$ ⊕ LD2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N129.14.43 Z2$^-$ ⊕ LD3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N129.14.44 Z2$^-$ ⊕ LD4	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$

TABLE S388: Collinear SSGs with parent space group $P4/ncc$ (No. 130).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L130.1.1 GM1$^+$	1	$4/mmm$	$\mathrm{A1_g}$
L130.2.1 GM1$^-$	0	-	-
L130.2.2 GM2$^+$	1	$4/mmm$	$\mathrm{B1_g}$
L130.2.3 GM2$^-$	0	-	-
L130.2.4 GM3$^+$	1	$4/mmm$	$\mathrm{A2_g}$
L130.2.5 GM3$^-$	0	-	-
L130.2.6 GM4$^+$	1	$4/mmm$	$\mathrm{B2_g}$
L130.2.7 GM4$^-$	0	-	-

TABLE S389: Coplanar SSGs with parent space group $P4/ncc$ (No. 130).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P130.1.1 GM1$^+$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g}$

Coplanar SSGs with parent space group $P4/ncc$ (No. 130) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P130.2.1 $\mathrm{GM1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u}$
P130.2.2 $\mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g}$
P130.2.3 $\mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u}$
P130.2.4 $\mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g}$
P130.2.5 $\mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_u}$
P130.2.6 $\mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_g}$
P130.2.7 $\mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_u}$
P130.3.1 $\mathrm{GM1}^- \oplus \mathrm{GM1}^-$	$\surd$	0	0	$\surd$	-	-
P130.3.2 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
P130.3.3 $\mathrm{GM1}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
P130.3.4 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u}$
P130.3.5 $\mathrm{GM1}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
P130.3.6 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_u}$
P130.3.7 $\mathrm{GM1}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
P130.3.8 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
P130.3.9 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g}$
P130.3.10 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g}$
P130.3.11 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
P130.3.12 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
P130.3.13 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u}$
P130.3.14 $\mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
P130.3.15 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_u}$
P130.3.16 $\mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
P130.3.17 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g}$
P130.3.18 $\mathrm{GM2}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
P130.3.19 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g}$
P130.3.20 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g}$
P130.3.21 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g}$
P130.3.22 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g}$
P130.3.23 $\mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
P130.3.24 $\mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_g}$
P130.3.25 $\mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
P130.3.26 $\mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_g}$
P130.3.27 $\mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g}$
P130.3.28 $\mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
P130.6.1 $\mathrm{GM5}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_g}$
P130.6.2 $\mathrm{GM5}^-$	$\surd$	0	0	$\surd$	-	-
P130.6.3 M1	$\surd$	1	1	$\times$	-	-
P130.6.4 M2	$\surd$	1	1	$\times$	-	-
P130.6.5 M3	$\surd$	1	1	$\times$	-	-
P130.6.6 M4	$\surd$	1	1	$\times$	-	-
P130.6.7 Z1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P130.6.8 Z2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P130.8.1 LD1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P130.8.2 LD2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$

TABLE S390: Non-coplanar SSGs with parent space group $P4/ncc$ (No. 130).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N130.1.1 GM1$^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A1_g}$
N130.2.1 GM1$^-$	$\surd$	2	2	$\surd$	422	$\mathrm{A1}\oplus\mathrm{A1}$
N130.2.2 GM2$^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{B1_g}$
N130.2.3 GM2$^-$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{A1}\oplus\mathrm{A1}$
N130.2.4 GM3$^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A2_g}$
N130.2.5 GM3$^-$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{A1}\oplus\mathrm{A1}$
N130.2.6 GM4$^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{B2_g}$
N130.2.7 GM4$^-$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{A1}\oplus\mathrm{A1}$
N130.3.1 GM1$^-\oplus$GM1$^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{A1_u}$
N130.3.2 GM1$^-\oplus$GM2$^+$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{A1}\oplus\mathrm{B1}$
N130.3.3 GM1$^-\oplus$GM2$^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{B1_u}$
N130.3.4 GM1$^-\oplus$GM3$^+$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{A1}\oplus\mathrm{A2}$
N130.3.5 GM1$^-\oplus$GM3$^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{A2_u}$
N130.3.6 GM1$^-\oplus$GM4$^+$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{A1}\oplus\mathrm{A2}$
N130.3.7 GM1$^-\oplus$GM4$^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{B2_u}$
N130.3.8 GM2$^+\oplus$GM2$^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B1_g}$
N130.3.9 GM2$^+\oplus$GM2$^-$	$\surd$	2	2	$\surd$	422	$\mathrm{A1}\oplus\mathrm{B1}$
N130.3.10 GM2$^+\oplus$GM3$^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}\oplus\mathrm{A2_g}$
N130.3.11 GM2$^+\oplus$GM3$^-$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{A1}\oplus\mathrm{B1}$
N130.3.12 GM2$^+\oplus$GM4$^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B2_g}$
N130.3.13 GM2$^+\oplus$GM4$^-$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{A1}\oplus\mathrm{B1}$
N130.3.14 GM2$^-\oplus$GM2$^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}\oplus\mathrm{B1_u}$
N130.3.15 GM2$^-\oplus$GM3$^+$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{A1}\oplus\mathrm{B2}$
N130.3.16 GM2$^-\oplus$GM3$^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}\oplus\mathrm{A2_u}$
N130.3.17 GM2$^-\oplus$GM4$^+$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{A1}\oplus\mathrm{B2}$
N130.3.18 GM2$^-\oplus$GM4$^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}\oplus\mathrm{B2_u}$
N130.3.19 GM3$^+\oplus$GM3$^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_g}$
N130.3.20 GM3$^+\oplus$GM3$^-$	$\surd$	2	2	$\surd$	422	$\mathrm{A1}\oplus\mathrm{A2}$
N130.3.21 GM3$^+\oplus$GM4$^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_g}\oplus\mathrm{B2_g}$
N130.3.22 GM3$^+\oplus$GM4$^-$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{A1}\oplus\mathrm{A2}$
N130.3.23 GM3$^-\oplus$GM3$^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_u}\oplus\mathrm{A2_u}$
N130.3.24 GM3$^-\oplus$GM4$^+$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{A1}\oplus\mathrm{B2}$
N130.3.25 GM3$^-\oplus$GM4$^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_u}\oplus\mathrm{B2_u}$
N130.3.26 GM4$^+\oplus$GM4$^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_g}\oplus\mathrm{B2_g}$
N130.3.27 GM4$^+\oplus$GM4$^-$	$\surd$	2	2	$\surd$	422	$\mathrm{A1}\oplus\mathrm{B2}$
N130.3.28 GM4$^-\oplus$GM4$^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_u}\oplus\mathrm{B2_u}$
N130.6.1 GM5$^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{E_g}$
N130.6.2 GM5$^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{E_u}$
N130.6.3 M1	$\surd$	1	1	$\surd$	422	A1
N130.6.4 M2	$\surd$	1	1	$\surd$	422	A1
N130.6.5 M3	$\surd$	1	1	$\surd$	$\bar{4}2m$	A1
N130.6.6 M4	$\surd$	1	1	$\surd$	$\bar{4}2m$	A1
N130.6.7 Z1	$\surd$	1	1	$\surd$	$4mm$	A1
N130.6.8 Z2	$\surd$	1	1	$\surd$	$4mm$	A1
N130.8.1 LD1	$\surd$	1	1	$\surd$	$4mm$	A1
N130.8.2 LD2	$\surd$	1	1	$\surd$	$4mm$	A1

Non-coplanar SSGs with parent space group $P4/ncc$ (No. 130) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N130.9.1 $\mathrm{GM1^-}\oplus\mathrm{GM1^-}\oplus\mathrm{GM1^-}$	$\surd$	0	0	$\surd$	-	-
N130.9.2 $\mathrm{GM1^-}\oplus\mathrm{GM1^-}\oplus\mathrm{GM2^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_u}\oplus\mathrm{B1_u}$
N130.9.3 $\mathrm{GM1^-}\oplus\mathrm{GM1^-}\oplus\mathrm{GM2^-}$	$\surd$	0	0	$\surd$	-	-
N130.9.4 $\mathrm{GM1^-}\oplus\mathrm{GM1^-}\oplus\mathrm{GM3^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{A2_u}\oplus\mathrm{A2_u}$
N130.9.5 $\mathrm{GM1^-}\oplus\mathrm{GM1^-}\oplus\mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
N130.9.6 $\mathrm{GM1^-}\oplus\mathrm{GM1^-}\oplus\mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B2_g}\oplus\mathrm{B2_u}\oplus\mathrm{B2_u}$
N130.9.7 $\mathrm{GM1^-}\oplus\mathrm{GM1^-}\oplus\mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N130.9.8 $\mathrm{GM1^-}\oplus\mathrm{GM2^+}\oplus\mathrm{GM2^+}$	$\surd$	2	2	$\surd$	422	$\mathrm{B1}\oplus\mathrm{B1}$
N130.9.9 $\mathrm{GM1^-}\oplus\mathrm{GM2^+}\oplus\mathrm{GM2^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B1_g}\oplus\mathrm{B1_u}$
N130.9.10 $\mathrm{GM1^-}\oplus\mathrm{GM2^+}\oplus\mathrm{GM3^+}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{B1}\oplus\mathrm{B2}$
N130.9.11 $\mathrm{GM1^-}\oplus\mathrm{GM2^+}\oplus\mathrm{GM3^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_u}\oplus\mathrm{B2_u}$
N130.9.12 $\mathrm{GM1^-}\oplus\mathrm{GM2^+}\oplus\mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{B1}\oplus\mathrm{B2}$
N130.9.13 $\mathrm{GM1^-}\oplus\mathrm{GM2^+}\oplus\mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_u}\oplus\mathrm{A2_u}$
N130.9.14 $\mathrm{GM1^-}\oplus\mathrm{GM2^-}\oplus\mathrm{GM2^-}$	$\surd$	0	0	$\surd$	-	-
N130.9.15 $\mathrm{GM1^-}\oplus\mathrm{GM2^-}\oplus\mathrm{GM3^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{A2_u}\oplus\mathrm{B2_u}$
N130.9.16 $\mathrm{GM1^-}\oplus\mathrm{GM2^-}\oplus\mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
N130.9.17 $\mathrm{GM1^-}\oplus\mathrm{GM2^-}\oplus\mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_u}\oplus\mathrm{B2_g}\oplus\mathrm{B2_u}$
N130.9.18 $\mathrm{GM1^-}\oplus\mathrm{GM2^-}\oplus\mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N130.9.19 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{GM3^+}$	$\surd$	2	2	$\surd$	422	$\mathrm{A2}\oplus\mathrm{A2}$
N130.9.20 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{GM3^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A2_g}\oplus\mathrm{A2_u}$
N130.9.21 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B2}\oplus\mathrm{A2}$
N130.9.22 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{A2_g}\oplus\mathrm{A2_u}$
N130.9.23 $\mathrm{GM1^-}\oplus\mathrm{GM3^-}\oplus\mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
N130.9.24 $\mathrm{GM1^-}\oplus\mathrm{GM3^-}\oplus\mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{B2_g}\oplus\mathrm{B2_u}$
N130.9.25 $\mathrm{GM1^-}\oplus\mathrm{GM3^-}\oplus\mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N130.9.26 $\mathrm{GM1^-}\oplus\mathrm{GM4^+}\oplus\mathrm{GM4^+}$	$\surd$	2	2	$\surd$	422	$\mathrm{B2}\oplus\mathrm{B2}$
N130.9.27 $\mathrm{GM1^-}\oplus\mathrm{GM4^+}\oplus\mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B2_g}\oplus\mathrm{B2_u}$
N130.9.28 $\mathrm{GM1^-}\oplus\mathrm{GM4^-}\oplus\mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N130.9.29 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{GM2^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B1_g}$
N130.9.30 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{GM2^-}$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B1}\oplus\mathrm{B1}$
N130.9.31 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{GM3^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_g}\oplus\mathrm{A2_g}$
N130.9.32 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{GM3^-}$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{B1}\oplus\mathrm{B1}$
N130.9.33 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B2_g}$
N130.9.34 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{B1}\oplus\mathrm{B1}$
N130.9.35 $\mathrm{GM2^+}\oplus\mathrm{GM2^-}\oplus\mathrm{GM2^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A1_u}\oplus\mathrm{B1_g}$
N130.9.36 $\mathrm{GM2^+}\oplus\mathrm{GM2^-}\oplus\mathrm{GM3^+}$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{B1}\oplus\mathrm{A2}$
N130.9.37 $\mathrm{GM2^+}\oplus\mathrm{GM2^-}\oplus\mathrm{GM3^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B1_g}\oplus\mathrm{B2_u}$
N130.9.38 $\mathrm{GM2^+}\oplus\mathrm{GM2^-}\oplus\mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{B1}\oplus\mathrm{A2}$
N130.9.39 $\mathrm{GM2^+}\oplus\mathrm{GM2^-}\oplus\mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B1_g}\oplus\mathrm{A2_u}$
N130.9.40 $\mathrm{GM2^+}\oplus\mathrm{GM3^+}\oplus\mathrm{GM3^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_g}$
N130.9.41 $\mathrm{GM2^+}\oplus\mathrm{GM3^+}\oplus\mathrm{GM3^-}$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B1}\oplus\mathrm{A2}$
N130.9.42 $\mathrm{GM2^+}\oplus\mathrm{GM3^+}\oplus\mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_g}\oplus\mathrm{B2_g}$
N130.9.43 $\mathrm{GM2^+}\oplus\mathrm{GM3^+}\oplus\mathrm{GM4^-}$	$\surd$	2	2	$\surd$	422	$\mathrm{B1}\oplus\mathrm{A2}$
N130.9.44 $\mathrm{GM2^+}\oplus\mathrm{GM3^-}\oplus\mathrm{GM3^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B2_u}\oplus\mathrm{B2_u}$
N130.9.45 $\mathrm{GM2^+}\oplus\mathrm{GM3^-}\oplus\mathrm{GM4^+}$	$\surd$	2	2	$\surd$	422	$\mathrm{B1}\oplus\mathrm{B2}$
N130.9.46 $\mathrm{GM2^+}\oplus\mathrm{GM3^-}\oplus\mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_u}\oplus\mathrm{B2_u}$

Non-coplanar SSGs with parent space group $P4/ncc$ (No. 130) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N130.9.47 $\mathrm{GM2}^{+}\oplus\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{+}$	√	3	3	√	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B2_g}\oplus\mathrm{B2_g}$
N130.9.48 $\mathrm{GM2}^{+}\oplus\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{-}$	√	2	2	√	$\bar{4}2m$	$\mathrm{B1}\oplus\mathrm{B2}$
N130.9.49 $\mathrm{GM2}^{+}\oplus\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}$	√	3	3	√	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_u}\oplus\mathrm{A2_u}$
N130.9.50 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}$	√	0	0	√	-	-
N130.9.51 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{+}$	√	3	3	√	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{B2_u}\oplus\mathrm{B2_u}$
N130.9.52 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}$	√	0	0	√	-	-
N130.9.53 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{GM4}^{+}$	√	3	3	√	$4/mmm$	$\mathrm{A2_u}\oplus\mathrm{A2_u}\oplus\mathrm{B2_g}$
N130.9.54 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{GM4}^{-}$	√	0	0	√	-	-
N130.9.55 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{+}$	√	2	2	√	$\bar{4}2m$	$\mathrm{A2}\oplus\mathrm{A2}$
N130.9.56 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{-}$	√	3	3	√	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A2_g}\oplus\mathrm{B2_u}$
N130.9.57 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{+}\oplus\mathrm{GM4}^{+}$	√	2	2	√	422	$\mathrm{A2}\oplus\mathrm{B2}$
N130.9.58 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{+}\oplus\mathrm{GM4}^{-}$	√	3	3	√	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{A2_g}\oplus\mathrm{B2_u}$
N130.9.59 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}$	√	0	0	√	-	-
N130.9.60 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{+}$	√	3	3	√	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{A2_u}\oplus\mathrm{B2_g}$
N130.9.61 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{-}$	√	0	0	√	-	-
N130.9.62 $\mathrm{GM2}^{-}\oplus\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{+}$	√	2	2	√	$\bar{4}2m$	$\mathrm{B2}\oplus\mathrm{B2}$
N130.9.63 $\mathrm{GM2}^{-}\oplus\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{-}$	√	3	3	√	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A2_u}\oplus\mathrm{B2_g}$
N130.9.64 $\mathrm{GM2}^{-}\oplus\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}$	√	0	0	√	-	-
N130.9.65 $\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{+}$	√	3	3	√	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_g}$
N130.9.66 $\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{-}$	√	2	2	√	$4mm$	$\mathrm{A2}\oplus\mathrm{A2}$
N130.9.67 $\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{+}\oplus\mathrm{GM4}^{+}$	√	3	3	√	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{A2_g}\oplus\mathrm{B2_g}$
N130.9.68 $\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{+}\oplus\mathrm{GM4}^{-}$	√	2	2	√	$\bar{4}m2$	$\mathrm{B2}\oplus\mathrm{B2}$
N130.9.69 $\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}$	√	3	3	√	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A1_u}\oplus\mathrm{A2_g}$
N130.9.70 $\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{+}$	√	2	2	√	$\bar{4}m2$	$\mathrm{B2}\oplus\mathrm{A2}$
N130.9.71 $\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{-}$	√	3	3	√	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B1_u}\oplus\mathrm{A2_g}$
N130.9.72 $\mathrm{GM3}^{+}\oplus\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{+}$	√	3	3	√	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{B2_g}\oplus\mathrm{B2_g}$
N130.9.73 $\mathrm{GM3}^{+}\oplus\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{-}$	√	2	2	√	$4mm$	$\mathrm{B2}\oplus\mathrm{A2}$
N130.9.74 $\mathrm{GM3}^{+}\oplus\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}$	√	3	3	√	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{B1_u}\oplus\mathrm{A2_g}$
N130.9.75 $\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}$	√	0	0	√	-	-
N130.9.76 $\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{+}$	√	3	3	√	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{B1_u}\oplus\mathrm{B2_g}$
N130.9.77 $\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{-}$	√	0	0	√	-	-
N130.9.78 $\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{+}$	√	2	2	√	$4mm$	$\mathrm{B2}\oplus\mathrm{B2}$
N130.9.79 $\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{-}$	√	3	3	√	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B1_u}\oplus\mathrm{B2_g}$
N130.9.80 $\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}$	√	0	0	√	-	-
N130.9.81 $\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{+}$	√	3	3	√	$4/mmm$	$\mathrm{B2_g}\oplus\mathrm{B2_g}\oplus\mathrm{B2_g}$
N130.9.82 $\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{-}$	√	2	2	√	$\bar{4}m2$	$\mathrm{A2}\oplus\mathrm{A2}$
N130.9.83 $\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}$	√	3	3	√	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A1_u}\oplus\mathrm{B2_g}$
N130.9.84 $\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}$	√	0	0	√	-	-
N130.12.1 $\mathrm{GM1}^{-}\oplus\mathrm{GM5}^{+}$	√	2	2	√	$4mm$	E
N130.12.2 $\mathrm{GM1}^{-}\oplus\mathrm{GM5}^{-}$	√	0	0	√	-	-
N130.12.3 $\mathrm{GM1}^{-}\oplus\mathrm{M1}$	√	1	1	×	-	-
N130.12.4 $\mathrm{GM1}^{-}\oplus\mathrm{M2}$	√	1	1	×	-	-
N130.12.5 $\mathrm{GM1}^{-}\oplus\mathrm{M3}$	√	1	1	×	-	-
N130.12.6 $\mathrm{GM1}^{-}\oplus\mathrm{M4}$	√	1	1	×	-	-
N130.12.7 $\mathrm{GM1}^{-}\oplus\mathrm{Z1}$	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N130.12.8 $\mathrm{GM1}^{-}\oplus\mathrm{Z2}$	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$

Non-coplanar SSGs with parent space group $P4/ncc$ (No. 130) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N130.12.9 $\mathrm{GM2}^{+}\oplus\mathrm{GM5}^{+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{E_g}$
N130.12.10 $\mathrm{GM2}^{+}\oplus\mathrm{GM5}^{-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{E_u}$
N130.12.11 $\mathrm{GM2}^{+}\oplus\mathrm{M1}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	B1
N130.12.12 $\mathrm{GM2}^{+}\oplus\mathrm{M2}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	B1
N130.12.13 $\mathrm{GM2}^{+}\oplus\mathrm{M3}$	$\surd$	1	1	$\surd$	422	B1
N130.12.14 $\mathrm{GM2}^{+}\oplus\mathrm{M4}$	$\surd$	1	1	$\surd$	422	B1
N130.12.15 $\mathrm{GM2}^{+}\oplus\mathrm{Z1}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N130.12.16 $\mathrm{GM2}^{+}\oplus\mathrm{Z2}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N130.12.17 $\mathrm{GM2}^{-}\oplus\mathrm{GM5}^{+}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	E
N130.12.18 $\mathrm{GM2}^{-}\oplus\mathrm{GM5}^{-}$	$\surd$	0	0	$\surd$	-	-
N130.12.19 $\mathrm{GM2}^{-}\oplus\mathrm{M1}$	$\surd$	1	1	$\times$	-	-
N130.12.20 $\mathrm{GM2}^{-}\oplus\mathrm{M2}$	$\surd$	1	1	$\times$	-	-
N130.12.21 $\mathrm{GM2}^{-}\oplus\mathrm{M3}$	$\surd$	1	1	$\times$	-	-
N130.12.22 $\mathrm{GM2}^{-}\oplus\mathrm{M4}$	$\surd$	1	1	$\times$	-	-
N130.12.23 $\mathrm{GM2}^{-}\oplus\mathrm{Z1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N130.12.24 $\mathrm{GM2}^{-}\oplus\mathrm{Z2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N130.12.25 $\mathrm{GM3}^{+}\oplus\mathrm{GM5}^{+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{E_g}$
N130.12.26 $\mathrm{GM3}^{+}\oplus\mathrm{GM5}^{-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{E_u}$
N130.12.27 $\mathrm{GM3}^{+}\oplus\mathrm{M1}$	$\surd$	1	1	$\times$	-	-
N130.12.28 $\mathrm{GM3}^{+}\oplus\mathrm{M2}$	$\surd$	1	1	$\times$	-	-
N130.12.29 $\mathrm{GM3}^{+}\oplus\mathrm{M3}$	$\surd$	1	1	$\times$	-	-
N130.12.30 $\mathrm{GM3}^{+}\oplus\mathrm{M4}$	$\surd$	1	1	$\times$	-	-
N130.12.31 $\mathrm{GM3}^{+}\oplus\mathrm{Z1}$	$\surd$	1	1	$\surd$	422	A2
N130.12.32 $\mathrm{GM3}^{+}\oplus\mathrm{Z2}$	$\surd$	1	1	$\surd$	422	A2
N130.12.33 $\mathrm{GM3}^{-}\oplus\mathrm{GM5}^{+}$	$\surd$	2	2	$\surd$	422	E
N130.12.34 $\mathrm{GM3}^{-}\oplus\mathrm{GM5}^{-}$	$\surd$	0	0	$\surd$	-	-
N130.12.35 $\mathrm{GM3}^{-}\oplus\mathrm{M1}$	$\surd$	1	1	$\times$	-	-
N130.12.36 $\mathrm{GM3}^{-}\oplus\mathrm{M2}$	$\surd$	1	1	$\times$	-	-
N130.12.37 $\mathrm{GM3}^{-}\oplus\mathrm{M3}$	$\surd$	1	1	$\times$	-	-
N130.12.38 $\mathrm{GM3}^{-}\oplus\mathrm{M4}$	$\surd$	1	1	$\times$	-	-
N130.12.39 $\mathrm{GM3}^{-}\oplus\mathrm{Z1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N130.12.40 $\mathrm{GM3}^{-}\oplus\mathrm{Z2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N130.12.41 $\mathrm{GM4}^{+}\oplus\mathrm{GM5}^{+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B2_g}\oplus\mathrm{E_g}$
N130.12.42 $\mathrm{GM4}^{+}\oplus\mathrm{GM5}^{-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B2_g}\oplus\mathrm{E_u}$
N130.12.43 $\mathrm{GM4}^{+}\oplus\mathrm{M1}$	$\surd$	1	1	$\times$	-	-
N130.12.44 $\mathrm{GM4}^{+}\oplus\mathrm{M2}$	$\surd$	1	1	$\times$	-	-
N130.12.45 $\mathrm{GM4}^{+}\oplus\mathrm{M3}$	$\surd$	1	1	$\times$	-	-
N130.12.46 $\mathrm{GM4}^{+}\oplus\mathrm{M4}$	$\surd$	1	1	$\times$	-	-
N130.12.47 $\mathrm{GM4}^{+}\oplus\mathrm{Z1}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N130.12.48 $\mathrm{GM4}^{+}\oplus\mathrm{Z2}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N130.12.49 $\mathrm{GM4}^{-}\oplus\mathrm{GM5}^{+}$	$\surd$	2	2	$\surd$	$\bar{4}2m$	E
N130.12.50 $\mathrm{GM4}^{-}\oplus\mathrm{GM5}^{-}$	$\surd$	0	0	$\surd$	-	-
N130.12.51 $\mathrm{GM4}^{-}\oplus\mathrm{M1}$	$\surd$	1	1	$\times$	-	-
N130.12.52 $\mathrm{GM4}^{-}\oplus\mathrm{M2}$	$\surd$	1	1	$\times$	-	-
N130.12.53 $\mathrm{GM4}^{-}\oplus\mathrm{M3}$	$\surd$	1	1	$\times$	-	-
N130.12.54 $\mathrm{GM4}^{-}\oplus\mathrm{M4}$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $P4/ncc$ (No. 130) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N130.12.55 GM4$^-$ $\oplus$ Z1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N130.12.56 GM4$^-$ $\oplus$ Z2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N130.14.1 GM1$^-$ $\oplus$ LD1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N130.14.2 GM1$^-$ $\oplus$ LD2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N130.14.3 GM2$^+$ $\oplus$ LD1	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N130.14.4 GM2$^+$ $\oplus$ LD2	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N130.14.5 GM2$^-$ $\oplus$ LD1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N130.14.6 GM2$^-$ $\oplus$ LD2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N130.14.7 GM3$^+$ $\oplus$ LD1	$\surd$	1	1	$\surd$	422	A2
N130.14.8 GM3$^+$ $\oplus$ LD2	$\surd$	1	1	$\surd$	422	A2
N130.14.9 GM3$^-$ $\oplus$ LD1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N130.14.10 GM3$^-$ $\oplus$ LD2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N130.14.11 GM4$^+$ $\oplus$ LD1	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N130.14.12 GM4$^+$ $\oplus$ LD2	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N130.14.13 GM4$^-$ $\oplus$ LD1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N130.14.14 GM4$^-$ $\oplus$ LD2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$

TABLE S391: Collinear SSGs with parent space group $P4_2/mmc$ (No. 131).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L131.1.1 GM1$^+$	1	$4/mmm$	$\mathrm{A1_g}$
L131.2.1 GM1$^-$	0	-	-
L131.2.2 GM2$^+$	1	$4/mmm$	$\mathrm{B1_g}$
L131.2.3 GM2$^-$	0	-	-
L131.2.4 GM3$^+$	1	$4/mmm$	$\mathrm{A2_g}$
L131.2.5 GM3$^-$	0	-	-
L131.2.6 GM4$^+$	1	$4/mmm$	$\mathrm{B2_g}$
L131.2.7 GM4$^-$	0	-	-
L131.2.8 M1$^+$	0	-	-
L131.2.9 M1$^-$	0	-	-
L131.2.10 M2$^+$	0	-	-
L131.2.11 M2$^-$	0	-	-

TABLE S392: Coplanar SSGs with parent space group $P4_2/mmc$ (No. 131).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P131.1.1 GM1$^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g}$
P131.2.1 GM1$^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u}$
P131.2.2 GM2$^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g}$
P131.2.3 GM2$^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u}$
P131.2.4 GM3$^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g}$
P131.2.5 GM3$^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_u}$
P131.2.6 GM4$^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_g}$
P131.2.7 GM4$^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_u}$
P131.2.8 M1$^+$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$

Coplanar SSGs with parent space group $P4_2/mmc$ (No. 131) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P131.2.9 $\mathrm{M1}^-$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P131.2.10 $\mathrm{M2}^+$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P131.2.11 $\mathrm{M2}^-$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P131.3.1 $\mathrm{GM1}^- \oplus \mathrm{GM1}^-$	$\surd$	0	0	$\surd$	-	-
P131.3.2 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
P131.3.3 $\mathrm{GM1}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
P131.3.4 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u}$
P131.3.5 $\mathrm{GM1}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
P131.3.6 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_u}$
P131.3.7 $\mathrm{GM1}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
P131.3.8 $\mathrm{GM1}^- \oplus \mathrm{M1}^+$	$\surd$	1	1	$\times$	-	-
P131.3.9 $\mathrm{GM1}^- \oplus \mathrm{M1}^-$	$\surd$	1	1	$\times$	-	-
P131.3.10 $\mathrm{GM1}^- \oplus \mathrm{M2}^+$	$\surd$	1	1	$\times$	-	-
P131.3.11 $\mathrm{GM1}^- \oplus \mathrm{M2}^-$	$\surd$	1	1	$\times$	-	-
P131.3.12 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
P131.3.13 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g}$
P131.3.14 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g}$
P131.3.15 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
P131.3.16 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
P131.3.17 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u}$
P131.3.18 $\mathrm{GM2}^+ \oplus \mathrm{M1}^+$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
P131.3.19 $\mathrm{GM2}^+ \oplus \mathrm{M1}^-$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
P131.3.20 $\mathrm{GM2}^+ \oplus \mathrm{M2}^+$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
P131.3.21 $\mathrm{GM2}^+ \oplus \mathrm{M2}^-$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
P131.3.22 $\mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
P131.3.23 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_u}$
P131.3.24 $\mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
P131.3.25 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g}$
P131.3.26 $\mathrm{GM2}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
P131.3.27 $\mathrm{GM2}^- \oplus \mathrm{M1}^+$	$\surd$	1	1	$\times$	-	-
P131.3.28 $\mathrm{GM2}^- \oplus \mathrm{M1}^-$	$\surd$	1	1	$\times$	-	-
P131.3.29 $\mathrm{GM2}^- \oplus \mathrm{M2}^+$	$\surd$	1	1	$\times$	-	-
P131.3.30 $\mathrm{GM2}^- \oplus \mathrm{M2}^-$	$\surd$	1	1	$\times$	-	-
P131.3.31 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g}$
P131.3.32 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g}$
P131.3.33 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g}$
P131.3.34 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g}$
P131.3.35 $\mathrm{GM3}^+ \oplus \mathrm{M1}^+$	$\surd$	1	0	$\times$	-	-
P131.3.36 $\mathrm{GM3}^+ \oplus \mathrm{M1}^-$	$\surd$	1	0	$\times$	-	-
P131.3.37 $\mathrm{GM3}^+ \oplus \mathrm{M2}^+$	$\surd$	1	0	$\times$	-	-
P131.3.38 $\mathrm{GM3}^+ \oplus \mathrm{M2}^-$	$\surd$	1	0	$\times$	-	-
P131.3.39 $\mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
P131.3.40 $\mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_g}$
P131.3.41 $\mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
P131.3.42 $\mathrm{GM3}^- \oplus \mathrm{M1}^+$	$\surd$	1	1	$\times$	-	-
P131.3.43 $\mathrm{GM3}^- \oplus \mathrm{M1}^-$	$\surd$	1	1	$\times$	-	-

Coplanar SSGs with parent space group $P4_2/mmc$ (No. 131) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P131.3.44 $\mathrm{GM3}^- \oplus \mathrm{M2}^+$	$\surd$	1	1	$\times$	-	-
P131.3.45 $\mathrm{GM3}^- \oplus \mathrm{M2}^-$	$\surd$	1	1	$\times$	-	-
P131.3.46 $\mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_g}$
P131.3.47 $\mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g}$
P131.3.48 $\mathrm{GM4}^+ \oplus \mathrm{M1}^+$	$\surd$	1	0	$\times$	-	-
P131.3.49 $\mathrm{GM4}^+ \oplus \mathrm{M1}^-$	$\surd$	1	0	$\times$	-	-
P131.3.50 $\mathrm{GM4}^+ \oplus \mathrm{M2}^+$	$\surd$	1	0	$\times$	-	-
P131.3.51 $\mathrm{GM4}^+ \oplus \mathrm{M2}^-$	$\surd$	1	0	$\times$	-	-
P131.3.52 $\mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
P131.3.53 $\mathrm{GM4}^- \oplus \mathrm{M1}^+$	$\surd$	1	1	$\times$	-	-
P131.3.54 $\mathrm{GM4}^- \oplus \mathrm{M1}^-$	$\surd$	1	1	$\times$	-	-
P131.3.55 $\mathrm{GM4}^- \oplus \mathrm{M2}^+$	$\surd$	1	1	$\times$	-	-
P131.3.56 $\mathrm{GM4}^- \oplus \mathrm{M2}^-$	$\surd$	1	1	$\times$	-	-
P131.3.57 $\mathrm{M1}^+ \oplus \mathrm{M1}^+$	$\surd$	1	0	$\times$	-	-
P131.3.58 $\mathrm{M1}^+ \oplus \mathrm{M4}^+$	$\surd$	1	0	$\times$	-	-
P131.3.59 $\mathrm{M1}^+ \oplus \mathrm{M1}^-$	$\surd$	1	1	$\times$	-	-
P131.3.60 $\mathrm{M1}^+ \oplus \mathrm{M4}^-$	$\surd$	1	1	$\times$	-	-
P131.3.61 $\mathrm{M1}^+ \oplus \mathrm{M2}^+$	$\surd$	1	0	$\times$	-	-
P131.3.62 $\mathrm{M1}^+ \oplus \mathrm{M3}^+$	$\surd$	1	0	$\times$	-	-
P131.3.63 $\mathrm{M1}^+ \oplus \mathrm{M2}^-$	$\surd$	1	1	$\times$	-	-
P131.3.64 $\mathrm{M1}^+ \oplus \mathrm{M3}^-$	$\surd$	1	1	$\times$	-	-
P131.3.65 $\mathrm{M1}^- \oplus \mathrm{M1}^-$	$\surd$	1	0	$\times$	-	-
P131.3.66 $\mathrm{M1}^- \oplus \mathrm{M4}^-$	$\surd$	1	0	$\times$	-	-
P131.3.67 $\mathrm{M1}^- \oplus \mathrm{M2}^+$	$\surd$	1	1	$\times$	-	-
P131.3.68 $\mathrm{M1}^- \oplus \mathrm{M3}^+$	$\surd$	1	1	$\times$	-	-
P131.3.69 $\mathrm{M1}^- \oplus \mathrm{M2}^-$	$\surd$	1	0	$\times$	-	-
P131.3.70 $\mathrm{M1}^- \oplus \mathrm{M3}^-$	$\surd$	1	0	$\times$	-	-
P131.3.71 $\mathrm{M2}^+ \oplus \mathrm{M2}^+$	$\surd$	1	0	$\times$	-	-
P131.3.72 $\mathrm{M2}^+ \oplus \mathrm{M3}^+$	$\surd$	1	0	$\times$	-	-
P131.3.73 $\mathrm{M2}^+ \oplus \mathrm{M2}^-$	$\surd$	1	1	$\times$	-	-
P131.3.74 $\mathrm{M2}^+ \oplus \mathrm{M3}^-$	$\surd$	1	1	$\times$	-	-
P131.3.75 $\mathrm{M2}^- \oplus \mathrm{M2}^-$	$\surd$	1	0	$\times$	-	-
P131.3.76 $\mathrm{M2}^- \oplus \mathrm{M3}^-$	$\surd$	1	0	$\times$	-	-
P131.6.1 $\mathrm{GM5}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_g}$
P131.6.2 $\mathrm{GM5}^-$	$\surd$	0	0	$\surd$	-	-
P131.6.3 A1	$\surd$	1	1	$\times$	-	-
P131.6.4 A3	$\surd$	1	1	$\times$	-	-
P131.6.5 $\mathrm{M5}^+$	$\surd$	1	0	$\times$	-	-
P131.6.6 $\mathrm{M5}^-$	$\surd$	1	0	$\times$	-	-
P131.6.7 Z1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P131.6.8 Z2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P131.6.9 Z3	$\surd$	1	1	$\times$	-	-
P131.7.1 $\mathrm{R1}^+$	$\times$	-	-	-	-	-
P131.7.2 $\mathrm{R1}^-$	$\times$	-	-	-	-	-
P131.7.3 $\mathrm{X1}^+$	$\times$	-	-	-	-	-
P131.7.4 $\mathrm{X1}^-$	$\times$	-	-	-	-	-

Coplanar SSGs with parent space group $P4_2/mmc$ (No. 131) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P131.7.5 X2$^+$	$\times$	-	-	-	-	-
P131.7.6 X2$^-$	$\times$	-	-	-	-	-
P131.8.1 LD1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P131.8.2 LD3	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P131.8.3 V1	$\surd$	1	1	$\times$	-	-

TABLE S393: Non-coplanar SSGs with parent space group $P4_2/mmc$ (No. 131).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N131.1.1 GM1$^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A1_g}$
N131.2.1 GM1$^-$	$\surd$	2	2	$\surd$	422	$\mathrm{A1}\oplus\mathrm{A1}$
N131.2.2 GM2$^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{B1_g}$
N131.2.3 GM2$^-$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{A1}\oplus\mathrm{A1}$
N131.2.4 GM3$^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A2_g}$
N131.2.5 GM3$^-$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{A1}\oplus\mathrm{A1}$
N131.2.6 GM4$^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{B2_g}$
N131.2.7 GM4$^-$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{A1}\oplus\mathrm{A1}$
N131.2.8 M1$^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}$
N131.2.9 M1$^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}$
N131.2.10 M2$^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}$
N131.2.11 M2$^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}$
N131.3.1 GM1$^-\oplus$GM1$^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{A1_u}$
N131.3.2 GM1$^-\oplus$GM2$^+$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{A1}\oplus\mathrm{B1}$
N131.3.3 GM1$^-\oplus$GM2$^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{B1_u}$
N131.3.4 GM1$^-\oplus$GM3$^+$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{A1}\oplus\mathrm{A2}$
N131.3.5 GM1$^-\oplus$GM3$^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{A2_u}$
N131.3.6 GM1$^-\oplus$GM4$^+$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{A1}\oplus\mathrm{A2}$
N131.3.7 GM1$^-\oplus$GM4$^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{B2_u}$
N131.3.8 GM1$^-\oplus$M1$^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}$
N131.3.9 GM1$^-\oplus$M1$^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}$
N131.3.10 GM1$^-\oplus$M2$^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}$
N131.3.11 GM1$^-\oplus$M2$^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}$
N131.3.12 GM2$^+\oplus$GM2$^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B1_g}$
N131.3.13 GM2$^+\oplus$GM2$^-$	$\surd$	2	2	$\surd$	422	$\mathrm{A1}\oplus\mathrm{B1}$
N131.3.14 GM2$^+\oplus$GM3$^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}\oplus\mathrm{A2_g}$
N131.3.15 GM2$^+\oplus$GM3$^-$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{A1}\oplus\mathrm{B1}$
N131.3.16 GM2$^+\oplus$GM4$^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B2_g}$
N131.3.17 GM2$^+\oplus$GM4$^-$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{A1}\oplus\mathrm{B1}$
N131.3.18 GM2$^+\oplus$M1$^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}$
N131.3.19 GM2$^+\oplus$M1$^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}$
N131.3.20 GM2$^+\oplus$M2$^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}$
N131.3.21 GM2$^+\oplus$M2$^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}$
N131.3.22 GM2$^-\oplus$GM2$^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}\oplus\mathrm{B1_u}$
N131.3.23 GM2$^-\oplus$GM3$^+$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{A1}\oplus\mathrm{B2}$
N131.3.24 GM2$^-\oplus$GM3$^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}\oplus\mathrm{A2_u}$
N131.3.25 GM2$^-\oplus$GM4$^+$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{A1}\oplus\mathrm{B2}$

Non-coplanar SSGs with parent space group $P4_2/mmc$ (No. 131) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N131.3.26 $\mathrm{GM2^-}\oplus\mathrm{GM4^-}$	√	3	3	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}\oplus\mathrm{B2_u}$
N131.3.27 $\mathrm{GM2^-}\oplus\mathrm{M1^+}$	√	2	2	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}$
N131.3.28 $\mathrm{GM2^-}\oplus\mathrm{M1^-}$	√	2	2	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}$
N131.3.29 $\mathrm{GM2^-}\oplus\mathrm{M2^+}$	√	2	2	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}$
N131.3.30 $\mathrm{GM2^-}\oplus\mathrm{M2^-}$	√	2	2	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}$
N131.3.31 $\mathrm{GM3^+}\oplus\mathrm{GM3^+}$	√	3	3	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_g}$
N131.3.32 $\mathrm{GM3^+}\oplus\mathrm{GM3^-}$	√	2	2	√	422	$\mathrm{A1}\oplus\mathrm{A2}$
N131.3.33 $\mathrm{GM3^+}\oplus\mathrm{GM4^+}$	√	3	3	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_g}\oplus\mathrm{B2_g}$
N131.3.34 $\mathrm{GM3^+}\oplus\mathrm{GM4^-}$	√	2	2	√	$\bar{4}2m$	$\mathrm{A1}\oplus\mathrm{A2}$
N131.3.35 $\mathrm{GM3^+}\oplus\mathrm{M1^+}$	√	2	2	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_g}$
N131.3.36 $\mathrm{GM3^+}\oplus\mathrm{M1^-}$	√	2	2	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_g}$
N131.3.37 $\mathrm{GM3^+}\oplus\mathrm{M2^+}$	√	2	2	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_g}$
N131.3.38 $\mathrm{GM3^+}\oplus\mathrm{M2^-}$	√	2	2	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_g}$
N131.3.39 $\mathrm{GM3^-}\oplus\mathrm{GM3^-}$	√	3	3	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_u}\oplus\mathrm{A2_u}$
N131.3.40 $\mathrm{GM3^-}\oplus\mathrm{GM4^+}$	√	2	2	√	$\bar{4}2m$	$\mathrm{A1}\oplus\mathrm{B2}$
N131.3.41 $\mathrm{GM3^-}\oplus\mathrm{GM4^-}$	√	3	3	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_u}\oplus\mathrm{B2_u}$
N131.3.42 $\mathrm{GM3^-}\oplus\mathrm{M1^+}$	√	2	2	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_u}$
N131.3.43 $\mathrm{GM3^-}\oplus\mathrm{M1^-}$	√	2	2	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_u}$
N131.3.44 $\mathrm{GM3^-}\oplus\mathrm{M2^+}$	√	2	2	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_u}$
N131.3.45 $\mathrm{GM3^-}\oplus\mathrm{M2^-}$	√	2	2	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_u}$
N131.3.46 $\mathrm{GM4^+}\oplus\mathrm{GM4^+}$	√	3	3	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_g}\oplus\mathrm{B2_g}$
N131.3.47 $\mathrm{GM4^+}\oplus\mathrm{GM4^-}$	√	2	2	√	422	$\mathrm{A1}\oplus\mathrm{B2}$
N131.3.48 $\mathrm{GM4^+}\oplus\mathrm{M1^+}$	√	2	2	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_g}$
N131.3.49 $\mathrm{GM4^+}\oplus\mathrm{M1^-}$	√	2	2	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_g}$
N131.3.50 $\mathrm{GM4^+}\oplus\mathrm{M2^+}$	√	2	2	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_g}$
N131.3.51 $\mathrm{GM4^+}\oplus\mathrm{M2^-}$	√	2	2	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_g}$
N131.3.52 $\mathrm{GM4^-}\oplus\mathrm{GM4^-}$	√	3	3	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_u}\oplus\mathrm{B2_u}$
N131.3.53 $\mathrm{GM4^-}\oplus\mathrm{M1^+}$	√	2	2	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_u}$
N131.3.54 $\mathrm{GM4^-}\oplus\mathrm{M1^-}$	√	2	2	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_u}$
N131.3.55 $\mathrm{GM4^-}\oplus\mathrm{M2^+}$	√	2	2	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_u}$
N131.3.56 $\mathrm{GM4^-}\oplus\mathrm{M2^-}$	√	2	2	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_u}$
N131.3.57 $\mathrm{M1^+}\oplus\mathrm{M1^+}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N131.3.58 $\mathrm{M1^+}\oplus\mathrm{M4^+}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N131.3.59 $\mathrm{M1^+}\oplus\mathrm{M1^-}$	√	1	1	√	422	$\mathrm{A1}$
N131.3.60 $\mathrm{M1^+}\oplus\mathrm{M4^-}$	√	1	1	√	$\bar{4}m2$	$\mathrm{A1}$
N131.3.61 $\mathrm{M1^+}\oplus\mathrm{M2^+}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N131.3.62 $\mathrm{M1^+}\oplus\mathrm{M3^+}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N131.3.63 $\mathrm{M1^+}\oplus\mathrm{M2^-}$	√	1	1	√	$\bar{4}2m$	$\mathrm{A1}$
N131.3.64 $\mathrm{M1^+}\oplus\mathrm{M3^-}$	√	1	1	√	$4mm$	$\mathrm{A1}$
N131.3.65 $\mathrm{M1^-}\oplus\mathrm{M1^-}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N131.3.66 $\mathrm{M1^-}\oplus\mathrm{M4^-}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N131.3.67 $\mathrm{M1^-}\oplus\mathrm{M2^+}$	√	1	1	√	$\bar{4}2m$	$\mathrm{A1}$
N131.3.68 $\mathrm{M1^-}\oplus\mathrm{M3^+}$	√	1	1	√	$4mm$	$\mathrm{A1}$
N131.3.69 $\mathrm{M1^-}\oplus\mathrm{M2^-}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N131.3.70 $\mathrm{M1^-}\oplus\mathrm{M3^-}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N131.3.71 $\mathrm{M2^+}\oplus\mathrm{M2^+}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$

Non-coplanar SSGs with parent space group $P4_2/mmc$ (No. 131) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N131.3.72 $\mathrm{M2^+} \oplus \mathrm{M3^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N131.3.73 $\mathrm{M2^+} \oplus \mathrm{M2^-}$	$\surd$	1	1	$\surd$	422	$\mathrm{A1}$
N131.3.74 $\mathrm{M2^+} \oplus \mathrm{M3^-}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	$\mathrm{A1}$
N131.3.75 $\mathrm{M2^-} \oplus \mathrm{M2^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N131.3.76 $\mathrm{M2^-} \oplus \mathrm{M3^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N131.6.1 $\mathrm{GM5^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{E_g}$
N131.6.2 $\mathrm{GM5^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{E_u}$
N131.6.3 $\mathrm{A1}$	$\surd$	1	1	$\surd$	$4mm$	$\mathrm{A1}$
N131.6.4 $\mathrm{A3}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	$\mathrm{A1}$
N131.6.5 $\mathrm{M5^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N131.6.6 $\mathrm{M5^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N131.6.7 $\mathrm{Z1}$	$\surd$	1	1	$\surd$	$4mm$	$\mathrm{A1}$
N131.6.8 $\mathrm{Z2}$	$\surd$	1	1	$\surd$	$4mm$	$\mathrm{A1}$
N131.6.9 $\mathrm{Z3}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	$\mathrm{A1}$
N131.7.1 $\mathrm{R1^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N131.7.2 $\mathrm{R1^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N131.7.3 $\mathrm{X1^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N131.7.4 $\mathrm{X1^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N131.7.5 $\mathrm{X2^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N131.7.6 $\mathrm{X2^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N131.8.1 $\mathrm{LD1}$	$\surd$	1	1	$\surd$	$4mm$	$\mathrm{A1}$
N131.8.2 $\mathrm{LD3}$	$\surd$	1	1	$\surd$	$4mm$	$\mathrm{A1}$
N131.8.3 $\mathrm{V1}$	$\surd$	1	1	$\surd$	$4mm$	$\mathrm{A1}$
N131.9.1 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM1^-}$	$\surd$	0	0	$\surd$	-	-
N131.9.2 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM2^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N131.9.3 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM2^-}$	$\surd$	0	0	$\surd$	-	-
N131.9.4 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM3^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N131.9.5 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
N131.9.6 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N131.9.7 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N131.9.8 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{M1^+}$	$\surd$	0	0	$\surd$	-	-
N131.9.9 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{M1^-}$	$\surd$	0	0	$\surd$	-	-
N131.9.10 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{M2^+}$	$\surd$	0	0	$\surd$	-	-
N131.9.11 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{M2^-}$	$\surd$	0	0	$\surd$	-	-
N131.9.12 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{GM2^+}$	$\surd$	2	2	$\surd$	422	$\mathrm{B1} \oplus \mathrm{B1}$
N131.9.13 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{GM2^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N131.9.14 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{GM3^+}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{B1} \oplus \mathrm{B2}$
N131.9.15 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{GM3^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_u}$
N131.9.16 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{B1} \oplus \mathrm{B2}$
N131.9.17 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{A2_u}$
N131.9.18 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{M1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N131.9.19 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N131.9.20 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{M2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N131.9.21 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N131.9.22 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{GM2^-}$	$\surd$	0	0	$\surd$	-	-
N131.9.23 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{GM3^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$

Non-coplanar SSGs with parent space group $P4_2/mmc$ (No. 131) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N131.9.24 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N131.9.25 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N131.9.26 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N131.9.27 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{M1}^+$	$\surd$	0	0	$\surd$	-	-
N131.9.28 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{M1}^-$	$\surd$	0	0	$\surd$	-	-
N131.9.29 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{M2}^+$	$\surd$	0	0	$\surd$	-	-
N131.9.30 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{M2}^-$	$\surd$	0	0	$\surd$	-	-
N131.9.31 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	422	$\mathrm{A2} \oplus \mathrm{A2}$
N131.9.32 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
N131.9.33 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B2} \oplus \mathrm{A2}$
N131.9.34 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
N131.9.35 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{M1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u}$
N131.9.36 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{M1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u}$
N131.9.37 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{M2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u}$
N131.9.38 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{M2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u}$
N131.9.39 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N131.9.40 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N131.9.41 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N131.9.42 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{M1}^+$	$\surd$	0	0	$\surd$	-	-
N131.9.43 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{M1}^-$	$\surd$	0	0	$\surd$	-	-
N131.9.44 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{M2}^+$	$\surd$	0	0	$\surd$	-	-
N131.9.45 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{M2}^-$	$\surd$	0	0	$\surd$	-	-
N131.9.46 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	422	$\mathrm{B2} \oplus \mathrm{B2}$
N131.9.47 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N131.9.48 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{M1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_u}$
N131.9.49 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{M1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_u}$
N131.9.50 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{M2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_u}$
N131.9.51 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{M2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_u}$
N131.9.52 $\mathrm{GM1}^- \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N131.9.53 $\mathrm{GM1}^- \oplus \mathrm{GM4}^- \oplus \mathrm{M1}^+$	$\surd$	0	0	$\surd$	-	-
N131.9.54 $\mathrm{GM1}^- \oplus \mathrm{GM4}^- \oplus \mathrm{M1}^-$	$\surd$	0	0	$\surd$	-	-
N131.9.55 $\mathrm{GM1}^- \oplus \mathrm{GM4}^- \oplus \mathrm{M2}^+$	$\surd$	0	0	$\surd$	-	-
N131.9.56 $\mathrm{GM1}^- \oplus \mathrm{GM4}^- \oplus \mathrm{M2}^-$	$\surd$	0	0	$\surd$	-	-
N131.9.57 $\mathrm{GM1}^- \oplus \mathrm{M1}^+ \oplus \mathrm{M1}^+$	$\surd$	1	0	$\times$	-	-
N131.9.58 $\mathrm{GM1}^- \oplus \mathrm{M1}^+ \oplus \mathrm{M4}^+$	$\surd$	1	0	$\times$	-	-
N131.9.59 $\mathrm{GM1}^- \oplus \mathrm{M1}^+ \oplus \mathrm{M1}^-$	$\surd$	1	1	$\times$	-	-
N131.9.60 $\mathrm{GM1}^- \oplus \mathrm{M1}^+ \oplus \mathrm{M4}^-$	$\surd$	1	1	$\times$	-	-
N131.9.61 $\mathrm{GM1}^- \oplus \mathrm{M1}^+ \oplus \mathrm{M2}^+$	$\surd$	1	0	$\times$	-	-
N131.9.62 $\mathrm{GM1}^- \oplus \mathrm{M1}^+ \oplus \mathrm{M3}^+$	$\surd$	1	0	$\times$	-	-
N131.9.63 $\mathrm{GM1}^- \oplus \mathrm{M1}^+ \oplus \mathrm{M2}^-$	$\surd$	1	1	$\times$	-	-
N131.9.64 $\mathrm{GM1}^- \oplus \mathrm{M1}^+ \oplus \mathrm{M3}^-$	$\surd$	1	1	$\times$	-	-
N131.9.65 $\mathrm{GM1}^- \oplus \mathrm{M1}^- \oplus \mathrm{M1}^-$	$\surd$	1	0	$\times$	-	-
N131.9.66 $\mathrm{GM1}^- \oplus \mathrm{M1}^- \oplus \mathrm{M4}^-$	$\surd$	1	0	$\times$	-	-
N131.9.67 $\mathrm{GM1}^- \oplus \mathrm{M1}^- \oplus \mathrm{M2}^+$	$\surd$	1	1	$\times$	-	-
N131.9.68 $\mathrm{GM1}^- \oplus \mathrm{M1}^- \oplus \mathrm{M3}^+$	$\surd$	1	1	$\times$	-	-
N131.9.69 $\mathrm{GM1}^- \oplus \mathrm{M1}^- \oplus \mathrm{M2}^-$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $P4_2/mmc$ (No. 131) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N131.9.70 $\mathrm{GM1^-} \oplus \mathrm{M1^-} \oplus \mathrm{M3^-}$	$\surd$	1	0	$\times$	-	-
N131.9.71 $\mathrm{GM1^-} \oplus \mathrm{M2^+} \oplus \mathrm{M2^+}$	$\surd$	1	0	$\times$	-	-
N131.9.72 $\mathrm{GM1^-} \oplus \mathrm{M2^+} \oplus \mathrm{M3^+}$	$\surd$	1	0	$\times$	-	-
N131.9.73 $\mathrm{GM1^-} \oplus \mathrm{M2^+} \oplus \mathrm{M2^-}$	$\surd$	1	1	$\times$	-	-
N131.9.74 $\mathrm{GM1^-} \oplus \mathrm{M2^+} \oplus \mathrm{M3^-}$	$\surd$	1	1	$\times$	-	-
N131.9.75 $\mathrm{GM1^-} \oplus \mathrm{M2^-} \oplus \mathrm{M2^-}$	$\surd$	1	0	$\times$	-	-
N131.9.76 $\mathrm{GM1^-} \oplus \mathrm{M2^-} \oplus \mathrm{M3^-}$	$\surd$	1	0	$\times$	-	-
N131.9.77 $\mathrm{GM2^+} \oplus \mathrm{GM2^+} \oplus \mathrm{GM2^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N131.9.78 $\mathrm{GM2^+} \oplus \mathrm{GM2^+} \oplus \mathrm{GM2^-}$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B1} \oplus \mathrm{B1}$
N131.9.79 $\mathrm{GM2^+} \oplus \mathrm{GM2^+} \oplus \mathrm{GM3^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{A2_g}$
N131.9.80 $\mathrm{GM2^+} \oplus \mathrm{GM2^+} \oplus \mathrm{GM3^-}$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{B1} \oplus \mathrm{B1}$
N131.9.81 $\mathrm{GM2^+} \oplus \mathrm{GM2^+} \oplus \mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B2_g}$
N131.9.82 $\mathrm{GM2^+} \oplus \mathrm{GM2^+} \oplus \mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{B1} \oplus \mathrm{B1}$
N131.9.83 $\mathrm{GM2^+} \oplus \mathrm{GM2^+} \oplus \mathrm{M1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N131.9.84 $\mathrm{GM2^+} \oplus \mathrm{GM2^+} \oplus \mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N131.9.85 $\mathrm{GM2^+} \oplus \mathrm{GM2^+} \oplus \mathrm{M2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N131.9.86 $\mathrm{GM2^+} \oplus \mathrm{GM2^+} \oplus \mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N131.9.87 $\mathrm{GM2^+} \oplus \mathrm{GM2^-} \oplus \mathrm{GM2^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{B1_g}$
N131.9.88 $\mathrm{GM2^+} \oplus \mathrm{GM2^-} \oplus \mathrm{GM3^+}$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{B1} \oplus \mathrm{A2}$
N131.9.89 $\mathrm{GM2^+} \oplus \mathrm{GM2^-} \oplus \mathrm{GM3^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B2_u}$
N131.9.90 $\mathrm{GM2^+} \oplus \mathrm{GM2^-} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{B1} \oplus \mathrm{A2}$
N131.9.91 $\mathrm{GM2^+} \oplus \mathrm{GM2^-} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{A2_u}$
N131.9.92 $\mathrm{GM2^+} \oplus \mathrm{GM2^-} \oplus \mathrm{M1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g}$
N131.9.93 $\mathrm{GM2^+} \oplus \mathrm{GM2^-} \oplus \mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g}$
N131.9.94 $\mathrm{GM2^+} \oplus \mathrm{GM2^-} \oplus \mathrm{M2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g}$
N131.9.95 $\mathrm{GM2^+} \oplus \mathrm{GM2^-} \oplus \mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g}$
N131.9.96 $\mathrm{GM2^+} \oplus \mathrm{GM3^+} \oplus \mathrm{GM3^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
N131.9.97 $\mathrm{GM2^+} \oplus \mathrm{GM3^+} \oplus \mathrm{GM3^-}$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B1} \oplus \mathrm{A2}$
N131.9.98 $\mathrm{GM2^+} \oplus \mathrm{GM3^+} \oplus \mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g} \oplus \mathrm{B2_g}$
N131.9.99 $\mathrm{GM2^+} \oplus \mathrm{GM3^+} \oplus \mathrm{GM4^-}$	$\surd$	2	2	$\surd$	422	$\mathrm{B1} \oplus \mathrm{A2}$
N131.9.100 $\mathrm{GM2^+} \oplus \mathrm{GM3^+} \oplus \mathrm{M1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g}$
N131.9.101 $\mathrm{GM2^+} \oplus \mathrm{GM3^+} \oplus \mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g}$
N131.9.102 $\mathrm{GM2^+} \oplus \mathrm{GM3^+} \oplus \mathrm{M2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g}$
N131.9.103 $\mathrm{GM2^+} \oplus \mathrm{GM3^+} \oplus \mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g}$
N131.9.104 $\mathrm{GM2^+} \oplus \mathrm{GM3^-} \oplus \mathrm{GM3^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N131.9.105 $\mathrm{GM2^+} \oplus \mathrm{GM3^-} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	422	$\mathrm{B1} \oplus \mathrm{B2}$
N131.9.106 $\mathrm{GM2^+} \oplus \mathrm{GM3^-} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N131.9.107 $\mathrm{GM2^+} \oplus \mathrm{GM3^-} \oplus \mathrm{M1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N131.9.108 $\mathrm{GM2^+} \oplus \mathrm{GM3^-} \oplus \mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N131.9.109 $\mathrm{GM2^+} \oplus \mathrm{GM3^-} \oplus \mathrm{M2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N131.9.110 $\mathrm{GM2^+} \oplus \mathrm{GM3^-} \oplus \mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N131.9.111 $\mathrm{GM2^+} \oplus \mathrm{GM4^+} \oplus \mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N131.9.112 $\mathrm{GM2^+} \oplus \mathrm{GM4^+} \oplus \mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B1} \oplus \mathrm{B2}$
N131.9.113 $\mathrm{GM2^+} \oplus \mathrm{GM4^+} \oplus \mathrm{M1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
N131.9.114 $\mathrm{GM2^+} \oplus \mathrm{GM4^+} \oplus \mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
N131.9.115 $\mathrm{GM2^+} \oplus \mathrm{GM4^+} \oplus \mathrm{M2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_g}$

Non-coplanar SSGs with parent space group $P4_2/mmc$ (No. 131) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N131.9.116 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{M2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
N131.9.117 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N131.9.118 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{M1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u}$
N131.9.119 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{M1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u}$
N131.9.120 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{M2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u}$
N131.9.121 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{M2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u}$
N131.9.122 $\mathrm{GM2}^+ \oplus \mathrm{M1}^+ \oplus \mathrm{M1}^+$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N131.9.123 $\mathrm{GM2}^+ \oplus \mathrm{M1}^+ \oplus \mathrm{M4}^+$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N131.9.124 $\mathrm{GM2}^+ \oplus \mathrm{M1}^+ \oplus \mathrm{M1}^-$	$\surd$	1	1	$\surd$	$\bar{4}2m$	B1
N131.9.125 $\mathrm{GM2}^+ \oplus \mathrm{M1}^+ \oplus \mathrm{M4}^-$	$\surd$	1	1	$\surd$	$4mm$	B1
N131.9.126 $\mathrm{GM2}^+ \oplus \mathrm{M1}^+ \oplus \mathrm{M2}^+$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N131.9.127 $\mathrm{GM2}^+ \oplus \mathrm{M1}^+ \oplus \mathrm{M3}^+$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N131.9.128 $\mathrm{GM2}^+ \oplus \mathrm{M1}^+ \oplus \mathrm{M2}^-$	$\surd$	1	1	$\surd$	422	B1
N131.9.129 $\mathrm{GM2}^+ \oplus \mathrm{M1}^+ \oplus \mathrm{M3}^-$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N131.9.130 $\mathrm{GM2}^+ \oplus \mathrm{M1}^- \oplus \mathrm{M1}^-$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N131.9.131 $\mathrm{GM2}^+ \oplus \mathrm{M1}^- \oplus \mathrm{M4}^-$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N131.9.132 $\mathrm{GM2}^+ \oplus \mathrm{M1}^- \oplus \mathrm{M2}^+$	$\surd$	1	1	$\surd$	422	B1
N131.9.133 $\mathrm{GM2}^+ \oplus \mathrm{M1}^- \oplus \mathrm{M3}^+$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N131.9.134 $\mathrm{GM2}^+ \oplus \mathrm{M1}^- \oplus \mathrm{M2}^-$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N131.9.135 $\mathrm{GM2}^+ \oplus \mathrm{M1}^- \oplus \mathrm{M3}^-$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N131.9.136 $\mathrm{GM2}^+ \oplus \mathrm{M2}^+ \oplus \mathrm{M2}^+$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N131.9.137 $\mathrm{GM2}^+ \oplus \mathrm{M2}^+ \oplus \mathrm{M3}^+$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N131.9.138 $\mathrm{GM2}^+ \oplus \mathrm{M2}^+ \oplus \mathrm{M2}^-$	$\surd$	1	1	$\surd$	$\bar{4}2m$	B1
N131.9.139 $\mathrm{GM2}^+ \oplus \mathrm{M2}^+ \oplus \mathrm{M3}^-$	$\surd$	1	1	$\surd$	$4mm$	B1
N131.9.140 $\mathrm{GM2}^+ \oplus \mathrm{M2}^- \oplus \mathrm{M2}^-$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N131.9.141 $\mathrm{GM2}^+ \oplus \mathrm{M2}^- \oplus \mathrm{M3}^-$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N131.9.142 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
N131.9.143 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N131.9.144 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N131.9.145 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$
N131.9.146 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N131.9.147 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{M1}^+$	$\surd$	0	0	$\surd$	-	-
N131.9.148 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{M1}^-$	$\surd$	0	0	$\surd$	-	-
N131.9.149 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{M2}^+$	$\surd$	0	0	$\surd$	-	-
N131.9.150 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{M2}^-$	$\surd$	0	0	$\surd$	-	-
N131.9.151 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{A2} \oplus \mathrm{A2}$
N131.9.152 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{B2_u}$
N131.9.153 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	422	$\mathrm{A2} \oplus \mathrm{B2}$
N131.9.154 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g} \oplus \mathrm{B2_u}$
N131.9.155 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{M1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_u}$
N131.9.156 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{M1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_u}$
N131.9.157 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{M2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_u}$
N131.9.158 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{M2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_u}$
N131.9.159 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N131.9.160 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$
N131.9.161 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-

Non-coplanar SSGs with parent space group $P4_2/mmc$ (No. 131) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N131.9.162 $\mathrm{GM2^-}\oplus\mathrm{GM3^-}\oplus\mathrm{M1^+}$	$\surd$	0	0	$\surd$	-	-
N131.9.163 $\mathrm{GM2^-}\oplus\mathrm{GM3^-}\oplus\mathrm{M1^-}$	$\surd$	0	0	$\surd$	-	-
N131.9.164 $\mathrm{GM2^-}\oplus\mathrm{GM3^-}\oplus\mathrm{M2^+}$	$\surd$	0	0	$\surd$	-	-
N131.9.165 $\mathrm{GM2^-}\oplus\mathrm{GM3^-}\oplus\mathrm{M2^-}$	$\surd$	0	0	$\surd$	-	-
N131.9.166 $\mathrm{GM2^-}\oplus\mathrm{GM4^+}\oplus\mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B2}\oplus\mathrm{B2}$
N131.9.167 $\mathrm{GM2^-}\oplus\mathrm{GM4^+}\oplus\mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A2_u}\oplus\mathrm{B2_g}$
N131.9.168 $\mathrm{GM2^-}\oplus\mathrm{GM4^+}\oplus\mathrm{M1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u}\oplus\mathrm{B2_g}$
N131.9.169 $\mathrm{GM2^-}\oplus\mathrm{GM4^+}\oplus\mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u}\oplus\mathrm{B2_g}$
N131.9.170 $\mathrm{GM2^-}\oplus\mathrm{GM4^+}\oplus\mathrm{M2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u}\oplus\mathrm{B2_g}$
N131.9.171 $\mathrm{GM2^-}\oplus\mathrm{GM4^+}\oplus\mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u}\oplus\mathrm{B2_g}$
N131.9.172 $\mathrm{GM2^-}\oplus\mathrm{GM4^-}\oplus\mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N131.9.173 $\mathrm{GM2^-}\oplus\mathrm{GM4^-}\oplus\mathrm{M1^+}$	$\surd$	0	0	$\surd$	-	-
N131.9.174 $\mathrm{GM2^-}\oplus\mathrm{GM4^-}\oplus\mathrm{M1^-}$	$\surd$	0	0	$\surd$	-	-
N131.9.175 $\mathrm{GM2^-}\oplus\mathrm{GM4^-}\oplus\mathrm{M2^+}$	$\surd$	0	0	$\surd$	-	-
N131.9.176 $\mathrm{GM2^-}\oplus\mathrm{GM4^-}\oplus\mathrm{M2^-}$	$\surd$	0	0	$\surd$	-	-
N131.9.177 $\mathrm{GM2^-}\oplus\mathrm{M1^+}\oplus\mathrm{M1^+}$	$\surd$	1	0	$\times$	-	-
N131.9.178 $\mathrm{GM2^-}\oplus\mathrm{M1^+}\oplus\mathrm{M4^+}$	$\surd$	1	0	$\times$	-	-
N131.9.179 $\mathrm{GM2^-}\oplus\mathrm{M1^+}\oplus\mathrm{M1^-}$	$\surd$	1	1	$\times$	-	-
N131.9.180 $\mathrm{GM2^-}\oplus\mathrm{M1^+}\oplus\mathrm{M4^-}$	$\surd$	1	1	$\times$	-	-
N131.9.181 $\mathrm{GM2^-}\oplus\mathrm{M1^+}\oplus\mathrm{M2^+}$	$\surd$	1	0	$\times$	-	-
N131.9.182 $\mathrm{GM2^-}\oplus\mathrm{M1^+}\oplus\mathrm{M3^+}$	$\surd$	1	0	$\times$	-	-
N131.9.183 $\mathrm{GM2^-}\oplus\mathrm{M1^+}\oplus\mathrm{M2^-}$	$\surd$	1	1	$\times$	-	-
N131.9.184 $\mathrm{GM2^-}\oplus\mathrm{M1^+}\oplus\mathrm{M3^-}$	$\surd$	1	1	$\times$	-	-
N131.9.185 $\mathrm{GM2^-}\oplus\mathrm{M1^-}\oplus\mathrm{M1^-}$	$\surd$	1	0	$\times$	-	-
N131.9.186 $\mathrm{GM2^-}\oplus\mathrm{M1^-}\oplus\mathrm{M4^-}$	$\surd$	1	0	$\times$	-	-
N131.9.187 $\mathrm{GM2^-}\oplus\mathrm{M1^-}\oplus\mathrm{M2^+}$	$\surd$	1	1	$\times$	-	-
N131.9.188 $\mathrm{GM2^-}\oplus\mathrm{M1^-}\oplus\mathrm{M3^+}$	$\surd$	1	1	$\times$	-	-
N131.9.189 $\mathrm{GM2^-}\oplus\mathrm{M1^-}\oplus\mathrm{M2^-}$	$\surd$	1	0	$\times$	-	-
N131.9.190 $\mathrm{GM2^-}\oplus\mathrm{M1^-}\oplus\mathrm{M3^-}$	$\surd$	1	0	$\times$	-	-
N131.9.191 $\mathrm{GM2^-}\oplus\mathrm{M2^+}\oplus\mathrm{M2^+}$	$\surd$	1	0	$\times$	-	-
N131.9.192 $\mathrm{GM2^-}\oplus\mathrm{M2^+}\oplus\mathrm{M3^+}$	$\surd$	1	0	$\times$	-	-
N131.9.193 $\mathrm{GM2^-}\oplus\mathrm{M2^+}\oplus\mathrm{M2^-}$	$\surd$	1	1	$\times$	-	-
N131.9.194 $\mathrm{GM2^-}\oplus\mathrm{M2^+}\oplus\mathrm{M3^-}$	$\surd$	1	1	$\times$	-	-
N131.9.195 $\mathrm{GM2^-}\oplus\mathrm{M2^-}\oplus\mathrm{M2^-}$	$\surd$	1	0	$\times$	-	-
N131.9.196 $\mathrm{GM2^-}\oplus\mathrm{M2^-}\oplus\mathrm{M3^-}$	$\surd$	1	0	$\times$	-	-
N131.9.197 $\mathrm{GM3^+}\oplus\mathrm{GM3^+}\oplus\mathrm{GM3^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_g}$
N131.9.198 $\mathrm{GM3^+}\oplus\mathrm{GM3^+}\oplus\mathrm{GM3^-}$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{A2}\oplus\mathrm{A2}$
N131.9.199 $\mathrm{GM3^+}\oplus\mathrm{GM3^+}\oplus\mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{A2_g}\oplus\mathrm{B2_g}$
N131.9.200 $\mathrm{GM3^+}\oplus\mathrm{GM3^+}\oplus\mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{B2}\oplus\mathrm{B2}$
N131.9.201 $\mathrm{GM3^+}\oplus\mathrm{GM3^+}\oplus\mathrm{M1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{A2_g}$
N131.9.202 $\mathrm{GM3^+}\oplus\mathrm{GM3^+}\oplus\mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{A2_g}$
N131.9.203 $\mathrm{GM3^+}\oplus\mathrm{GM3^+}\oplus\mathrm{M2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{A2_g}$
N131.9.204 $\mathrm{GM3^+}\oplus\mathrm{GM3^+}\oplus\mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{A2_g}$
N131.9.205 $\mathrm{GM3^+}\oplus\mathrm{GM3^-}\oplus\mathrm{GM3^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A1_u}\oplus\mathrm{A2_g}$
N131.9.206 $\mathrm{GM3^+}\oplus\mathrm{GM3^-}\oplus\mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{B2}\oplus\mathrm{A2}$
N131.9.207 $\mathrm{GM3^+}\oplus\mathrm{GM3^-}\oplus\mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B1_u}\oplus\mathrm{A2_g}$

Non-coplanar SSGs with parent space group $P4_2/mmc$ (No. 131) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N131.9.208 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{M1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g}$
N131.9.209 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g}$
N131.9.210 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{M2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g}$
N131.9.211 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g}$
N131.9.212 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N131.9.213 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{B2} \oplus \mathrm{A2}$
N131.9.214 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{M1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g}$
N131.9.215 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g}$
N131.9.216 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{M2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g}$
N131.9.217 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g}$
N131.9.218 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{A2_g}$
N131.9.219 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{M1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g}$
N131.9.220 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g}$
N131.9.221 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{M2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g}$
N131.9.222 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g}$
N131.9.223 $\mathrm{GM3^+} \oplus \mathrm{M1^+} \oplus \mathrm{M1^+}$	$\surd$	1	1	$\times$	-	-
N131.9.224 $\mathrm{GM3^+} \oplus \mathrm{M1^+} \oplus \mathrm{M4^+}$	$\surd$	1	1	$\times$	-	-
N131.9.225 $\mathrm{GM3^+} \oplus \mathrm{M1^+} \oplus \mathrm{M1^-}$	$\surd$	1	1	$\times$	-	-
N131.9.226 $\mathrm{GM3^+} \oplus \mathrm{M1^+} \oplus \mathrm{M4^-}$	$\surd$	1	1	$\times$	-	-
N131.9.227 $\mathrm{GM3^+} \oplus \mathrm{M1^+} \oplus \mathrm{M2^+}$	$\surd$	1	1	$\times$	-	-
N131.9.228 $\mathrm{GM3^+} \oplus \mathrm{M1^+} \oplus \mathrm{M3^+}$	$\surd$	1	1	$\times$	-	-
N131.9.229 $\mathrm{GM3^+} \oplus \mathrm{M1^+} \oplus \mathrm{M2^-}$	$\surd$	1	1	$\times$	-	-
N131.9.230 $\mathrm{GM3^+} \oplus \mathrm{M1^+} \oplus \mathrm{M3^-}$	$\surd$	1	1	$\times$	-	-
N131.9.231 $\mathrm{GM3^+} \oplus \mathrm{M1^-} \oplus \mathrm{M1^-}$	$\surd$	1	1	$\times$	-	-
N131.9.232 $\mathrm{GM3^+} \oplus \mathrm{M1^-} \oplus \mathrm{M4^-}$	$\surd$	1	1	$\times$	-	-
N131.9.233 $\mathrm{GM3^+} \oplus \mathrm{M1^-} \oplus \mathrm{M2^+}$	$\surd$	1	1	$\times$	-	-
N131.9.234 $\mathrm{GM3^+} \oplus \mathrm{M1^-} \oplus \mathrm{M3^+}$	$\surd$	1	1	$\times$	-	-
N131.9.235 $\mathrm{GM3^+} \oplus \mathrm{M1^-} \oplus \mathrm{M2^-}$	$\surd$	1	1	$\times$	-	-
N131.9.236 $\mathrm{GM3^+} \oplus \mathrm{M1^-} \oplus \mathrm{M3^-}$	$\surd$	1	1	$\times$	-	-
N131.9.237 $\mathrm{GM3^+} \oplus \mathrm{M2^+} \oplus \mathrm{M2^+}$	$\surd$	1	1	$\times$	-	-
N131.9.238 $\mathrm{GM3^+} \oplus \mathrm{M2^+} \oplus \mathrm{M3^+}$	$\surd$	1	1	$\times$	-	-
N131.9.239 $\mathrm{GM3^+} \oplus \mathrm{M2^+} \oplus \mathrm{M2^-}$	$\surd$	1	1	$\times$	-	-
N131.9.240 $\mathrm{GM3^+} \oplus \mathrm{M2^+} \oplus \mathrm{M3^-}$	$\surd$	1	1	$\times$	-	-
N131.9.241 $\mathrm{GM3^+} \oplus \mathrm{M2^-} \oplus \mathrm{M2^-}$	$\surd$	1	1	$\times$	-	-
N131.9.242 $\mathrm{GM3^+} \oplus \mathrm{M2^-} \oplus \mathrm{M3^-}$	$\surd$	1	1	$\times$	-	-
N131.9.243 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
N131.9.244 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B2_g}$
N131.9.245 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N131.9.246 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{M1^+}$	$\surd$	0	0	$\surd$	-	-
N131.9.247 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{M1^-}$	$\surd$	0	0	$\surd$	-	-
N131.9.248 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{M2^+}$	$\surd$	0	0	$\surd$	-	-
N131.9.249 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{M2^-}$	$\surd$	0	0	$\surd$	-	-
N131.9.250 $\mathrm{GM3^-} \oplus \mathrm{GM4^+} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{B2} \oplus \mathrm{B2}$
N131.9.251 $\mathrm{GM3^-} \oplus \mathrm{GM4^+} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B2_g}$
N131.9.252 $\mathrm{GM3^-} \oplus \mathrm{GM4^+} \oplus \mathrm{M1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_g}$
N131.9.253 $\mathrm{GM3^-} \oplus \mathrm{GM4^+} \oplus \mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_g}$

Non-coplanar SSGs with parent space group $P4_2/mmc$ (No. 131) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N131.9.254 $\mathrm{GM3^-}\oplus\mathrm{GM4^+}\oplus\mathrm{M2^+}$	√	2	2	√	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{B2_g}$
N131.9.255 $\mathrm{GM3^-}\oplus\mathrm{GM4^+}\oplus\mathrm{M2^-}$	√	2	2	√	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{B2_g}$
N131.9.256 $\mathrm{GM3^-}\oplus\mathrm{GM4^-}\oplus\mathrm{GM4^-}$	√	0	0	√	-	-
N131.9.257 $\mathrm{GM3^-}\oplus\mathrm{GM4^-}\oplus\mathrm{M1^+}$	√	0	0	√	-	-
N131.9.258 $\mathrm{GM3^-}\oplus\mathrm{GM4^-}\oplus\mathrm{M1^-}$	√	0	0	√	-	-
N131.9.259 $\mathrm{GM3^-}\oplus\mathrm{GM4^-}\oplus\mathrm{M2^+}$	√	0	0	√	-	-
N131.9.260 $\mathrm{GM3^-}\oplus\mathrm{GM4^-}\oplus\mathrm{M2^-}$	√	0	0	√	-	-
N131.9.261 $\mathrm{GM3^-}\oplus\mathrm{M1^+}\oplus\mathrm{M1^+}$	√	1	0	×	-	-
N131.9.262 $\mathrm{GM3^-}\oplus\mathrm{M1^+}\oplus\mathrm{M4^+}$	√	1	0	×	-	-
N131.9.263 $\mathrm{GM3^-}\oplus\mathrm{M1^+}\oplus\mathrm{M1^-}$	√	1	1	×	-	-
N131.9.264 $\mathrm{GM3^-}\oplus\mathrm{M1^+}\oplus\mathrm{M4^-}$	√	1	1	×	-	-
N131.9.265 $\mathrm{GM3^-}\oplus\mathrm{M1^+}\oplus\mathrm{M2^+}$	√	1	0	×	-	-
N131.9.266 $\mathrm{GM3^-}\oplus\mathrm{M1^+}\oplus\mathrm{M3^+}$	√	1	0	×	-	-
N131.9.267 $\mathrm{GM3^-}\oplus\mathrm{M1^+}\oplus\mathrm{M2^-}$	√	1	1	×	-	-
N131.9.268 $\mathrm{GM3^-}\oplus\mathrm{M1^+}\oplus\mathrm{M3^-}$	√	1	1	×	-	-
N131.9.269 $\mathrm{GM3^-}\oplus\mathrm{M1^-}\oplus\mathrm{M1^-}$	√	1	0	×	-	-
N131.9.270 $\mathrm{GM3^-}\oplus\mathrm{M1^-}\oplus\mathrm{M4^-}$	√	1	0	×	-	-
N131.9.271 $\mathrm{GM3^-}\oplus\mathrm{M1^-}\oplus\mathrm{M2^+}$	√	1	1	×	-	-
N131.9.272 $\mathrm{GM3^-}\oplus\mathrm{M1^-}\oplus\mathrm{M3^+}$	√	1	1	×	-	-
N131.9.273 $\mathrm{GM3^-}\oplus\mathrm{M1^-}\oplus\mathrm{M2^-}$	√	1	0	×	-	-
N131.9.274 $\mathrm{GM3^-}\oplus\mathrm{M1^-}\oplus\mathrm{M3^-}$	√	1	0	×	-	-
N131.9.275 $\mathrm{GM3^-}\oplus\mathrm{M2^+}\oplus\mathrm{M2^+}$	√	1	0	×	-	-
N131.9.276 $\mathrm{GM3^-}\oplus\mathrm{M2^+}\oplus\mathrm{M3^+}$	√	1	0	×	-	-
N131.9.277 $\mathrm{GM3^-}\oplus\mathrm{M2^+}\oplus\mathrm{M2^-}$	√	1	1	×	-	-
N131.9.278 $\mathrm{GM3^-}\oplus\mathrm{M2^+}\oplus\mathrm{M3^-}$	√	1	1	×	-	-
N131.9.279 $\mathrm{GM3^-}\oplus\mathrm{M2^-}\oplus\mathrm{M2^-}$	√	1	0	×	-	-
N131.9.280 $\mathrm{GM3^-}\oplus\mathrm{M2^-}\oplus\mathrm{M3^-}$	√	1	0	×	-	-
N131.9.281 $\mathrm{GM4^+}\oplus\mathrm{GM4^+}\oplus\mathrm{GM4^+}$	√	3	3	√	$4/mmm$	$\mathrm{B2_g}\oplus\mathrm{B2_g}\oplus\mathrm{B2_g}$
N131.9.282 $\mathrm{GM4^+}\oplus\mathrm{GM4^+}\oplus\mathrm{GM4^-}$	√	2	2	√	$\bar{4}m2$	$\mathrm{A2}\oplus\mathrm{A2}$
N131.9.283 $\mathrm{GM4^+}\oplus\mathrm{GM4^+}\oplus\mathrm{M1^+}$	√	2	2	√	$4/mmm$	$\mathrm{B2_g}\oplus\mathrm{B2_g}$
N131.9.284 $\mathrm{GM4^+}\oplus\mathrm{GM4^+}\oplus\mathrm{M1^-}$	√	2	2	√	$4/mmm$	$\mathrm{B2_g}\oplus\mathrm{B2_g}$
N131.9.285 $\mathrm{GM4^+}\oplus\mathrm{GM4^+}\oplus\mathrm{M2^+}$	√	2	2	√	$4/mmm$	$\mathrm{B2_g}\oplus\mathrm{B2_g}$
N131.9.286 $\mathrm{GM4^+}\oplus\mathrm{GM4^+}\oplus\mathrm{M2^-}$	√	2	2	√	$4/mmm$	$\mathrm{B2_g}\oplus\mathrm{B2_g}$
N131.9.287 $\mathrm{GM4^+}\oplus\mathrm{GM4^-}\oplus\mathrm{GM4^-}$	√	3	3	√	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A1_u}\oplus\mathrm{B2_g}$
N131.9.288 $\mathrm{GM4^+}\oplus\mathrm{GM4^-}\oplus\mathrm{M1^+}$	√	2	2	√	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B2_g}$
N131.9.289 $\mathrm{GM4^+}\oplus\mathrm{GM4^-}\oplus\mathrm{M1^-}$	√	2	2	√	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B2_g}$
N131.9.290 $\mathrm{GM4^+}\oplus\mathrm{GM4^-}\oplus\mathrm{M2^+}$	√	2	2	√	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B2_g}$
N131.9.291 $\mathrm{GM4^+}\oplus\mathrm{GM4^-}\oplus\mathrm{M2^-}$	√	2	2	√	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B2_g}$
N131.9.292 $\mathrm{GM4^+}\oplus\mathrm{M1^+}\oplus\mathrm{M1^+}$	√	1	1	×	-	-
N131.9.293 $\mathrm{GM4^+}\oplus\mathrm{M1^+}\oplus\mathrm{M4^+}$	√	1	1	×	-	-
N131.9.294 $\mathrm{GM4^+}\oplus\mathrm{M1^+}\oplus\mathrm{M1^-}$	√	1	1	×	-	-
N131.9.295 $\mathrm{GM4^+}\oplus\mathrm{M1^+}\oplus\mathrm{M4^-}$	√	1	1	×	-	-
N131.9.296 $\mathrm{GM4^+}\oplus\mathrm{M1^+}\oplus\mathrm{M2^+}$	√	1	1	×	-	-
N131.9.297 $\mathrm{GM4^+}\oplus\mathrm{M1^+}\oplus\mathrm{M3^+}$	√	1	1	×	-	-
N131.9.298 $\mathrm{GM4^+}\oplus\mathrm{M1^+}\oplus\mathrm{M2^-}$	√	1	1	×	-	-
N131.9.299 $\mathrm{GM4^+}\oplus\mathrm{M1^+}\oplus\mathrm{M3^-}$	√	1	1	×	-	-

Non-coplanar SSGs with parent space group $P4_2/mmc$ (No. 131) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N131.9.300 $\mathrm{GM4^+} \oplus \mathrm{M1^-} \oplus \mathrm{M1^-}$	$\surd$	1	1	$\times$	-	-
N131.9.301 $\mathrm{GM4^+} \oplus \mathrm{M1^-} \oplus \mathrm{M4^-}$	$\surd$	1	1	$\times$	-	-
N131.9.302 $\mathrm{GM4^+} \oplus \mathrm{M1^-} \oplus \mathrm{M2^+}$	$\surd$	1	1	$\times$	-	-
N131.9.303 $\mathrm{GM4^+} \oplus \mathrm{M1^-} \oplus \mathrm{M3^+}$	$\surd$	1	1	$\times$	-	-
N131.9.304 $\mathrm{GM4^+} \oplus \mathrm{M1^-} \oplus \mathrm{M2^-}$	$\surd$	1	1	$\times$	-	-
N131.9.305 $\mathrm{GM4^+} \oplus \mathrm{M1^-} \oplus \mathrm{M3^-}$	$\surd$	1	1	$\times$	-	-
N131.9.306 $\mathrm{GM4^+} \oplus \mathrm{M2^+} \oplus \mathrm{M2^+}$	$\surd$	1	1	$\times$	-	-
N131.9.307 $\mathrm{GM4^+} \oplus \mathrm{M2^+} \oplus \mathrm{M3^+}$	$\surd$	1	1	$\times$	-	-
N131.9.308 $\mathrm{GM4^+} \oplus \mathrm{M2^+} \oplus \mathrm{M2^-}$	$\surd$	1	1	$\times$	-	-
N131.9.309 $\mathrm{GM4^+} \oplus \mathrm{M2^+} \oplus \mathrm{M3^-}$	$\surd$	1	1	$\times$	-	-
N131.9.310 $\mathrm{GM4^+} \oplus \mathrm{M2^-} \oplus \mathrm{M2^-}$	$\surd$	1	1	$\times$	-	-
N131.9.311 $\mathrm{GM4^+} \oplus \mathrm{M2^-} \oplus \mathrm{M3^-}$	$\surd$	1	1	$\times$	-	-
N131.9.312 $\mathrm{GM4^-} \oplus \mathrm{GM4^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N131.9.313 $\mathrm{GM4^-} \oplus \mathrm{GM4^-} \oplus \mathrm{M1^+}$	$\surd$	0	0	$\surd$	-	-
N131.9.314 $\mathrm{GM4^-} \oplus \mathrm{GM4^-} \oplus \mathrm{M1^-}$	$\surd$	0	0	$\surd$	-	-
N131.9.315 $\mathrm{GM4^-} \oplus \mathrm{GM4^-} \oplus \mathrm{M2^+}$	$\surd$	0	0	$\surd$	-	-
N131.9.316 $\mathrm{GM4^-} \oplus \mathrm{GM4^-} \oplus \mathrm{M2^-}$	$\surd$	0	0	$\surd$	-	-
N131.9.317 $\mathrm{GM4^-} \oplus \mathrm{M1^+} \oplus \mathrm{M1^+}$	$\surd$	1	0	$\times$	-	-
N131.9.318 $\mathrm{GM4^-} \oplus \mathrm{M1^+} \oplus \mathrm{M4^+}$	$\surd$	1	0	$\times$	-	-
N131.9.319 $\mathrm{GM4^-} \oplus \mathrm{M1^+} \oplus \mathrm{M1^-}$	$\surd$	1	1	$\times$	-	-
N131.9.320 $\mathrm{GM4^-} \oplus \mathrm{M1^+} \oplus \mathrm{M4^-}$	$\surd$	1	1	$\times$	-	-
N131.9.321 $\mathrm{GM4^-} \oplus \mathrm{M1^+} \oplus \mathrm{M2^+}$	$\surd$	1	0	$\times$	-	-
N131.9.322 $\mathrm{GM4^-} \oplus \mathrm{M1^+} \oplus \mathrm{M3^+}$	$\surd$	1	0	$\times$	-	-
N131.9.323 $\mathrm{GM4^-} \oplus \mathrm{M1^+} \oplus \mathrm{M2^-}$	$\surd$	1	1	$\times$	-	-
N131.9.324 $\mathrm{GM4^-} \oplus \mathrm{M1^+} \oplus \mathrm{M3^-}$	$\surd$	1	1	$\times$	-	-
N131.9.325 $\mathrm{GM4^-} \oplus \mathrm{M1^-} \oplus \mathrm{M1^-}$	$\surd$	1	0	$\times$	-	-
N131.9.326 $\mathrm{GM4^-} \oplus \mathrm{M1^-} \oplus \mathrm{M4^-}$	$\surd$	1	0	$\times$	-	-
N131.9.327 $\mathrm{GM4^-} \oplus \mathrm{M1^-} \oplus \mathrm{M2^+}$	$\surd$	1	1	$\times$	-	-
N131.9.328 $\mathrm{GM4^-} \oplus \mathrm{M1^-} \oplus \mathrm{M3^+}$	$\surd$	1	1	$\times$	-	-
N131.9.329 $\mathrm{GM4^-} \oplus \mathrm{M1^-} \oplus \mathrm{M2^-}$	$\surd$	1	0	$\times$	-	-
N131.9.330 $\mathrm{GM4^-} \oplus \mathrm{M1^-} \oplus \mathrm{M3^-}$	$\surd$	1	0	$\times$	-	-
N131.9.331 $\mathrm{GM4^-} \oplus \mathrm{M2^+} \oplus \mathrm{M2^+}$	$\surd$	1	0	$\times$	-	-
N131.9.332 $\mathrm{GM4^-} \oplus \mathrm{M2^+} \oplus \mathrm{M3^+}$	$\surd$	1	0	$\times$	-	-
N131.9.333 $\mathrm{GM4^-} \oplus \mathrm{M2^+} \oplus \mathrm{M2^-}$	$\surd$	1	1	$\times$	-	-
N131.9.334 $\mathrm{GM4^-} \oplus \mathrm{M2^+} \oplus \mathrm{M3^-}$	$\surd$	1	1	$\times$	-	-
N131.9.335 $\mathrm{GM4^-} \oplus \mathrm{M2^-} \oplus \mathrm{M2^-}$	$\surd$	1	0	$\times$	-	-
N131.9.336 $\mathrm{GM4^-} \oplus \mathrm{M2^-} \oplus \mathrm{M3^-}$	$\surd$	1	0	$\times$	-	-
N131.9.337 $\mathrm{M1^+} \oplus \mathrm{M1^+} \oplus \mathrm{M1^+}$	$\surd$	0	0	$\surd$	-	-
N131.9.338 $\mathrm{M1^+} \oplus \mathrm{M1^+} \oplus \mathrm{M4^+}$	$\surd$	0	0	$\surd$	-	-
N131.9.339 $\mathrm{M1^+} \oplus \mathrm{M1^+} \oplus \mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u}$
N131.9.340 $\mathrm{M1^+} \oplus \mathrm{M1^+} \oplus \mathrm{M4^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_u} \oplus \mathrm{B2_u}$
N131.9.341 $\mathrm{M1^+} \oplus \mathrm{M4^+} \oplus \mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_u}$
N131.9.342 $\mathrm{M1^+} \oplus \mathrm{M1^+} \oplus \mathrm{M2^+}$	$\surd$	0	0	$\surd$	-	-
N131.9.343 $\mathrm{M1^+} \oplus \mathrm{M1^+} \oplus \mathrm{M3^+}$	$\surd$	0	0	$\surd$	-	-
N131.9.344 $\mathrm{M1^+} \oplus \mathrm{M4^+} \oplus \mathrm{M2^+}$	$\surd$	0	0	$\surd$	-	-
N131.9.345 $\mathrm{M1^+} \oplus \mathrm{M1^+} \oplus \mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u}$

Non-coplanar SSGs with parent space group $P4_2/mmc$ (No. 131) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N131.9.346 $\mathrm{M1}^+ \oplus \mathrm{M1}^+ \oplus \mathrm{M3}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u}$
N131.9.347 $\mathrm{M1}^+ \oplus \mathrm{M4}^+ \oplus \mathrm{M2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_u}$
N131.9.348 $\mathrm{M1}^+ \oplus \mathrm{M1}^- \oplus \mathrm{M1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u}$
N131.9.349 $\mathrm{M1}^+ \oplus \mathrm{M1}^- \oplus \mathrm{M4}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_u}$
N131.9.350 $\mathrm{M1}^+ \oplus \mathrm{M4}^- \oplus \mathrm{M4}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_u} \oplus \mathrm{B2_u}$
N131.9.351 $\mathrm{M1}^+ \oplus \mathrm{M1}^- \oplus \mathrm{M2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u}$
N131.9.352 $\mathrm{M1}^+ \oplus \mathrm{M1}^- \oplus \mathrm{M3}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u}$
N131.9.353 $\mathrm{M1}^+ \oplus \mathrm{M4}^- \oplus \mathrm{M2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_u}$
N131.9.354 $\mathrm{M1}^+ \oplus \mathrm{M4}^- \oplus \mathrm{M3}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N131.9.355 $\mathrm{M1}^+ \oplus \mathrm{M1}^- \oplus \mathrm{M2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u}$
N131.9.356 $\mathrm{M1}^+ \oplus \mathrm{M1}^- \oplus \mathrm{M3}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u}$
N131.9.357 $\mathrm{M1}^+ \oplus \mathrm{M4}^- \oplus \mathrm{M2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N131.9.358 $\mathrm{M1}^+ \oplus \mathrm{M4}^- \oplus \mathrm{M3}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_u}$
N131.9.359 $\mathrm{M1}^+ \oplus \mathrm{M2}^+ \oplus \mathrm{M2}^+$	$\surd$	0	0	$\surd$	-	-
N131.9.360 $\mathrm{M1}^+ \oplus \mathrm{M2}^+ \oplus \mathrm{M3}^+$	$\surd$	0	0	$\surd$	-	-
N131.9.361 $\mathrm{M1}^+ \oplus \mathrm{M3}^+ \oplus \mathrm{M3}^+$	$\surd$	0	0	$\surd$	-	-
N131.9.362 $\mathrm{M1}^+ \oplus \mathrm{M2}^+ \oplus \mathrm{M2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u}$
N131.9.363 $\mathrm{M1}^+ \oplus \mathrm{M2}^+ \oplus \mathrm{M3}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_u}$
N131.9.364 $\mathrm{M1}^+ \oplus \mathrm{M3}^+ \oplus \mathrm{M2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N131.9.365 $\mathrm{M1}^+ \oplus \mathrm{M3}^+ \oplus \mathrm{M3}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u}$
N131.9.366 $\mathrm{M1}^+ \oplus \mathrm{M2}^- \oplus \mathrm{M2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N131.9.367 $\mathrm{M1}^+ \oplus \mathrm{M2}^- \oplus \mathrm{M3}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_u}$
N131.9.368 $\mathrm{M1}^+ \oplus \mathrm{M3}^- \oplus \mathrm{M3}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u}$
N131.9.369 $\mathrm{M1}^- \oplus \mathrm{M1}^- \oplus \mathrm{M1}^-$	$\surd$	0	0	$\surd$	-	-
N131.9.370 $\mathrm{M1}^- \oplus \mathrm{M1}^- \oplus \mathrm{M4}^-$	$\surd$	0	0	$\surd$	-	-
N131.9.371 $\mathrm{M1}^- \oplus \mathrm{M1}^- \oplus \mathrm{M2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N131.9.372 $\mathrm{M1}^- \oplus \mathrm{M1}^- \oplus \mathrm{M3}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u}$
N131.9.373 $\mathrm{M1}^- \oplus \mathrm{M4}^- \oplus \mathrm{M2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_u}$
N131.9.374 $\mathrm{M1}^- \oplus \mathrm{M1}^- \oplus \mathrm{M2}^-$	$\surd$	0	0	$\surd$	-	-
N131.9.375 $\mathrm{M1}^- \oplus \mathrm{M1}^- \oplus \mathrm{M3}^-$	$\surd$	0	0	$\surd$	-	-
N131.9.376 $\mathrm{M1}^- \oplus \mathrm{M4}^- \oplus \mathrm{M2}^-$	$\surd$	0	0	$\surd$	-	-
N131.9.377 $\mathrm{M1}^- \oplus \mathrm{M2}^+ \oplus \mathrm{M2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N131.9.378 $\mathrm{M1}^- \oplus \mathrm{M2}^+ \oplus \mathrm{M3}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_u}$
N131.9.379 $\mathrm{M1}^- \oplus \mathrm{M3}^+ \oplus \mathrm{M3}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u}$
N131.9.380 $\mathrm{M1}^- \oplus \mathrm{M2}^+ \oplus \mathrm{M2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u}$
N131.9.381 $\mathrm{M1}^- \oplus \mathrm{M2}^+ \oplus \mathrm{M3}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N131.9.382 $\mathrm{M1}^- \oplus \mathrm{M3}^+ \oplus \mathrm{M2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_u}$
N131.9.383 $\mathrm{M1}^- \oplus \mathrm{M3}^+ \oplus \mathrm{M3}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u}$
N131.9.384 $\mathrm{M1}^- \oplus \mathrm{M2}^- \oplus \mathrm{M2}^-$	$\surd$	0	0	$\surd$	-	-
N131.9.385 $\mathrm{M1}^- \oplus \mathrm{M2}^- \oplus \mathrm{M3}^-$	$\surd$	0	0	$\surd$	-	-
N131.9.386 $\mathrm{M1}^- \oplus \mathrm{M3}^- \oplus \mathrm{M3}^-$	$\surd$	0	0	$\surd$	-	-
N131.9.387 $\mathrm{M2}^+ \oplus \mathrm{M2}^+ \oplus \mathrm{M2}^+$	$\surd$	0	0	$\surd$	-	-
N131.9.388 $\mathrm{M2}^+ \oplus \mathrm{M2}^+ \oplus \mathrm{M3}^+$	$\surd$	0	0	$\surd$	-	-
N131.9.389 $\mathrm{M2}^+ \oplus \mathrm{M2}^+ \oplus \mathrm{M2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u}$
N131.9.390 $\mathrm{M2}^+ \oplus \mathrm{M2}^+ \oplus \mathrm{M3}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_u} \oplus \mathrm{B2_u}$
N131.9.391 $\mathrm{M2}^+ \oplus \mathrm{M3}^+ \oplus \mathrm{M2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_u}$

Non-coplanar SSGs with parent space group $P4_2/mmc$ (No. 131) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N131.9.392 $\mathrm{M2}^+ \oplus \mathrm{M2}^- \oplus \mathrm{M2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u}$
N131.9.393 $\mathrm{M2}^+ \oplus \mathrm{M2}^- \oplus \mathrm{M3}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_u}$
N131.9.394 $\mathrm{M2}^+ \oplus \mathrm{M3}^- \oplus \mathrm{M3}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_u} \oplus \mathrm{B2_u}$
N131.9.395 $\mathrm{M2}^- \oplus \mathrm{M2}^- \oplus \mathrm{M2}^-$	$\surd$	0	0	$\surd$	-	-
N131.9.396 $\mathrm{M2}^- \oplus \mathrm{M2}^- \oplus \mathrm{M3}^-$	$\surd$	0	0	$\surd$	-	-
N131.12.1 $\mathrm{GM1}^- \oplus \mathrm{GM5}^+$	$\surd$	2	2	$\surd$	$4mm$	E
N131.12.2 $\mathrm{GM1}^- \oplus \mathrm{GM5}^-$	$\surd$	0	0	$\surd$	-	-
N131.12.3 $\mathrm{GM1}^- \oplus \mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N131.12.4 $\mathrm{GM1}^- \oplus \mathrm{A3}$	$\surd$	1	1	$\times$	-	-
N131.12.5 $\mathrm{GM1}^- \oplus \mathrm{M5}^+$	$\surd$	1	0	$\times$	-	-
N131.12.6 $\mathrm{GM1}^- \oplus \mathrm{M5}^-$	$\surd$	1	0	$\times$	-	-
N131.12.7 $\mathrm{GM1}^- \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N131.12.8 $\mathrm{GM1}^- \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N131.12.9 $\mathrm{GM1}^- \oplus \mathrm{Z3}$	$\surd$	1	1	$\times$	-	-
N131.12.10 $\mathrm{GM2}^+ \oplus \mathrm{GM5}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{E_g}$
N131.12.11 $\mathrm{GM2}^+ \oplus \mathrm{GM5}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{E_u}$
N131.12.12 $\mathrm{GM2}^+ \oplus \mathrm{A1}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N131.12.13 $\mathrm{GM2}^+ \oplus \mathrm{A3}$	$\surd$	1	1	$\times$	-	-
N131.12.14 $\mathrm{GM2}^+ \oplus \mathrm{M5}^+$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N131.12.15 $\mathrm{GM2}^+ \oplus \mathrm{M5}^-$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N131.12.16 $\mathrm{GM2}^+ \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N131.12.17 $\mathrm{GM2}^+ \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N131.12.18 $\mathrm{GM2}^+ \oplus \mathrm{Z3}$	$\surd$	1	1	$\times$	-	-
N131.12.19 $\mathrm{GM2}^- \oplus \mathrm{GM5}^+$	$\surd$	2	2	$\surd$	$\bar{4}m2$	E
N131.12.20 $\mathrm{GM2}^- \oplus \mathrm{GM5}^-$	$\surd$	0	0	$\surd$	-	-
N131.12.21 $\mathrm{GM2}^- \oplus \mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N131.12.22 $\mathrm{GM2}^- \oplus \mathrm{A3}$	$\surd$	1	1	$\times$	-	-
N131.12.23 $\mathrm{GM2}^- \oplus \mathrm{M5}^+$	$\surd$	1	0	$\times$	-	-
N131.12.24 $\mathrm{GM2}^- \oplus \mathrm{M5}^-$	$\surd$	1	0	$\times$	-	-
N131.12.25 $\mathrm{GM2}^- \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N131.12.26 $\mathrm{GM2}^- \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N131.12.27 $\mathrm{GM2}^- \oplus \mathrm{Z3}$	$\surd$	1	1	$\times$	-	-
N131.12.28 $\mathrm{GM3}^+ \oplus \mathrm{GM5}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{E_g}$
N131.12.29 $\mathrm{GM3}^+ \oplus \mathrm{GM5}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{E_u}$
N131.12.30 $\mathrm{GM3}^+ \oplus \mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N131.12.31 $\mathrm{GM3}^+ \oplus \mathrm{A3}$	$\surd$	1	1	$\times$	-	-
N131.12.32 $\mathrm{GM3}^+ \oplus \mathrm{M5}^+$	$\surd$	1	1	$\times$	-	-
N131.12.33 $\mathrm{GM3}^+ \oplus \mathrm{M5}^-$	$\surd$	1	1	$\times$	-	-
N131.12.34 $\mathrm{GM3}^+ \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	422	A2
N131.12.35 $\mathrm{GM3}^+ \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	422	A2
N131.12.36 $\mathrm{GM3}^+ \oplus \mathrm{Z3}$	$\surd$	1	1	$\times$	-	-
N131.12.37 $\mathrm{GM3}^- \oplus \mathrm{GM5}^+$	$\surd$	2	2	$\surd$	422	E
N131.12.38 $\mathrm{GM3}^- \oplus \mathrm{GM5}^-$	$\surd$	0	0	$\surd$	-	-
N131.12.39 $\mathrm{GM3}^- \oplus \mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N131.12.40 $\mathrm{GM3}^- \oplus \mathrm{A3}$	$\surd$	1	1	$\times$	-	-
N131.12.41 $\mathrm{GM3}^- \oplus \mathrm{M5}^+$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $P4_2/mmc$ (No. 131) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N131.12.42 $\mathrm{GM3^-} \oplus \mathrm{M5^-}$	$\surd$	1	0	$\times$	-	-
N131.12.43 $\mathrm{GM3^-} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N131.12.44 $\mathrm{GM3^-} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N131.12.45 $\mathrm{GM3^-} \oplus \mathrm{Z3}$	$\surd$	1	1	$\times$	-	-
N131.12.46 $\mathrm{GM4^+} \oplus \mathrm{GM5^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{E_g}$
N131.12.47 $\mathrm{GM4^+} \oplus \mathrm{GM5^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{E_u}$
N131.12.48 $\mathrm{GM4^+} \oplus \mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N131.12.49 $\mathrm{GM4^+} \oplus \mathrm{A3}$	$\surd$	1	1	$\times$	-	-
N131.12.50 $\mathrm{GM4^+} \oplus \mathrm{M5^+}$	$\surd$	1	1	$\times$	-	-
N131.12.51 $\mathrm{GM4^+} \oplus \mathrm{M5^-}$	$\surd$	1	1	$\times$	-	-
N131.12.52 $\mathrm{GM4^+} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N131.12.53 $\mathrm{GM4^+} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N131.12.54 $\mathrm{GM4^+} \oplus \mathrm{Z3}$	$\surd$	1	1	$\times$	-	-
N131.12.55 $\mathrm{GM4^-} \oplus \mathrm{GM5^+}$	$\surd$	2	2	$\surd$	$\bar{4}2m$	E
N131.12.56 $\mathrm{GM4^-} \oplus \mathrm{GM5^-}$	$\surd$	0	0	$\surd$	-	-
N131.12.57 $\mathrm{GM4^-} \oplus \mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N131.12.58 $\mathrm{GM4^-} \oplus \mathrm{A3}$	$\surd$	1	1	$\times$	-	-
N131.12.59 $\mathrm{GM4^-} \oplus \mathrm{M5^+}$	$\surd$	1	0	$\times$	-	-
N131.12.60 $\mathrm{GM4^-} \oplus \mathrm{M5^-}$	$\surd$	1	0	$\times$	-	-
N131.12.61 $\mathrm{GM4^-} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N131.12.62 $\mathrm{GM4^-} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N131.12.63 $\mathrm{GM4^-} \oplus \mathrm{Z3}$	$\surd$	1	1	$\times$	-	-
N131.12.64 $\mathrm{M1^+} \oplus \mathrm{GM5^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_g}$
N131.12.65 $\mathrm{M1^+} \oplus \mathrm{GM5^-}$	$\surd$	0	0	$\surd$	-	-
N131.12.66 $\mathrm{M1^+} \oplus \mathrm{A1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N131.12.67 $\mathrm{M1^+} \oplus \mathrm{A2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N131.12.68 $\mathrm{M1^+} \oplus \mathrm{A3}$	$\surd$	1	1	$\times$	-	-
N131.12.69 $\mathrm{M1^+} \oplus \mathrm{M5^+}$	$\surd$	0	0	$\surd$	-	-
N131.12.70 $\mathrm{M1^+} \oplus \mathrm{M5^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_u}$
N131.12.71 $\mathrm{M1^+} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N131.12.72 $\mathrm{M1^+} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N131.12.73 $\mathrm{M1^+} \oplus \mathrm{Z3}$	$\surd$	1	1	$\times$	-	-
N131.12.74 $\mathrm{M1^-} \oplus \mathrm{GM5^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_g}$
N131.12.75 $\mathrm{M1^-} \oplus \mathrm{GM5^-}$	$\surd$	0	0	$\surd$	-	-
N131.12.76 $\mathrm{M1^-} \oplus \mathrm{A1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N131.12.77 $\mathrm{M1^-} \oplus \mathrm{A2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N131.12.78 $\mathrm{M1^-} \oplus \mathrm{A3}$	$\surd$	1	1	$\times$	-	-
N131.12.79 $\mathrm{M1^-} \oplus \mathrm{M5^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_u}$
N131.12.80 $\mathrm{M1^-} \oplus \mathrm{M5^-}$	$\surd$	0	0	$\surd$	-	-
N131.12.81 $\mathrm{M1^-} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N131.12.82 $\mathrm{M1^-} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N131.12.83 $\mathrm{M1^-} \oplus \mathrm{Z3}$	$\surd$	1	1	$\times$	-	-
N131.12.84 $\mathrm{M2^+} \oplus \mathrm{GM5^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_g}$
N131.12.85 $\mathrm{M2^+} \oplus \mathrm{GM5^-}$	$\surd$	0	0	$\surd$	-	-
N131.12.86 $\mathrm{M2^+} \oplus \mathrm{A1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N131.12.87 $\mathrm{M2^+} \oplus \mathrm{A2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$

Non-coplanar SSGs with parent space group $P4_2/mmc$ (No. 131) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N131.12.88 $\mathrm{M2^+} \oplus \mathrm{A3}$	$\surd$	1	1	$\times$	-	-
N131.12.89 $\mathrm{M2^+} \oplus \mathrm{M5^+}$	$\surd$	0	0	$\surd$	-	-
N131.12.90 $\mathrm{M2^+} \oplus \mathrm{M5^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_u}$
N131.12.91 $\mathrm{M2^+} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N131.12.92 $\mathrm{M2^+} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N131.12.93 $\mathrm{M2^+} \oplus \mathrm{Z3}$	$\surd$	1	1	$\times$	-	-
N131.12.94 $\mathrm{M2^-} \oplus \mathrm{GM5^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_g}$
N131.12.95 $\mathrm{M2^-} \oplus \mathrm{GM5^-}$	$\surd$	0	0	$\surd$	-	-
N131.12.96 $\mathrm{M2^-} \oplus \mathrm{A1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N131.12.97 $\mathrm{M2^-} \oplus \mathrm{A2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N131.12.98 $\mathrm{M2^-} \oplus \mathrm{A3}$	$\surd$	1	1	$\times$	-	-
N131.12.99 $\mathrm{M2^-} \oplus \mathrm{M5^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_u}$
N131.12.100 $\mathrm{M2^-} \oplus \mathrm{M5^-}$	$\surd$	0	0	$\surd$	-	-
N131.12.101 $\mathrm{M2^-} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N131.12.102 $\mathrm{M2^-} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N131.12.103 $\mathrm{M2^-} \oplus \mathrm{Z3}$	$\surd$	1	1	$\times$	-	-
N131.13.1 $\mathrm{GM1^-} \oplus \mathrm{R1^+}$	$\surd$	1	0	$\times$	-	-
N131.13.2 $\mathrm{GM1^-} \oplus \mathrm{R1^-}$	$\surd$	1	0	$\times$	-	-
N131.13.3 $\mathrm{GM1^-} \oplus \mathrm{X1^+}$	$\surd$	1	0	$\times$	-	-
N131.13.4 $\mathrm{GM1^-} \oplus \mathrm{X1^-}$	$\surd$	1	0	$\times$	-	-
N131.13.5 $\mathrm{GM1^-} \oplus \mathrm{X2^+}$	$\surd$	1	0	$\times$	-	-
N131.13.6 $\mathrm{GM1^-} \oplus \mathrm{X2^-}$	$\surd$	1	0	$\times$	-	-
N131.13.7 $\mathrm{GM2^+} \oplus \mathrm{R1^+}$	$\surd$	1	1	$\times$	-	-
N131.13.8 $\mathrm{GM2^+} \oplus \mathrm{R1^-}$	$\surd$	1	1	$\times$	-	-
N131.13.9 $\mathrm{GM2^+} \oplus \mathrm{X1^+}$	$\surd$	1	1	$\times$	-	-
N131.13.10 $\mathrm{GM2^+} \oplus \mathrm{X1^-}$	$\surd$	1	1	$\times$	-	-
N131.13.11 $\mathrm{GM2^+} \oplus \mathrm{X2^+}$	$\surd$	1	1	$\times$	-	-
N131.13.12 $\mathrm{GM2^+} \oplus \mathrm{X2^-}$	$\surd$	1	1	$\times$	-	-
N131.13.13 $\mathrm{GM2^-} \oplus \mathrm{R1^+}$	$\surd$	1	0	$\times$	-	-
N131.13.14 $\mathrm{GM2^-} \oplus \mathrm{R1^-}$	$\surd$	1	0	$\times$	-	-
N131.13.15 $\mathrm{GM2^-} \oplus \mathrm{X1^+}$	$\surd$	1	0	$\times$	-	-
N131.13.16 $\mathrm{GM2^-} \oplus \mathrm{X1^-}$	$\surd$	1	0	$\times$	-	-
N131.13.17 $\mathrm{GM2^-} \oplus \mathrm{X2^+}$	$\surd$	1	0	$\times$	-	-
N131.13.18 $\mathrm{GM2^-} \oplus \mathrm{X2^-}$	$\surd$	1	0	$\times$	-	-
N131.13.19 $\mathrm{GM3^+} \oplus \mathrm{R1^+}$	$\surd$	1	1	$\times$	-	-
N131.13.20 $\mathrm{GM3^+} \oplus \mathrm{R1^-}$	$\surd$	1	1	$\times$	-	-
N131.13.21 $\mathrm{GM3^+} \oplus \mathrm{X1^+}$	$\surd$	1	1	$\times$	-	-
N131.13.22 $\mathrm{GM3^+} \oplus \mathrm{X1^-}$	$\surd$	1	1	$\times$	-	-
N131.13.23 $\mathrm{GM3^+} \oplus \mathrm{X2^+}$	$\surd$	1	1	$\times$	-	-
N131.13.24 $\mathrm{GM3^+} \oplus \mathrm{X2^-}$	$\surd$	1	1	$\times$	-	-
N131.13.25 $\mathrm{GM3^-} \oplus \mathrm{R1^+}$	$\surd$	1	0	$\times$	-	-
N131.13.26 $\mathrm{GM3^-} \oplus \mathrm{R1^-}$	$\surd$	1	0	$\times$	-	-
N131.13.27 $\mathrm{GM3^-} \oplus \mathrm{X1^+}$	$\surd$	1	0	$\times$	-	-
N131.13.28 $\mathrm{GM3^-} \oplus \mathrm{X1^-}$	$\surd$	1	0	$\times$	-	-
N131.13.29 $\mathrm{GM3^-} \oplus \mathrm{X2^+}$	$\surd$	1	0	$\times$	-	-
N131.13.30 $\mathrm{GM3^-} \oplus \mathrm{X2^-}$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $P4_2/mmc$ (No. 131) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N131.13.31 $\mathrm{GM4^+} \oplus \mathrm{R1^+}$	$\surd$	1	1	$\times$	-	-
N131.13.32 $\mathrm{GM4^+} \oplus \mathrm{R1^-}$	$\surd$	1	1	$\times$	-	-
N131.13.33 $\mathrm{GM4^+} \oplus \mathrm{X1^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_g}$
N131.13.34 $\mathrm{GM4^+} \oplus \mathrm{X1^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_g}$
N131.13.35 $\mathrm{GM4^+} \oplus \mathrm{X2^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_g}$
N131.13.36 $\mathrm{GM4^+} \oplus \mathrm{X2^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_g}$
N131.13.37 $\mathrm{GM4^-} \oplus \mathrm{R1^+}$	$\surd$	1	0	$\times$	-	-
N131.13.38 $\mathrm{GM4^-} \oplus \mathrm{R1^-}$	$\surd$	1	0	$\times$	-	-
N131.13.39 $\mathrm{GM4^-} \oplus \mathrm{X1^+}$	$\surd$	1	0	$\times$	-	-
N131.13.40 $\mathrm{GM4^-} \oplus \mathrm{X1^-}$	$\surd$	1	0	$\times$	-	-
N131.13.41 $\mathrm{GM4^-} \oplus \mathrm{X2^+}$	$\surd$	1	0	$\times$	-	-
N131.13.42 $\mathrm{GM4^-} \oplus \mathrm{X2^-}$	$\surd$	1	0	$\times$	-	-
N131.13.43 $\mathrm{M1^+} \oplus \mathrm{R1^+}$	$\times$	-	-	-	-	-
N131.13.44 $\mathrm{M1^+} \oplus \mathrm{R3^+}$	$\times$	-	-	-	-	-
N131.13.45 $\mathrm{M1^+} \oplus \mathrm{R1^-}$	$\times$	-	-	-	-	-
N131.13.46 $\mathrm{M1^+} \oplus \mathrm{R3^-}$	$\times$	-	-	-	-	-
N131.13.47 $\mathrm{M1^+} \oplus \mathrm{X1^+}$	$\times$	-	-	-	-	-
N131.13.48 $\mathrm{M1^+} \oplus \mathrm{X4^-}$	$\times$	-	-	-	-	-
N131.13.49 $\mathrm{M1^+} \oplus \mathrm{X1^-}$	$\times$	-	-	-	-	-
N131.13.50 $\mathrm{M1^+} \oplus \mathrm{X4^+}$	$\times$	-	-	-	-	-
N131.13.51 $\mathrm{M1^+} \oplus \mathrm{X2^+}$	$\times$	-	-	-	-	-
N131.13.52 $\mathrm{M1^+} \oplus \mathrm{X3^-}$	$\times$	-	-	-	-	-
N131.13.53 $\mathrm{M1^+} \oplus \mathrm{X2^-}$	$\times$	-	-	-	-	-
N131.13.54 $\mathrm{M1^+} \oplus \mathrm{X3^+}$	$\times$	-	-	-	-	-
N131.13.55 $\mathrm{M1^-} \oplus \mathrm{R1^+}$	$\times$	-	-	-	-	-
N131.13.56 $\mathrm{M1^-} \oplus \mathrm{R3^+}$	$\times$	-	-	-	-	-
N131.13.57 $\mathrm{M1^-} \oplus \mathrm{R1^-}$	$\times$	-	-	-	-	-
N131.13.58 $\mathrm{M1^-} \oplus \mathrm{R3^-}$	$\times$	-	-	-	-	-
N131.13.59 $\mathrm{M1^-} \oplus \mathrm{X1^+}$	$\times$	-	-	-	-	-
N131.13.60 $\mathrm{M1^-} \oplus \mathrm{X4^-}$	$\times$	-	-	-	-	-
N131.13.61 $\mathrm{M1^-} \oplus \mathrm{X1^-}$	$\times$	-	-	-	-	-
N131.13.62 $\mathrm{M1^-} \oplus \mathrm{X4^+}$	$\times$	-	-	-	-	-
N131.13.63 $\mathrm{M1^-} \oplus \mathrm{X2^+}$	$\times$	-	-	-	-	-
N131.13.64 $\mathrm{M1^-} \oplus \mathrm{X3^-}$	$\times$	-	-	-	-	-
N131.13.65 $\mathrm{M1^-} \oplus \mathrm{X2^-}$	$\times$	-	-	-	-	-
N131.13.66 $\mathrm{M1^-} \oplus \mathrm{X3^+}$	$\times$	-	-	-	-	-
N131.13.67 $\mathrm{M2^+} \oplus \mathrm{R1^+}$	$\times$	-	-	-	-	-
N131.13.68 $\mathrm{M2^+} \oplus \mathrm{R3^+}$	$\times$	-	-	-	-	-
N131.13.69 $\mathrm{M2^+} \oplus \mathrm{R1^-}$	$\times$	-	-	-	-	-
N131.13.70 $\mathrm{M2^+} \oplus \mathrm{R3^-}$	$\times$	-	-	-	-	-
N131.13.71 $\mathrm{M2^+} \oplus \mathrm{X1^+}$	$\times$	-	-	-	-	-
N131.13.72 $\mathrm{M2^+} \oplus \mathrm{X4^-}$	$\times$	-	-	-	-	-
N131.13.73 $\mathrm{M2^+} \oplus \mathrm{X1^-}$	$\times$	-	-	-	-	-
N131.13.74 $\mathrm{M2^+} \oplus \mathrm{X4^+}$	$\times$	-	-	-	-	-
N131.13.75 $\mathrm{M2^+} \oplus \mathrm{X2^+}$	$\times$	-	-	-	-	-
N131.13.76 $\mathrm{M2^+} \oplus \mathrm{X3^-}$	$\times$	-	-	-	-	-

Non-coplanar SSGs with parent space group $P4_2/mmc$ (No. 131) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N131.13.77 $\mathrm{M2}^{+} \oplus \mathrm{X2}^{-}$	$\times$	-	-	-	-	-
N131.13.78 $\mathrm{M2}^{+} \oplus \mathrm{X3}^{+}$	$\times$	-	-	-	-	-
N131.13.79 $\mathrm{M2}^{-} \oplus \mathrm{R1}^{+}$	$\times$	-	-	-	-	-
N131.13.80 $\mathrm{M2}^{-} \oplus \mathrm{R3}^{+}$	$\times$	-	-	-	-	-
N131.13.81 $\mathrm{M2}^{-} \oplus \mathrm{R1}^{-}$	$\times$	-	-	-	-	-
N131.13.82 $\mathrm{M2}^{-} \oplus \mathrm{R3}^{-}$	$\times$	-	-	-	-	-
N131.13.83 $\mathrm{M2}^{-} \oplus \mathrm{X1}^{+}$	$\times$	-	-	-	-	-
N131.13.84 $\mathrm{M2}^{-} \oplus \mathrm{X4}^{-}$	$\times$	-	-	-	-	-
N131.13.85 $\mathrm{M2}^{-} \oplus \mathrm{X1}^{-}$	$\times$	-	-	-	-	-
N131.13.86 $\mathrm{M2}^{-} \oplus \mathrm{X4}^{+}$	$\times$	-	-	-	-	-
N131.13.87 $\mathrm{M2}^{-} \oplus \mathrm{X2}^{+}$	$\times$	-	-	-	-	-
N131.13.88 $\mathrm{M2}^{-} \oplus \mathrm{X3}^{-}$	$\times$	-	-	-	-	-
N131.13.89 $\mathrm{M2}^{-} \oplus \mathrm{X2}^{-}$	$\times$	-	-	-	-	-
N131.13.90 $\mathrm{M2}^{-} \oplus \mathrm{X3}^{+}$	$\times$	-	-	-	-	-
N131.14.1 $\mathrm{GM1}^{-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N131.14.2 $\mathrm{GM1}^{-} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N131.14.3 $\mathrm{GM1}^{-} \oplus \mathrm{V1}$	$\surd$	1	1	$\times$	-	-
N131.14.4 $\mathrm{GM2}^{+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N131.14.5 $\mathrm{GM2}^{+} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N131.14.6 $\mathrm{GM2}^{+} \oplus \mathrm{V1}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N131.14.7 $\mathrm{GM2}^{-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N131.14.8 $\mathrm{GM2}^{-} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N131.14.9 $\mathrm{GM2}^{-} \oplus \mathrm{V1}$	$\surd$	1	1	$\times$	-	-
N131.14.10 $\mathrm{GM3}^{+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	422	A2
N131.14.11 $\mathrm{GM3}^{+} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	422	A2
N131.14.12 $\mathrm{GM3}^{+} \oplus \mathrm{V1}$	$\surd$	1	1	$\times$	-	-
N131.14.13 $\mathrm{GM3}^{-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N131.14.14 $\mathrm{GM3}^{-} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N131.14.15 $\mathrm{GM3}^{-} \oplus \mathrm{V1}$	$\surd$	1	1	$\times$	-	-
N131.14.16 $\mathrm{GM4}^{+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N131.14.17 $\mathrm{GM4}^{+} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N131.14.18 $\mathrm{GM4}^{+} \oplus \mathrm{V1}$	$\surd$	1	1	$\times$	-	-
N131.14.19 $\mathrm{GM4}^{-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N131.14.20 $\mathrm{GM4}^{-} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N131.14.21 $\mathrm{GM4}^{-} \oplus \mathrm{V1}$	$\surd$	1	1	$\times$	-	-
N131.14.22 $\mathrm{M1}^{+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N131.14.23 $\mathrm{M1}^{+} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N131.14.24 $\mathrm{M1}^{+} \oplus \mathrm{V1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N131.14.25 $\mathrm{M1}^{+} \oplus \mathrm{V3}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N131.14.26 $\mathrm{M1}^{-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N131.14.27 $\mathrm{M1}^{-} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N131.14.28 $\mathrm{M1}^{-} \oplus \mathrm{V1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N131.14.29 $\mathrm{M1}^{-} \oplus \mathrm{V3}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N131.14.30 $\mathrm{M2}^{+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N131.14.31 $\mathrm{M2}^{+} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N131.14.32 $\mathrm{M2}^{+} \oplus \mathrm{V1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$

Non-coplanar SSGs with parent space group $P4_2/mmc$ (No. 131) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N131.14.33 $\mathrm{M2}^+ \oplus \mathrm{V3}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N131.14.34 $\mathrm{M2}^- \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N131.14.35 $\mathrm{M2}^- \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N131.14.36 $\mathrm{M2}^- \oplus \mathrm{V1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N131.14.37 $\mathrm{M2}^- \oplus \mathrm{V3}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$

TABLE S394: Collinear SSGs with parent space group $P4_2/mcm$ (No. 132).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L132.1.1 $\mathrm{GM1}^+$	1	$4/mmm$	$\mathrm{A1_g}$
L132.2.1 $\mathrm{GM1}^-$	0	-	-
L132.2.2 $\mathrm{GM2}^+$	1	$4/mmm$	$\mathrm{B1_g}$
L132.2.3 $\mathrm{GM2}^-$	0	-	-
L132.2.4 $\mathrm{GM3}^+$	1	$4/mmm$	$\mathrm{A2_g}$
L132.2.5 $\mathrm{GM3}^-$	0	-	-
L132.2.6 $\mathrm{GM4}^+$	1	$4/mmm$	$\mathrm{B2_g}$
L132.2.7 $\mathrm{GM4}^-$	0	-	-
L132.2.8 $\mathrm{M1}^+$	0	-	-
L132.2.9 $\mathrm{M1}^-$	0	-	-
L132.2.10 $\mathrm{M2}^+$	0	-	-
L132.2.11 $\mathrm{M2}^-$	0	-	-

TABLE S395: Coplanar SSGs with parent space group $P4_2/mcm$ (No. 132).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P132.1.1 $\mathrm{GM1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g}$
P132.2.1 $\mathrm{GM1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u}$
P132.2.2 $\mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g}$
P132.2.3 $\mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u}$
P132.2.4 $\mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g}$
P132.2.5 $\mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_u}$
P132.2.6 $\mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_g}$
P132.2.7 $\mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_u}$
P132.2.8 $\mathrm{M1}^+$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P132.2.9 $\mathrm{M1}^-$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P132.2.10 $\mathrm{M2}^+$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P132.2.11 $\mathrm{M2}^-$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P132.3.1 $\mathrm{GM1}^- \oplus \mathrm{GM1}^-$	$\surd$	0	0	$\surd$	-	-
P132.3.2 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
P132.3.3 $\mathrm{GM1}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
P132.3.4 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u}$
P132.3.5 $\mathrm{GM1}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
P132.3.6 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_u}$
P132.3.7 $\mathrm{GM1}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
P132.3.8 $\mathrm{GM1}^- \oplus \mathrm{M1}^+$	$\surd$	1	1	$\times$	-	-

Coplanar SSGs with parent space group $P4_2/mcm$ (No. 132) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P132.3.9 $\mathrm{GM1}^- \oplus \mathrm{M1}^-$	$\surd$	1	1	$\times$	-	-
P132.3.10 $\mathrm{GM1}^- \oplus \mathrm{M2}^+$	$\surd$	1	1	$\times$	-	-
P132.3.11 $\mathrm{GM1}^- \oplus \mathrm{M2}^-$	$\surd$	1	1	$\times$	-	-
P132.3.12 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
P132.3.13 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g}$
P132.3.14 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g}$
P132.3.15 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
P132.3.16 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
P132.3.17 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u}$
P132.3.18 $\mathrm{GM2}^+ \oplus \mathrm{M1}^+$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
P132.3.19 $\mathrm{GM2}^+ \oplus \mathrm{M1}^-$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
P132.3.20 $\mathrm{GM2}^+ \oplus \mathrm{M2}^+$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
P132.3.21 $\mathrm{GM2}^+ \oplus \mathrm{M2}^-$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
P132.3.22 $\mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
P132.3.23 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_u}$
P132.3.24 $\mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
P132.3.25 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g}$
P132.3.26 $\mathrm{GM2}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
P132.3.27 $\mathrm{GM2}^- \oplus \mathrm{M1}^+$	$\surd$	1	1	$\times$	-	-
P132.3.28 $\mathrm{GM2}^- \oplus \mathrm{M1}^-$	$\surd$	1	1	$\times$	-	-
P132.3.29 $\mathrm{GM2}^- \oplus \mathrm{M2}^+$	$\surd$	1	1	$\times$	-	-
P132.3.30 $\mathrm{GM2}^- \oplus \mathrm{M2}^-$	$\surd$	1	1	$\times$	-	-
P132.3.31 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g}$
P132.3.32 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g}$
P132.3.33 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g}$
P132.3.34 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g}$
P132.3.35 $\mathrm{GM3}^+ \oplus \mathrm{M1}^+$	$\surd$	1	0	$\times$	-	-
P132.3.36 $\mathrm{GM3}^+ \oplus \mathrm{M1}^-$	$\surd$	1	0	$\times$	-	-
P132.3.37 $\mathrm{GM3}^+ \oplus \mathrm{M2}^+$	$\surd$	1	0	$\times$	-	-
P132.3.38 $\mathrm{GM3}^+ \oplus \mathrm{M2}^-$	$\surd$	1	0	$\times$	-	-
P132.3.39 $\mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
P132.3.40 $\mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_g}$
P132.3.41 $\mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
P132.3.42 $\mathrm{GM3}^- \oplus \mathrm{M1}^+$	$\surd$	1	1	$\times$	-	-
P132.3.43 $\mathrm{GM3}^- \oplus \mathrm{M1}^-$	$\surd$	1	1	$\times$	-	-
P132.3.44 $\mathrm{GM3}^- \oplus \mathrm{M2}^+$	$\surd$	1	1	$\times$	-	-
P132.3.45 $\mathrm{GM3}^- \oplus \mathrm{M2}^-$	$\surd$	1	1	$\times$	-	-
P132.3.46 $\mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_g}$
P132.3.47 $\mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g}$
P132.3.48 $\mathrm{GM4}^+ \oplus \mathrm{M1}^+$	$\surd$	1	0	$\times$	-	-
P132.3.49 $\mathrm{GM4}^+ \oplus \mathrm{M1}^-$	$\surd$	1	0	$\times$	-	-
P132.3.50 $\mathrm{GM4}^+ \oplus \mathrm{M2}^+$	$\surd$	1	0	$\times$	-	-
P132.3.51 $\mathrm{GM4}^+ \oplus \mathrm{M2}^-$	$\surd$	1	0	$\times$	-	-
P132.3.52 $\mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
P132.3.53 $\mathrm{GM4}^- \oplus \mathrm{M1}^+$	$\surd$	1	1	$\times$	-	-
P132.3.54 $\mathrm{GM4}^- \oplus \mathrm{M1}^-$	$\surd$	1	1	$\times$	-	-

Coplanar SSGs with parent space group $P4_2/mcm$ (No. 132) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P132.3.55 $\mathrm{GM4}^- \oplus \mathrm{M2}^+$	$\surd$	1	1	$\times$	-	-
P132.3.56 $\mathrm{GM4}^- \oplus \mathrm{M2}^-$	$\surd$	1	1	$\times$	-	-
P132.3.57 $\mathrm{M1}^+ \oplus \mathrm{M1}^+$	$\surd$	1	0	$\times$	-	-
P132.3.58 $\mathrm{M1}^+ \oplus \mathrm{M4}^+$	$\surd$	1	0	$\times$	-	-
P132.3.59 $\mathrm{M1}^+ \oplus \mathrm{M1}^-$	$\surd$	1	1	$\times$	-	-
P132.3.60 $\mathrm{M1}^+ \oplus \mathrm{M4}^-$	$\surd$	1	1	$\times$	-	-
P132.3.61 $\mathrm{M1}^+ \oplus \mathrm{M2}^+$	$\surd$	1	0	$\times$	-	-
P132.3.62 $\mathrm{M1}^+ \oplus \mathrm{M3}^+$	$\surd$	1	0	$\times$	-	-
P132.3.63 $\mathrm{M1}^+ \oplus \mathrm{M2}^-$	$\surd$	1	1	$\times$	-	-
P132.3.64 $\mathrm{M1}^+ \oplus \mathrm{M3}^-$	$\surd$	1	1	$\times$	-	-
P132.3.65 $\mathrm{M1}^- \oplus \mathrm{M1}^-$	$\surd$	1	0	$\times$	-	-
P132.3.66 $\mathrm{M1}^- \oplus \mathrm{M4}^-$	$\surd$	1	0	$\times$	-	-
P132.3.67 $\mathrm{M1}^- \oplus \mathrm{M2}^+$	$\surd$	1	1	$\times$	-	-
P132.3.68 $\mathrm{M1}^- \oplus \mathrm{M3}^+$	$\surd$	1	1	$\times$	-	-
P132.3.69 $\mathrm{M1}^- \oplus \mathrm{M2}^-$	$\surd$	1	0	$\times$	-	-
P132.3.70 $\mathrm{M1}^- \oplus \mathrm{M3}^-$	$\surd$	1	0	$\times$	-	-
P132.3.71 $\mathrm{M2}^+ \oplus \mathrm{M2}^+$	$\surd$	1	0	$\times$	-	-
P132.3.72 $\mathrm{M2}^+ \oplus \mathrm{M3}^+$	$\surd$	1	0	$\times$	-	-
P132.3.73 $\mathrm{M2}^+ \oplus \mathrm{M2}^-$	$\surd$	1	1	$\times$	-	-
P132.3.74 $\mathrm{M2}^+ \oplus \mathrm{M3}^-$	$\surd$	1	1	$\times$	-	-
P132.3.75 $\mathrm{M2}^- \oplus \mathrm{M2}^-$	$\surd$	1	0	$\times$	-	-
P132.3.76 $\mathrm{M2}^- \oplus \mathrm{M3}^-$	$\surd$	1	0	$\times$	-	-
P132.6.1 $\mathrm{GM5}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_g}$
P132.6.2 $\mathrm{GM5}^-$	$\surd$	0	0	$\surd$	-	-
P132.6.3 A1	$\surd$	1	1	$\times$	-	-
P132.6.4 A2	$\surd$	1	1	$\times$	-	-
P132.6.5 A3	$\surd$	1	1	$\times$	-	-
P132.6.6 $\mathrm{M5}^+$	$\surd$	1	0	$\times$	-	-
P132.6.7 $\mathrm{M5}^-$	$\surd$	1	0	$\times$	-	-
P132.6.8 Z1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P132.6.9 Z2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P132.6.10 Z3	$\surd$	1	1	$\times$	-	-
P132.7.1 $\mathrm{X1}^+$	$\times$	-	-	-	-	-
P132.7.2 $\mathrm{X1}^-$	$\times$	-	-	-	-	-
P132.7.3 $\mathrm{X2}^+$	$\times$	-	-	-	-	-
P132.7.4 $\mathrm{X2}^-$	$\times$	-	-	-	-	-
P132.8.1 LD1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P132.8.2 LD2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P132.8.3 V1	$\surd$	1	1	$\times$	-	-
P132.8.4 V2	$\surd$	1	1	$\times$	-	-

TABLE S396: Non-coplanar SSGs with parent space group $P4_2/mcm$ (No. 132).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N132.1.1 $\mathrm{GM1}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A1_g}$

Non-coplanar SSGs with parent space group $P4_2/mcm$ (No. 132) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N132.2.1 $\mathrm{GM1}^-$	$\surd$	2	2	$\surd$	422	$\mathrm{A1}\oplus\mathrm{A1}$
N132.2.2 $\mathrm{GM2}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{B1_g}$
N132.2.3 $\mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{A1}\oplus\mathrm{A1}$
N132.2.4 $\mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A2_g}$
N132.2.5 $\mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{A1}\oplus\mathrm{A1}$
N132.2.6 $\mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{B2_g}$
N132.2.7 $\mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{A1}\oplus\mathrm{A1}$
N132.2.8 $\mathrm{M1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}$
N132.2.9 $\mathrm{M1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}$
N132.2.10 $\mathrm{M2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}$
N132.2.11 $\mathrm{M2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}$
N132.3.1 $\mathrm{GM1}^-\oplus\mathrm{GM1}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{A1_u}$
N132.3.2 $\mathrm{GM1}^-\oplus\mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{A1}\oplus\mathrm{B1}$
N132.3.3 $\mathrm{GM1}^-\oplus\mathrm{GM2}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{B1_u}$
N132.3.4 $\mathrm{GM1}^-\oplus\mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{A1}\oplus\mathrm{A2}$
N132.3.5 $\mathrm{GM1}^-\oplus\mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{A2_u}$
N132.3.6 $\mathrm{GM1}^-\oplus\mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{A1}\oplus\mathrm{A2}$
N132.3.7 $\mathrm{GM1}^-\oplus\mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{B2_u}$
N132.3.8 $\mathrm{GM1}^-\oplus\mathrm{M1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}$
N132.3.9 $\mathrm{GM1}^-\oplus\mathrm{M1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}$
N132.3.10 $\mathrm{GM1}^-\oplus\mathrm{M2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}$
N132.3.11 $\mathrm{GM1}^-\oplus\mathrm{M2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}$
N132.3.12 $\mathrm{GM2}^+\oplus\mathrm{GM2}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B1_g}$
N132.3.13 $\mathrm{GM2}^+\oplus\mathrm{GM2}^-$	$\surd$	2	2	$\surd$	422	$\mathrm{A1}\oplus\mathrm{B1}$
N132.3.14 $\mathrm{GM2}^+\oplus\mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}\oplus\mathrm{A2_g}$
N132.3.15 $\mathrm{GM2}^+\oplus\mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{A1}\oplus\mathrm{B1}$
N132.3.16 $\mathrm{GM2}^+\oplus\mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B2_g}$
N132.3.17 $\mathrm{GM2}^+\oplus\mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{A1}\oplus\mathrm{B1}$
N132.3.18 $\mathrm{GM2}^+\oplus\mathrm{M1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}$
N132.3.19 $\mathrm{GM2}^+\oplus\mathrm{M1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}$
N132.3.20 $\mathrm{GM2}^+\oplus\mathrm{M2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}$
N132.3.21 $\mathrm{GM2}^+\oplus\mathrm{M2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}$
N132.3.22 $\mathrm{GM2}^-\oplus\mathrm{GM2}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}\oplus\mathrm{B1_u}$
N132.3.23 $\mathrm{GM2}^-\oplus\mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{A1}\oplus\mathrm{B2}$
N132.3.24 $\mathrm{GM2}^-\oplus\mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}\oplus\mathrm{A2_u}$
N132.3.25 $\mathrm{GM2}^-\oplus\mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{A1}\oplus\mathrm{B2}$
N132.3.26 $\mathrm{GM2}^-\oplus\mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}\oplus\mathrm{B2_u}$
N132.3.27 $\mathrm{GM2}^-\oplus\mathrm{M1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}$
N132.3.28 $\mathrm{GM2}^-\oplus\mathrm{M1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}$
N132.3.29 $\mathrm{GM2}^-\oplus\mathrm{M2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}$
N132.3.30 $\mathrm{GM2}^-\oplus\mathrm{M2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}$
N132.3.31 $\mathrm{GM3}^+\oplus\mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_g}$
N132.3.32 $\mathrm{GM3}^+\oplus\mathrm{GM3}^-$	$\surd$	2	2	$\surd$	422	$\mathrm{A1}\oplus\mathrm{A2}$
N132.3.33 $\mathrm{GM3}^+\oplus\mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_g}\oplus\mathrm{B2_g}$
N132.3.34 $\mathrm{GM3}^+\oplus\mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{A1}\oplus\mathrm{A2}$
N132.3.35 $\mathrm{GM3}^+\oplus\mathrm{M1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_g}$

Non-coplanar SSGs with parent space group $P4_2/mcm$ (No. 132) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N132.3.36 $\mathrm{GM3^+} \oplus \mathrm{M1^-}$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g}$
N132.3.37 $\mathrm{GM3^+} \oplus \mathrm{M2^+}$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g}$
N132.3.38 $\mathrm{GM3^+} \oplus \mathrm{M2^-}$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g}$
N132.3.39 $\mathrm{GM3^-} \oplus \mathrm{GM3^-}$	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N132.3.40 $\mathrm{GM3^-} \oplus \mathrm{GM4^+}$	√	2	2	√	$\bar{4}2m$	$\mathrm{A1} \oplus \mathrm{B2}$
N132.3.41 $\mathrm{GM3^-} \oplus \mathrm{GM4^-}$	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N132.3.42 $\mathrm{GM3^-} \oplus \mathrm{M1^+}$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_u}$
N132.3.43 $\mathrm{GM3^-} \oplus \mathrm{M1^-}$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_u}$
N132.3.44 $\mathrm{GM3^-} \oplus \mathrm{M2^+}$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_u}$
N132.3.45 $\mathrm{GM3^-} \oplus \mathrm{M2^-}$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_u}$
N132.3.46 $\mathrm{GM4^+} \oplus \mathrm{GM4^+}$	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N132.3.47 $\mathrm{GM4^+} \oplus \mathrm{GM4^-}$	√	2	2	√	422	$\mathrm{A1} \oplus \mathrm{B2}$
N132.3.48 $\mathrm{GM4^+} \oplus \mathrm{M1^+}$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_g}$
N132.3.49 $\mathrm{GM4^+} \oplus \mathrm{M1^-}$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_g}$
N132.3.50 $\mathrm{GM4^+} \oplus \mathrm{M2^+}$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_g}$
N132.3.51 $\mathrm{GM4^+} \oplus \mathrm{M2^-}$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_g}$
N132.3.52 $\mathrm{GM4^-} \oplus \mathrm{GM4^-}$	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N132.3.53 $\mathrm{GM4^-} \oplus \mathrm{M1^+}$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_u}$
N132.3.54 $\mathrm{GM4^-} \oplus \mathrm{M1^-}$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_u}$
N132.3.55 $\mathrm{GM4^-} \oplus \mathrm{M2^+}$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_u}$
N132.3.56 $\mathrm{GM4^-} \oplus \mathrm{M2^-}$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_u}$
N132.3.57 $\mathrm{M1^+} \oplus \mathrm{M1^+}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N132.3.58 $\mathrm{M1^+} \oplus \mathrm{M4^+}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N132.3.59 $\mathrm{M1^+} \oplus \mathrm{M1^-}$	√	1	1	√	422	$\mathrm{A1}$
N132.3.60 $\mathrm{M1^+} \oplus \mathrm{M4^-}$	√	1	1	√	$\bar{4}m2$	$\mathrm{A1}$
N132.3.61 $\mathrm{M1^+} \oplus \mathrm{M2^+}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N132.3.62 $\mathrm{M1^+} \oplus \mathrm{M3^+}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N132.3.63 $\mathrm{M1^+} \oplus \mathrm{M2^-}$	√	1	1	√	$\bar{4}2m$	$\mathrm{A1}$
N132.3.64 $\mathrm{M1^+} \oplus \mathrm{M3^-}$	√	1	1	√	$4mm$	$\mathrm{A1}$
N132.3.65 $\mathrm{M1^-} \oplus \mathrm{M1^-}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N132.3.66 $\mathrm{M1^-} \oplus \mathrm{M4^-}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N132.3.67 $\mathrm{M1^-} \oplus \mathrm{M2^+}$	√	1	1	√	$\bar{4}2m$	$\mathrm{A1}$
N132.3.68 $\mathrm{M1^-} \oplus \mathrm{M3^+}$	√	1	1	√	$4mm$	$\mathrm{A1}$
N132.3.69 $\mathrm{M1^-} \oplus \mathrm{M2^-}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N132.3.70 $\mathrm{M1^-} \oplus \mathrm{M3^-}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N132.3.71 $\mathrm{M2^+} \oplus \mathrm{M2^+}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N132.3.72 $\mathrm{M2^+} \oplus \mathrm{M3^+}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N132.3.73 $\mathrm{M2^+} \oplus \mathrm{M2^-}$	√	1	1	√	422	$\mathrm{A1}$
N132.3.74 $\mathrm{M2^+} \oplus \mathrm{M3^-}$	√	1	1	√	$\bar{4}m2$	$\mathrm{A1}$
N132.3.75 $\mathrm{M2^-} \oplus \mathrm{M2^-}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N132.3.76 $\mathrm{M2^-} \oplus \mathrm{M3^-}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N132.6.1 $\mathrm{GM5^+}$	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{E_g}$
N132.6.2 $\mathrm{GM5^-}$	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{E_u}$
N132.6.3 A1	√	1	1	√	$4mm$	A1
N132.6.4 A2	√	1	1	√	$4mm$	A1
N132.6.5 A3	√	1	1	√	$\bar{4}m2$	A1

Non-coplanar SSGs with parent space group $P4_2/mcm$ (No. 132) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N132.6.6 $\mathrm{M5}^{+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N132.6.7 $\mathrm{M5}^{-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N132.6.8 Z1	$\surd$	1	1	$\surd$	$4mm$	A1
N132.6.9 Z2	$\surd$	1	1	$\surd$	$4mm$	A1
N132.6.10 Z3	$\surd$	1	1	$\surd$	$\bar{4}m2$	A1
N132.7.1 $\mathrm{X1}^{+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N132.7.2 $\mathrm{X1}^{-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N132.7.3 $\mathrm{X2}^{+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N132.7.4 $\mathrm{X2}^{-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N132.8.1 LD1	$\surd$	1	1	$\surd$	$4mm$	A1
N132.8.2 LD2	$\surd$	1	1	$\surd$	$4mm$	A1
N132.8.3 V1	$\surd$	1	1	$\surd$	$4mm$	A1
N132.8.4 V2	$\surd$	1	1	$\surd$	$4mm$	A1
N132.9.1 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}$	$\surd$	0	0	$\surd$	-	-
N132.9.2 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_u}\oplus\mathrm{B1_u}$
N132.9.3 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
N132.9.4 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}\oplus\mathrm{GM3}^{+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{A2_u}\oplus\mathrm{A2_u}$
N132.9.5 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}\oplus\mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
N132.9.6 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}\oplus\mathrm{GM4}^{+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B2_g}\oplus\mathrm{B2_u}\oplus\mathrm{B2_u}$
N132.9.7 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}\oplus\mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
N132.9.8 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}\oplus\mathrm{M1}^{+}$	$\surd$	0	0	$\surd$	-	-
N132.9.9 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}\oplus\mathrm{M1}^{-}$	$\surd$	0	0	$\surd$	-	-
N132.9.10 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}\oplus\mathrm{M2}^{+}$	$\surd$	0	0	$\surd$	-	-
N132.9.11 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}\oplus\mathrm{M2}^{-}$	$\surd$	0	0	$\surd$	-	-
N132.9.12 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	422	$\mathrm{B1}\oplus\mathrm{B1}$
N132.9.13 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B1_g}\oplus\mathrm{B1_u}$
N132.9.14 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{B1}\oplus\mathrm{B2}$
N132.9.15 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_u}\oplus\mathrm{B2_u}$
N132.9.16 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}\oplus\mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{B1}\oplus\mathrm{B2}$
N132.9.17 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}\oplus\mathrm{GM4}^{-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_u}\oplus\mathrm{A2_u}$
N132.9.18 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}\oplus\mathrm{M1}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_u}$
N132.9.19 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}\oplus\mathrm{M1}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_u}$
N132.9.20 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}\oplus\mathrm{M2}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_u}$
N132.9.21 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}\oplus\mathrm{M2}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_u}$
N132.9.22 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
N132.9.23 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{A2_u}\oplus\mathrm{B2_u}$
N132.9.24 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
N132.9.25 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{GM4}^{+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_u}\oplus\mathrm{B2_g}\oplus\mathrm{B2_u}$
N132.9.26 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
N132.9.27 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{M1}^{+}$	$\surd$	0	0	$\surd$	-	-
N132.9.28 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{M1}^{-}$	$\surd$	0	0	$\surd$	-	-
N132.9.29 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{M2}^{+}$	$\surd$	0	0	$\surd$	-	-
N132.9.30 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{M2}^{-}$	$\surd$	0	0	$\surd$	-	-
N132.9.31 $\mathrm{GM1}^{-}\oplus\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	422	$\mathrm{A2}\oplus\mathrm{A2}$
N132.9.32 $\mathrm{GM1}^{-}\oplus\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A2_g}\oplus\mathrm{A2_u}$
N132.9.33 $\mathrm{GM1}^{-}\oplus\mathrm{GM3}^{+}\oplus\mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B2}\oplus\mathrm{A2}$

Non-coplanar SSGs with parent space group $P4_2/mcm$ (No. 132) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N132.9.34 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
N132.9.35 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{M1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u}$
N132.9.36 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{M1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u}$
N132.9.37 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{M2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u}$
N132.9.38 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{M2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u}$
N132.9.39 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N132.9.40 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N132.9.41 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N132.9.42 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{M1}^+$	$\surd$	0	0	$\surd$	-	-
N132.9.43 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{M1}^-$	$\surd$	0	0	$\surd$	-	-
N132.9.44 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{M2}^+$	$\surd$	0	0	$\surd$	-	-
N132.9.45 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{M2}^-$	$\surd$	0	0	$\surd$	-	-
N132.9.46 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	422	$\mathrm{B2} \oplus \mathrm{B2}$
N132.9.47 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N132.9.48 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{M1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_u}$
N132.9.49 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{M1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_u}$
N132.9.50 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{M2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_u}$
N132.9.51 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{M2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_u}$
N132.9.52 $\mathrm{GM1}^- \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N132.9.53 $\mathrm{GM1}^- \oplus \mathrm{GM4}^- \oplus \mathrm{M1}^+$	$\surd$	0	0	$\surd$	-	-
N132.9.54 $\mathrm{GM1}^- \oplus \mathrm{GM4}^- \oplus \mathrm{M1}^-$	$\surd$	0	0	$\surd$	-	-
N132.9.55 $\mathrm{GM1}^- \oplus \mathrm{GM4}^- \oplus \mathrm{M2}^+$	$\surd$	0	0	$\surd$	-	-
N132.9.56 $\mathrm{GM1}^- \oplus \mathrm{GM4}^- \oplus \mathrm{M2}^-$	$\surd$	0	0	$\surd$	-	-
N132.9.57 $\mathrm{GM1}^- \oplus \mathrm{M1}^+ \oplus \mathrm{M1}^+$	$\surd$	1	0	$\times$	-	-
N132.9.58 $\mathrm{GM1}^- \oplus \mathrm{M1}^+ \oplus \mathrm{M4}^+$	$\surd$	1	0	$\times$	-	-
N132.9.59 $\mathrm{GM1}^- \oplus \mathrm{M1}^+ \oplus \mathrm{M1}^-$	$\surd$	1	1	$\times$	-	-
N132.9.60 $\mathrm{GM1}^- \oplus \mathrm{M1}^+ \oplus \mathrm{M4}^-$	$\surd$	1	1	$\times$	-	-
N132.9.61 $\mathrm{GM1}^- \oplus \mathrm{M1}^+ \oplus \mathrm{M2}^+$	$\surd$	1	0	$\times$	-	-
N132.9.62 $\mathrm{GM1}^- \oplus \mathrm{M1}^+ \oplus \mathrm{M3}^+$	$\surd$	1	0	$\times$	-	-
N132.9.63 $\mathrm{GM1}^- \oplus \mathrm{M1}^+ \oplus \mathrm{M2}^-$	$\surd$	1	1	$\times$	-	-
N132.9.64 $\mathrm{GM1}^- \oplus \mathrm{M1}^+ \oplus \mathrm{M3}^-$	$\surd$	1	1	$\times$	-	-
N132.9.65 $\mathrm{GM1}^- \oplus \mathrm{M1}^- \oplus \mathrm{M1}^-$	$\surd$	1	0	$\times$	-	-
N132.9.66 $\mathrm{GM1}^- \oplus \mathrm{M1}^- \oplus \mathrm{M4}^-$	$\surd$	1	0	$\times$	-	-
N132.9.67 $\mathrm{GM1}^- \oplus \mathrm{M1}^- \oplus \mathrm{M2}^+$	$\surd$	1	1	$\times$	-	-
N132.9.68 $\mathrm{GM1}^- \oplus \mathrm{M1}^- \oplus \mathrm{M3}^+$	$\surd$	1	1	$\times$	-	-
N132.9.69 $\mathrm{GM1}^- \oplus \mathrm{M1}^- \oplus \mathrm{M2}^-$	$\surd$	1	0	$\times$	-	-
N132.9.70 $\mathrm{GM1}^- \oplus \mathrm{M1}^- \oplus \mathrm{M3}^-$	$\surd$	1	0	$\times$	-	-
N132.9.71 $\mathrm{GM1}^- \oplus \mathrm{M2}^+ \oplus \mathrm{M2}^+$	$\surd$	1	0	$\times$	-	-
N132.9.72 $\mathrm{GM1}^- \oplus \mathrm{M2}^+ \oplus \mathrm{M3}^+$	$\surd$	1	0	$\times$	-	-
N132.9.73 $\mathrm{GM1}^- \oplus \mathrm{M2}^+ \oplus \mathrm{M2}^-$	$\surd$	1	1	$\times$	-	-
N132.9.74 $\mathrm{GM1}^- \oplus \mathrm{M2}^+ \oplus \mathrm{M3}^-$	$\surd$	1	1	$\times$	-	-
N132.9.75 $\mathrm{GM1}^- \oplus \mathrm{M2}^- \oplus \mathrm{M2}^-$	$\surd$	1	0	$\times$	-	-
N132.9.76 $\mathrm{GM1}^- \oplus \mathrm{M2}^- \oplus \mathrm{M3}^-$	$\surd$	1	0	$\times$	-	-
N132.9.77 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N132.9.78 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B1} \oplus \mathrm{B1}$
N132.9.79 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{A2_g}$

Non-coplanar SSGs with parent space group $P4_2/mcm$ (No. 132) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N132.9.80 $\mathrm{GM2^+} \oplus \mathrm{GM2^+} \oplus \mathrm{GM3^-}$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{B1} \oplus \mathrm{B1}$
N132.9.81 $\mathrm{GM2^+} \oplus \mathrm{GM2^+} \oplus \mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B2_g}$
N132.9.82 $\mathrm{GM2^+} \oplus \mathrm{GM2^+} \oplus \mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{B1} \oplus \mathrm{B1}$
N132.9.83 $\mathrm{GM2^+} \oplus \mathrm{GM2^+} \oplus \mathrm{M1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N132.9.84 $\mathrm{GM2^+} \oplus \mathrm{GM2^+} \oplus \mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N132.9.85 $\mathrm{GM2^+} \oplus \mathrm{GM2^+} \oplus \mathrm{M2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N132.9.86 $\mathrm{GM2^+} \oplus \mathrm{GM2^+} \oplus \mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N132.9.87 $\mathrm{GM2^+} \oplus \mathrm{GM2^-} \oplus \mathrm{GM2^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{B1_g}$
N132.9.88 $\mathrm{GM2^+} \oplus \mathrm{GM2^-} \oplus \mathrm{GM3^+}$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{B1} \oplus \mathrm{A2}$
N132.9.89 $\mathrm{GM2^+} \oplus \mathrm{GM2^-} \oplus \mathrm{GM3^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B2_u}$
N132.9.90 $\mathrm{GM2^+} \oplus \mathrm{GM2^-} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{B1} \oplus \mathrm{A2}$
N132.9.91 $\mathrm{GM2^+} \oplus \mathrm{GM2^-} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{A2_u}$
N132.9.92 $\mathrm{GM2^+} \oplus \mathrm{GM2^-} \oplus \mathrm{M1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g}$
N132.9.93 $\mathrm{GM2^+} \oplus \mathrm{GM2^-} \oplus \mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g}$
N132.9.94 $\mathrm{GM2^+} \oplus \mathrm{GM2^-} \oplus \mathrm{M2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g}$
N132.9.95 $\mathrm{GM2^+} \oplus \mathrm{GM2^-} \oplus \mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g}$
N132.9.96 $\mathrm{GM2^+} \oplus \mathrm{GM3^+} \oplus \mathrm{GM3^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
N132.9.97 $\mathrm{GM2^+} \oplus \mathrm{GM3^+} \oplus \mathrm{GM3^-}$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B1} \oplus \mathrm{A2}$
N132.9.98 $\mathrm{GM2^+} \oplus \mathrm{GM3^+} \oplus \mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g} \oplus \mathrm{B2_g}$
N132.9.99 $\mathrm{GM2^+} \oplus \mathrm{GM3^+} \oplus \mathrm{GM4^-}$	$\surd$	2	2	$\surd$	422	$\mathrm{B1} \oplus \mathrm{A2}$
N132.9.100 $\mathrm{GM2^+} \oplus \mathrm{GM3^+} \oplus \mathrm{M1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g}$
N132.9.101 $\mathrm{GM2^+} \oplus \mathrm{GM3^+} \oplus \mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g}$
N132.9.102 $\mathrm{GM2^+} \oplus \mathrm{GM3^+} \oplus \mathrm{M2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g}$
N132.9.103 $\mathrm{GM2^+} \oplus \mathrm{GM3^+} \oplus \mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g}$
N132.9.104 $\mathrm{GM2^+} \oplus \mathrm{GM3^-} \oplus \mathrm{GM3^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N132.9.105 $\mathrm{GM2^+} \oplus \mathrm{GM3^-} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	422	$\mathrm{B1} \oplus \mathrm{B2}$
N132.9.106 $\mathrm{GM2^+} \oplus \mathrm{GM3^-} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N132.9.107 $\mathrm{GM2^+} \oplus \mathrm{GM3^-} \oplus \mathrm{M1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N132.9.108 $\mathrm{GM2^+} \oplus \mathrm{GM3^-} \oplus \mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N132.9.109 $\mathrm{GM2^+} \oplus \mathrm{GM3^-} \oplus \mathrm{M2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N132.9.110 $\mathrm{GM2^+} \oplus \mathrm{GM3^-} \oplus \mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N132.9.111 $\mathrm{GM2^+} \oplus \mathrm{GM4^+} \oplus \mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N132.9.112 $\mathrm{GM2^+} \oplus \mathrm{GM4^+} \oplus \mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B1} \oplus \mathrm{B2}$
N132.9.113 $\mathrm{GM2^+} \oplus \mathrm{GM4^+} \oplus \mathrm{M1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
N132.9.114 $\mathrm{GM2^+} \oplus \mathrm{GM4^+} \oplus \mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
N132.9.115 $\mathrm{GM2^+} \oplus \mathrm{GM4^+} \oplus \mathrm{M2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
N132.9.116 $\mathrm{GM2^+} \oplus \mathrm{GM4^+} \oplus \mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
N132.9.117 $\mathrm{GM2^+} \oplus \mathrm{GM4^-} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N132.9.118 $\mathrm{GM2^+} \oplus \mathrm{GM4^-} \oplus \mathrm{M1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u}$
N132.9.119 $\mathrm{GM2^+} \oplus \mathrm{GM4^-} \oplus \mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u}$
N132.9.120 $\mathrm{GM2^+} \oplus \mathrm{GM4^-} \oplus \mathrm{M2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u}$
N132.9.121 $\mathrm{GM2^+} \oplus \mathrm{GM4^-} \oplus \mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u}$
N132.9.122 $\mathrm{GM2^+} \oplus \mathrm{M1^+} \oplus \mathrm{M1^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N132.9.123 $\mathrm{GM2^+} \oplus \mathrm{M1^+} \oplus \mathrm{M4^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N132.9.124 $\mathrm{GM2^+} \oplus \mathrm{M1^+} \oplus \mathrm{M1^-}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	$\mathrm{B1}$
N132.9.125 $\mathrm{GM2^+} \oplus \mathrm{M1^+} \oplus \mathrm{M4^-}$	$\surd$	1	1	$\surd$	$4mm$	$\mathrm{B1}$

Non-coplanar SSGs with parent space group $P4_2/mcm$ (No. 132) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N132.9.126 $\mathrm{GM2}^+\oplus\mathrm{M1}^+\oplus\mathrm{M2}^+$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N132.9.127 $\mathrm{GM2}^+\oplus\mathrm{M1}^+\oplus\mathrm{M3}^+$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N132.9.128 $\mathrm{GM2}^+\oplus\mathrm{M1}^+\oplus\mathrm{M2}^-$	$\surd$	1	1	$\surd$	422	$\mathrm{B1}$
N132.9.129 $\mathrm{GM2}^+\oplus\mathrm{M1}^+\oplus\mathrm{M3}^-$	$\surd$	1	1	$\surd$	$\bar{4}m2$	$\mathrm{B1}$
N132.9.130 $\mathrm{GM2}^+\oplus\mathrm{M1}^-\oplus\mathrm{M1}^-$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N132.9.131 $\mathrm{GM2}^+\oplus\mathrm{M1}^-\oplus\mathrm{M4}^-$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N132.9.132 $\mathrm{GM2}^+\oplus\mathrm{M1}^-\oplus\mathrm{M2}^+$	$\surd$	1	1	$\surd$	422	$\mathrm{B1}$
N132.9.133 $\mathrm{GM2}^+\oplus\mathrm{M1}^-\oplus\mathrm{M3}^+$	$\surd$	1	1	$\surd$	$\bar{4}m2$	$\mathrm{B1}$
N132.9.134 $\mathrm{GM2}^+\oplus\mathrm{M1}^-\oplus\mathrm{M2}^-$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N132.9.135 $\mathrm{GM2}^+\oplus\mathrm{M1}^-\oplus\mathrm{M3}^-$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N132.9.136 $\mathrm{GM2}^+\oplus\mathrm{M2}^+\oplus\mathrm{M2}^+$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N132.9.137 $\mathrm{GM2}^+\oplus\mathrm{M2}^+\oplus\mathrm{M3}^+$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N132.9.138 $\mathrm{GM2}^+\oplus\mathrm{M2}^+\oplus\mathrm{M2}^-$	$\surd$	1	1	$\surd$	$\bar{4}2m$	$\mathrm{B1}$
N132.9.139 $\mathrm{GM2}^+\oplus\mathrm{M2}^+\oplus\mathrm{M3}^-$	$\surd$	1	1	$\surd$	$4mm$	$\mathrm{B1}$
N132.9.140 $\mathrm{GM2}^+\oplus\mathrm{M2}^-\oplus\mathrm{M2}^-$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N132.9.141 $\mathrm{GM2}^+\oplus\mathrm{M2}^-\oplus\mathrm{M3}^-$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N132.9.142 $\mathrm{GM2}^-\oplus\mathrm{GM2}^-\oplus\mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
N132.9.143 $\mathrm{GM2}^-\oplus\mathrm{GM2}^-\oplus\mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{B2_u}\oplus\mathrm{B2_u}$
N132.9.144 $\mathrm{GM2}^-\oplus\mathrm{GM2}^-\oplus\mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N132.9.145 $\mathrm{GM2}^-\oplus\mathrm{GM2}^-\oplus\mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_u}\oplus\mathrm{A2_u}\oplus\mathrm{B2_g}$
N132.9.146 $\mathrm{GM2}^-\oplus\mathrm{GM2}^-\oplus\mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N132.9.147 $\mathrm{GM2}^-\oplus\mathrm{GM2}^-\oplus\mathrm{M1}^+$	$\surd$	0	0	$\surd$	-	-
N132.9.148 $\mathrm{GM2}^-\oplus\mathrm{GM2}^-\oplus\mathrm{M1}^-$	$\surd$	0	0	$\surd$	-	-
N132.9.149 $\mathrm{GM2}^-\oplus\mathrm{GM2}^-\oplus\mathrm{M2}^+$	$\surd$	0	0	$\surd$	-	-
N132.9.150 $\mathrm{GM2}^-\oplus\mathrm{GM2}^-\oplus\mathrm{M2}^-$	$\surd$	0	0	$\surd$	-	-
N132.9.151 $\mathrm{GM2}^-\oplus\mathrm{GM3}^+\oplus\mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{A2}\oplus\mathrm{A2}$
N132.9.152 $\mathrm{GM2}^-\oplus\mathrm{GM3}^+\oplus\mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A2_g}\oplus\mathrm{B2_u}$
N132.9.153 $\mathrm{GM2}^-\oplus\mathrm{GM3}^+\oplus\mathrm{GM4}^+$	$\surd$	2	2	$\surd$	422	$\mathrm{A2}\oplus\mathrm{B2}$
N132.9.154 $\mathrm{GM2}^-\oplus\mathrm{GM3}^+\oplus\mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{A2_g}\oplus\mathrm{B2_u}$
N132.9.155 $\mathrm{GM2}^-\oplus\mathrm{GM3}^+\oplus\mathrm{M1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{B2_u}$
N132.9.156 $\mathrm{GM2}^-\oplus\mathrm{GM3}^+\oplus\mathrm{M1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{B2_u}$
N132.9.157 $\mathrm{GM2}^-\oplus\mathrm{GM3}^+\oplus\mathrm{M2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{B2_u}$
N132.9.158 $\mathrm{GM2}^-\oplus\mathrm{GM3}^+\oplus\mathrm{M2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{B2_u}$
N132.9.159 $\mathrm{GM2}^-\oplus\mathrm{GM3}^-\oplus\mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N132.9.160 $\mathrm{GM2}^-\oplus\mathrm{GM3}^-\oplus\mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{A2_u}\oplus\mathrm{B2_g}$
N132.9.161 $\mathrm{GM2}^-\oplus\mathrm{GM3}^-\oplus\mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N132.9.162 $\mathrm{GM2}^-\oplus\mathrm{GM3}^-\oplus\mathrm{M1}^+$	$\surd$	0	0	$\surd$	-	-
N132.9.163 $\mathrm{GM2}^-\oplus\mathrm{GM3}^-\oplus\mathrm{M1}^-$	$\surd$	0	0	$\surd$	-	-
N132.9.164 $\mathrm{GM2}^-\oplus\mathrm{GM3}^-\oplus\mathrm{M2}^+$	$\surd$	0	0	$\surd$	-	-
N132.9.165 $\mathrm{GM2}^-\oplus\mathrm{GM3}^-\oplus\mathrm{M2}^-$	$\surd$	0	0	$\surd$	-	-
N132.9.166 $\mathrm{GM2}^-\oplus\mathrm{GM4}^+\oplus\mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B2}\oplus\mathrm{B2}$
N132.9.167 $\mathrm{GM2}^-\oplus\mathrm{GM4}^+\oplus\mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A2_u}\oplus\mathrm{B2_g}$
N132.9.168 $\mathrm{GM2}^-\oplus\mathrm{GM4}^+\oplus\mathrm{M1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u}\oplus\mathrm{B2_g}$
N132.9.169 $\mathrm{GM2}^-\oplus\mathrm{GM4}^+\oplus\mathrm{M1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u}\oplus\mathrm{B2_g}$
N132.9.170 $\mathrm{GM2}^-\oplus\mathrm{GM4}^+\oplus\mathrm{M2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u}\oplus\mathrm{B2_g}$
N132.9.171 $\mathrm{GM2}^-\oplus\mathrm{GM4}^+\oplus\mathrm{M2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u}\oplus\mathrm{B2_g}$

Non-coplanar SSGs with parent space group $P4_2/mcm$ (No. 132) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N132.9.172 $\mathrm{GM2^-} \oplus \mathrm{GM4^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N132.9.173 $\mathrm{GM2^-} \oplus \mathrm{GM4^-} \oplus \mathrm{M1^+}$	$\surd$	0	0	$\surd$	-	-
N132.9.174 $\mathrm{GM2^-} \oplus \mathrm{GM4^-} \oplus \mathrm{M1^-}$	$\surd$	0	0	$\surd$	-	-
N132.9.175 $\mathrm{GM2^-} \oplus \mathrm{GM4^-} \oplus \mathrm{M2^+}$	$\surd$	0	0	$\surd$	-	-
N132.9.176 $\mathrm{GM2^-} \oplus \mathrm{GM4^-} \oplus \mathrm{M2^-}$	$\surd$	0	0	$\surd$	-	-
N132.9.177 $\mathrm{GM2^-} \oplus \mathrm{M1^+} \oplus \mathrm{M1^+}$	$\surd$	1	0	$\times$	-	-
N132.9.178 $\mathrm{GM2^-} \oplus \mathrm{M1^+} \oplus \mathrm{M4^+}$	$\surd$	1	0	$\times$	-	-
N132.9.179 $\mathrm{GM2^-} \oplus \mathrm{M1^+} \oplus \mathrm{M1^-}$	$\surd$	1	1	$\times$	-	-
N132.9.180 $\mathrm{GM2^-} \oplus \mathrm{M1^+} \oplus \mathrm{M4^-}$	$\surd$	1	1	$\times$	-	-
N132.9.181 $\mathrm{GM2^-} \oplus \mathrm{M1^+} \oplus \mathrm{M2^+}$	$\surd$	1	0	$\times$	-	-
N132.9.182 $\mathrm{GM2^-} \oplus \mathrm{M1^+} \oplus \mathrm{M3^+}$	$\surd$	1	0	$\times$	-	-
N132.9.183 $\mathrm{GM2^-} \oplus \mathrm{M1^+} \oplus \mathrm{M2^-}$	$\surd$	1	1	$\times$	-	-
N132.9.184 $\mathrm{GM2^-} \oplus \mathrm{M1^+} \oplus \mathrm{M3^-}$	$\surd$	1	1	$\times$	-	-
N132.9.185 $\mathrm{GM2^-} \oplus \mathrm{M1^-} \oplus \mathrm{M1^-}$	$\surd$	1	0	$\times$	-	-
N132.9.186 $\mathrm{GM2^-} \oplus \mathrm{M1^-} \oplus \mathrm{M4^-}$	$\surd$	1	0	$\times$	-	-
N132.9.187 $\mathrm{GM2^-} \oplus \mathrm{M1^-} \oplus \mathrm{M2^+}$	$\surd$	1	1	$\times$	-	-
N132.9.188 $\mathrm{GM2^-} \oplus \mathrm{M1^-} \oplus \mathrm{M3^+}$	$\surd$	1	1	$\times$	-	-
N132.9.189 $\mathrm{GM2^-} \oplus \mathrm{M1^-} \oplus \mathrm{M2^-}$	$\surd$	1	0	$\times$	-	-
N132.9.190 $\mathrm{GM2^-} \oplus \mathrm{M1^-} \oplus \mathrm{M3^-}$	$\surd$	1	0	$\times$	-	-
N132.9.191 $\mathrm{GM2^-} \oplus \mathrm{M2^+} \oplus \mathrm{M2^+}$	$\surd$	1	0	$\times$	-	-
N132.9.192 $\mathrm{GM2^-} \oplus \mathrm{M2^+} \oplus \mathrm{M3^+}$	$\surd$	1	0	$\times$	-	-
N132.9.193 $\mathrm{GM2^-} \oplus \mathrm{M2^+} \oplus \mathrm{M2^-}$	$\surd$	1	1	$\times$	-	-
N132.9.194 $\mathrm{GM2^-} \oplus \mathrm{M2^+} \oplus \mathrm{M3^-}$	$\surd$	1	1	$\times$	-	-
N132.9.195 $\mathrm{GM2^-} \oplus \mathrm{M2^-} \oplus \mathrm{M2^-}$	$\surd$	1	0	$\times$	-	-
N132.9.196 $\mathrm{GM2^-} \oplus \mathrm{M2^-} \oplus \mathrm{M3^-}$	$\surd$	1	0	$\times$	-	-
N132.9.197 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{GM3^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
N132.9.198 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{GM3^-}$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{A2} \oplus \mathrm{A2}$
N132.9.199 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{B2_g}$
N132.9.200 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{B2} \oplus \mathrm{B2}$
N132.9.201 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{M1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g}$
N132.9.202 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g}$
N132.9.203 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{M2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g}$
N132.9.204 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g}$
N132.9.205 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{GM3^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A2_g}$
N132.9.206 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{B2} \oplus \mathrm{A2}$
N132.9.207 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{A2_g}$
N132.9.208 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{M1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g}$
N132.9.209 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g}$
N132.9.210 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{M2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g}$
N132.9.211 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g}$
N132.9.212 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N132.9.213 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{B2} \oplus \mathrm{A2}$
N132.9.214 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{M1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g}$
N132.9.215 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g}$
N132.9.216 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{M2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g}$
N132.9.217 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g}$

Non-coplanar SSGs with parent space group $P4_2/mcm$ (No. 132) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N132.9.218 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{A2_g}$
N132.9.219 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{M1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g}$
N132.9.220 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g}$
N132.9.221 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{M2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g}$
N132.9.222 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g}$
N132.9.223 $\mathrm{GM3^+} \oplus \mathrm{M1^+} \oplus \mathrm{M1^+}$	$\surd$	1	1	$\times$	-	-
N132.9.224 $\mathrm{GM3^+} \oplus \mathrm{M1^+} \oplus \mathrm{M4^+}$	$\surd$	1	1	$\times$	-	-
N132.9.225 $\mathrm{GM3^+} \oplus \mathrm{M1^+} \oplus \mathrm{M1^-}$	$\surd$	1	1	$\times$	-	-
N132.9.226 $\mathrm{GM3^+} \oplus \mathrm{M1^+} \oplus \mathrm{M4^-}$	$\surd$	1	1	$\times$	-	-
N132.9.227 $\mathrm{GM3^+} \oplus \mathrm{M1^+} \oplus \mathrm{M2^+}$	$\surd$	1	1	$\times$	-	-
N132.9.228 $\mathrm{GM3^+} \oplus \mathrm{M1^+} \oplus \mathrm{M3^+}$	$\surd$	1	1	$\times$	-	-
N132.9.229 $\mathrm{GM3^+} \oplus \mathrm{M1^+} \oplus \mathrm{M2^-}$	$\surd$	1	1	$\times$	-	-
N132.9.230 $\mathrm{GM3^+} \oplus \mathrm{M1^+} \oplus \mathrm{M3^-}$	$\surd$	1	1	$\times$	-	-
N132.9.231 $\mathrm{GM3^+} \oplus \mathrm{M1^-} \oplus \mathrm{M1^-}$	$\surd$	1	1	$\times$	-	-
N132.9.232 $\mathrm{GM3^+} \oplus \mathrm{M1^-} \oplus \mathrm{M4^-}$	$\surd$	1	1	$\times$	-	-
N132.9.233 $\mathrm{GM3^+} \oplus \mathrm{M1^-} \oplus \mathrm{M2^+}$	$\surd$	1	1	$\times$	-	-
N132.9.234 $\mathrm{GM3^+} \oplus \mathrm{M1^-} \oplus \mathrm{M3^+}$	$\surd$	1	1	$\times$	-	-
N132.9.235 $\mathrm{GM3^+} \oplus \mathrm{M1^-} \oplus \mathrm{M2^-}$	$\surd$	1	1	$\times$	-	-
N132.9.236 $\mathrm{GM3^+} \oplus \mathrm{M1^-} \oplus \mathrm{M3^-}$	$\surd$	1	1	$\times$	-	-
N132.9.237 $\mathrm{GM3^+} \oplus \mathrm{M2^+} \oplus \mathrm{M2^+}$	$\surd$	1	1	$\times$	-	-
N132.9.238 $\mathrm{GM3^+} \oplus \mathrm{M2^+} \oplus \mathrm{M3^+}$	$\surd$	1	1	$\times$	-	-
N132.9.239 $\mathrm{GM3^+} \oplus \mathrm{M2^+} \oplus \mathrm{M2^-}$	$\surd$	1	1	$\times$	-	-
N132.9.240 $\mathrm{GM3^+} \oplus \mathrm{M2^+} \oplus \mathrm{M3^-}$	$\surd$	1	1	$\times$	-	-
N132.9.241 $\mathrm{GM3^+} \oplus \mathrm{M2^-} \oplus \mathrm{M2^-}$	$\surd$	1	1	$\times$	-	-
N132.9.242 $\mathrm{GM3^+} \oplus \mathrm{M2^-} \oplus \mathrm{M3^-}$	$\surd$	1	1	$\times$	-	-
N132.9.243 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
N132.9.244 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B2_g}$
N132.9.245 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N132.9.246 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{M1^+}$	$\surd$	0	0	$\surd$	-	-
N132.9.247 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{M1^-}$	$\surd$	0	0	$\surd$	-	-
N132.9.248 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{M2^+}$	$\surd$	0	0	$\surd$	-	-
N132.9.249 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{M2^-}$	$\surd$	0	0	$\surd$	-	-
N132.9.250 $\mathrm{GM3^-} \oplus \mathrm{GM4^+} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{B2} \oplus \mathrm{B2}$
N132.9.251 $\mathrm{GM3^-} \oplus \mathrm{GM4^+} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B2_g}$
N132.9.252 $\mathrm{GM3^-} \oplus \mathrm{GM4^+} \oplus \mathrm{M1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_g}$
N132.9.253 $\mathrm{GM3^-} \oplus \mathrm{GM4^+} \oplus \mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_g}$
N132.9.254 $\mathrm{GM3^-} \oplus \mathrm{GM4^+} \oplus \mathrm{M2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_g}$
N132.9.255 $\mathrm{GM3^-} \oplus \mathrm{GM4^+} \oplus \mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_g}$
N132.9.256 $\mathrm{GM3^-} \oplus \mathrm{GM4^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N132.9.257 $\mathrm{GM3^-} \oplus \mathrm{GM4^-} \oplus \mathrm{M1^+}$	$\surd$	0	0	$\surd$	-	-
N132.9.258 $\mathrm{GM3^-} \oplus \mathrm{GM4^-} \oplus \mathrm{M1^-}$	$\surd$	0	0	$\surd$	-	-
N132.9.259 $\mathrm{GM3^-} \oplus \mathrm{GM4^-} \oplus \mathrm{M2^+}$	$\surd$	0	0	$\surd$	-	-
N132.9.260 $\mathrm{GM3^-} \oplus \mathrm{GM4^-} \oplus \mathrm{M2^-}$	$\surd$	0	0	$\surd$	-	-
N132.9.261 $\mathrm{GM3^-} \oplus \mathrm{M1^+} \oplus \mathrm{M1^+}$	$\surd$	1	0	$\times$	-	-
N132.9.262 $\mathrm{GM3^-} \oplus \mathrm{M1^+} \oplus \mathrm{M4^+}$	$\surd$	1	0	$\times$	-	-
N132.9.263 $\mathrm{GM3^-} \oplus \mathrm{M1^+} \oplus \mathrm{M1^-}$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $P4_2/mcm$ (No. 132) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N132.9.264 $\mathrm{GM3^-}\oplus\mathrm{M1^+}\oplus\mathrm{M4^-}$	$\surd$	1	1	$\times$	-	-
N132.9.265 $\mathrm{GM3^-}\oplus\mathrm{M1^+}\oplus\mathrm{M2^+}$	$\surd$	1	0	$\times$	-	-
N132.9.266 $\mathrm{GM3^-}\oplus\mathrm{M1^+}\oplus\mathrm{M3^+}$	$\surd$	1	0	$\times$	-	-
N132.9.267 $\mathrm{GM3^-}\oplus\mathrm{M1^+}\oplus\mathrm{M2^-}$	$\surd$	1	1	$\times$	-	-
N132.9.268 $\mathrm{GM3^-}\oplus\mathrm{M1^+}\oplus\mathrm{M3^-}$	$\surd$	1	1	$\times$	-	-
N132.9.269 $\mathrm{GM3^-}\oplus\mathrm{M1^-}\oplus\mathrm{M1^-}$	$\surd$	1	0	$\times$	-	-
N132.9.270 $\mathrm{GM3^-}\oplus\mathrm{M1^-}\oplus\mathrm{M4^-}$	$\surd$	1	0	$\times$	-	-
N132.9.271 $\mathrm{GM3^-}\oplus\mathrm{M1^-}\oplus\mathrm{M2^+}$	$\surd$	1	1	$\times$	-	-
N132.9.272 $\mathrm{GM3^-}\oplus\mathrm{M1^-}\oplus\mathrm{M3^+}$	$\surd$	1	1	$\times$	-	-
N132.9.273 $\mathrm{GM3^-}\oplus\mathrm{M1^-}\oplus\mathrm{M2^-}$	$\surd$	1	0	$\times$	-	-
N132.9.274 $\mathrm{GM3^-}\oplus\mathrm{M1^-}\oplus\mathrm{M3^-}$	$\surd$	1	0	$\times$	-	-
N132.9.275 $\mathrm{GM3^-}\oplus\mathrm{M2^+}\oplus\mathrm{M2^+}$	$\surd$	1	0	$\times$	-	-
N132.9.276 $\mathrm{GM3^-}\oplus\mathrm{M2^+}\oplus\mathrm{M3^+}$	$\surd$	1	0	$\times$	-	-
N132.9.277 $\mathrm{GM3^-}\oplus\mathrm{M2^+}\oplus\mathrm{M2^-}$	$\surd$	1	1	$\times$	-	-
N132.9.278 $\mathrm{GM3^-}\oplus\mathrm{M2^+}\oplus\mathrm{M3^-}$	$\surd$	1	1	$\times$	-	-
N132.9.279 $\mathrm{GM3^-}\oplus\mathrm{M2^-}\oplus\mathrm{M2^-}$	$\surd$	1	0	$\times$	-	-
N132.9.280 $\mathrm{GM3^-}\oplus\mathrm{M2^-}\oplus\mathrm{M3^-}$	$\surd$	1	0	$\times$	-	-
N132.9.281 $\mathrm{GM4^+}\oplus\mathrm{GM4^+}\oplus\mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B2_g}\oplus\mathrm{B2_g}\oplus\mathrm{B2_g}$
N132.9.282 $\mathrm{GM4^+}\oplus\mathrm{GM4^+}\oplus\mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{A2}\oplus\mathrm{A2}$
N132.9.283 $\mathrm{GM4^+}\oplus\mathrm{GM4^+}\oplus\mathrm{M1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g}\oplus\mathrm{B2_g}$
N132.9.284 $\mathrm{GM4^+}\oplus\mathrm{GM4^+}\oplus\mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g}\oplus\mathrm{B2_g}$
N132.9.285 $\mathrm{GM4^+}\oplus\mathrm{GM4^+}\oplus\mathrm{M2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g}\oplus\mathrm{B2_g}$
N132.9.286 $\mathrm{GM4^+}\oplus\mathrm{GM4^+}\oplus\mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g}\oplus\mathrm{B2_g}$
N132.9.287 $\mathrm{GM4^+}\oplus\mathrm{GM4^-}\oplus\mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A1_u}\oplus\mathrm{B2_g}$
N132.9.288 $\mathrm{GM4^+}\oplus\mathrm{GM4^-}\oplus\mathrm{M1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B2_g}$
N132.9.289 $\mathrm{GM4^+}\oplus\mathrm{GM4^-}\oplus\mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B2_g}$
N132.9.290 $\mathrm{GM4^+}\oplus\mathrm{GM4^-}\oplus\mathrm{M2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B2_g}$
N132.9.291 $\mathrm{GM4^+}\oplus\mathrm{GM4^-}\oplus\mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B2_g}$
N132.9.292 $\mathrm{GM4^+}\oplus\mathrm{M1^+}\oplus\mathrm{M1^+}$	$\surd$	1	1	$\times$	-	-
N132.9.293 $\mathrm{GM4^+}\oplus\mathrm{M1^+}\oplus\mathrm{M4^+}$	$\surd$	1	1	$\times$	-	-
N132.9.294 $\mathrm{GM4^+}\oplus\mathrm{M1^+}\oplus\mathrm{M1^-}$	$\surd$	1	1	$\times$	-	-
N132.9.295 $\mathrm{GM4^+}\oplus\mathrm{M1^+}\oplus\mathrm{M4^-}$	$\surd$	1	1	$\times$	-	-
N132.9.296 $\mathrm{GM4^+}\oplus\mathrm{M1^+}\oplus\mathrm{M2^+}$	$\surd$	1	1	$\times$	-	-
N132.9.297 $\mathrm{GM4^+}\oplus\mathrm{M1^+}\oplus\mathrm{M3^+}$	$\surd$	1	1	$\times$	-	-
N132.9.298 $\mathrm{GM4^+}\oplus\mathrm{M1^+}\oplus\mathrm{M2^-}$	$\surd$	1	1	$\times$	-	-
N132.9.299 $\mathrm{GM4^+}\oplus\mathrm{M1^+}\oplus\mathrm{M3^-}$	$\surd$	1	1	$\times$	-	-
N132.9.300 $\mathrm{GM4^+}\oplus\mathrm{M1^-}\oplus\mathrm{M1^-}$	$\surd$	1	1	$\times$	-	-
N132.9.301 $\mathrm{GM4^+}\oplus\mathrm{M1^-}\oplus\mathrm{M4^-}$	$\surd$	1	1	$\times$	-	-
N132.9.302 $\mathrm{GM4^+}\oplus\mathrm{M1^-}\oplus\mathrm{M2^+}$	$\surd$	1	1	$\times$	-	-
N132.9.303 $\mathrm{GM4^+}\oplus\mathrm{M1^-}\oplus\mathrm{M3^+}$	$\surd$	1	1	$\times$	-	-
N132.9.304 $\mathrm{GM4^+}\oplus\mathrm{M1^-}\oplus\mathrm{M2^-}$	$\surd$	1	1	$\times$	-	-
N132.9.305 $\mathrm{GM4^+}\oplus\mathrm{M1^-}\oplus\mathrm{M3^-}$	$\surd$	1	1	$\times$	-	-
N132.9.306 $\mathrm{GM4^+}\oplus\mathrm{M2^+}\oplus\mathrm{M2^+}$	$\surd$	1	1	$\times$	-	-
N132.9.307 $\mathrm{GM4^+}\oplus\mathrm{M2^+}\oplus\mathrm{M3^+}$	$\surd$	1	1	$\times$	-	-
N132.9.308 $\mathrm{GM4^+}\oplus\mathrm{M2^+}\oplus\mathrm{M2^-}$	$\surd$	1	1	$\times$	-	-
N132.9.309 $\mathrm{GM4^+}\oplus\mathrm{M2^+}\oplus\mathrm{M3^-}$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $P4_2/mcm$ (No. 132) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N132.9.310 $\mathrm{GM4^+} \oplus \mathrm{M2^-} \oplus \mathrm{M2^-}$	$\surd$	1	1	$\times$	-	-
N132.9.311 $\mathrm{GM4^+} \oplus \mathrm{M2^-} \oplus \mathrm{M3^-}$	$\surd$	1	1	$\times$	-	-
N132.9.312 $\mathrm{GM4^-} \oplus \mathrm{GM4^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N132.9.313 $\mathrm{GM4^-} \oplus \mathrm{GM4^-} \oplus \mathrm{M1^+}$	$\surd$	0	0	$\surd$	-	-
N132.9.314 $\mathrm{GM4^-} \oplus \mathrm{GM4^-} \oplus \mathrm{M1^-}$	$\surd$	0	0	$\surd$	-	-
N132.9.315 $\mathrm{GM4^-} \oplus \mathrm{GM4^-} \oplus \mathrm{M2^+}$	$\surd$	0	0	$\surd$	-	-
N132.9.316 $\mathrm{GM4^-} \oplus \mathrm{GM4^-} \oplus \mathrm{M2^-}$	$\surd$	0	0	$\surd$	-	-
N132.9.317 $\mathrm{GM4^-} \oplus \mathrm{M1^+} \oplus \mathrm{M1^+}$	$\surd$	1	0	$\times$	-	-
N132.9.318 $\mathrm{GM4^-} \oplus \mathrm{M1^+} \oplus \mathrm{M4^+}$	$\surd$	1	0	$\times$	-	-
N132.9.319 $\mathrm{GM4^-} \oplus \mathrm{M1^+} \oplus \mathrm{M1^-}$	$\surd$	1	1	$\times$	-	-
N132.9.320 $\mathrm{GM4^-} \oplus \mathrm{M1^+} \oplus \mathrm{M4^-}$	$\surd$	1	1	$\times$	-	-
N132.9.321 $\mathrm{GM4^-} \oplus \mathrm{M1^+} \oplus \mathrm{M2^+}$	$\surd$	1	0	$\times$	-	-
N132.9.322 $\mathrm{GM4^-} \oplus \mathrm{M1^+} \oplus \mathrm{M3^+}$	$\surd$	1	0	$\times$	-	-
N132.9.323 $\mathrm{GM4^-} \oplus \mathrm{M1^+} \oplus \mathrm{M2^-}$	$\surd$	1	1	$\times$	-	-
N132.9.324 $\mathrm{GM4^-} \oplus \mathrm{M1^+} \oplus \mathrm{M3^-}$	$\surd$	1	1	$\times$	-	-
N132.9.325 $\mathrm{GM4^-} \oplus \mathrm{M1^-} \oplus \mathrm{M1^-}$	$\surd$	1	0	$\times$	-	-
N132.9.326 $\mathrm{GM4^-} \oplus \mathrm{M1^-} \oplus \mathrm{M4^-}$	$\surd$	1	0	$\times$	-	-
N132.9.327 $\mathrm{GM4^-} \oplus \mathrm{M1^-} \oplus \mathrm{M2^+}$	$\surd$	1	1	$\times$	-	-
N132.9.328 $\mathrm{GM4^-} \oplus \mathrm{M1^-} \oplus \mathrm{M3^+}$	$\surd$	1	1	$\times$	-	-
N132.9.329 $\mathrm{GM4^-} \oplus \mathrm{M1^-} \oplus \mathrm{M2^-}$	$\surd$	1	0	$\times$	-	-
N132.9.330 $\mathrm{GM4^-} \oplus \mathrm{M1^-} \oplus \mathrm{M3^-}$	$\surd$	1	0	$\times$	-	-
N132.9.331 $\mathrm{GM4^-} \oplus \mathrm{M2^+} \oplus \mathrm{M2^+}$	$\surd$	1	0	$\times$	-	-
N132.9.332 $\mathrm{GM4^-} \oplus \mathrm{M2^+} \oplus \mathrm{M3^+}$	$\surd$	1	0	$\times$	-	-
N132.9.333 $\mathrm{GM4^-} \oplus \mathrm{M2^+} \oplus \mathrm{M2^-}$	$\surd$	1	1	$\times$	-	-
N132.9.334 $\mathrm{GM4^-} \oplus \mathrm{M2^+} \oplus \mathrm{M3^-}$	$\surd$	1	1	$\times$	-	-
N132.9.335 $\mathrm{GM4^-} \oplus \mathrm{M2^-} \oplus \mathrm{M2^-}$	$\surd$	1	0	$\times$	-	-
N132.9.336 $\mathrm{GM4^-} \oplus \mathrm{M2^-} \oplus \mathrm{M3^-}$	$\surd$	1	0	$\times$	-	-
N132.9.337 $\mathrm{M1^+} \oplus \mathrm{M1^+} \oplus \mathrm{M1^+}$	$\surd$	0	0	$\surd$	-	-
N132.9.338 $\mathrm{M1^+} \oplus \mathrm{M1^+} \oplus \mathrm{M4^+}$	$\surd$	0	0	$\surd$	-	-
N132.9.339 $\mathrm{M1^+} \oplus \mathrm{M1^+} \oplus \mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u}$
N132.9.340 $\mathrm{M1^+} \oplus \mathrm{M1^+} \oplus \mathrm{M4^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_u} \oplus \mathrm{B2_u}$
N132.9.341 $\mathrm{M1^+} \oplus \mathrm{M4^+} \oplus \mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_u}$
N132.9.342 $\mathrm{M1^+} \oplus \mathrm{M1^+} \oplus \mathrm{M2^+}$	$\surd$	0	0	$\surd$	-	-
N132.9.343 $\mathrm{M1^+} \oplus \mathrm{M1^+} \oplus \mathrm{M3^+}$	$\surd$	0	0	$\surd$	-	-
N132.9.344 $\mathrm{M1^+} \oplus \mathrm{M4^+} \oplus \mathrm{M2^+}$	$\surd$	0	0	$\surd$	-	-
N132.9.345 $\mathrm{M1^+} \oplus \mathrm{M1^+} \oplus \mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N132.9.346 $\mathrm{M1^+} \oplus \mathrm{M1^+} \oplus \mathrm{M3^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u}$
N132.9.347 $\mathrm{M1^+} \oplus \mathrm{M4^+} \oplus \mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_u}$
N132.9.348 $\mathrm{M1^+} \oplus \mathrm{M1^-} \oplus \mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u}$
N132.9.349 $\mathrm{M1^+} \oplus \mathrm{M1^-} \oplus \mathrm{M4^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_u}$
N132.9.350 $\mathrm{M1^+} \oplus \mathrm{M4^-} \oplus \mathrm{M4^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_u} \oplus \mathrm{B2_u}$
N132.9.351 $\mathrm{M1^+} \oplus \mathrm{M1^-} \oplus \mathrm{M2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u}$
N132.9.352 $\mathrm{M1^+} \oplus \mathrm{M1^-} \oplus \mathrm{M3^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u}$
N132.9.353 $\mathrm{M1^+} \oplus \mathrm{M4^-} \oplus \mathrm{M2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_u}$
N132.9.354 $\mathrm{M1^+} \oplus \mathrm{M4^-} \oplus \mathrm{M3^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N132.9.355 $\mathrm{M1^+} \oplus \mathrm{M1^-} \oplus \mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u}$

Non-coplanar SSGs with parent space group $P4_2/mcm$ (No. 132) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N132.9.356 $\mathrm{M1}^+ \oplus \mathrm{M1}^- \oplus \mathrm{M3}^-$	√	2	2	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u}$
N132.9.357 $\mathrm{M1}^+ \oplus \mathrm{M4}^- \oplus \mathrm{M2}^-$	√	2	2	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N132.9.358 $\mathrm{M1}^+ \oplus \mathrm{M4}^- \oplus \mathrm{M3}^-$	√	2	2	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_u}$
N132.9.359 $\mathrm{M1}^+ \oplus \mathrm{M2}^+ \oplus \mathrm{M2}^+$	√	0	0	√	-	-
N132.9.360 $\mathrm{M1}^+ \oplus \mathrm{M2}^+ \oplus \mathrm{M3}^+$	√	0	0	√	-	-
N132.9.361 $\mathrm{M1}^+ \oplus \mathrm{M3}^+ \oplus \mathrm{M3}^+$	√	0	0	√	-	-
N132.9.362 $\mathrm{M1}^+ \oplus \mathrm{M2}^+ \oplus \mathrm{M2}^-$	√	2	2	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u}$
N132.9.363 $\mathrm{M1}^+ \oplus \mathrm{M2}^+ \oplus \mathrm{M3}^-$	√	2	2	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_u}$
N132.9.364 $\mathrm{M1}^+ \oplus \mathrm{M3}^+ \oplus \mathrm{M2}^-$	√	2	2	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N132.9.365 $\mathrm{M1}^+ \oplus \mathrm{M3}^+ \oplus \mathrm{M3}^-$	√	2	2	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u}$
N132.9.366 $\mathrm{M1}^+ \oplus \mathrm{M2}^- \oplus \mathrm{M2}^-$	√	2	2	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N132.9.367 $\mathrm{M1}^+ \oplus \mathrm{M2}^- \oplus \mathrm{M3}^-$	√	2	2	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_u}$
N132.9.368 $\mathrm{M1}^+ \oplus \mathrm{M3}^- \oplus \mathrm{M3}^-$	√	2	2	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u}$
N132.9.369 $\mathrm{M1}^- \oplus \mathrm{M1}^- \oplus \mathrm{M1}^-$	√	0	0	√	-	-
N132.9.370 $\mathrm{M1}^- \oplus \mathrm{M1}^- \oplus \mathrm{M4}^-$	√	0	0	√	-	-
N132.9.371 $\mathrm{M1}^- \oplus \mathrm{M1}^- \oplus \mathrm{M2}^+$	√	2	2	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N132.9.372 $\mathrm{M1}^- \oplus \mathrm{M1}^- \oplus \mathrm{M3}^+$	√	2	2	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u}$
N132.9.373 $\mathrm{M1}^- \oplus \mathrm{M4}^- \oplus \mathrm{M2}^+$	√	2	2	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_u}$
N132.9.374 $\mathrm{M1}^- \oplus \mathrm{M1}^- \oplus \mathrm{M2}^-$	√	0	0	√	-	-
N132.9.375 $\mathrm{M1}^- \oplus \mathrm{M1}^- \oplus \mathrm{M3}^-$	√	0	0	√	-	-
N132.9.376 $\mathrm{M1}^- \oplus \mathrm{M4}^- \oplus \mathrm{M2}^-$	√	0	0	√	-	-
N132.9.377 $\mathrm{M1}^- \oplus \mathrm{M2}^+ \oplus \mathrm{M2}^+$	√	2	2	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N132.9.378 $\mathrm{M1}^- \oplus \mathrm{M2}^+ \oplus \mathrm{M3}^+$	√	2	2	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_u}$
N132.9.379 $\mathrm{M1}^- \oplus \mathrm{M3}^+ \oplus \mathrm{M3}^+$	√	2	2	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u}$
N132.9.380 $\mathrm{M1}^- \oplus \mathrm{M2}^+ \oplus \mathrm{M2}^-$	√	2	2	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u}$
N132.9.381 $\mathrm{M1}^- \oplus \mathrm{M2}^+ \oplus \mathrm{M3}^-$	√	2	2	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N132.9.382 $\mathrm{M1}^- \oplus \mathrm{M3}^+ \oplus \mathrm{M2}^-$	√	2	2	√	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_u}$
N132.9.383 $\mathrm{M1}^- \oplus \mathrm{M3}^+ \oplus \mathrm{M3}^-$	√	2	2	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u}$
N132.9.384 $\mathrm{M1}^- \oplus \mathrm{M2}^- \oplus \mathrm{M2}^-$	√	0	0	√	-	-
N132.9.385 $\mathrm{M1}^- \oplus \mathrm{M2}^- \oplus \mathrm{M3}^-$	√	0	0	√	-	-
N132.9.386 $\mathrm{M1}^- \oplus \mathrm{M3}^- \oplus \mathrm{M3}^-$	√	0	0	√	-	-
N132.9.387 $\mathrm{M2}^+ \oplus \mathrm{M2}^+ \oplus \mathrm{M2}^+$	√	0	0	√	-	-
N132.9.388 $\mathrm{M2}^+ \oplus \mathrm{M2}^+ \oplus \mathrm{M3}^+$	√	0	0	√	-	-
N132.9.389 $\mathrm{M2}^+ \oplus \mathrm{M2}^+ \oplus \mathrm{M2}^-$	√	2	2	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u}$
N132.9.390 $\mathrm{M2}^+ \oplus \mathrm{M2}^+ \oplus \mathrm{M3}^-$	√	2	2	√	$4/mmm$	$\mathrm{B2_u} \oplus \mathrm{B2_u}$
N132.9.391 $\mathrm{M2}^+ \oplus \mathrm{M3}^+ \oplus \mathrm{M2}^-$	√	2	2	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_u}$
N132.9.392 $\mathrm{M2}^+ \oplus \mathrm{M2}^- \oplus \mathrm{M2}^-$	√	2	2	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u}$
N132.9.393 $\mathrm{M2}^+ \oplus \mathrm{M2}^- \oplus \mathrm{M3}^-$	√	2	2	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_u}$
N132.9.394 $\mathrm{M2}^+ \oplus \mathrm{M3}^- \oplus \mathrm{M3}^-$	√	2	2	√	$4/mmm$	$\mathrm{B2_u} \oplus \mathrm{B2_u}$
N132.9.395 $\mathrm{M2}^- \oplus \mathrm{M2}^- \oplus \mathrm{M2}^-$	√	0	0	√	-	-
N132.9.396 $\mathrm{M2}^- \oplus \mathrm{M2}^- \oplus \mathrm{M3}^-$	√	0	0	√	-	-
N132.12.1 $\mathrm{GM1}^- \oplus \mathrm{GM5}^+$	√	2	2	√	$4mm$	E
N132.12.2 $\mathrm{GM1}^- \oplus \mathrm{GM5}^-$	√	0	0	√	-	-
N132.12.3 $\mathrm{GM1}^- \oplus \mathrm{A1}$	√	1	1	×	-	-
N132.12.4 $\mathrm{GM1}^- \oplus \mathrm{A2}$	√	1	1	×	-	-
N132.12.5 $\mathrm{GM1}^- \oplus \mathrm{A3}$	√	1	1	×	-	-

Non-coplanar SSGs with parent space group $P4_2/mcm$ (No. 132) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N132.12.6 $\mathrm{GM1^-} \oplus \mathrm{M5^+}$	$\surd$	1	0	$\times$	-	-
N132.12.7 $\mathrm{GM1^-} \oplus \mathrm{M5^-}$	$\surd$	1	0	$\times$	-	-
N132.12.8 $\mathrm{GM1^-} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N132.12.9 $\mathrm{GM1^-} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N132.12.10 $\mathrm{GM1^-} \oplus \mathrm{Z3}$	$\surd$	1	1	$\times$	-	-
N132.12.11 $\mathrm{GM2^+} \oplus \mathrm{GM5^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{E_g}$
N132.12.12 $\mathrm{GM2^+} \oplus \mathrm{GM5^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{E_u}$
N132.12.13 $\mathrm{GM2^+} \oplus \mathrm{A1}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N132.12.14 $\mathrm{GM2^+} \oplus \mathrm{A2}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N132.12.15 $\mathrm{GM2^+} \oplus \mathrm{A3}$	$\surd$	1	1	$\times$	-	-
N132.12.16 $\mathrm{GM2^+} \oplus \mathrm{M5^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N132.12.17 $\mathrm{GM2^+} \oplus \mathrm{M5^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N132.12.18 $\mathrm{GM2^+} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N132.12.19 $\mathrm{GM2^+} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N132.12.20 $\mathrm{GM2^+} \oplus \mathrm{Z3}$	$\surd$	1	1	$\times$	-	-
N132.12.21 $\mathrm{GM2^-} \oplus \mathrm{GM5^+}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	E
N132.12.22 $\mathrm{GM2^-} \oplus \mathrm{GM5^-}$	$\surd$	0	0	$\surd$	-	-
N132.12.23 $\mathrm{GM2^-} \oplus \mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N132.12.24 $\mathrm{GM2^-} \oplus \mathrm{A2}$	$\surd$	1	1	$\times$	-	-
N132.12.25 $\mathrm{GM2^-} \oplus \mathrm{A3}$	$\surd$	1	1	$\times$	-	-
N132.12.26 $\mathrm{GM2^-} \oplus \mathrm{M5^+}$	$\surd$	1	0	$\times$	-	-
N132.12.27 $\mathrm{GM2^-} \oplus \mathrm{M5^-}$	$\surd$	1	0	$\times$	-	-
N132.12.28 $\mathrm{GM2^-} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N132.12.29 $\mathrm{GM2^-} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N132.12.30 $\mathrm{GM2^-} \oplus \mathrm{Z3}$	$\surd$	1	1	$\times$	-	-
N132.12.31 $\mathrm{GM3^+} \oplus \mathrm{GM5^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{E_g}$
N132.12.32 $\mathrm{GM3^+} \oplus \mathrm{GM5^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{E_u}$
N132.12.33 $\mathrm{GM3^+} \oplus \mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N132.12.34 $\mathrm{GM3^+} \oplus \mathrm{A2}$	$\surd$	1	1	$\times$	-	-
N132.12.35 $\mathrm{GM3^+} \oplus \mathrm{A3}$	$\surd$	1	1	$\times$	-	-
N132.12.36 $\mathrm{GM3^+} \oplus \mathrm{M5^+}$	$\surd$	1	1	$\times$	-	-
N132.12.37 $\mathrm{GM3^+} \oplus \mathrm{M5^-}$	$\surd$	1	1	$\times$	-	-
N132.12.38 $\mathrm{GM3^+} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	422	A2
N132.12.39 $\mathrm{GM3^+} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	422	A2
N132.12.40 $\mathrm{GM3^+} \oplus \mathrm{Z3}$	$\surd$	1	1	$\times$	-	-
N132.12.41 $\mathrm{GM3^-} \oplus \mathrm{GM5^+}$	$\surd$	2	2	$\surd$	422	E
N132.12.42 $\mathrm{GM3^-} \oplus \mathrm{GM5^-}$	$\surd$	0	0	$\surd$	-	-
N132.12.43 $\mathrm{GM3^-} \oplus \mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N132.12.44 $\mathrm{GM3^-} \oplus \mathrm{A2}$	$\surd$	1	1	$\times$	-	-
N132.12.45 $\mathrm{GM3^-} \oplus \mathrm{A3}$	$\surd$	1	1	$\times$	-	-
N132.12.46 $\mathrm{GM3^-} \oplus \mathrm{M5^+}$	$\surd$	1	0	$\times$	-	-
N132.12.47 $\mathrm{GM3^-} \oplus \mathrm{M5^-}$	$\surd$	1	0	$\times$	-	-
N132.12.48 $\mathrm{GM3^-} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N132.12.49 $\mathrm{GM3^-} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N132.12.50 $\mathrm{GM3^-} \oplus \mathrm{Z3}$	$\surd$	1	1	$\times$	-	-
N132.12.51 $\mathrm{GM4^+} \oplus \mathrm{GM5^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{E_g}$

Non-coplanar SSGs with parent space group $P4_2/mcm$ (No. 132) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N132.12.52 $\mathrm{GM4^+} \oplus \mathrm{GM5^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{E_u}$
N132.12.53 $\mathrm{GM4^+} \oplus \mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N132.12.54 $\mathrm{GM4^+} \oplus \mathrm{A2}$	$\surd$	1	1	$\times$	-	-
N132.12.55 $\mathrm{GM4^+} \oplus \mathrm{A3}$	$\surd$	1	1	$\times$	-	-
N132.12.56 $\mathrm{GM4^+} \oplus \mathrm{M5^+}$	$\surd$	1	1	$\times$	-	-
N132.12.57 $\mathrm{GM4^+} \oplus \mathrm{M5^-}$	$\surd$	1	1	$\times$	-	-
N132.12.58 $\mathrm{GM4^+} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N132.12.59 $\mathrm{GM4^+} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N132.12.60 $\mathrm{GM4^+} \oplus \mathrm{Z3}$	$\surd$	1	1	$\times$	-	-
N132.12.61 $\mathrm{GM4^-} \oplus \mathrm{GM5^+}$	$\surd$	2	2	$\surd$	$\bar{4}2m$	E
N132.12.62 $\mathrm{GM4^-} \oplus \mathrm{GM5^-}$	$\surd$	0	0	$\surd$	-	-
N132.12.63 $\mathrm{GM4^-} \oplus \mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N132.12.64 $\mathrm{GM4^-} \oplus \mathrm{A2}$	$\surd$	1	1	$\times$	-	-
N132.12.65 $\mathrm{GM4^-} \oplus \mathrm{A3}$	$\surd$	1	1	$\times$	-	-
N132.12.66 $\mathrm{GM4^-} \oplus \mathrm{M5^+}$	$\surd$	1	0	$\times$	-	-
N132.12.67 $\mathrm{GM4^-} \oplus \mathrm{M5^-}$	$\surd$	1	0	$\times$	-	-
N132.12.68 $\mathrm{GM4^-} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N132.12.69 $\mathrm{GM4^-} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N132.12.70 $\mathrm{GM4^-} \oplus \mathrm{Z3}$	$\surd$	1	1	$\times$	-	-
N132.12.71 $\mathrm{M1^+} \oplus \mathrm{GM5^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_g}$
N132.12.72 $\mathrm{M1^+} \oplus \mathrm{GM5^-}$	$\surd$	0	0	$\surd$	-	-
N132.12.73 $\mathrm{M1^+} \oplus \mathrm{A1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N132.12.74 $\mathrm{M1^+} \oplus \mathrm{A2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N132.12.75 $\mathrm{M1^+} \oplus \mathrm{A3}$	$\surd$	1	1	$\times$	-	-
N132.12.76 $\mathrm{M1^+} \oplus \mathrm{M5^+}$	$\surd$	0	0	$\surd$	-	-
N132.12.77 $\mathrm{M1^+} \oplus \mathrm{M5^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_u}$
N132.12.78 $\mathrm{M1^+} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N132.12.79 $\mathrm{M1^+} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N132.12.80 $\mathrm{M1^+} \oplus \mathrm{Z3}$	$\surd$	1	1	$\times$	-	-
N132.12.81 $\mathrm{M1^-} \oplus \mathrm{GM5^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_g}$
N132.12.82 $\mathrm{M1^-} \oplus \mathrm{GM5^-}$	$\surd$	0	0	$\surd$	-	-
N132.12.83 $\mathrm{M1^-} \oplus \mathrm{A1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N132.12.84 $\mathrm{M1^-} \oplus \mathrm{A2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N132.12.85 $\mathrm{M1^-} \oplus \mathrm{A3}$	$\surd$	1	1	$\times$	-	-
N132.12.86 $\mathrm{M1^-} \oplus \mathrm{M5^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_u}$
N132.12.87 $\mathrm{M1^-} \oplus \mathrm{M5^-}$	$\surd$	0	0	$\surd$	-	-
N132.12.88 $\mathrm{M1^-} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N132.12.89 $\mathrm{M1^-} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N132.12.90 $\mathrm{M1^-} \oplus \mathrm{Z3}$	$\surd$	1	1	$\times$	-	-
N132.12.91 $\mathrm{M2^+} \oplus \mathrm{GM5^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_g}$
N132.12.92 $\mathrm{M2^+} \oplus \mathrm{GM5^-}$	$\surd$	0	0	$\surd$	-	-
N132.12.93 $\mathrm{M2^+} \oplus \mathrm{A1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N132.12.94 $\mathrm{M2^+} \oplus \mathrm{A2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N132.12.95 $\mathrm{M2^+} \oplus \mathrm{A3}$	$\surd$	1	1	$\times$	-	-
N132.12.96 $\mathrm{M2^+} \oplus \mathrm{M5^+}$	$\surd$	0	0	$\surd$	-	-
N132.12.97 $\mathrm{M2^+} \oplus \mathrm{M5^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_u}$

Non-coplanar SSGs with parent space group $P4_2/mcm$ (No. 132) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N132.12.98 $\mathrm{M2^+} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N132.12.99 $\mathrm{M2^+} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N132.12.100 $\mathrm{M2^+} \oplus \mathrm{Z3}$	$\surd$	1	1	$\times$	-	-
N132.12.101 $\mathrm{M2^-} \oplus \mathrm{GM5^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_g}$
N132.12.102 $\mathrm{M2^-} \oplus \mathrm{GM5^-}$	$\surd$	0	0	$\surd$	-	-
N132.12.103 $\mathrm{M2^-} \oplus \mathrm{A1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N132.12.104 $\mathrm{M2^-} \oplus \mathrm{A2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N132.12.105 $\mathrm{M2^-} \oplus \mathrm{A3}$	$\surd$	1	1	$\times$	-	-
N132.12.106 $\mathrm{M2^-} \oplus \mathrm{M5^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_u}$
N132.12.107 $\mathrm{M2^-} \oplus \mathrm{M5^-}$	$\surd$	0	0	$\surd$	-	-
N132.12.108 $\mathrm{M2^-} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N132.12.109 $\mathrm{M2^-} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N132.12.110 $\mathrm{M2^-} \oplus \mathrm{Z3}$	$\surd$	1	1	$\times$	-	-
N132.13.1 $\mathrm{GM1^-} \oplus \mathrm{X1^+}$	$\surd$	1	0	$\times$	-	-
N132.13.2 $\mathrm{GM1^-} \oplus \mathrm{X1^-}$	$\surd$	1	0	$\times$	-	-
N132.13.3 $\mathrm{GM1^-} \oplus \mathrm{X2^+}$	$\surd$	1	0	$\times$	-	-
N132.13.4 $\mathrm{GM1^-} \oplus \mathrm{X2^-}$	$\surd$	1	0	$\times$	-	-
N132.13.5 $\mathrm{GM2^+} \oplus \mathrm{X1^+}$	$\surd$	1	1	$\times$	-	-
N132.13.6 $\mathrm{GM2^+} \oplus \mathrm{X1^-}$	$\surd$	1	1	$\times$	-	-
N132.13.7 $\mathrm{GM2^+} \oplus \mathrm{X2^+}$	$\surd$	1	1	$\times$	-	-
N132.13.8 $\mathrm{GM2^+} \oplus \mathrm{X2^-}$	$\surd$	1	1	$\times$	-	-
N132.13.9 $\mathrm{GM2^-} \oplus \mathrm{X1^+}$	$\surd$	1	0	$\times$	-	-
N132.13.10 $\mathrm{GM2^-} \oplus \mathrm{X1^-}$	$\surd$	1	0	$\times$	-	-
N132.13.11 $\mathrm{GM2^-} \oplus \mathrm{X2^+}$	$\surd$	1	0	$\times$	-	-
N132.13.12 $\mathrm{GM2^-} \oplus \mathrm{X2^-}$	$\surd$	1	0	$\times$	-	-
N132.13.13 $\mathrm{GM3^+} \oplus \mathrm{X1^+}$	$\surd$	1	1	$\times$	-	-
N132.13.14 $\mathrm{GM3^+} \oplus \mathrm{X1^-}$	$\surd$	1	1	$\times$	-	-
N132.13.15 $\mathrm{GM3^+} \oplus \mathrm{X2^+}$	$\surd$	1	1	$\times$	-	-
N132.13.16 $\mathrm{GM3^+} \oplus \mathrm{X2^-}$	$\surd$	1	1	$\times$	-	-
N132.13.17 $\mathrm{GM3^-} \oplus \mathrm{X1^+}$	$\surd$	1	0	$\times$	-	-
N132.13.18 $\mathrm{GM3^-} \oplus \mathrm{X1^-}$	$\surd$	1	0	$\times$	-	-
N132.13.19 $\mathrm{GM3^-} \oplus \mathrm{X2^+}$	$\surd$	1	0	$\times$	-	-
N132.13.20 $\mathrm{GM3^-} \oplus \mathrm{X2^-}$	$\surd$	1	0	$\times$	-	-
N132.13.21 $\mathrm{GM4^+} \oplus \mathrm{X1^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_g}$
N132.13.22 $\mathrm{GM4^+} \oplus \mathrm{X1^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_g}$
N132.13.23 $\mathrm{GM4^+} \oplus \mathrm{X2^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_g}$
N132.13.24 $\mathrm{GM4^+} \oplus \mathrm{X2^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_g}$
N132.13.25 $\mathrm{GM4^-} \oplus \mathrm{X1^+}$	$\surd$	1	0	$\times$	-	-
N132.13.26 $\mathrm{GM4^-} \oplus \mathrm{X1^-}$	$\surd$	1	0	$\times$	-	-
N132.13.27 $\mathrm{GM4^-} \oplus \mathrm{X2^+}$	$\surd$	1	0	$\times$	-	-
N132.13.28 $\mathrm{GM4^-} \oplus \mathrm{X2^-}$	$\surd$	1	0	$\times$	-	-
N132.13.29 $\mathrm{M1^+} \oplus \mathrm{X1^+}$	$\times$	-	-	-	-	-
N132.13.30 $\mathrm{M1^+} \oplus \mathrm{X4^-}$	$\times$	-	-	-	-	-
N132.13.31 $\mathrm{M1^+} \oplus \mathrm{X1^-}$	$\times$	-	-	-	-	-
N132.13.32 $\mathrm{M1^+} \oplus \mathrm{X4^+}$	$\times$	-	-	-	-	-
N132.13.33 $\mathrm{M1^+} \oplus \mathrm{X2^+}$	$\times$	-	-	-	-	-

Non-coplanar SSGs with parent space group $P4_2/mcm$ (No. 132) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N132.13.34 $\mathrm{M1}^+ \oplus \mathrm{X3}^-$	$\times$	-	-	-	-	-
N132.13.35 $\mathrm{M1}^+ \oplus \mathrm{X2}^-$	$\times$	-	-	-	-	-
N132.13.36 $\mathrm{M1}^+ \oplus \mathrm{X3}^+$	$\times$	-	-	-	-	-
N132.13.37 $\mathrm{M1}^- \oplus \mathrm{X1}^+$	$\times$	-	-	-	-	-
N132.13.38 $\mathrm{M1}^- \oplus \mathrm{X4}^-$	$\times$	-	-	-	-	-
N132.13.39 $\mathrm{M1}^- \oplus \mathrm{X1}^-$	$\times$	-	-	-	-	-
N132.13.40 $\mathrm{M1}^- \oplus \mathrm{X4}^+$	$\times$	-	-	-	-	-
N132.13.41 $\mathrm{M1}^- \oplus \mathrm{X2}^+$	$\times$	-	-	-	-	-
N132.13.42 $\mathrm{M1}^- \oplus \mathrm{X3}^-$	$\times$	-	-	-	-	-
N132.13.43 $\mathrm{M1}^- \oplus \mathrm{X2}^-$	$\times$	-	-	-	-	-
N132.13.44 $\mathrm{M1}^- \oplus \mathrm{X3}^+$	$\times$	-	-	-	-	-
N132.13.45 $\mathrm{M2}^+ \oplus \mathrm{X1}^+$	$\times$	-	-	-	-	-
N132.13.46 $\mathrm{M2}^+ \oplus \mathrm{X4}^-$	$\times$	-	-	-	-	-
N132.13.47 $\mathrm{M2}^+ \oplus \mathrm{X1}^-$	$\times$	-	-	-	-	-
N132.13.48 $\mathrm{M2}^+ \oplus \mathrm{X4}^+$	$\times$	-	-	-	-	-
N132.13.49 $\mathrm{M2}^+ \oplus \mathrm{X2}^+$	$\times$	-	-	-	-	-
N132.13.50 $\mathrm{M2}^+ \oplus \mathrm{X3}^-$	$\times$	-	-	-	-	-
N132.13.51 $\mathrm{M2}^+ \oplus \mathrm{X2}^-$	$\times$	-	-	-	-	-
N132.13.52 $\mathrm{M2}^+ \oplus \mathrm{X3}^+$	$\times$	-	-	-	-	-
N132.13.53 $\mathrm{M2}^- \oplus \mathrm{X1}^+$	$\times$	-	-	-	-	-
N132.13.54 $\mathrm{M2}^- \oplus \mathrm{X4}^-$	$\times$	-	-	-	-	-
N132.13.55 $\mathrm{M2}^- \oplus \mathrm{X1}^-$	$\times$	-	-	-	-	-
N132.13.56 $\mathrm{M2}^- \oplus \mathrm{X4}^+$	$\times$	-	-	-	-	-
N132.13.57 $\mathrm{M2}^- \oplus \mathrm{X2}^+$	$\times$	-	-	-	-	-
N132.13.58 $\mathrm{M2}^- \oplus \mathrm{X3}^-$	$\times$	-	-	-	-	-
N132.13.59 $\mathrm{M2}^- \oplus \mathrm{X2}^-$	$\times$	-	-	-	-	-
N132.13.60 $\mathrm{M2}^- \oplus \mathrm{X3}^+$	$\times$	-	-	-	-	-
N132.14.1 $\mathrm{GM1}^- \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N132.14.2 $\mathrm{GM1}^- \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N132.14.3 $\mathrm{GM1}^- \oplus \mathrm{V1}$	$\surd$	1	1	$\times$	-	-
N132.14.4 $\mathrm{GM1}^- \oplus \mathrm{V2}$	$\surd$	1	1	$\times$	-	-
N132.14.5 $\mathrm{GM2}^+ \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N132.14.6 $\mathrm{GM2}^+ \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N132.14.7 $\mathrm{GM2}^+ \oplus \mathrm{V1}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N132.14.8 $\mathrm{GM2}^+ \oplus \mathrm{V2}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N132.14.9 $\mathrm{GM2}^- \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N132.14.10 $\mathrm{GM2}^- \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N132.14.11 $\mathrm{GM2}^- \oplus \mathrm{V1}$	$\surd$	1	1	$\times$	-	-
N132.14.12 $\mathrm{GM2}^- \oplus \mathrm{V2}$	$\surd$	1	1	$\times$	-	-
N132.14.13 $\mathrm{GM3}^+ \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	422	A2
N132.14.14 $\mathrm{GM3}^+ \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	422	A2
N132.14.15 $\mathrm{GM3}^+ \oplus \mathrm{V1}$	$\surd$	1	1	$\times$	-	-
N132.14.16 $\mathrm{GM3}^+ \oplus \mathrm{V2}$	$\surd$	1	1	$\times$	-	-
N132.14.17 $\mathrm{GM3}^- \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N132.14.18 $\mathrm{GM3}^- \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N132.14.19 $\mathrm{GM3}^- \oplus \mathrm{V1}$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $P4_2/mcm$ (No. 132) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N132.14.20 GM3$^-$ ⊕ V2	√	1	1	×	-	-
N132.14.21 GM4$^+$ ⊕ LD1	√	1	1	√	$\bar{4}2m$	B2
N132.14.22 GM4$^+$ ⊕ LD2	√	1	1	√	$\bar{4}2m$	B2
N132.14.23 GM4$^+$ ⊕ V1	√	1	1	×	-	-
N132.14.24 GM4$^+$ ⊕ V2	√	1	1	×	-	-
N132.14.25 GM4$^-$ ⊕ LD1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N132.14.26 GM4$^-$ ⊕ LD2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N132.14.27 GM4$^-$ ⊕ V1	√	1	1	×	-	-
N132.14.28 GM4$^-$ ⊕ V2	√	1	1	×	-	-
N132.14.29 M1$^+$ ⊕ LD1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N132.14.30 M1$^+$ ⊕ LD2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N132.14.31 M1$^+$ ⊕ V1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N132.14.32 M1$^+$ ⊕ V2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N132.14.33 M1$^-$ ⊕ LD1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N132.14.34 M1$^-$ ⊕ LD2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N132.14.35 M1$^-$ ⊕ V1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N132.14.36 M1$^-$ ⊕ V2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N132.14.37 M2$^+$ ⊕ LD1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N132.14.38 M2$^+$ ⊕ LD2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N132.14.39 M2$^+$ ⊕ V1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N132.14.40 M2$^+$ ⊕ V2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N132.14.41 M2$^-$ ⊕ LD1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N132.14.42 M2$^-$ ⊕ LD2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N132.14.43 M2$^-$ ⊕ V1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N132.14.44 M2$^-$ ⊕ V2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$

TABLE S397: Collinear SSGs with parent space group $P4_2/nbc$ (No. 133).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L133.1.1 GM1$^+$	1	$4/mmm$	$\mathrm{A1_g}$
L133.2.1 GM1$^-$	0	-	-
L133.2.2 GM2$^+$	1	$4/mmm$	$\mathrm{B1_g}$
L133.2.3 GM2$^-$	0	-	-
L133.2.4 GM3$^+$	1	$4/mmm$	$\mathrm{A2_g}$
L133.2.5 GM3$^-$	0	-	-
L133.2.6 GM4$^+$	1	$4/mmm$	$\mathrm{B2_g}$
L133.2.7 GM4$^-$	0	-	-

TABLE S398: Coplanar SSGs with parent space group $P4_2/nbc$ (No. 133).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P133.1.1 GM1$^+$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g}$
P133.2.1 GM1$^-$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u}$
P133.2.2 GM2$^+$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g}$
P133.2.3 GM2$^-$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u}$
P133.2.4 GM3$^+$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g}$

Coplanar SSGs with parent space group $P4_2/nbc$ (No. 133) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P133.2.5 $\mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_u}$
P133.2.6 $\mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_g}$
P133.2.7 $\mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_u}$
P133.3.1 $\mathrm{GM1}^- \oplus \mathrm{GM1}^-$	$\surd$	0	0	$\surd$	-	-
P133.3.2 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
P133.3.3 $\mathrm{GM1}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
P133.3.4 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u}$
P133.3.5 $\mathrm{GM1}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
P133.3.6 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_u}$
P133.3.7 $\mathrm{GM1}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
P133.3.8 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
P133.3.9 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g}$
P133.3.10 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g}$
P133.3.11 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
P133.3.12 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
P133.3.13 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u}$
P133.3.14 $\mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
P133.3.15 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_u}$
P133.3.16 $\mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
P133.3.17 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g}$
P133.3.18 $\mathrm{GM2}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
P133.3.19 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g}$
P133.3.20 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g}$
P133.3.21 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g}$
P133.3.22 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g}$
P133.3.23 $\mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
P133.3.24 $\mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_g}$
P133.3.25 $\mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
P133.3.26 $\mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_g}$
P133.3.27 $\mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g}$
P133.3.28 $\mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
P133.6.1 $\mathrm{GM5}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_g}$
P133.6.2 $\mathrm{GM5}^-$	$\surd$	0	0	$\surd$	-	-
P133.6.3 A1	$\surd$	1	1	$\times$	-	-
P133.6.4 M1	$\surd$	1	1	$\times$	-	-
P133.6.5 M2	$\surd$	1	1	$\times$	-	-
P133.6.6 M3	$\surd$	1	1	$\times$	-	-
P133.6.7 M4	$\surd$	1	1	$\times$	-	-
P133.6.8 Z1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P133.6.9 Z2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P133.6.10 Z3	$\surd$	1	1	$\times$	-	-
P133.8.1 LD1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P133.8.2 LD3	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P133.8.3 V1	$\surd$	1	1	$\times$	-	-

TABLE S399: Non-coplanar SSGs with parent space group $P4_2/nbc$ (No. 133).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N133.1.1 GM1$^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A1_g}$
N133.2.1 GM1$^-$	$\surd$	2	2	$\surd$	422	$\mathrm{A1}\oplus\mathrm{A1}$
N133.2.2 GM2$^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{B1_g}$
N133.2.3 GM2$^-$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{A1}\oplus\mathrm{A1}$
N133.2.4 GM3$^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A2_g}$
N133.2.5 GM3$^-$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{A1}\oplus\mathrm{A1}$
N133.2.6 GM4$^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{B2_g}$
N133.2.7 GM4$^-$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{A1}\oplus\mathrm{A1}$
N133.3.1 GM1$^-\oplus$GM1$^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{A1_u}$
N133.3.2 GM1$^-\oplus$GM2$^+$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{A1}\oplus\mathrm{B1}$
N133.3.3 GM1$^-\oplus$GM2$^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{B1_u}$
N133.3.4 GM1$^-\oplus$GM3$^+$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{A1}\oplus\mathrm{A2}$
N133.3.5 GM1$^-\oplus$GM3$^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{A2_u}$
N133.3.6 GM1$^-\oplus$GM4$^+$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{A1}\oplus\mathrm{A2}$
N133.3.7 GM1$^-\oplus$GM4$^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{B2_u}$
N133.3.8 GM2$^+\oplus$GM2$^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B1_g}$
N133.3.9 GM2$^+\oplus$GM2$^-$	$\surd$	2	2	$\surd$	422	$\mathrm{A1}\oplus\mathrm{B1}$
N133.3.10 GM2$^+\oplus$GM3$^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}\oplus\mathrm{A2_g}$
N133.3.11 GM2$^+\oplus$GM3$^-$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{A1}\oplus\mathrm{B1}$
N133.3.12 GM2$^+\oplus$GM4$^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B2_g}$
N133.3.13 GM2$^+\oplus$GM4$^-$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{A1}\oplus\mathrm{B1}$
N133.3.14 GM2$^-\oplus$GM2$^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}\oplus\mathrm{B1_u}$
N133.3.15 GM2$^-\oplus$GM3$^+$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{A1}\oplus\mathrm{B2}$
N133.3.16 GM2$^-\oplus$GM3$^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}\oplus\mathrm{A2_u}$
N133.3.17 GM2$^-\oplus$GM4$^+$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{A1}\oplus\mathrm{B2}$
N133.3.18 GM2$^-\oplus$GM4$^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}\oplus\mathrm{B2_u}$
N133.3.19 GM3$^+\oplus$GM3$^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_g}$
N133.3.20 GM3$^+\oplus$GM3$^-$	$\surd$	2	2	$\surd$	422	$\mathrm{A1}\oplus\mathrm{A2}$
N133.3.21 GM3$^+\oplus$GM4$^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_g}\oplus\mathrm{B2_g}$
N133.3.22 GM3$^+\oplus$GM4$^-$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{A1}\oplus\mathrm{A2}$
N133.3.23 GM3$^-\oplus$GM3$^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_u}\oplus\mathrm{A2_u}$
N133.3.24 GM3$^-\oplus$GM4$^+$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{A1}\oplus\mathrm{B2}$
N133.3.25 GM3$^-\oplus$GM4$^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_u}\oplus\mathrm{B2_u}$
N133.3.26 GM4$^+\oplus$GM4$^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_g}\oplus\mathrm{B2_g}$
N133.3.27 GM4$^+\oplus$GM4$^-$	$\surd$	2	2	$\surd$	422	$\mathrm{A1}\oplus\mathrm{B2}$
N133.3.28 GM4$^-\oplus$GM4$^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_u}\oplus\mathrm{B2_u}$
N133.6.1 GM5$^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{E_g}$
N133.6.2 GM5$^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{E_u}$
N133.6.3 A1	$\surd$	1	1	$\surd$	$4mm$	A1
N133.6.4 M1	$\surd$	1	1	$\surd$	$4mm$	A1
N133.6.5 M2	$\surd$	1	1	$\surd$	$4mm$	A1
N133.6.6 M3	$\surd$	1	1	$\surd$	$\bar{4}m2$	A1
N133.6.7 M4	$\surd$	1	1	$\surd$	$\bar{4}m2$	A1
N133.6.8 Z1	$\surd$	1	1	$\surd$	$4mm$	A1
N133.6.9 Z2	$\surd$	1	1	$\surd$	$4mm$	A1
N133.6.10 Z3	$\surd$	1	1	$\surd$	$\bar{4}2m$	A1

Non-coplanar SSGs with parent space group $P4_2/nbc$ (No. 133) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N133.8.1 LD1	$\surd$	1	1	$\surd$	$4mm$	A1
N133.8.2 LD3	$\surd$	1	1	$\surd$	$4mm$	A1
N133.8.3 V1	$\surd$	1	1	$\surd$	$4mm$	A1
N133.9.1 $\mathrm{GM1^-}\oplus\mathrm{GM1^-}\oplus\mathrm{GM1^-}$	$\surd$	0	0	$\surd$	-	-
N133.9.2 $\mathrm{GM1^-}\oplus\mathrm{GM1^-}\oplus\mathrm{GM2^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_u}\oplus\mathrm{B1_u}$
N133.9.3 $\mathrm{GM1^-}\oplus\mathrm{GM1^-}\oplus\mathrm{GM2^-}$	$\surd$	0	0	$\surd$	-	-
N133.9.4 $\mathrm{GM1^-}\oplus\mathrm{GM1^-}\oplus\mathrm{GM3^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{A2_u}\oplus\mathrm{A2_u}$
N133.9.5 $\mathrm{GM1^-}\oplus\mathrm{GM1^-}\oplus\mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
N133.9.6 $\mathrm{GM1^-}\oplus\mathrm{GM1^-}\oplus\mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B2_g}\oplus\mathrm{B2_u}\oplus\mathrm{B2_u}$
N133.9.7 $\mathrm{GM1^-}\oplus\mathrm{GM1^-}\oplus\mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N133.9.8 $\mathrm{GM1^-}\oplus\mathrm{GM2^+}\oplus\mathrm{GM2^+}$	$\surd$	2	2	$\surd$	422	$\mathrm{B1}\oplus\mathrm{B1}$
N133.9.9 $\mathrm{GM1^-}\oplus\mathrm{GM2^+}\oplus\mathrm{GM2^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B1_g}\oplus\mathrm{B1_u}$
N133.9.10 $\mathrm{GM1^-}\oplus\mathrm{GM2^+}\oplus\mathrm{GM3^+}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{B1}\oplus\mathrm{B2}$
N133.9.11 $\mathrm{GM1^-}\oplus\mathrm{GM2^+}\oplus\mathrm{GM3^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_u}\oplus\mathrm{B2_u}$
N133.9.12 $\mathrm{GM1^-}\oplus\mathrm{GM2^+}\oplus\mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{B1}\oplus\mathrm{B2}$
N133.9.13 $\mathrm{GM1^-}\oplus\mathrm{GM2^+}\oplus\mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_u}\oplus\mathrm{A2_u}$
N133.9.14 $\mathrm{GM1^-}\oplus\mathrm{GM2^-}\oplus\mathrm{GM2^-}$	$\surd$	0	0	$\surd$	-	-
N133.9.15 $\mathrm{GM1^-}\oplus\mathrm{GM2^-}\oplus\mathrm{GM3^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{A2_u}\oplus\mathrm{B2_u}$
N133.9.16 $\mathrm{GM1^-}\oplus\mathrm{GM2^-}\oplus\mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
N133.9.17 $\mathrm{GM1^-}\oplus\mathrm{GM2^-}\oplus\mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_u}\oplus\mathrm{B2_g}\oplus\mathrm{B2_u}$
N133.9.18 $\mathrm{GM1^-}\oplus\mathrm{GM2^-}\oplus\mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N133.9.19 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{GM3^+}$	$\surd$	2	2	$\surd$	422	$\mathrm{A2}\oplus\mathrm{A2}$
N133.9.20 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{GM3^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A2_g}\oplus\mathrm{A2_u}$
N133.9.21 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B2}\oplus\mathrm{A2}$
N133.9.22 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{A2_g}\oplus\mathrm{A2_u}$
N133.9.23 $\mathrm{GM1^-}\oplus\mathrm{GM3^-}\oplus\mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
N133.9.24 $\mathrm{GM1^-}\oplus\mathrm{GM3^-}\oplus\mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{B2_g}\oplus\mathrm{B2_u}$
N133.9.25 $\mathrm{GM1^-}\oplus\mathrm{GM3^-}\oplus\mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N133.9.26 $\mathrm{GM1^-}\oplus\mathrm{GM4^+}\oplus\mathrm{GM4^+}$	$\surd$	2	2	$\surd$	422	$\mathrm{B2}\oplus\mathrm{B2}$
N133.9.27 $\mathrm{GM1^-}\oplus\mathrm{GM4^+}\oplus\mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B2_g}\oplus\mathrm{B2_u}$
N133.9.28 $\mathrm{GM1^-}\oplus\mathrm{GM4^-}\oplus\mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N133.9.29 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{GM2^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B1_g}$
N133.9.30 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{GM2^-}$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B1}\oplus\mathrm{B1}$
N133.9.31 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{GM3^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_g}\oplus\mathrm{A2_g}$
N133.9.32 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{GM3^-}$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{B1}\oplus\mathrm{B1}$
N133.9.33 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B2_g}$
N133.9.34 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{B1}\oplus\mathrm{B1}$
N133.9.35 $\mathrm{GM2^+}\oplus\mathrm{GM2^-}\oplus\mathrm{GM2^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A1_u}\oplus\mathrm{B1_g}$
N133.9.36 $\mathrm{GM2^+}\oplus\mathrm{GM2^-}\oplus\mathrm{GM3^+}$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{B1}\oplus\mathrm{A2}$
N133.9.37 $\mathrm{GM2^+}\oplus\mathrm{GM2^-}\oplus\mathrm{GM3^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B1_g}\oplus\mathrm{B2_u}$
N133.9.38 $\mathrm{GM2^+}\oplus\mathrm{GM2^-}\oplus\mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{B1}\oplus\mathrm{A2}$
N133.9.39 $\mathrm{GM2^+}\oplus\mathrm{GM2^-}\oplus\mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B1_g}\oplus\mathrm{A2_u}$
N133.9.40 $\mathrm{GM2^+}\oplus\mathrm{GM3^+}\oplus\mathrm{GM3^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_g}$
N133.9.41 $\mathrm{GM2^+}\oplus\mathrm{GM3^+}\oplus\mathrm{GM3^-}$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B1}\oplus\mathrm{A2}$
N133.9.42 $\mathrm{GM2^+}\oplus\mathrm{GM3^+}\oplus\mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_g}\oplus\mathrm{B2_g}$
N133.9.43 $\mathrm{GM2^+}\oplus\mathrm{GM3^+}\oplus\mathrm{GM4^-}$	$\surd$	2	2	$\surd$	422	$\mathrm{B1}\oplus\mathrm{A2}$

Non-coplanar SSGs with parent space group $P4_2/nbc$ (No. 133) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N133.9.44 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N133.9.45 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	422	$\mathrm{B1} \oplus \mathrm{B2}$
N133.9.46 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N133.9.47 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N133.9.48 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B1} \oplus \mathrm{B2}$
N133.9.49 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N133.9.50 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
N133.9.51 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N133.9.52 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N133.9.53 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$
N133.9.54 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N133.9.55 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{A2} \oplus \mathrm{A2}$
N133.9.56 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{B2_u}$
N133.9.57 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	422	$\mathrm{A2} \oplus \mathrm{B2}$
N133.9.58 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g} \oplus \mathrm{B2_u}$
N133.9.59 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N133.9.60 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$
N133.9.61 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N133.9.62 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B2} \oplus \mathrm{B2}$
N133.9.63 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$
N133.9.64 $\mathrm{GM2}^- \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N133.9.65 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
N133.9.66 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{A2} \oplus \mathrm{A2}$
N133.9.67 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{B2_g}$
N133.9.68 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{B2} \oplus \mathrm{B2}$
N133.9.69 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A2_g}$
N133.9.70 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{B2} \oplus \mathrm{A2}$
N133.9.71 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{A2_g}$
N133.9.72 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N133.9.73 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{B2} \oplus \mathrm{A2}$
N133.9.74 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{A2_g}$
N133.9.75 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N133.9.76 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B2_g}$
N133.9.77 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N133.9.78 $\mathrm{GM3}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{B2} \oplus \mathrm{B2}$
N133.9.79 $\mathrm{GM3}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B2_g}$
N133.9.80 $\mathrm{GM3}^- \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N133.9.81 $\mathrm{GM4}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N133.9.82 $\mathrm{GM4}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{A2} \oplus \mathrm{A2}$
N133.9.83 $\mathrm{GM4}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{B2_g}$
N133.9.84 $\mathrm{GM4}^- \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N133.12.1 $\mathrm{GM1}^- \oplus \mathrm{GM5}^+$	$\surd$	2	2	$\surd$	$4mm$	E
N133.12.2 $\mathrm{GM1}^- \oplus \mathrm{GM5}^-$	$\surd$	0	0	$\surd$	-	-
N133.12.3 $\mathrm{GM1}^- \oplus \mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N133.12.4 $\mathrm{GM1}^- \oplus \mathrm{M1}$	$\surd$	1	1	$\times$	-	-
N133.12.5 $\mathrm{GM1}^- \oplus \mathrm{M2}$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $P4_2/nbc$ (No. 133) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N133.12.6 $\mathrm{GM1^-} \oplus \mathrm{M3}$	$\surd$	1	1	$\times$	-	-
N133.12.7 $\mathrm{GM1^-} \oplus \mathrm{M4}$	$\surd$	1	1	$\times$	-	-
N133.12.8 $\mathrm{GM1^-} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N133.12.9 $\mathrm{GM1^-} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N133.12.10 $\mathrm{GM1^-} \oplus \mathrm{Z3}$	$\surd$	1	1	$\times$	-	-
N133.12.11 $\mathrm{GM2^+} \oplus \mathrm{GM5^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{E_g}$
N133.12.12 $\mathrm{GM2^+} \oplus \mathrm{GM5^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{E_u}$
N133.12.13 $\mathrm{GM2^+} \oplus \mathrm{A1}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N133.12.14 $\mathrm{GM2^+} \oplus \mathrm{M1}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N133.12.15 $\mathrm{GM2^+} \oplus \mathrm{M2}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N133.12.16 $\mathrm{GM2^+} \oplus \mathrm{M3}$	$\surd$	1	1	$\surd$	$4mm$	B1
N133.12.17 $\mathrm{GM2^+} \oplus \mathrm{M4}$	$\surd$	1	1	$\surd$	$4mm$	B1
N133.12.18 $\mathrm{GM2^+} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N133.12.19 $\mathrm{GM2^+} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N133.12.20 $\mathrm{GM2^+} \oplus \mathrm{Z3}$	$\surd$	1	1	$\times$	-	-
N133.12.21 $\mathrm{GM2^-} \oplus \mathrm{GM5^+}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	E
N133.12.22 $\mathrm{GM2^-} \oplus \mathrm{GM5^-}$	$\surd$	0	0	$\surd$	-	-
N133.12.23 $\mathrm{GM2^-} \oplus \mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N133.12.24 $\mathrm{GM2^-} \oplus \mathrm{M1}$	$\surd$	1	1	$\times$	-	-
N133.12.25 $\mathrm{GM2^-} \oplus \mathrm{M2}$	$\surd$	1	1	$\times$	-	-
N133.12.26 $\mathrm{GM2^-} \oplus \mathrm{M3}$	$\surd$	1	1	$\times$	-	-
N133.12.27 $\mathrm{GM2^-} \oplus \mathrm{M4}$	$\surd$	1	1	$\times$	-	-
N133.12.28 $\mathrm{GM2^-} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N133.12.29 $\mathrm{GM2^-} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N133.12.30 $\mathrm{GM2^-} \oplus \mathrm{Z3}$	$\surd$	1	1	$\times$	-	-
N133.12.31 $\mathrm{GM3^+} \oplus \mathrm{GM5^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{E_g}$
N133.12.32 $\mathrm{GM3^+} \oplus \mathrm{GM5^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{E_u}$
N133.12.33 $\mathrm{GM3^+} \oplus \mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N133.12.34 $\mathrm{GM3^+} \oplus \mathrm{M1}$	$\surd$	1	1	$\times$	-	-
N133.12.35 $\mathrm{GM3^+} \oplus \mathrm{M2}$	$\surd$	1	1	$\times$	-	-
N133.12.36 $\mathrm{GM3^+} \oplus \mathrm{M3}$	$\surd$	1	1	$\times$	-	-
N133.12.37 $\mathrm{GM3^+} \oplus \mathrm{M4}$	$\surd$	1	1	$\times$	-	-
N133.12.38 $\mathrm{GM3^+} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	422	A2
N133.12.39 $\mathrm{GM3^+} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	422	A2
N133.12.40 $\mathrm{GM3^+} \oplus \mathrm{Z3}$	$\surd$	1	1	$\times$	-	-
N133.12.41 $\mathrm{GM3^-} \oplus \mathrm{GM5^+}$	$\surd$	2	2	$\surd$	422	E
N133.12.42 $\mathrm{GM3^-} \oplus \mathrm{GM5^-}$	$\surd$	0	0	$\surd$	-	-
N133.12.43 $\mathrm{GM3^-} \oplus \mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N133.12.44 $\mathrm{GM3^-} \oplus \mathrm{M1}$	$\surd$	1	1	$\times$	-	-
N133.12.45 $\mathrm{GM3^-} \oplus \mathrm{M2}$	$\surd$	1	1	$\times$	-	-
N133.12.46 $\mathrm{GM3^-} \oplus \mathrm{M3}$	$\surd$	1	1	$\times$	-	-
N133.12.47 $\mathrm{GM3^-} \oplus \mathrm{M4}$	$\surd$	1	1	$\times$	-	-
N133.12.48 $\mathrm{GM3^-} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N133.12.49 $\mathrm{GM3^-} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N133.12.50 $\mathrm{GM3^-} \oplus \mathrm{Z3}$	$\surd$	1	1	$\times$	-	-
N133.12.51 $\mathrm{GM4^+} \oplus \mathrm{GM5^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{E_g}$

Non-coplanar SSGs with parent space group $P4_2/nbc$ (No. 133) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N133.12.52 $\mathrm{GM4^+} \oplus \mathrm{GM5^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{E_u}$
N133.12.53 $\mathrm{GM4^+} \oplus \mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N133.12.54 $\mathrm{GM4^+} \oplus \mathrm{M1}$	$\surd$	1	1	$\times$	-	-
N133.12.55 $\mathrm{GM4^+} \oplus \mathrm{M2}$	$\surd$	1	1	$\times$	-	-
N133.12.56 $\mathrm{GM4^+} \oplus \mathrm{M3}$	$\surd$	1	1	$\times$	-	-
N133.12.57 $\mathrm{GM4^+} \oplus \mathrm{M4}$	$\surd$	1	1	$\times$	-	-
N133.12.58 $\mathrm{GM4^+} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N133.12.59 $\mathrm{GM4^+} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N133.12.60 $\mathrm{GM4^+} \oplus \mathrm{Z3}$	$\surd$	1	1	$\times$	-	-
N133.12.61 $\mathrm{GM4^-} \oplus \mathrm{GM5^+}$	$\surd$	2	2	$\surd$	$\bar{4}2m$	E
N133.12.62 $\mathrm{GM4^-} \oplus \mathrm{GM5^-}$	$\surd$	0	0	$\surd$	-	-
N133.12.63 $\mathrm{GM4^-} \oplus \mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N133.12.64 $\mathrm{GM4^-} \oplus \mathrm{M1}$	$\surd$	1	1	$\times$	-	-
N133.12.65 $\mathrm{GM4^-} \oplus \mathrm{M2}$	$\surd$	1	1	$\times$	-	-
N133.12.66 $\mathrm{GM4^-} \oplus \mathrm{M3}$	$\surd$	1	1	$\times$	-	-
N133.12.67 $\mathrm{GM4^-} \oplus \mathrm{M4}$	$\surd$	1	1	$\times$	-	-
N133.12.68 $\mathrm{GM4^-} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N133.12.69 $\mathrm{GM4^-} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N133.12.70 $\mathrm{GM4^-} \oplus \mathrm{Z3}$	$\surd$	1	1	$\times$	-	-
N133.14.1 $\mathrm{GM1^-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N133.14.2 $\mathrm{GM1^-} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N133.14.3 $\mathrm{GM1^-} \oplus \mathrm{V1}$	$\surd$	1	1	$\times$	-	-
N133.14.4 $\mathrm{GM2^+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N133.14.5 $\mathrm{GM2^+} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N133.14.6 $\mathrm{GM2^+} \oplus \mathrm{V1}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N133.14.7 $\mathrm{GM2^-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N133.14.8 $\mathrm{GM2^-} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N133.14.9 $\mathrm{GM2^-} \oplus \mathrm{V1}$	$\surd$	1	1	$\times$	-	-
N133.14.10 $\mathrm{GM3^+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	422	A2
N133.14.11 $\mathrm{GM3^+} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	422	A2
N133.14.12 $\mathrm{GM3^+} \oplus \mathrm{V1}$	$\surd$	1	1	$\times$	-	-
N133.14.13 $\mathrm{GM3^-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N133.14.14 $\mathrm{GM3^-} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N133.14.15 $\mathrm{GM3^-} \oplus \mathrm{V1}$	$\surd$	1	1	$\times$	-	-
N133.14.16 $\mathrm{GM4^+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N133.14.17 $\mathrm{GM4^+} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N133.14.18 $\mathrm{GM4^+} \oplus \mathrm{V1}$	$\surd$	1	1	$\times$	-	-
N133.14.19 $\mathrm{GM4^-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N133.14.20 $\mathrm{GM4^-} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N133.14.21 $\mathrm{GM4^-} \oplus \mathrm{V1}$	$\surd$	1	1	$\times$	-	-

TABLE S400: Collinear SSGs with parent space group $P4_2/nnm$ (No. 134).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L134.1.1 $\mathrm{GM1^+}$	1	$4/mmm$	$\mathrm{A1_g}$
L134.2.1 $\mathrm{GM1^-}$	0	-	-

Collinear SSGs with parent space group $P4_2/nnm$ (No. 134)(continued)

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L134.2.2 $\mathrm{GM2}^+$	1	$4/mmm$	$\mathrm{B1_g}$
L134.2.3 $\mathrm{GM2}^-$	0	-	-
L134.2.4 $\mathrm{GM3}^+$	1	$4/mmm$	$\mathrm{A2_g}$
L134.2.5 $\mathrm{GM3}^-$	0	-	-
L134.2.6 $\mathrm{GM4}^+$	1	$4/mmm$	$\mathrm{B2_g}$
L134.2.7 $\mathrm{GM4}^-$	0	-	-
L134.2.8 $\mathrm{A1}^+$	0	-	-
L134.2.9 $\mathrm{A1}^-$	0	-	-

TABLE S401: Coplanar SSGs with parent space group $P4_2/nnm$ (No. 134).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P134.1.1 $\mathrm{GM1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}$
P134.2.1 $\mathrm{GM1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}$
P134.2.2 $\mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}$
P134.2.3 $\mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}$
P134.2.4 $\mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_g}$
P134.2.5 $\mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_u}$
P134.2.6 $\mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_g}$
P134.2.7 $\mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_u}$
P134.2.8 $\mathrm{A1}^+$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P134.2.9 $\mathrm{A1}^-$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P134.3.1 $\mathrm{GM1}^-\oplus\mathrm{GM1}^-$	$\surd$	0	0	$\surd$	-	-
P134.3.2 $\mathrm{GM1}^-\oplus\mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_u}$
P134.3.3 $\mathrm{GM1}^-\oplus\mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
P134.3.4 $\mathrm{GM1}^-\oplus\mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{A2_u}$
P134.3.5 $\mathrm{GM1}^-\oplus\mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
P134.3.6 $\mathrm{GM1}^-\oplus\mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g}\oplus\mathrm{B2_u}$
P134.3.7 $\mathrm{GM1}^-\oplus\mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
P134.3.8 $\mathrm{GM1}^-\oplus\mathrm{A1}^+$	$\surd$	1	1	$\times$	-	-
P134.3.9 $\mathrm{GM1}^-\oplus\mathrm{A1}^-$	$\surd$	1	1	$\times$	-	-
P134.3.10 $\mathrm{GM2}^+\oplus\mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_g}$
P134.3.11 $\mathrm{GM2}^+\oplus\mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B1_g}$
P134.3.12 $\mathrm{GM2}^+\oplus\mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_g}$
P134.3.13 $\mathrm{GM2}^+\oplus\mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B2_u}$
P134.3.14 $\mathrm{GM2}^+\oplus\mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B2_g}$
P134.3.15 $\mathrm{GM2}^+\oplus\mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_u}$
P134.3.16 $\mathrm{GM2}^+\oplus\mathrm{A1}^+$	$\surd$	1	0	$\times$	-	-
P134.3.17 $\mathrm{GM2}^+\oplus\mathrm{A1}^-$	$\surd$	1	0	$\times$	-	-
P134.3.18 $\mathrm{GM2}^-\oplus\mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
P134.3.19 $\mathrm{GM2}^-\oplus\mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{B2_u}$
P134.3.20 $\mathrm{GM2}^-\oplus\mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
P134.3.21 $\mathrm{GM2}^-\oplus\mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u}\oplus\mathrm{B2_g}$
P134.3.22 $\mathrm{GM2}^-\oplus\mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
P134.3.23 $\mathrm{GM2}^-\oplus\mathrm{A1}^+$	$\surd$	1	1	$\times$	-	-
P134.3.24 $\mathrm{GM2}^-\oplus\mathrm{A1}^-$	$\surd$	1	1	$\times$	-	-

Coplanar SSGs with parent space group $P4_2/nnm$ (No. 134) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P134.3.25 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g}$
P134.3.26 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g}$
P134.3.27 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g}$
P134.3.28 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g}$
P134.3.29 $\mathrm{GM3}^+ \oplus \mathrm{A1}^+$	$\surd$	1	0	$\times$	-	-
P134.3.30 $\mathrm{GM3}^+ \oplus \mathrm{A1}^-$	$\surd$	1	0	$\times$	-	-
P134.3.31 $\mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
P134.3.32 $\mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_g}$
P134.3.33 $\mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
P134.3.34 $\mathrm{GM3}^- \oplus \mathrm{A1}^+$	$\surd$	1	1	$\times$	-	-
P134.3.35 $\mathrm{GM3}^- \oplus \mathrm{A1}^-$	$\surd$	1	1	$\times$	-	-
P134.3.36 $\mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_g}$
P134.3.37 $\mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g}$
P134.3.38 $\mathrm{GM4}^+ \oplus \mathrm{A1}^+$	$\surd$	1	0	$\times$	-	-
P134.3.39 $\mathrm{GM4}^+ \oplus \mathrm{A1}^-$	$\surd$	1	0	$\times$	-	-
P134.3.40 $\mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
P134.3.41 $\mathrm{GM4}^- \oplus \mathrm{A1}^+$	$\surd$	1	1	$\times$	-	-
P134.3.42 $\mathrm{GM4}^- \oplus \mathrm{A1}^-$	$\surd$	1	1	$\times$	-	-
P134.3.43 $\mathrm{A1}^+ \oplus \mathrm{A1}^+$	$\surd$	1	0	$\times$	-	-
P134.3.44 $\mathrm{A1}^+ \oplus \mathrm{A2}^-$	$\surd$	1	1	$\times$	-	-
P134.3.45 $\mathrm{A1}^+ \oplus \mathrm{A3}^-$	$\surd$	1	1	$\times$	-	-
P134.3.46 $\mathrm{A1}^+ \oplus \mathrm{A4}^+$	$\surd$	1	0	$\times$	-	-
P134.3.47 $\mathrm{A1}^+ \oplus \mathrm{A1}^-$	$\surd$	1	1	$\times$	-	-
P134.3.48 $\mathrm{A1}^+ \oplus \mathrm{A2}^+$	$\surd$	1	0	$\times$	-	-
P134.3.49 $\mathrm{A1}^+ \oplus \mathrm{A3}^+$	$\surd$	1	0	$\times$	-	-
P134.3.50 $\mathrm{A1}^+ \oplus \mathrm{A4}^-$	$\surd$	1	1	$\times$	-	-
P134.3.51 $\mathrm{A1}^- \oplus \mathrm{A1}^-$	$\surd$	1	0	$\times$	-	-
P134.3.52 $\mathrm{A1}^- \oplus \mathrm{A2}^+$	$\surd$	1	1	$\times$	-	-
P134.3.53 $\mathrm{A1}^- \oplus \mathrm{A3}^+$	$\surd$	1	1	$\times$	-	-
P134.3.54 $\mathrm{A1}^- \oplus \mathrm{A4}^-$	$\surd$	1	0	$\times$	-	-
P134.6.1 $\mathrm{GM5}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_g}$
P134.6.2 $\mathrm{GM5}^-$	$\surd$	0	0	$\surd$	-	-
P134.6.3 $\mathrm{A5}^+$	$\surd$	1	0	$\times$	-	-
P134.6.4 M1	$\surd$	1	1	$\times$	-	-
P134.6.5 M2	$\surd$	1	1	$\times$	-	-
P134.6.6 M3	$\surd$	1	1	$\times$	-	-
P134.6.7 M4	$\surd$	1	1	$\times$	-	-
P134.6.8 Z1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P134.6.9 Z2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P134.6.10 Z3	$\surd$	1	1	$\times$	-	-
P134.8.1 LD1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P134.8.2 LD2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P134.8.3 V2	$\surd$	1	1	$\times$	-	-
P134.8.4 V1	$\surd$	1	1	$\times$	-	-

TABLE S402: Non-coplanar SSGs with parent space group $P4_2/nnm$ (No. 134).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N134.1.1 GM1$^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A1_g}$
N134.2.1 GM1$^-$	$\surd$	2	2	$\surd$	422	$\mathrm{A1}\oplus\mathrm{A1}$
N134.2.2 GM2$^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{B1_g}$
N134.2.3 GM2$^-$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{A1}\oplus\mathrm{A1}$
N134.2.4 GM3$^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A2_g}$
N134.2.5 GM3$^-$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{A1}\oplus\mathrm{A1}$
N134.2.6 GM4$^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{B2_g}$
N134.2.7 GM4$^-$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{A1}\oplus\mathrm{A1}$
N134.2.8 A1$^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}$
N134.2.9 A1$^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}$
N134.3.1 GM1$^-\oplus$GM1$^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{A1_u}$
N134.3.2 GM1$^-\oplus$GM2$^+$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{A1}\oplus\mathrm{B1}$
N134.3.3 GM1$^-\oplus$GM2$^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{B1_u}$
N134.3.4 GM1$^-\oplus$GM3$^+$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{A1}\oplus\mathrm{A2}$
N134.3.5 GM1$^-\oplus$GM3$^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{A2_u}$
N134.3.6 GM1$^-\oplus$GM4$^+$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{A1}\oplus\mathrm{A2}$
N134.3.7 GM1$^-\oplus$GM4$^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{B2_u}$
N134.3.8 GM1$^-\oplus$A1$^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}$
N134.3.9 GM1$^-\oplus$A1$^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}$
N134.3.10 GM2$^+\oplus$GM2$^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B1_g}$
N134.3.11 GM2$^+\oplus$GM2$^-$	$\surd$	2	2	$\surd$	422	$\mathrm{A1}\oplus\mathrm{B1}$
N134.3.12 GM2$^+\oplus$GM3$^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}\oplus\mathrm{A2_g}$
N134.3.13 GM2$^+\oplus$GM3$^-$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{A1}\oplus\mathrm{B1}$
N134.3.14 GM2$^+\oplus$GM4$^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B2_g}$
N134.3.15 GM2$^+\oplus$GM4$^-$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{A1}\oplus\mathrm{B1}$
N134.3.16 GM2$^+\oplus$A1$^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}$
N134.3.17 GM2$^+\oplus$A1$^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}$
N134.3.18 GM2$^-\oplus$GM2$^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}\oplus\mathrm{B1_u}$
N134.3.19 GM2$^-\oplus$GM3$^+$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{A1}\oplus\mathrm{B2}$
N134.3.20 GM2$^-\oplus$GM3$^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}\oplus\mathrm{A2_u}$
N134.3.21 GM2$^-\oplus$GM4$^+$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{A1}\oplus\mathrm{B2}$
N134.3.22 GM2$^-\oplus$GM4$^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}\oplus\mathrm{B2_u}$
N134.3.23 GM2$^-\oplus$A1$^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}$
N134.3.24 GM2$^-\oplus$A1$^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}$
N134.3.25 GM3$^+\oplus$GM3$^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_g}$
N134.3.26 GM3$^+\oplus$GM3$^-$	$\surd$	2	2	$\surd$	422	$\mathrm{A1}\oplus\mathrm{A2}$
N134.3.27 GM3$^+\oplus$GM4$^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_g}\oplus\mathrm{B2_g}$
N134.3.28 GM3$^+\oplus$GM4$^-$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{A1}\oplus\mathrm{A2}$
N134.3.29 GM3$^+\oplus$A1$^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_g}$
N134.3.30 GM3$^+\oplus$A1$^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_g}$
N134.3.31 GM3$^-\oplus$GM3$^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_u}\oplus\mathrm{A2_u}$
N134.3.32 GM3$^-\oplus$GM4$^+$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{A1}\oplus\mathrm{B2}$
N134.3.33 GM3$^-\oplus$GM4$^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_u}\oplus\mathrm{B2_u}$
N134.3.34 GM3$^-\oplus$A1$^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_u}$
N134.3.35 GM3$^-\oplus$A1$^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_u}$
N134.3.36 GM4$^+\oplus$GM4$^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_g}\oplus\mathrm{B2_g}$

Non-coplanar SSGs with parent space group $P4_2/nnm$ (No. 134) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N134.3.37 $\mathrm{GM4^+} \oplus \mathrm{GM4^-}$	√	2	2	√	422	$\mathrm{A1} \oplus \mathrm{B2}$
N134.3.38 $\mathrm{GM4^+} \oplus \mathrm{A1^+}$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_g}$
N134.3.39 $\mathrm{GM4^+} \oplus \mathrm{A1^-}$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_g}$
N134.3.40 $\mathrm{GM4^-} \oplus \mathrm{GM4^-}$	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N134.3.41 $\mathrm{GM4^-} \oplus \mathrm{A1^+}$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_u}$
N134.3.42 $\mathrm{GM4^-} \oplus \mathrm{A1^-}$	√	2	2	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_u}$
N134.3.43 $\mathrm{A1^+} \oplus \mathrm{A1^+}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N134.3.44 $\mathrm{A1^+} \oplus \mathrm{A2^-}$	√	1	1	√	$\bar{4}2m$	A1
N134.3.45 $\mathrm{A1^+} \oplus \mathrm{A3^-}$	√	1	1	√	$4mm$	A1
N134.3.46 $\mathrm{A1^+} \oplus \mathrm{A4^+}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N134.3.47 $\mathrm{A1^+} \oplus \mathrm{A1^-}$	√	1	1	√	422	A1
N134.3.48 $\mathrm{A1^+} \oplus \mathrm{A2^+}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N134.3.49 $\mathrm{A1^+} \oplus \mathrm{A3^+}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N134.3.50 $\mathrm{A1^+} \oplus \mathrm{A4^-}$	√	1	1	√	$\bar{4}m2$	A1
N134.3.51 $\mathrm{A1^-} \oplus \mathrm{A1^-}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N134.3.52 $\mathrm{A1^-} \oplus \mathrm{A2^+}$	√	1	1	√	$\bar{4}2m$	A1
N134.3.53 $\mathrm{A1^-} \oplus \mathrm{A3^+}$	√	1	1	√	$4mm$	A1
N134.3.54 $\mathrm{A1^-} \oplus \mathrm{A4^-}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N134.6.1 $\mathrm{GM5^+}$	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{E_g}$
N134.6.2 $\mathrm{GM5^-}$	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{E_u}$
N134.6.3 $\mathrm{A5^+}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N134.6.4 M1	√	1	1	√	$4mm$	A1
N134.6.5 M2	√	1	1	√	$4mm$	A1
N134.6.6 M3	√	1	1	√	$\bar{4}m2$	A1
N134.6.7 M4	√	1	1	√	$\bar{4}m2$	A1
N134.6.8 Z1	√	1	1	√	$4mm$	A1
N134.6.9 Z2	√	1	1	√	$4mm$	A1
N134.6.10 Z3	√	1	1	√	$\bar{4}m2$	A1
N134.8.1 LD1	√	1	1	√	$4mm$	A1
N134.8.2 LD2	√	1	1	√	$4mm$	A1
N134.8.3 V2	√	1	1	√	$4mm$	A1
N134.8.4 V1	√	1	1	√	$4mm$	A1
N134.9.1 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM1^-}$	√	0	0	√	-	-
N134.9.2 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM2^+}$	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N134.9.3 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM2^-}$	√	0	0	√	-	-
N134.9.4 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM3^+}$	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N134.9.5 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM3^-}$	√	0	0	√	-	-
N134.9.6 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM4^+}$	√	3	3	√	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N134.9.7 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM4^-}$	√	0	0	√	-	-
N134.9.8 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{A1^+}$	√	0	0	√	-	-
N134.9.9 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{A1^-}$	√	0	0	√	-	-
N134.9.10 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{GM2^+}$	√	2	2	√	422	$\mathrm{B1} \oplus \mathrm{B1}$
N134.9.11 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{GM2^-}$	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N134.9.12 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{GM3^+}$	√	2	2	√	$\bar{4}m2$	$\mathrm{B1} \oplus \mathrm{B2}$
N134.9.13 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{GM3^-}$	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_u}$
N134.9.14 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{GM4^+}$	√	2	2	√	$4mm$	$\mathrm{B1} \oplus \mathrm{B2}$

Non-coplanar SSGs with parent space group $P4_2/nnm$ (No. 134) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N134.9.15 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{A2_u}$
N134.9.16 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{A1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N134.9.17 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{A1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N134.9.18 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
N134.9.19 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N134.9.20 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N134.9.21 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N134.9.22 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N134.9.23 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{A1}^+$	$\surd$	0	0	$\surd$	-	-
N134.9.24 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{A1}^-$	$\surd$	0	0	$\surd$	-	-
N134.9.25 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	422	$\mathrm{A2} \oplus \mathrm{A2}$
N134.9.26 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
N134.9.27 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B2} \oplus \mathrm{A2}$
N134.9.28 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
N134.9.29 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{A1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u}$
N134.9.30 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{A1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u}$
N134.9.31 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N134.9.32 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N134.9.33 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N134.9.34 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{A1}^+$	$\surd$	0	0	$\surd$	-	-
N134.9.35 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{A1}^-$	$\surd$	0	0	$\surd$	-	-
N134.9.36 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	422	$\mathrm{B2} \oplus \mathrm{B2}$
N134.9.37 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N134.9.38 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{A1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_u}$
N134.9.39 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{A1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_u}$
N134.9.40 $\mathrm{GM1}^- \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N134.9.41 $\mathrm{GM1}^- \oplus \mathrm{GM4}^- \oplus \mathrm{A1}^+$	$\surd$	0	0	$\surd$	-	-
N134.9.42 $\mathrm{GM1}^- \oplus \mathrm{GM4}^- \oplus \mathrm{A1}^-$	$\surd$	0	0	$\surd$	-	-
N134.9.43 $\mathrm{GM1}^- \oplus \mathrm{A1}^+ \oplus \mathrm{A1}^+$	$\surd$	1	0	$\times$	-	-
N134.9.44 $\mathrm{GM1}^- \oplus \mathrm{A1}^+ \oplus \mathrm{A2}^-$	$\surd$	1	1	$\times$	-	-
N134.9.45 $\mathrm{GM1}^- \oplus \mathrm{A1}^+ \oplus \mathrm{A3}^-$	$\surd$	1	1	$\times$	-	-
N134.9.46 $\mathrm{GM1}^- \oplus \mathrm{A1}^+ \oplus \mathrm{A4}^+$	$\surd$	1	0	$\times$	-	-
N134.9.47 $\mathrm{GM1}^- \oplus \mathrm{A1}^+ \oplus \mathrm{A1}^-$	$\surd$	1	1	$\times$	-	-
N134.9.48 $\mathrm{GM1}^- \oplus \mathrm{A1}^+ \oplus \mathrm{A2}^+$	$\surd$	1	0	$\times$	-	-
N134.9.49 $\mathrm{GM1}^- \oplus \mathrm{A1}^+ \oplus \mathrm{A3}^+$	$\surd$	1	0	$\times$	-	-
N134.9.50 $\mathrm{GM1}^- \oplus \mathrm{A1}^+ \oplus \mathrm{A4}^-$	$\surd$	1	1	$\times$	-	-
N134.9.51 $\mathrm{GM1}^- \oplus \mathrm{A1}^- \oplus \mathrm{A1}^-$	$\surd$	1	0	$\times$	-	-
N134.9.52 $\mathrm{GM1}^- \oplus \mathrm{A1}^- \oplus \mathrm{A2}^+$	$\surd$	1	1	$\times$	-	-
N134.9.53 $\mathrm{GM1}^- \oplus \mathrm{A1}^- \oplus \mathrm{A3}^+$	$\surd$	1	1	$\times$	-	-
N134.9.54 $\mathrm{GM1}^- \oplus \mathrm{A1}^- \oplus \mathrm{A4}^-$	$\surd$	1	0	$\times$	-	-
N134.9.55 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N134.9.56 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B1} \oplus \mathrm{B1}$
N134.9.57 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{A2_g}$
N134.9.58 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{B1} \oplus \mathrm{B1}$
N134.9.59 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B2_g}$
N134.9.60 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{B1} \oplus \mathrm{B1}$

Non-coplanar SSGs with parent space group $P4_2/nnm$ (No. 134) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N134.9.61 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{A1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N134.9.62 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{A1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N134.9.63 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{B1_g}$
N134.9.64 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{B1} \oplus \mathrm{A2}$
N134.9.65 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B2_u}$
N134.9.66 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{B1} \oplus \mathrm{A2}$
N134.9.67 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{A2_u}$
N134.9.68 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{A1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g}$
N134.9.69 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{A1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g}$
N134.9.70 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
N134.9.71 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B1} \oplus \mathrm{A2}$
N134.9.72 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g} \oplus \mathrm{B2_g}$
N134.9.73 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	422	$\mathrm{B1} \oplus \mathrm{A2}$
N134.9.74 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{A1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g}$
N134.9.75 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{A1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g}$
N134.9.76 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N134.9.77 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	422	$\mathrm{B1} \oplus \mathrm{B2}$
N134.9.78 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N134.9.79 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{A1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N134.9.80 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{A1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N134.9.81 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N134.9.82 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B1} \oplus \mathrm{B2}$
N134.9.83 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{A1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
N134.9.84 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{A1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
N134.9.85 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N134.9.86 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{A1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u}$
N134.9.87 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{A1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u}$
N134.9.88 $\mathrm{GM2}^+ \oplus \mathrm{A1}^+ \oplus \mathrm{A1}^+$	$\surd$	1	1	$\times$	-	-
N134.9.89 $\mathrm{GM2}^+ \oplus \mathrm{A1}^+ \oplus \mathrm{A2}^-$	$\surd$	1	1	$\times$	-	-
N134.9.90 $\mathrm{GM2}^+ \oplus \mathrm{A1}^+ \oplus \mathrm{A3}^-$	$\surd$	1	1	$\surd$	$\bar{4}m2$	$\mathrm{B1}$
N134.9.91 $\mathrm{GM2}^+ \oplus \mathrm{A1}^+ \oplus \mathrm{A4}^+$	$\surd$	1	1	$\times$	-	-
N134.9.92 $\mathrm{GM2}^+ \oplus \mathrm{A1}^+ \oplus \mathrm{A1}^-$	$\surd$	1	1	$\times$	-	-
N134.9.93 $\mathrm{GM2}^+ \oplus \mathrm{A1}^+ \oplus \mathrm{A2}^+$	$\surd$	1	1	$\times$	-	-
N134.9.94 $\mathrm{GM2}^+ \oplus \mathrm{A1}^+ \oplus \mathrm{A3}^+$	$\surd$	1	1	$\times$	-	-
N134.9.95 $\mathrm{GM2}^+ \oplus \mathrm{A1}^+ \oplus \mathrm{A4}^-$	$\surd$	1	1	$\times$	-	-
N134.9.96 $\mathrm{GM2}^+ \oplus \mathrm{A1}^- \oplus \mathrm{A1}^-$	$\surd$	1	1	$\times$	-	-
N134.9.97 $\mathrm{GM2}^+ \oplus \mathrm{A1}^- \oplus \mathrm{A2}^+$	$\surd$	1	1	$\times$	-	-
N134.9.98 $\mathrm{GM2}^+ \oplus \mathrm{A1}^- \oplus \mathrm{A3}^+$	$\surd$	1	1	$\surd$	$\bar{4}m2$	$\mathrm{B1}$
N134.9.99 $\mathrm{GM2}^+ \oplus \mathrm{A1}^- \oplus \mathrm{A4}^-$	$\surd$	1	1	$\times$	-	-
N134.9.100 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
N134.9.101 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N134.9.102 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N134.9.103 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$
N134.9.104 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N134.9.105 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{A1}^+$	$\surd$	0	0	$\surd$	-	-
N134.9.106 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{A1}^-$	$\surd$	0	0	$\surd$	-	-

Non-coplanar SSGs with parent space group $P4_2/nnm$ (No. 134) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N134.9.107 $\mathrm{GM2^-} \oplus \mathrm{GM3^+} \oplus \mathrm{GM3^+}$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{A2} \oplus \mathrm{A2}$
N134.9.108 $\mathrm{GM2^-} \oplus \mathrm{GM3^+} \oplus \mathrm{GM3^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{B2_u}$
N134.9.109 $\mathrm{GM2^-} \oplus \mathrm{GM3^+} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	422	$\mathrm{A2} \oplus \mathrm{B2}$
N134.9.110 $\mathrm{GM2^-} \oplus \mathrm{GM3^+} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g} \oplus \mathrm{B2_u}$
N134.9.111 $\mathrm{GM2^-} \oplus \mathrm{GM3^+} \oplus \mathrm{A1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_u}$
N134.9.112 $\mathrm{GM2^-} \oplus \mathrm{GM3^+} \oplus \mathrm{A1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_u}$
N134.9.113 $\mathrm{GM2^-} \oplus \mathrm{GM3^-} \oplus \mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
N134.9.114 $\mathrm{GM2^-} \oplus \mathrm{GM3^-} \oplus \mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$
N134.9.115 $\mathrm{GM2^-} \oplus \mathrm{GM3^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N134.9.116 $\mathrm{GM2^-} \oplus \mathrm{GM3^-} \oplus \mathrm{A1^+}$	$\surd$	0	0	$\surd$	-	-
N134.9.117 $\mathrm{GM2^-} \oplus \mathrm{GM3^-} \oplus \mathrm{A1^-}$	$\surd$	0	0	$\surd$	-	-
N134.9.118 $\mathrm{GM2^-} \oplus \mathrm{GM4^+} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B2} \oplus \mathrm{B2}$
N134.9.119 $\mathrm{GM2^-} \oplus \mathrm{GM4^+} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$
N134.9.120 $\mathrm{GM2^-} \oplus \mathrm{GM4^+} \oplus \mathrm{A1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g}$
N134.9.121 $\mathrm{GM2^-} \oplus \mathrm{GM4^+} \oplus \mathrm{A1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g}$
N134.9.122 $\mathrm{GM2^-} \oplus \mathrm{GM4^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N134.9.123 $\mathrm{GM2^-} \oplus \mathrm{GM4^-} \oplus \mathrm{A1^+}$	$\surd$	0	0	$\surd$	-	-
N134.9.124 $\mathrm{GM2^-} \oplus \mathrm{GM4^-} \oplus \mathrm{A1^-}$	$\surd$	0	0	$\surd$	-	-
N134.9.125 $\mathrm{GM2^-} \oplus \mathrm{A1^+} \oplus \mathrm{A1^+}$	$\surd$	1	0	$\times$	-	-
N134.9.126 $\mathrm{GM2^-} \oplus \mathrm{A1^+} \oplus \mathrm{A2^-}$	$\surd$	1	1	$\times$	-	-
N134.9.127 $\mathrm{GM2^-} \oplus \mathrm{A1^+} \oplus \mathrm{A3^-}$	$\surd$	1	1	$\times$	-	-
N134.9.128 $\mathrm{GM2^-} \oplus \mathrm{A1^+} \oplus \mathrm{A4^+}$	$\surd$	1	0	$\times$	-	-
N134.9.129 $\mathrm{GM2^-} \oplus \mathrm{A1^+} \oplus \mathrm{A1^-}$	$\surd$	1	1	$\times$	-	-
N134.9.130 $\mathrm{GM2^-} \oplus \mathrm{A1^+} \oplus \mathrm{A2^+}$	$\surd$	1	0	$\times$	-	-
N134.9.131 $\mathrm{GM2^-} \oplus \mathrm{A1^+} \oplus \mathrm{A3^+}$	$\surd$	1	0	$\times$	-	-
N134.9.132 $\mathrm{GM2^-} \oplus \mathrm{A1^+} \oplus \mathrm{A4^-}$	$\surd$	1	1	$\times$	-	-
N134.9.133 $\mathrm{GM2^-} \oplus \mathrm{A1^-} \oplus \mathrm{A1^-}$	$\surd$	1	0	$\times$	-	-
N134.9.134 $\mathrm{GM2^-} \oplus \mathrm{A1^-} \oplus \mathrm{A2^+}$	$\surd$	1	1	$\times$	-	-
N134.9.135 $\mathrm{GM2^-} \oplus \mathrm{A1^-} \oplus \mathrm{A3^+}$	$\surd$	1	1	$\times$	-	-
N134.9.136 $\mathrm{GM2^-} \oplus \mathrm{A1^-} \oplus \mathrm{A4^-}$	$\surd$	1	0	$\times$	-	-
N134.9.137 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{GM3^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
N134.9.138 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{GM3^-}$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{A2} \oplus \mathrm{A2}$
N134.9.139 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{B2_g}$
N134.9.140 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{B2} \oplus \mathrm{B2}$
N134.9.141 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{A1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g}$
N134.9.142 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{A1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g}$
N134.9.143 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{GM3^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A2_g}$
N134.9.144 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{B2} \oplus \mathrm{A2}$
N134.9.145 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{A2_g}$
N134.9.146 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{A1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g}$
N134.9.147 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{A1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g}$
N134.9.148 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N134.9.149 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{B2} \oplus \mathrm{A2}$
N134.9.150 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{A1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g}$
N134.9.151 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{A1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g}$
N134.9.152 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{A2_g}$

Non-coplanar SSGs with parent space group $P4_2/nnm$ (No. 134) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N134.9.153 $\mathrm{GM3^+}\oplus\mathrm{GM4^-}\oplus\mathrm{A1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{A2_g}$
N134.9.154 $\mathrm{GM3^+}\oplus\mathrm{GM4^-}\oplus\mathrm{A1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{A2_g}$
N134.9.155 $\mathrm{GM3^+}\oplus\mathrm{A1^+}\oplus\mathrm{A1^+}$	$\surd$	1	1	$\times$	-	-
N134.9.156 $\mathrm{GM3^+}\oplus\mathrm{A1^+}\oplus\mathrm{A2^-}$	$\surd$	1	1	$\times$	-	-
N134.9.157 $\mathrm{GM3^+}\oplus\mathrm{A1^+}\oplus\mathrm{A3^-}$	$\surd$	1	1	$\times$	-	-
N134.9.158 $\mathrm{GM3^+}\oplus\mathrm{A1^+}\oplus\mathrm{A4^+}$	$\surd$	1	1	$\times$	-	-
N134.9.159 $\mathrm{GM3^+}\oplus\mathrm{A1^+}\oplus\mathrm{A1^-}$	$\surd$	1	1	$\times$	-	-
N134.9.160 $\mathrm{GM3^+}\oplus\mathrm{A1^+}\oplus\mathrm{A2^+}$	$\surd$	1	1	$\times$	-	-
N134.9.161 $\mathrm{GM3^+}\oplus\mathrm{A1^+}\oplus\mathrm{A3^+}$	$\surd$	1	1	$\times$	-	-
N134.9.162 $\mathrm{GM3^+}\oplus\mathrm{A1^+}\oplus\mathrm{A4^-}$	$\surd$	1	1	$\times$	-	-
N134.9.163 $\mathrm{GM3^+}\oplus\mathrm{A1^-}\oplus\mathrm{A1^-}$	$\surd$	1	1	$\times$	-	-
N134.9.164 $\mathrm{GM3^+}\oplus\mathrm{A1^-}\oplus\mathrm{A2^+}$	$\surd$	1	1	$\times$	-	-
N134.9.165 $\mathrm{GM3^+}\oplus\mathrm{A1^-}\oplus\mathrm{A3^+}$	$\surd$	1	1	$\times$	-	-
N134.9.166 $\mathrm{GM3^+}\oplus\mathrm{A1^-}\oplus\mathrm{A4^-}$	$\surd$	1	1	$\times$	-	-
N134.9.167 $\mathrm{GM3^-}\oplus\mathrm{GM3^-}\oplus\mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
N134.9.168 $\mathrm{GM3^-}\oplus\mathrm{GM3^-}\oplus\mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{B1_u}\oplus\mathrm{B2_g}$
N134.9.169 $\mathrm{GM3^-}\oplus\mathrm{GM3^-}\oplus\mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N134.9.170 $\mathrm{GM3^-}\oplus\mathrm{GM3^-}\oplus\mathrm{A1^+}$	$\surd$	0	0	$\surd$	-	-
N134.9.171 $\mathrm{GM3^-}\oplus\mathrm{GM3^-}\oplus\mathrm{A1^-}$	$\surd$	0	0	$\surd$	-	-
N134.9.172 $\mathrm{GM3^-}\oplus\mathrm{GM4^+}\oplus\mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{B2}\oplus\mathrm{B2}$
N134.9.173 $\mathrm{GM3^-}\oplus\mathrm{GM4^+}\oplus\mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B1_u}\oplus\mathrm{B2_g}$
N134.9.174 $\mathrm{GM3^-}\oplus\mathrm{GM4^+}\oplus\mathrm{A1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{B2_g}$
N134.9.175 $\mathrm{GM3^-}\oplus\mathrm{GM4^+}\oplus\mathrm{A1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{B2_g}$
N134.9.176 $\mathrm{GM3^-}\oplus\mathrm{GM4^-}\oplus\mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N134.9.177 $\mathrm{GM3^-}\oplus\mathrm{GM4^-}\oplus\mathrm{A1^+}$	$\surd$	0	0	$\surd$	-	-
N134.9.178 $\mathrm{GM3^-}\oplus\mathrm{GM4^-}\oplus\mathrm{A1^-}$	$\surd$	0	0	$\surd$	-	-
N134.9.179 $\mathrm{GM3^-}\oplus\mathrm{A1^+}\oplus\mathrm{A1^+}$	$\surd$	1	0	$\times$	-	-
N134.9.180 $\mathrm{GM3^-}\oplus\mathrm{A1^+}\oplus\mathrm{A2^-}$	$\surd$	1	1	$\times$	-	-
N134.9.181 $\mathrm{GM3^-}\oplus\mathrm{A1^+}\oplus\mathrm{A3^-}$	$\surd$	1	1	$\times$	-	-
N134.9.182 $\mathrm{GM3^-}\oplus\mathrm{A1^+}\oplus\mathrm{A4^+}$	$\surd$	1	0	$\times$	-	-
N134.9.183 $\mathrm{GM3^-}\oplus\mathrm{A1^+}\oplus\mathrm{A1^-}$	$\surd$	1	1	$\times$	-	-
N134.9.184 $\mathrm{GM3^-}\oplus\mathrm{A1^+}\oplus\mathrm{A2^+}$	$\surd$	1	0	$\times$	-	-
N134.9.185 $\mathrm{GM3^-}\oplus\mathrm{A1^+}\oplus\mathrm{A3^+}$	$\surd$	1	0	$\times$	-	-
N134.9.186 $\mathrm{GM3^-}\oplus\mathrm{A1^+}\oplus\mathrm{A4^-}$	$\surd$	1	1	$\times$	-	-
N134.9.187 $\mathrm{GM3^-}\oplus\mathrm{A1^-}\oplus\mathrm{A1^-}$	$\surd$	1	0	$\times$	-	-
N134.9.188 $\mathrm{GM3^-}\oplus\mathrm{A1^-}\oplus\mathrm{A2^+}$	$\surd$	1	1	$\times$	-	-
N134.9.189 $\mathrm{GM3^-}\oplus\mathrm{A1^-}\oplus\mathrm{A3^+}$	$\surd$	1	1	$\times$	-	-
N134.9.190 $\mathrm{GM3^-}\oplus\mathrm{A1^-}\oplus\mathrm{A4^-}$	$\surd$	1	0	$\times$	-	-
N134.9.191 $\mathrm{GM4^+}\oplus\mathrm{GM4^+}\oplus\mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B2_g}\oplus\mathrm{B2_g}\oplus\mathrm{B2_g}$
N134.9.192 $\mathrm{GM4^+}\oplus\mathrm{GM4^+}\oplus\mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{A2}\oplus\mathrm{A2}$
N134.9.193 $\mathrm{GM4^+}\oplus\mathrm{GM4^+}\oplus\mathrm{A1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g}\oplus\mathrm{B2_g}$
N134.9.194 $\mathrm{GM4^+}\oplus\mathrm{GM4^+}\oplus\mathrm{A1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g}\oplus\mathrm{B2_g}$
N134.9.195 $\mathrm{GM4^+}\oplus\mathrm{GM4^-}\oplus\mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A1_u}\oplus\mathrm{B2_g}$
N134.9.196 $\mathrm{GM4^+}\oplus\mathrm{GM4^-}\oplus\mathrm{A1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B2_g}$
N134.9.197 $\mathrm{GM4^+}\oplus\mathrm{GM4^-}\oplus\mathrm{A1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B2_g}$
N134.9.198 $\mathrm{GM4^+}\oplus\mathrm{A1^+}\oplus\mathrm{A1^+}$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $P4_2/nnm$ (No. 134) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N134.9.199 $\mathrm{GM4^+} \oplus \mathrm{A1^+} \oplus \mathrm{A2^-}$	$\surd$	1	1	$\times$	-	-
N134.9.200 $\mathrm{GM4^+} \oplus \mathrm{A1^+} \oplus \mathrm{A3^-}$	$\surd$	1	1	$\times$	-	-
N134.9.201 $\mathrm{GM4^+} \oplus \mathrm{A1^+} \oplus \mathrm{A4^+}$	$\surd$	1	1	$\times$	-	-
N134.9.202 $\mathrm{GM4^+} \oplus \mathrm{A1^+} \oplus \mathrm{A1^-}$	$\surd$	1	1	$\times$	-	-
N134.9.203 $\mathrm{GM4^+} \oplus \mathrm{A1^+} \oplus \mathrm{A2^+}$	$\surd$	1	1	$\times$	-	-
N134.9.204 $\mathrm{GM4^+} \oplus \mathrm{A1^+} \oplus \mathrm{A3^+}$	$\surd$	1	1	$\times$	-	-
N134.9.205 $\mathrm{GM4^+} \oplus \mathrm{A1^+} \oplus \mathrm{A4^-}$	$\surd$	1	1	$\times$	-	-
N134.9.206 $\mathrm{GM4^+} \oplus \mathrm{A1^-} \oplus \mathrm{A1^-}$	$\surd$	1	1	$\times$	-	-
N134.9.207 $\mathrm{GM4^+} \oplus \mathrm{A1^-} \oplus \mathrm{A2^+}$	$\surd$	1	1	$\times$	-	-
N134.9.208 $\mathrm{GM4^+} \oplus \mathrm{A1^-} \oplus \mathrm{A3^+}$	$\surd$	1	1	$\times$	-	-
N134.9.209 $\mathrm{GM4^+} \oplus \mathrm{A1^-} \oplus \mathrm{A4^-}$	$\surd$	1	1	$\times$	-	-
N134.9.210 $\mathrm{GM4^-} \oplus \mathrm{GM4^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N134.9.211 $\mathrm{GM4^-} \oplus \mathrm{GM4^-} \oplus \mathrm{A1^+}$	$\surd$	0	0	$\surd$	-	-
N134.9.212 $\mathrm{GM4^-} \oplus \mathrm{GM4^-} \oplus \mathrm{A1^-}$	$\surd$	0	0	$\surd$	-	-
N134.9.213 $\mathrm{GM4^-} \oplus \mathrm{A1^+} \oplus \mathrm{A1^+}$	$\surd$	1	0	$\times$	-	-
N134.9.214 $\mathrm{GM4^-} \oplus \mathrm{A1^+} \oplus \mathrm{A2^-}$	$\surd$	1	1	$\times$	-	-
N134.9.215 $\mathrm{GM4^-} \oplus \mathrm{A1^+} \oplus \mathrm{A3^-}$	$\surd$	1	1	$\times$	-	-
N134.9.216 $\mathrm{GM4^-} \oplus \mathrm{A1^+} \oplus \mathrm{A4^+}$	$\surd$	1	0	$\times$	-	-
N134.9.217 $\mathrm{GM4^-} \oplus \mathrm{A1^+} \oplus \mathrm{A1^-}$	$\surd$	1	1	$\times$	-	-
N134.9.218 $\mathrm{GM4^-} \oplus \mathrm{A1^+} \oplus \mathrm{A2^+}$	$\surd$	1	0	$\times$	-	-
N134.9.219 $\mathrm{GM4^-} \oplus \mathrm{A1^+} \oplus \mathrm{A3^+}$	$\surd$	1	0	$\times$	-	-
N134.9.220 $\mathrm{GM4^-} \oplus \mathrm{A1^+} \oplus \mathrm{A4^-}$	$\surd$	1	1	$\times$	-	-
N134.9.221 $\mathrm{GM4^-} \oplus \mathrm{A1^-} \oplus \mathrm{A1^-}$	$\surd$	1	0	$\times$	-	-
N134.9.222 $\mathrm{GM4^-} \oplus \mathrm{A1^-} \oplus \mathrm{A2^+}$	$\surd$	1	1	$\times$	-	-
N134.9.223 $\mathrm{GM4^-} \oplus \mathrm{A1^-} \oplus \mathrm{A3^+}$	$\surd$	1	1	$\times$	-	-
N134.9.224 $\mathrm{GM4^-} \oplus \mathrm{A1^-} \oplus \mathrm{A4^-}$	$\surd$	1	0	$\times$	-	-
N134.9.225 $\mathrm{A1^+} \oplus \mathrm{A1^+} \oplus \mathrm{A1^+}$	$\surd$	0	0	$\surd$	-	-
N134.9.226 $\mathrm{A1^+} \oplus \mathrm{A1^+} \oplus \mathrm{A2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N134.9.227 $\mathrm{A1^+} \oplus \mathrm{A1^+} \oplus \mathrm{A3^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u}$
N134.9.228 $\mathrm{A1^+} \oplus \mathrm{A1^+} \oplus \mathrm{A4^+}$	$\surd$	0	0	$\surd$	-	-
N134.9.229 $\mathrm{A1^+} \oplus \mathrm{A2^-} \oplus \mathrm{A3^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_u}$
N134.9.230 $\mathrm{A1^+} \oplus \mathrm{A1^+} \oplus \mathrm{A1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u}$
N134.9.231 $\mathrm{A1^+} \oplus \mathrm{A1^+} \oplus \mathrm{A2^+}$	$\surd$	0	0	$\surd$	-	-
N134.9.232 $\mathrm{A1^+} \oplus \mathrm{A1^+} \oplus \mathrm{A3^+}$	$\surd$	0	0	$\surd$	-	-
N134.9.233 $\mathrm{A1^+} \oplus \mathrm{A1^+} \oplus \mathrm{A4^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_u} \oplus \mathrm{B2_u}$
N134.9.234 $\mathrm{A1^+} \oplus \mathrm{A2^-} \oplus \mathrm{A1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u}$
N134.9.235 $\mathrm{A1^+} \oplus \mathrm{A2^-} \oplus \mathrm{A3^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N134.9.236 $\mathrm{A1^+} \oplus \mathrm{A3^-} \oplus \mathrm{A1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u}$
N134.9.237 $\mathrm{A1^+} \oplus \mathrm{A3^-} \oplus \mathrm{A2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_u}$
N134.9.238 $\mathrm{A1^+} \oplus \mathrm{A4^+} \oplus \mathrm{A1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_u}$
N134.9.239 $\mathrm{A1^+} \oplus \mathrm{A4^+} \oplus \mathrm{A2^+}$	$\surd$	0	0	$\surd$	-	-
N134.9.240 $\mathrm{A1^+} \oplus \mathrm{A1^-} \oplus \mathrm{A1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u}$
N134.9.241 $\mathrm{A1^+} \oplus \mathrm{A1^-} \oplus \mathrm{A2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u}$
N134.9.242 $\mathrm{A1^+} \oplus \mathrm{A1^-} \oplus \mathrm{A3^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u}$
N134.9.243 $\mathrm{A1^+} \oplus \mathrm{A1^-} \oplus \mathrm{A4^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_u}$
N134.9.244 $\mathrm{A1^+} \oplus \mathrm{A2^+} \oplus \mathrm{A2^+}$	$\surd$	0	0	$\surd$	-	-

Non-coplanar SSGs with parent space group $P4_2/nnm$ (No. 134) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N134.9.245 $\mathrm{A1}^+ \oplus \mathrm{A2}^+ \oplus \mathrm{A3}^+$	$\surd$	0	0	$\surd$	-	-
N134.9.246 $\mathrm{A1}^+ \oplus \mathrm{A2}^+ \oplus \mathrm{A4}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_u}$
N134.9.247 $\mathrm{A1}^+ \oplus \mathrm{A3}^+ \oplus \mathrm{A3}^+$	$\surd$	0	0	$\surd$	-	-
N134.9.248 $\mathrm{A1}^+ \oplus \mathrm{A3}^+ \oplus \mathrm{A4}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_u}$
N134.9.249 $\mathrm{A1}^+ \oplus \mathrm{A4}^- \oplus \mathrm{A4}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_u} \oplus \mathrm{B2_u}$
N134.9.250 $\mathrm{A1}^- \oplus \mathrm{A1}^- \oplus \mathrm{A1}^-$	$\surd$	0	0	$\surd$	-	-
N134.9.251 $\mathrm{A1}^- \oplus \mathrm{A1}^- \oplus \mathrm{A2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N134.9.252 $\mathrm{A1}^- \oplus \mathrm{A1}^- \oplus \mathrm{A3}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u}$
N134.9.253 $\mathrm{A1}^- \oplus \mathrm{A1}^- \oplus \mathrm{A4}^-$	$\surd$	0	0	$\surd$	-	-
N134.9.254 $\mathrm{A1}^- \oplus \mathrm{A2}^+ \oplus \mathrm{A3}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_u}$
N134.12.1 $\mathrm{GM1}^- \oplus \mathrm{GM5}^+$	$\surd$	2	2	$\surd$	$4mm$	E
N134.12.2 $\mathrm{GM1}^- \oplus \mathrm{GM5}^-$	$\surd$	0	0	$\surd$	-	-
N134.12.3 $\mathrm{GM1}^- \oplus \mathrm{A5}^+$	$\surd$	1	0	$\times$	-	-
N134.12.4 $\mathrm{GM1}^- \oplus \mathrm{M1}$	$\surd$	1	1	$\times$	-	-
N134.12.5 $\mathrm{GM1}^- \oplus \mathrm{M2}$	$\surd$	1	1	$\times$	-	-
N134.12.6 $\mathrm{GM1}^- \oplus \mathrm{M3}$	$\surd$	1	1	$\times$	-	-
N134.12.7 $\mathrm{GM1}^- \oplus \mathrm{M4}$	$\surd$	1	1	$\times$	-	-
N134.12.8 $\mathrm{GM1}^- \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N134.12.9 $\mathrm{GM1}^- \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N134.12.10 $\mathrm{GM1}^- \oplus \mathrm{Z3}$	$\surd$	1	1	$\times$	-	-
N134.12.11 $\mathrm{GM2}^+ \oplus \mathrm{GM5}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{E_g}$
N134.12.12 $\mathrm{GM2}^+ \oplus \mathrm{GM5}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{E_u}$
N134.12.13 $\mathrm{GM2}^+ \oplus \mathrm{A5}^+$	$\surd$	1	1	$\times$	-	-
N134.12.14 $\mathrm{GM2}^+ \oplus \mathrm{M1}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N134.12.15 $\mathrm{GM2}^+ \oplus \mathrm{M2}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N134.12.16 $\mathrm{GM2}^+ \oplus \mathrm{M3}$	$\surd$	1	1	$\surd$	$4mm$	B1
N134.12.17 $\mathrm{GM2}^+ \oplus \mathrm{M4}$	$\surd$	1	1	$\surd$	$4mm$	B1
N134.12.18 $\mathrm{GM2}^+ \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N134.12.19 $\mathrm{GM2}^+ \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N134.12.20 $\mathrm{GM2}^+ \oplus \mathrm{Z3}$	$\surd$	1	1	$\times$	-	-
N134.12.21 $\mathrm{GM2}^- \oplus \mathrm{GM5}^+$	$\surd$	2	2	$\surd$	$\bar{4}m2$	E
N134.12.22 $\mathrm{GM2}^- \oplus \mathrm{GM5}^-$	$\surd$	0	0	$\surd$	-	-
N134.12.23 $\mathrm{GM2}^- \oplus \mathrm{A5}^+$	$\surd$	1	0	$\times$	-	-
N134.12.24 $\mathrm{GM2}^- \oplus \mathrm{M1}$	$\surd$	1	1	$\times$	-	-
N134.12.25 $\mathrm{GM2}^- \oplus \mathrm{M2}$	$\surd$	1	1	$\times$	-	-
N134.12.26 $\mathrm{GM2}^- \oplus \mathrm{M3}$	$\surd$	1	1	$\times$	-	-
N134.12.27 $\mathrm{GM2}^- \oplus \mathrm{M4}$	$\surd$	1	1	$\times$	-	-
N134.12.28 $\mathrm{GM2}^- \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N134.12.29 $\mathrm{GM2}^- \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N134.12.30 $\mathrm{GM2}^- \oplus \mathrm{Z3}$	$\surd$	1	1	$\times$	-	-
N134.12.31 $\mathrm{GM3}^+ \oplus \mathrm{GM5}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{E_g}$
N134.12.32 $\mathrm{GM3}^+ \oplus \mathrm{GM5}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{E_u}$
N134.12.33 $\mathrm{GM3}^+ \oplus \mathrm{A5}^+$	$\surd$	1	1	$\times$	-	-
N134.12.34 $\mathrm{GM3}^+ \oplus \mathrm{M1}$	$\surd$	1	1	$\times$	-	-
N134.12.35 $\mathrm{GM3}^+ \oplus \mathrm{M2}$	$\surd$	1	1	$\times$	-	-
N134.12.36 $\mathrm{GM3}^+ \oplus \mathrm{M3}$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $P4_2/nnm$ (No. 134) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N134.12.37 $\mathrm{GM3^+} \oplus \mathrm{M4}$	$\surd$	1	1	$\times$	-	-
N134.12.38 $\mathrm{GM3^+} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	422	A2
N134.12.39 $\mathrm{GM3^+} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	422	A2
N134.12.40 $\mathrm{GM3^+} \oplus \mathrm{Z3}$	$\surd$	1	1	$\times$	-	-
N134.12.41 $\mathrm{GM3^-} \oplus \mathrm{GM5^+}$	$\surd$	2	2	$\surd$	422	E
N134.12.42 $\mathrm{GM3^-} \oplus \mathrm{GM5^-}$	$\surd$	0	0	$\surd$	-	-
N134.12.43 $\mathrm{GM3^-} \oplus \mathrm{A5^+}$	$\surd$	1	0	$\times$	-	-
N134.12.44 $\mathrm{GM3^-} \oplus \mathrm{M1}$	$\surd$	1	1	$\times$	-	-
N134.12.45 $\mathrm{GM3^-} \oplus \mathrm{M2}$	$\surd$	1	1	$\times$	-	-
N134.12.46 $\mathrm{GM3^-} \oplus \mathrm{M3}$	$\surd$	1	1	$\times$	-	-
N134.12.47 $\mathrm{GM3^-} \oplus \mathrm{M4}$	$\surd$	1	1	$\times$	-	-
N134.12.48 $\mathrm{GM3^-} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N134.12.49 $\mathrm{GM3^-} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N134.12.50 $\mathrm{GM3^-} \oplus \mathrm{Z3}$	$\surd$	1	1	$\times$	-	-
N134.12.51 $\mathrm{GM4^+} \oplus \mathrm{GM5^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{E_g}$
N134.12.52 $\mathrm{GM4^+} \oplus \mathrm{GM5^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{E_u}$
N134.12.53 $\mathrm{GM4^+} \oplus \mathrm{A5^+}$	$\surd$	1	1	$\times$	-	-
N134.12.54 $\mathrm{GM4^+} \oplus \mathrm{M1}$	$\surd$	1	1	$\times$	-	-
N134.12.55 $\mathrm{GM4^+} \oplus \mathrm{M2}$	$\surd$	1	1	$\times$	-	-
N134.12.56 $\mathrm{GM4^+} \oplus \mathrm{M3}$	$\surd$	1	1	$\times$	-	-
N134.12.57 $\mathrm{GM4^+} \oplus \mathrm{M4}$	$\surd$	1	1	$\times$	-	-
N134.12.58 $\mathrm{GM4^+} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N134.12.59 $\mathrm{GM4^+} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N134.12.60 $\mathrm{GM4^+} \oplus \mathrm{Z3}$	$\surd$	1	1	$\times$	-	-
N134.12.61 $\mathrm{GM4^-} \oplus \mathrm{GM5^+}$	$\surd$	2	2	$\surd$	$\bar{4}2m$	E
N134.12.62 $\mathrm{GM4^-} \oplus \mathrm{GM5^-}$	$\surd$	0	0	$\surd$	-	-
N134.12.63 $\mathrm{GM4^-} \oplus \mathrm{A5^+}$	$\surd$	1	0	$\times$	-	-
N134.12.64 $\mathrm{GM4^-} \oplus \mathrm{M1}$	$\surd$	1	1	$\times$	-	-
N134.12.65 $\mathrm{GM4^-} \oplus \mathrm{M2}$	$\surd$	1	1	$\times$	-	-
N134.12.66 $\mathrm{GM4^-} \oplus \mathrm{M3}$	$\surd$	1	1	$\times$	-	-
N134.12.67 $\mathrm{GM4^-} \oplus \mathrm{M4}$	$\surd$	1	1	$\times$	-	-
N134.12.68 $\mathrm{GM4^-} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N134.12.69 $\mathrm{GM4^-} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N134.12.70 $\mathrm{GM4^-} \oplus \mathrm{Z3}$	$\surd$	1	1	$\times$	-	-
N134.12.71 $\mathrm{A1^+} \oplus \mathrm{GM5^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_g}$
N134.12.72 $\mathrm{A1^+} \oplus \mathrm{GM5^-}$	$\surd$	0	0	$\surd$	-	-
N134.12.73 $\mathrm{A1^+} \oplus \mathrm{A5^+}$	$\surd$	0	0	$\surd$	-	-
N134.12.74 $\mathrm{A1^+} \oplus \mathrm{A5^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_u}$
N134.12.75 $\mathrm{A1^+} \oplus \mathrm{M1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N134.12.76 $\mathrm{A1^+} \oplus \mathrm{M2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N134.12.77 $\mathrm{A1^+} \oplus \mathrm{M3}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_u}$
N134.12.78 $\mathrm{A1^+} \oplus \mathrm{M4}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_u}$
N134.12.79 $\mathrm{A1^+} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N134.12.80 $\mathrm{A1^+} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N134.12.81 $\mathrm{A1^+} \oplus \mathrm{Z3}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_u}$
N134.12.82 $\mathrm{A1^+} \oplus \mathrm{Z4}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_u}$

Non-coplanar SSGs with parent space group $P4_2/nnm$ (No. 134) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N134.12.83 A1$^-$ ⊕ GM5$^+$	√	2	2	√	$4/mmm$	$\mathrm{E_g}$
N134.12.84 A1$^-$ ⊕ GM5$^-$	√	0	0	√	-	-
N134.12.85 A1$^-$ ⊕ A5$^+$	√	2	2	√	$4/mmm$	$\mathrm{E_u}$
N134.12.86 A1$^-$ ⊕ A5$^-$	√	0	0	√	-	-
N134.12.87 A1$^-$ ⊕ M1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N134.12.88 A1$^-$ ⊕ M2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N134.12.89 A1$^-$ ⊕ M3	√	1	1	√	$4/mmm$	$\mathrm{B2_u}$
N134.12.90 A1$^-$ ⊕ M4	√	1	1	√	$4/mmm$	$\mathrm{B2_u}$
N134.12.91 A1$^-$ ⊕ Z1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N134.12.92 A1$^-$ ⊕ Z2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N134.12.93 A1$^-$ ⊕ Z3	√	1	1	√	$4/mmm$	$\mathrm{B2_u}$
N134.12.94 A1$^-$ ⊕ Z4	√	1	1	√	$4/mmm$	$\mathrm{B2_u}$
N134.14.1 GM1$^-$ ⊕ LD1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N134.14.2 GM1$^-$ ⊕ LD2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N134.14.3 GM1$^-$ ⊕ V2	√	1	1	×	-	-
N134.14.4 GM1$^-$ ⊕ V1	√	1	1	×	-	-
N134.14.5 GM2$^+$ ⊕ LD1	√	1	1	√	$\bar{4}m2$	B1
N134.14.6 GM2$^+$ ⊕ LD2	√	1	1	√	$\bar{4}m2$	B1
N134.14.7 GM2$^+$ ⊕ V2	√	1	1	√	$\bar{4}m2$	B1
N134.14.8 GM2$^+$ ⊕ V1	√	1	1	√	$\bar{4}m2$	B1
N134.14.9 GM2$^-$ ⊕ LD1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N134.14.10 GM2$^-$ ⊕ LD2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N134.14.11 GM2$^-$ ⊕ V2	√	1	1	×	-	-
N134.14.12 GM2$^-$ ⊕ V1	√	1	1	×	-	-
N134.14.13 GM3$^+$ ⊕ LD1	√	1	1	√	422	A2
N134.14.14 GM3$^+$ ⊕ LD2	√	1	1	√	422	A2
N134.14.15 GM3$^+$ ⊕ V2	√	1	1	×	-	-
N134.14.16 GM3$^+$ ⊕ V1	√	1	1	×	-	-
N134.14.17 GM3$^-$ ⊕ LD1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N134.14.18 GM3$^-$ ⊕ LD2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N134.14.19 GM3$^-$ ⊕ V2	√	1	1	×	-	-
N134.14.20 GM3$^-$ ⊕ V1	√	1	1	×	-	-
N134.14.21 GM4$^+$ ⊕ LD1	√	1	1	√	$\bar{4}2m$	B2
N134.14.22 GM4$^+$ ⊕ LD2	√	1	1	√	$\bar{4}2m$	B2
N134.14.23 GM4$^+$ ⊕ V2	√	1	1	×	-	-
N134.14.24 GM4$^+$ ⊕ V1	√	1	1	×	-	-
N134.14.25 GM4$^-$ ⊕ LD1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N134.14.26 GM4$^-$ ⊕ LD2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N134.14.27 GM4$^-$ ⊕ V2	√	1	1	×	-	-
N134.14.28 GM4$^-$ ⊕ V1	√	1	1	×	-	-
N134.14.29 A1$^+$ ⊕ LD1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N134.14.30 A1$^+$ ⊕ LD2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N134.14.31 A1$^+$ ⊕ V2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N134.14.32 A1$^+$ ⊕ V1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N134.14.33 A1$^-$ ⊕ LD1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
N134.14.34 A1$^-$ ⊕ LD2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$

Non-coplanar SSGs with parent space group $P4_2/nnm$ (No. 134) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N134.14.35 $\mathrm{A1}^- \oplus \mathrm{V2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N134.14.36 $\mathrm{A1}^- \oplus \mathrm{V1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$

TABLE S403: Collinear SSGs with parent space group $P4_2/mbc$ (No. 135).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L135.1.1 $\mathrm{GM1}^+$	1	$4/mmm$	$\mathrm{A1_g}$
L135.2.1 $\mathrm{GM1}^-$	0	-	-
L135.2.2 $\mathrm{GM2}^+$	1	$4/mmm$	$\mathrm{B1_g}$
L135.2.3 $\mathrm{GM2}^-$	0	-	-
L135.2.4 $\mathrm{GM3}^+$	1	$4/mmm$	$\mathrm{A2_g}$
L135.2.5 $\mathrm{GM3}^-$	0	-	-
L135.2.6 $\mathrm{GM4}^+$	1	$4/mmm$	$\mathrm{B2_g}$
L135.2.7 $\mathrm{GM4}^-$	0	-	-

TABLE S404: Coplanar SSGs with parent space group $P4_2/mbc$ (No. 135).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P135.1.1 $\mathrm{GM1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g}$
P135.2.1 $\mathrm{GM1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u}$
P135.2.2 $\mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g}$
P135.2.3 $\mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u}$
P135.2.4 $\mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g}$
P135.2.5 $\mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_u}$
P135.2.6 $\mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_g}$
P135.2.7 $\mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_u}$
P135.3.1 $\mathrm{GM1}^- \oplus \mathrm{GM1}^-$	$\surd$	0	0	$\surd$	-	-
P135.3.2 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
P135.3.3 $\mathrm{GM1}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
P135.3.4 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u}$
P135.3.5 $\mathrm{GM1}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
P135.3.6 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_u}$
P135.3.7 $\mathrm{GM1}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
P135.3.8 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
P135.3.9 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g}$
P135.3.10 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g}$
P135.3.11 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
P135.3.12 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
P135.3.13 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u}$
P135.3.14 $\mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
P135.3.15 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_u}$
P135.3.16 $\mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
P135.3.17 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g}$
P135.3.18 $\mathrm{GM2}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
P135.3.19 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g}$

Coplanar SSGs with parent space group $P4_2/mbc$ (No. 135) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P135.3.20 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g}$
P135.3.21 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g}$
P135.3.22 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g}$
P135.3.23 $\mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
P135.3.24 $\mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_g}$
P135.3.25 $\mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
P135.3.26 $\mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_g}$
P135.3.27 $\mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g}$
P135.3.28 $\mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
P135.4.1 $\mathrm{M1}^+\mathrm{M4}^+$	$\surd$	1	0	$\times$	-	-
P135.4.2 $\mathrm{M1}^-\mathrm{M4}^-$	$\surd$	1	0	$\times$	-	-
P135.4.3 $\mathrm{M2}^+\mathrm{M3}^+$	$\surd$	1	0	$\times$	-	-
P135.4.4 $\mathrm{M2}^-\mathrm{M3}^-$	$\surd$	1	0	$\times$	-	-
P135.6.1 $\mathrm{GM5}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_g}$
P135.6.2 $\mathrm{GM5}^-$	$\surd$	0	0	$\surd$	-	-
P135.6.3 $\mathrm{M5}^+$	$\surd$	1	0	$\times$	-	-
P135.6.4 $\mathrm{M5}^-$	$\surd$	1	0	$\times$	-	-
P135.6.5 Z1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P135.6.6 Z2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P135.6.7 Z3	$\surd$	1	1	$\times$	-	-
P135.8.1 LD1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P135.8.2 LD3	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$

TABLE S405: Non-coplanar SSGs with parent space group $P4_2/mbc$ (No. 135).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N135.1.1 $\mathrm{GM1}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A1_g}$
N135.2.1 $\mathrm{GM1}^-$	$\surd$	2	2	$\surd$	422	$\mathrm{A1} \oplus \mathrm{A1}$
N135.2.2 $\mathrm{GM2}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{B1_g}$
N135.2.3 $\mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{A1} \oplus \mathrm{A1}$
N135.2.4 $\mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A2_g}$
N135.2.5 $\mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{A1} \oplus \mathrm{A1}$
N135.2.6 $\mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{B2_g}$
N135.2.7 $\mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{A1} \oplus \mathrm{A1}$
N135.3.1 $\mathrm{GM1}^- \oplus \mathrm{GM1}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{A1_u}$
N135.3.2 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{A1} \oplus \mathrm{B1}$
N135.3.3 $\mathrm{GM1}^- \oplus \mathrm{GM2}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{B1_u}$
N135.3.4 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{A1} \oplus \mathrm{A2}$
N135.3.5 $\mathrm{GM1}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{A2_u}$
N135.3.6 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{A1} \oplus \mathrm{A2}$
N135.3.7 $\mathrm{GM1}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{B2_u}$
N135.3.8 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N135.3.9 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	2	2	$\surd$	422	$\mathrm{A1} \oplus \mathrm{B1}$
N135.3.10 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g} \oplus \mathrm{A2_g}$
N135.3.11 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{A1} \oplus \mathrm{B1}$
N135.3.12 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B2_g}$

Non-coplanar SSGs with parent space group $P4_2/mbc$ (No. 135) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N135.3.13 $\mathrm{GM2^+} \oplus \mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{A1} \oplus \mathrm{B1}$
N135.3.14 $\mathrm{GM2^-} \oplus \mathrm{GM2^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N135.3.15 $\mathrm{GM2^-} \oplus \mathrm{GM3^+}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{A1} \oplus \mathrm{B2}$
N135.3.16 $\mathrm{GM2^-} \oplus \mathrm{GM3^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u} \oplus \mathrm{A2_u}$
N135.3.17 $\mathrm{GM2^-} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{A1} \oplus \mathrm{B2}$
N135.3.18 $\mathrm{GM2^-} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_u}$
N135.3.19 $\mathrm{GM3^+} \oplus \mathrm{GM3^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
N135.3.20 $\mathrm{GM3^+} \oplus \mathrm{GM3^-}$	$\surd$	2	2	$\surd$	422	$\mathrm{A1} \oplus \mathrm{A2}$
N135.3.21 $\mathrm{GM3^+} \oplus \mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g} \oplus \mathrm{B2_g}$
N135.3.22 $\mathrm{GM3^+} \oplus \mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{A1} \oplus \mathrm{A2}$
N135.3.23 $\mathrm{GM3^-} \oplus \mathrm{GM3^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N135.3.24 $\mathrm{GM3^-} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{A1} \oplus \mathrm{B2}$
N135.3.25 $\mathrm{GM3^-} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N135.3.26 $\mathrm{GM4^+} \oplus \mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N135.3.27 $\mathrm{GM4^+} \oplus \mathrm{GM4^-}$	$\surd$	2	2	$\surd$	422	$\mathrm{A1} \oplus \mathrm{B2}$
N135.3.28 $\mathrm{GM4^-} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N135.4.1 $\mathrm{M1^+M4^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N135.4.2 $\mathrm{M1^-M4^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N135.4.3 $\mathrm{M2^+M3^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N135.4.4 $\mathrm{M2^-M3^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N135.6.1 $\mathrm{GM5^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{E_g}$
N135.6.2 $\mathrm{GM5^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{E_u}$
N135.6.3 $\mathrm{M5^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N135.6.4 $\mathrm{M5^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N135.6.5 Z1	$\surd$	1	1	$\surd$	$4mm$	A1
N135.6.6 Z2	$\surd$	1	1	$\surd$	$4mm$	A1
N135.6.7 Z3	$\surd$	1	1	$\surd$	$\bar{4}2m$	A1
N135.8.1 LD1	$\surd$	1	1	$\surd$	$4mm$	A1
N135.8.2 LD3	$\surd$	1	1	$\surd$	$4mm$	A1
N135.9.1 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM1^-}$	$\surd$	0	0	$\surd$	-	-
N135.9.2 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM2^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N135.9.3 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM2^-}$	$\surd$	0	0	$\surd$	-	-
N135.9.4 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM3^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N135.9.5 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
N135.9.6 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N135.9.7 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N135.9.8 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{GM2^+}$	$\surd$	2	2	$\surd$	422	$\mathrm{B1} \oplus \mathrm{B1}$
N135.9.9 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{GM2^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N135.9.10 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{GM3^+}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{B1} \oplus \mathrm{B2}$
N135.9.11 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{GM3^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_u}$
N135.9.12 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{B1} \oplus \mathrm{B2}$
N135.9.13 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{A2_u}$
N135.9.14 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{GM2^-}$	$\surd$	0	0	$\surd$	-	-
N135.9.15 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{GM3^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N135.9.16 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
N135.9.17 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$

Non-coplanar SSGs with parent space group $P4_2/mbc$ (No. 135) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N135.9.18 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N135.9.19 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	422	$\mathrm{A2} \oplus \mathrm{A2}$
N135.9.20 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
N135.9.21 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B2} \oplus \mathrm{A2}$
N135.9.22 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
N135.9.23 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N135.9.24 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N135.9.25 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N135.9.26 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	422	$\mathrm{B2} \oplus \mathrm{B2}$
N135.9.27 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N135.9.28 $\mathrm{GM1}^- \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N135.9.29 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N135.9.30 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B1} \oplus \mathrm{B1}$
N135.9.31 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{A2_g}$
N135.9.32 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{B1} \oplus \mathrm{B1}$
N135.9.33 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B2_g}$
N135.9.34 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{B1} \oplus \mathrm{B1}$
N135.9.35 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{B1_g}$
N135.9.36 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{B1} \oplus \mathrm{A2}$
N135.9.37 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B2_u}$
N135.9.38 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{B1} \oplus \mathrm{A2}$
N135.9.39 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{A2_u}$
N135.9.40 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
N135.9.41 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B1} \oplus \mathrm{A2}$
N135.9.42 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g} \oplus \mathrm{B2_g}$
N135.9.43 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	422	$\mathrm{B1} \oplus \mathrm{A2}$
N135.9.44 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N135.9.45 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	422	$\mathrm{B1} \oplus \mathrm{B2}$
N135.9.46 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N135.9.47 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N135.9.48 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B1} \oplus \mathrm{B2}$
N135.9.49 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N135.9.50 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
N135.9.51 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N135.9.52 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N135.9.53 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$
N135.9.54 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N135.9.55 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{A2} \oplus \mathrm{A2}$
N135.9.56 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{B2_u}$
N135.9.57 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	422	$\mathrm{A2} \oplus \mathrm{B2}$
N135.9.58 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g} \oplus \mathrm{B2_u}$
N135.9.59 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N135.9.60 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$
N135.9.61 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N135.9.62 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B2} \oplus \mathrm{B2}$
N135.9.63 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$

Non-coplanar SSGs with parent space group $P4_2/mbc$ (No. 135) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N135.9.64 $\mathrm{GM2}^{-}\oplus\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}$	√	0	0	√	-	-
N135.9.65 $\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{+}$	√	3	3	√	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_g}$
N135.9.66 $\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{-}$	√	2	2	√	$4mm$	$\mathrm{A2}\oplus\mathrm{A2}$
N135.9.67 $\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{+}\oplus\mathrm{GM4}^{+}$	√	3	3	√	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{A2_g}\oplus\mathrm{B2_g}$
N135.9.68 $\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{+}\oplus\mathrm{GM4}^{-}$	√	2	2	√	$\bar{4}m2$	$\mathrm{B2}\oplus\mathrm{B2}$
N135.9.69 $\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}$	√	3	3	√	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A1_u}\oplus\mathrm{A2_g}$
N135.9.70 $\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{+}$	√	2	2	√	$\bar{4}m2$	$\mathrm{B2}\oplus\mathrm{A2}$
N135.9.71 $\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{-}$	√	3	3	√	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B1_u}\oplus\mathrm{A2_g}$
N135.9.72 $\mathrm{GM3}^{+}\oplus\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{+}$	√	3	3	√	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{B2_g}\oplus\mathrm{B2_g}$
N135.9.73 $\mathrm{GM3}^{+}\oplus\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{-}$	√	2	2	√	$4mm$	$\mathrm{B2}\oplus\mathrm{A2}$
N135.9.74 $\mathrm{GM3}^{+}\oplus\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}$	√	3	3	√	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{B1_u}\oplus\mathrm{A2_g}$
N135.9.75 $\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}$	√	0	0	√	-	-
N135.9.76 $\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{+}$	√	3	3	√	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{B1_u}\oplus\mathrm{B2_g}$
N135.9.77 $\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{-}$	√	0	0	√	-	-
N135.9.78 $\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{+}$	√	2	2	√	$4mm$	$\mathrm{B2}\oplus\mathrm{B2}$
N135.9.79 $\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{-}$	√	3	3	√	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B1_u}\oplus\mathrm{B2_g}$
N135.9.80 $\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}$	√	0	0	√	-	-
N135.9.81 $\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{+}$	√	3	3	√	$4/mmm$	$\mathrm{B2_g}\oplus\mathrm{B2_g}\oplus\mathrm{B2_g}$
N135.9.82 $\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{-}$	√	2	2	√	$\bar{4}m2$	$\mathrm{A2}\oplus\mathrm{A2}$
N135.9.83 $\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}$	√	3	3	√	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A1_u}\oplus\mathrm{B2_g}$
N135.9.84 $\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}$	√	0	0	√	-	-
N135.10.1 $\mathrm{GM1}^{-}\oplus\mathrm{M1}^{+}\mathrm{M4}^{+}$	√	1	0	×	-	-
N135.10.2 $\mathrm{GM1}^{-}\oplus\mathrm{M1}^{-}\mathrm{M4}^{-}$	√	1	0	×	-	-
N135.10.3 $\mathrm{GM1}^{-}\oplus\mathrm{M2}^{+}\mathrm{M3}^{+}$	√	1	0	×	-	-
N135.10.4 $\mathrm{GM1}^{-}\oplus\mathrm{M2}^{-}\mathrm{M3}^{-}$	√	1	0	×	-	-
N135.10.5 $\mathrm{GM2}^{+}\oplus\mathrm{M1}^{+}\mathrm{M4}^{+}$	√	1	1	√	$4/mmm$	$\mathrm{B1_g}$
N135.10.6 $\mathrm{GM2}^{+}\oplus\mathrm{M1}^{-}\mathrm{M4}^{-}$	√	1	1	√	$4/mmm$	$\mathrm{B1_g}$
N135.10.7 $\mathrm{GM2}^{+}\oplus\mathrm{M2}^{+}\mathrm{M3}^{+}$	√	1	1	√	$4/mmm$	$\mathrm{B1_g}$
N135.10.8 $\mathrm{GM2}^{+}\oplus\mathrm{M2}^{-}\mathrm{M3}^{-}$	√	1	1	√	$4/mmm$	$\mathrm{B1_g}$
N135.10.9 $\mathrm{GM2}^{-}\oplus\mathrm{M1}^{+}\mathrm{M4}^{+}$	√	1	0	×	-	-
N135.10.10 $\mathrm{GM2}^{-}\oplus\mathrm{M1}^{-}\mathrm{M4}^{-}$	√	1	0	×	-	-
N135.10.11 $\mathrm{GM2}^{-}\oplus\mathrm{M2}^{+}\mathrm{M3}^{+}$	√	1	0	×	-	-
N135.10.12 $\mathrm{GM2}^{-}\oplus\mathrm{M2}^{-}\mathrm{M3}^{-}$	√	1	0	×	-	-
N135.10.13 $\mathrm{GM3}^{+}\oplus\mathrm{M1}^{+}\mathrm{M4}^{+}$	√	1	1	×	-	-
N135.10.14 $\mathrm{GM3}^{+}\oplus\mathrm{M1}^{-}\mathrm{M4}^{-}$	√	1	1	×	-	-
N135.10.15 $\mathrm{GM3}^{+}\oplus\mathrm{M2}^{+}\mathrm{M3}^{+}$	√	1	1	×	-	-
N135.10.16 $\mathrm{GM3}^{+}\oplus\mathrm{M2}^{-}\mathrm{M3}^{-}$	√	1	1	×	-	-
N135.10.17 $\mathrm{GM3}^{-}\oplus\mathrm{M1}^{+}\mathrm{M4}^{+}$	√	1	0	×	-	-
N135.10.18 $\mathrm{GM3}^{-}\oplus\mathrm{M1}^{-}\mathrm{M4}^{-}$	√	1	0	×	-	-
N135.10.19 $\mathrm{GM3}^{-}\oplus\mathrm{M2}^{+}\mathrm{M3}^{+}$	√	1	0	×	-	-
N135.10.20 $\mathrm{GM3}^{-}\oplus\mathrm{M2}^{-}\mathrm{M3}^{-}$	√	1	0	×	-	-
N135.10.21 $\mathrm{GM4}^{+}\oplus\mathrm{M1}^{+}\mathrm{M4}^{+}$	√	1	1	×	-	-
N135.10.22 $\mathrm{GM4}^{+}\oplus\mathrm{M1}^{-}\mathrm{M4}^{-}$	√	1	1	×	-	-
N135.10.23 $\mathrm{GM4}^{+}\oplus\mathrm{M2}^{+}\mathrm{M3}^{+}$	√	1	1	×	-	-
N135.10.24 $\mathrm{GM4}^{+}\oplus\mathrm{M2}^{-}\mathrm{M3}^{-}$	√	1	1	×	-	-
N135.10.25 $\mathrm{GM4}^{-}\oplus\mathrm{M1}^{+}\mathrm{M4}^{+}$	√	1	0	×	-	-

Non-coplanar SSGs with parent space group $P4_2/mbc$ (No. 135) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N135.10.26 $\mathrm{GM4^-} \oplus \mathrm{M1^-M4^-}$	$\surd$	1	0	$\times$	-	-
N135.10.27 $\mathrm{GM4^-} \oplus \mathrm{M2^+M3^+}$	$\surd$	1	0	$\times$	-	-
N135.10.28 $\mathrm{GM4^-} \oplus \mathrm{M2^-M3^-}$	$\surd$	1	0	$\times$	-	-
N135.12.1 $\mathrm{GM1^-} \oplus \mathrm{GM5^+}$	$\surd$	2	2	$\surd$	$4mm$	E
N135.12.2 $\mathrm{GM1^-} \oplus \mathrm{GM5^-}$	$\surd$	0	0	$\surd$	-	-
N135.12.3 $\mathrm{GM1^-} \oplus \mathrm{M5^+}$	$\surd$	1	0	$\times$	-	-
N135.12.4 $\mathrm{GM1^-} \oplus \mathrm{M5^-}$	$\surd$	1	0	$\times$	-	-
N135.12.5 $\mathrm{GM1^-} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N135.12.6 $\mathrm{GM1^-} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N135.12.7 $\mathrm{GM1^-} \oplus \mathrm{Z3}$	$\surd$	1	1	$\times$	-	-
N135.12.8 $\mathrm{GM2^+} \oplus \mathrm{GM5^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{E_g}$
N135.12.9 $\mathrm{GM2^+} \oplus \mathrm{GM5^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{E_u}$
N135.12.10 $\mathrm{GM2^+} \oplus \mathrm{M5^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N135.12.11 $\mathrm{GM2^+} \oplus \mathrm{M5^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N135.12.12 $\mathrm{GM2^+} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N135.12.13 $\mathrm{GM2^+} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N135.12.14 $\mathrm{GM2^+} \oplus \mathrm{Z3}$	$\surd$	1	1	$\times$	-	-
N135.12.15 $\mathrm{GM2^-} \oplus \mathrm{GM5^+}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	E
N135.12.16 $\mathrm{GM2^-} \oplus \mathrm{GM5^-}$	$\surd$	0	0	$\surd$	-	-
N135.12.17 $\mathrm{GM2^-} \oplus \mathrm{M5^+}$	$\surd$	1	0	$\times$	-	-
N135.12.18 $\mathrm{GM2^-} \oplus \mathrm{M5^-}$	$\surd$	1	0	$\times$	-	-
N135.12.19 $\mathrm{GM2^-} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N135.12.20 $\mathrm{GM2^-} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N135.12.21 $\mathrm{GM2^-} \oplus \mathrm{Z3}$	$\surd$	1	1	$\times$	-	-
N135.12.22 $\mathrm{GM3^+} \oplus \mathrm{GM5^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{E_g}$
N135.12.23 $\mathrm{GM3^+} \oplus \mathrm{GM5^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{E_u}$
N135.12.24 $\mathrm{GM3^+} \oplus \mathrm{M5^+}$	$\surd$	1	1	$\times$	-	-
N135.12.25 $\mathrm{GM3^+} \oplus \mathrm{M5^-}$	$\surd$	1	1	$\times$	-	-
N135.12.26 $\mathrm{GM3^+} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	422	A2
N135.12.27 $\mathrm{GM3^+} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	422	A2
N135.12.28 $\mathrm{GM3^+} \oplus \mathrm{Z3}$	$\surd$	1	1	$\times$	-	-
N135.12.29 $\mathrm{GM3^-} \oplus \mathrm{GM5^+}$	$\surd$	2	2	$\surd$	422	E
N135.12.30 $\mathrm{GM3^-} \oplus \mathrm{GM5^-}$	$\surd$	0	0	$\surd$	-	-
N135.12.31 $\mathrm{GM3^-} \oplus \mathrm{M5^+}$	$\surd$	1	0	$\times$	-	-
N135.12.32 $\mathrm{GM3^-} \oplus \mathrm{M5^-}$	$\surd$	1	0	$\times$	-	-
N135.12.33 $\mathrm{GM3^-} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N135.12.34 $\mathrm{GM3^-} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N135.12.35 $\mathrm{GM3^-} \oplus \mathrm{Z3}$	$\surd$	1	1	$\times$	-	-
N135.12.36 $\mathrm{GM4^+} \oplus \mathrm{GM5^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{E_g}$
N135.12.37 $\mathrm{GM4^+} \oplus \mathrm{GM5^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{E_u}$
N135.12.38 $\mathrm{GM4^+} \oplus \mathrm{M5^+}$	$\surd$	1	1	$\times$	-	-
N135.12.39 $\mathrm{GM4^+} \oplus \mathrm{M5^-}$	$\surd$	1	1	$\times$	-	-
N135.12.40 $\mathrm{GM4^+} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N135.12.41 $\mathrm{GM4^+} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N135.12.42 $\mathrm{GM4^+} \oplus \mathrm{Z3}$	$\surd$	1	1	$\times$	-	-
N135.12.43 $\mathrm{GM4^-} \oplus \mathrm{GM5^+}$	$\surd$	2	2	$\surd$	$\bar{4}2m$	E

Non-coplanar SSGs with parent space group $P4_2/mbc$ (No. 135) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N135.12.44 $\mathrm{GM4}^- \oplus \mathrm{GM5}^-$	$\surd$	0	0	$\surd$	-	-
N135.12.45 $\mathrm{GM4}^- \oplus \mathrm{M5}^+$	$\surd$	1	0	$\times$	-	-
N135.12.46 $\mathrm{GM4}^- \oplus \mathrm{M5}^-$	$\surd$	1	0	$\times$	-	-
N135.12.47 $\mathrm{GM4}^- \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N135.12.48 $\mathrm{GM4}^- \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N135.12.49 $\mathrm{GM4}^- \oplus \mathrm{Z3}$	$\surd$	1	1	$\times$	-	-
N135.14.1 $\mathrm{GM1}^- \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N135.14.2 $\mathrm{GM1}^- \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N135.14.3 $\mathrm{GM2}^+ \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N135.14.4 $\mathrm{GM2}^+ \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N135.14.5 $\mathrm{GM2}^- \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N135.14.6 $\mathrm{GM2}^- \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N135.14.7 $\mathrm{GM3}^+ \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	422	A2
N135.14.8 $\mathrm{GM3}^+ \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	422	A2
N135.14.9 $\mathrm{GM3}^- \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N135.14.10 $\mathrm{GM3}^- \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N135.14.11 $\mathrm{GM4}^+ \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N135.14.12 $\mathrm{GM4}^+ \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N135.14.13 $\mathrm{GM4}^- \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N135.14.14 $\mathrm{GM4}^- \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$

TABLE S406: Collinear SSGs with parent space group $P4_2/mnm$ (No. 136).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L136.1.1 $\mathrm{GM1}^+$	1	$4/mmm$	$\mathrm{A1_g}$
L136.2.1 $\mathrm{GM1}^-$	0	-	-
L136.2.2 $\mathrm{GM2}^+$	1	$4/mmm$	$\mathrm{B1_g}$
L136.2.3 $\mathrm{GM2}^-$	0	-	-
L136.2.4 $\mathrm{GM3}^+$	1	$4/mmm$	$\mathrm{A2_g}$
L136.2.5 $\mathrm{GM3}^-$	0	-	-
L136.2.6 $\mathrm{GM4}^+$	1	$4/mmm$	$\mathrm{B2_g}$
L136.2.7 $\mathrm{GM4}^-$	0	-	-

TABLE S407: Coplanar SSGs with parent space group $P4_2/mnm$ (No. 136).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P136.1.1 $\mathrm{GM1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g}$
P136.2.1 $\mathrm{GM1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u}$
P136.2.2 $\mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g}$
P136.2.3 $\mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u}$
P136.2.4 $\mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g}$
P136.2.5 $\mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_u}$
P136.2.6 $\mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_g}$
P136.2.7 $\mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_u}$

Coplanar SSGs with parent space group $P4_2/mnm$ (No. 136) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P136.3.1 $\mathrm{GM1^-} \oplus \mathrm{GM1^-}$	$\surd$	0	0	$\surd$	-	-
P136.3.2 $\mathrm{GM1^-} \oplus \mathrm{GM2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
P136.3.3 $\mathrm{GM1^-} \oplus \mathrm{GM2^-}$	$\surd$	0	0	$\surd$	-	-
P136.3.4 $\mathrm{GM1^-} \oplus \mathrm{GM3^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u}$
P136.3.5 $\mathrm{GM1^-} \oplus \mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
P136.3.6 $\mathrm{GM1^-} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_u}$
P136.3.7 $\mathrm{GM1^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
P136.3.8 $\mathrm{GM2^+} \oplus \mathrm{GM2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
P136.3.9 $\mathrm{GM2^+} \oplus \mathrm{GM2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g}$
P136.3.10 $\mathrm{GM2^+} \oplus \mathrm{GM3^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g}$
P136.3.11 $\mathrm{GM2^+} \oplus \mathrm{GM3^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
P136.3.12 $\mathrm{GM2^+} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
P136.3.13 $\mathrm{GM2^+} \oplus \mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u}$
P136.3.14 $\mathrm{GM2^-} \oplus \mathrm{GM2^-}$	$\surd$	0	0	$\surd$	-	-
P136.3.15 $\mathrm{GM2^-} \oplus \mathrm{GM3^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_u}$
P136.3.16 $\mathrm{GM2^-} \oplus \mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
P136.3.17 $\mathrm{GM2^-} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g}$
P136.3.18 $\mathrm{GM2^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
P136.3.19 $\mathrm{GM3^+} \oplus \mathrm{GM3^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g}$
P136.3.20 $\mathrm{GM3^+} \oplus \mathrm{GM3^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g}$
P136.3.21 $\mathrm{GM3^+} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g}$
P136.3.22 $\mathrm{GM3^+} \oplus \mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g}$
P136.3.23 $\mathrm{GM3^-} \oplus \mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
P136.3.24 $\mathrm{GM3^-} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_g}$
P136.3.25 $\mathrm{GM3^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
P136.3.26 $\mathrm{GM4^+} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_g}$
P136.3.27 $\mathrm{GM4^+} \oplus \mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g}$
P136.3.28 $\mathrm{GM4^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
P136.4.1 $\mathrm{M1^+M4^+}$	$\surd$	1	0	$\times$	-	-
P136.4.2 $\mathrm{M1^-M4^-}$	$\surd$	1	0	$\times$	-	-
P136.4.3 $\mathrm{M2^+M3^+}$	$\surd$	1	0	$\times$	-	-
P136.4.4 $\mathrm{M2^-M3^-}$	$\surd$	1	0	$\times$	-	-
P136.6.1 $\mathrm{GM5^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_g}$
P136.6.2 $\mathrm{GM5^-}$	$\surd$	0	0	$\surd$	-	-
P136.6.3 A1	$\surd$	1	1	$\times$	-	-
P136.6.4 A2	$\surd$	1	1	$\times$	-	-
P136.6.5 A3	$\surd$	1	1	$\times$	-	-
P136.6.6 $\mathrm{M5^+}$	$\surd$	1	0	$\times$	-	-
P136.6.7 $\mathrm{M5^-}$	$\surd$	1	0	$\times$	-	-
P136.6.8 Z1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P136.6.9 Z2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P136.6.10 Z3	$\surd$	1	1	$\times$	-	-
P136.8.1 LD1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P136.8.2 LD2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$

TABLE S408: Non-coplanar SSGs with parent space group $P4_2/mnm$ (No. 136).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N136.1.1 $\mathrm{GM1}^{+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A1_g}$
N136.2.1 $\mathrm{GM1}^{-}$	$\surd$	2	2	$\surd$	422	$\mathrm{A1}\oplus\mathrm{A1}$
N136.2.2 $\mathrm{GM2}^{+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{B1_g}$
N136.2.3 $\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{A1}\oplus\mathrm{A1}$
N136.2.4 $\mathrm{GM3}^{+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A2_g}$
N136.2.5 $\mathrm{GM3}^{-}$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{A1}\oplus\mathrm{A1}$
N136.2.6 $\mathrm{GM4}^{+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{B2_g}$
N136.2.7 $\mathrm{GM4}^{-}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{A1}\oplus\mathrm{A1}$
N136.3.1 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{A1_u}$
N136.3.2 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{A1}\oplus\mathrm{B1}$
N136.3.3 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{B1_u}$
N136.3.4 $\mathrm{GM1}^{-}\oplus\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{A1}\oplus\mathrm{A2}$
N136.3.5 $\mathrm{GM1}^{-}\oplus\mathrm{GM3}^{-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{A2_u}$
N136.3.6 $\mathrm{GM1}^{-}\oplus\mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{A1}\oplus\mathrm{A2}$
N136.3.7 $\mathrm{GM1}^{-}\oplus\mathrm{GM4}^{-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{B2_u}$
N136.3.8 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B1_g}$
N136.3.9 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	422	$\mathrm{A1}\oplus\mathrm{B1}$
N136.3.10 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}\oplus\mathrm{A2_g}$
N136.3.11 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{-}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{A1}\oplus\mathrm{B1}$
N136.3.12 $\mathrm{GM2}^{+}\oplus\mathrm{GM4}^{+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B2_g}$
N136.3.13 $\mathrm{GM2}^{+}\oplus\mathrm{GM4}^{-}$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{A1}\oplus\mathrm{B1}$
N136.3.14 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}\oplus\mathrm{B1_u}$
N136.3.15 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{A1}\oplus\mathrm{B2}$
N136.3.16 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}\oplus\mathrm{A2_u}$
N136.3.17 $\mathrm{GM2}^{-}\oplus\mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{A1}\oplus\mathrm{B2}$
N136.3.18 $\mathrm{GM2}^{-}\oplus\mathrm{GM4}^{-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}\oplus\mathrm{B2_u}$
N136.3.19 $\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_g}$
N136.3.20 $\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{-}$	$\surd$	2	2	$\surd$	422	$\mathrm{A1}\oplus\mathrm{A2}$
N136.3.21 $\mathrm{GM3}^{+}\oplus\mathrm{GM4}^{+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_g}\oplus\mathrm{B2_g}$
N136.3.22 $\mathrm{GM3}^{+}\oplus\mathrm{GM4}^{-}$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{A1}\oplus\mathrm{A2}$
N136.3.23 $\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_u}\oplus\mathrm{A2_u}$
N136.3.24 $\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{A1}\oplus\mathrm{B2}$
N136.3.25 $\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_u}\oplus\mathrm{B2_u}$
N136.3.26 $\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_g}\oplus\mathrm{B2_g}$
N136.3.27 $\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{-}$	$\surd$	2	2	$\surd$	422	$\mathrm{A1}\oplus\mathrm{B2}$
N136.3.28 $\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_u}\oplus\mathrm{B2_u}$
N136.4.1 $\mathrm{M1}^{+}\mathrm{M4}^{+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N136.4.2 $\mathrm{M1}^{-}\mathrm{M4}^{-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N136.4.3 $\mathrm{M2}^{+}\mathrm{M3}^{+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N136.4.4 $\mathrm{M2}^{-}\mathrm{M3}^{-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N136.6.1 $\mathrm{GM5}^{+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{E_g}$
N136.6.2 $\mathrm{GM5}^{-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{E_u}$
N136.6.3 A1	$\surd$	1	1	$\surd$	$\bar{4}2m$	A1
N136.6.4 A2	$\surd$	1	1	$\surd$	$\bar{4}2m$	A1
N136.6.5 A3	$\surd$	1	1	$\surd$	422	A1
N136.6.6 $\mathrm{M5}^{+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$

Non-coplanar SSGs with parent space group $P4_2/mnm$ (No. 136) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N136.6.7 $\mathrm{M5}^-$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N136.6.8 Z1	$\surd$	1	1	$\surd$	$4mm$	A1
N136.6.9 Z2	$\surd$	1	1	$\surd$	$4mm$	A1
N136.6.10 Z3	$\surd$	1	1	$\surd$	$\bar{4}m2$	A1
N136.8.1 LD1	$\surd$	1	1	$\surd$	$4mm$	A1
N136.8.2 LD2	$\surd$	1	1	$\surd$	$4mm$	A1
N136.9.1 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{GM1}^-$	$\surd$	0	0	$\surd$	-	-
N136.9.2 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{GM2}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N136.9.3 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
N136.9.4 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N136.9.5 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N136.9.6 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N136.9.7 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N136.9.8 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	2	2	$\surd$	422	$\mathrm{B1} \oplus \mathrm{B1}$
N136.9.9 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N136.9.10 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{B1} \oplus \mathrm{B2}$
N136.9.11 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_u}$
N136.9.12 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{B1} \oplus \mathrm{B2}$
N136.9.13 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{A2_u}$
N136.9.14 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
N136.9.15 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N136.9.16 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N136.9.17 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N136.9.18 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N136.9.19 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	422	$\mathrm{A2} \oplus \mathrm{A2}$
N136.9.20 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
N136.9.21 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B2} \oplus \mathrm{A2}$
N136.9.22 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
N136.9.23 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N136.9.24 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N136.9.25 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N136.9.26 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	422	$\mathrm{B2} \oplus \mathrm{B2}$
N136.9.27 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N136.9.28 $\mathrm{GM1}^- \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N136.9.29 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N136.9.30 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B1} \oplus \mathrm{B1}$
N136.9.31 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{A2_g}$
N136.9.32 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{B1} \oplus \mathrm{B1}$
N136.9.33 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B2_g}$
N136.9.34 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{B1} \oplus \mathrm{B1}$
N136.9.35 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{B1_g}$
N136.9.36 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{B1} \oplus \mathrm{A2}$
N136.9.37 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B2_u}$
N136.9.38 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{B1} \oplus \mathrm{A2}$
N136.9.39 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{A2_u}$
N136.9.40 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$

Non-coplanar SSGs with parent space group $P4_2/mnm$ (No. 136) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N136.9.41 $\mathrm{GM2^+}\oplus\mathrm{GM3^+}\oplus\mathrm{GM3^-}$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B1}\oplus\mathrm{A2}$
N136.9.42 $\mathrm{GM2^+}\oplus\mathrm{GM3^+}\oplus\mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_g}\oplus\mathrm{B2_g}$
N136.9.43 $\mathrm{GM2^+}\oplus\mathrm{GM3^+}\oplus\mathrm{GM4^-}$	$\surd$	2	2	$\surd$	422	$\mathrm{B1}\oplus\mathrm{A2}$
N136.9.44 $\mathrm{GM2^+}\oplus\mathrm{GM3^-}\oplus\mathrm{GM3^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B2_u}\oplus\mathrm{B2_u}$
N136.9.45 $\mathrm{GM2^+}\oplus\mathrm{GM3^-}\oplus\mathrm{GM4^+}$	$\surd$	2	2	$\surd$	422	$\mathrm{B1}\oplus\mathrm{B2}$
N136.9.46 $\mathrm{GM2^+}\oplus\mathrm{GM3^-}\oplus\mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_u}\oplus\mathrm{B2_u}$
N136.9.47 $\mathrm{GM2^+}\oplus\mathrm{GM4^+}\oplus\mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B2_g}\oplus\mathrm{B2_g}$
N136.9.48 $\mathrm{GM2^+}\oplus\mathrm{GM4^+}\oplus\mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B1}\oplus\mathrm{B2}$
N136.9.49 $\mathrm{GM2^+}\oplus\mathrm{GM4^-}\oplus\mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_u}\oplus\mathrm{A2_u}$
N136.9.50 $\mathrm{GM2^-}\oplus\mathrm{GM2^-}\oplus\mathrm{GM2^-}$	$\surd$	0	0	$\surd$	-	-
N136.9.51 $\mathrm{GM2^-}\oplus\mathrm{GM2^-}\oplus\mathrm{GM3^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{B2_u}\oplus\mathrm{B2_u}$
N136.9.52 $\mathrm{GM2^-}\oplus\mathrm{GM2^-}\oplus\mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
N136.9.53 $\mathrm{GM2^-}\oplus\mathrm{GM2^-}\oplus\mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_u}\oplus\mathrm{A2_u}\oplus\mathrm{B2_g}$
N136.9.54 $\mathrm{GM2^-}\oplus\mathrm{GM2^-}\oplus\mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N136.9.55 $\mathrm{GM2^-}\oplus\mathrm{GM3^+}\oplus\mathrm{GM3^+}$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{A2}\oplus\mathrm{A2}$
N136.9.56 $\mathrm{GM2^-}\oplus\mathrm{GM3^+}\oplus\mathrm{GM3^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A2_g}\oplus\mathrm{B2_u}$
N136.9.57 $\mathrm{GM2^-}\oplus\mathrm{GM3^+}\oplus\mathrm{GM4^+}$	$\surd$	2	2	$\surd$	422	$\mathrm{A2}\oplus\mathrm{B2}$
N136.9.58 $\mathrm{GM2^-}\oplus\mathrm{GM3^+}\oplus\mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{A2_g}\oplus\mathrm{B2_u}$
N136.9.59 $\mathrm{GM2^-}\oplus\mathrm{GM3^-}\oplus\mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
N136.9.60 $\mathrm{GM2^-}\oplus\mathrm{GM3^-}\oplus\mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{A2_u}\oplus\mathrm{B2_g}$
N136.9.61 $\mathrm{GM2^-}\oplus\mathrm{GM3^-}\oplus\mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N136.9.62 $\mathrm{GM2^-}\oplus\mathrm{GM4^+}\oplus\mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B2}\oplus\mathrm{B2}$
N136.9.63 $\mathrm{GM2^-}\oplus\mathrm{GM4^+}\oplus\mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A2_u}\oplus\mathrm{B2_g}$
N136.9.64 $\mathrm{GM2^-}\oplus\mathrm{GM4^-}\oplus\mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N136.9.65 $\mathrm{GM3^+}\oplus\mathrm{GM3^+}\oplus\mathrm{GM3^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_g}$
N136.9.66 $\mathrm{GM3^+}\oplus\mathrm{GM3^+}\oplus\mathrm{GM3^-}$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{A2}\oplus\mathrm{A2}$
N136.9.67 $\mathrm{GM3^+}\oplus\mathrm{GM3^+}\oplus\mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{A2_g}\oplus\mathrm{B2_g}$
N136.9.68 $\mathrm{GM3^+}\oplus\mathrm{GM3^+}\oplus\mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{B2}\oplus\mathrm{B2}$
N136.9.69 $\mathrm{GM3^+}\oplus\mathrm{GM3^-}\oplus\mathrm{GM3^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A1_u}\oplus\mathrm{A2_g}$
N136.9.70 $\mathrm{GM3^+}\oplus\mathrm{GM3^-}\oplus\mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{B2}\oplus\mathrm{A2}$
N136.9.71 $\mathrm{GM3^+}\oplus\mathrm{GM3^-}\oplus\mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B1_u}\oplus\mathrm{A2_g}$
N136.9.72 $\mathrm{GM3^+}\oplus\mathrm{GM4^+}\oplus\mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{B2_g}\oplus\mathrm{B2_g}$
N136.9.73 $\mathrm{GM3^+}\oplus\mathrm{GM4^+}\oplus\mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{B2}\oplus\mathrm{A2}$
N136.9.74 $\mathrm{GM3^+}\oplus\mathrm{GM4^-}\oplus\mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{B1_u}\oplus\mathrm{A2_g}$
N136.9.75 $\mathrm{GM3^-}\oplus\mathrm{GM3^-}\oplus\mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
N136.9.76 $\mathrm{GM3^-}\oplus\mathrm{GM3^-}\oplus\mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{B1_u}\oplus\mathrm{B2_g}$
N136.9.77 $\mathrm{GM3^-}\oplus\mathrm{GM3^-}\oplus\mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N136.9.78 $\mathrm{GM3^-}\oplus\mathrm{GM4^+}\oplus\mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{B2}\oplus\mathrm{B2}$
N136.9.79 $\mathrm{GM3^-}\oplus\mathrm{GM4^+}\oplus\mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B1_u}\oplus\mathrm{B2_g}$
N136.9.80 $\mathrm{GM3^-}\oplus\mathrm{GM4^-}\oplus\mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N136.9.81 $\mathrm{GM4^+}\oplus\mathrm{GM4^+}\oplus\mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B2_g}\oplus\mathrm{B2_g}\oplus\mathrm{B2_g}$
N136.9.82 $\mathrm{GM4^+}\oplus\mathrm{GM4^+}\oplus\mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{A2}\oplus\mathrm{A2}$
N136.9.83 $\mathrm{GM4^+}\oplus\mathrm{GM4^-}\oplus\mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A1_u}\oplus\mathrm{B2_g}$
N136.9.84 $\mathrm{GM4^-}\oplus\mathrm{GM4^-}\oplus\mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N136.10.1 $\mathrm{GM1^-}\oplus\mathrm{M1^+M4^+}$	$\surd$	1	0	$\times$	-	-
N136.10.2 $\mathrm{GM1^-}\oplus\mathrm{M1^-M4^-}$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $P4_2/mnm$ (No. 136) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N136.10.3 $\mathrm{GM1^-} \oplus \mathrm{M2^+M3^+}$	$\surd$	1	0	$\times$	-	-
N136.10.4 $\mathrm{GM1^-} \oplus \mathrm{M2^-M3^-}$	$\surd$	1	0	$\times$	-	-
N136.10.5 $\mathrm{GM2^+} \oplus \mathrm{M1^+M4^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N136.10.6 $\mathrm{GM2^+} \oplus \mathrm{M1^-M4^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N136.10.7 $\mathrm{GM2^+} \oplus \mathrm{M2^+M3^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N136.10.8 $\mathrm{GM2^+} \oplus \mathrm{M2^-M3^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N136.10.9 $\mathrm{GM2^-} \oplus \mathrm{M1^+M4^+}$	$\surd$	1	0	$\times$	-	-
N136.10.10 $\mathrm{GM2^-} \oplus \mathrm{M1^-M4^-}$	$\surd$	1	0	$\times$	-	-
N136.10.11 $\mathrm{GM2^-} \oplus \mathrm{M2^+M3^+}$	$\surd$	1	0	$\times$	-	-
N136.10.12 $\mathrm{GM2^-} \oplus \mathrm{M2^-M3^-}$	$\surd$	1	0	$\times$	-	-
N136.10.13 $\mathrm{GM3^+} \oplus \mathrm{M1^+M4^+}$	$\surd$	1	1	$\times$	-	-
N136.10.14 $\mathrm{GM3^+} \oplus \mathrm{M1^-M4^-}$	$\surd$	1	1	$\times$	-	-
N136.10.15 $\mathrm{GM3^+} \oplus \mathrm{M2^+M3^+}$	$\surd$	1	1	$\times$	-	-
N136.10.16 $\mathrm{GM3^+} \oplus \mathrm{M2^-M3^-}$	$\surd$	1	1	$\times$	-	-
N136.10.17 $\mathrm{GM3^-} \oplus \mathrm{M1^+M4^+}$	$\surd$	1	0	$\times$	-	-
N136.10.18 $\mathrm{GM3^-} \oplus \mathrm{M1^-M4^-}$	$\surd$	1	0	$\times$	-	-
N136.10.19 $\mathrm{GM3^-} \oplus \mathrm{M2^+M3^+}$	$\surd$	1	0	$\times$	-	-
N136.10.20 $\mathrm{GM3^-} \oplus \mathrm{M2^-M3^-}$	$\surd$	1	0	$\times$	-	-
N136.10.21 $\mathrm{GM4^+} \oplus \mathrm{M1^+M4^+}$	$\surd$	1	1	$\times$	-	-
N136.10.22 $\mathrm{GM4^+} \oplus \mathrm{M1^-M4^-}$	$\surd$	1	1	$\times$	-	-
N136.10.23 $\mathrm{GM4^+} \oplus \mathrm{M2^+M3^+}$	$\surd$	1	1	$\times$	-	-
N136.10.24 $\mathrm{GM4^+} \oplus \mathrm{M2^-M3^-}$	$\surd$	1	1	$\times$	-	-
N136.10.25 $\mathrm{GM4^-} \oplus \mathrm{M1^+M4^+}$	$\surd$	1	0	$\times$	-	-
N136.10.26 $\mathrm{GM4^-} \oplus \mathrm{M1^-M4^-}$	$\surd$	1	0	$\times$	-	-
N136.10.27 $\mathrm{GM4^-} \oplus \mathrm{M2^+M3^+}$	$\surd$	1	0	$\times$	-	-
N136.10.28 $\mathrm{GM4^-} \oplus \mathrm{M2^-M3^-}$	$\surd$	1	0	$\times$	-	-
N136.12.1 $\mathrm{GM1^-} \oplus \mathrm{GM5^+}$	$\surd$	2	2	$\surd$	$4mm$	E
N136.12.2 $\mathrm{GM1^-} \oplus \mathrm{GM5^-}$	$\surd$	0	0	$\surd$	-	-
N136.12.3 $\mathrm{GM1^-} \oplus \mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N136.12.4 $\mathrm{GM1^-} \oplus \mathrm{A2}$	$\surd$	1	1	$\times$	-	-
N136.12.5 $\mathrm{GM1^-} \oplus \mathrm{A3}$	$\surd$	1	1	$\times$	-	-
N136.12.6 $\mathrm{GM1^-} \oplus \mathrm{M5^+}$	$\surd$	1	0	$\times$	-	-
N136.12.7 $\mathrm{GM1^-} \oplus \mathrm{M5^-}$	$\surd$	1	0	$\times$	-	-
N136.12.8 $\mathrm{GM1^-} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N136.12.9 $\mathrm{GM1^-} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N136.12.10 $\mathrm{GM1^-} \oplus \mathrm{Z3}$	$\surd$	1	1	$\times$	-	-
N136.12.11 $\mathrm{GM2^+} \oplus \mathrm{GM5^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{E_g}$
N136.12.12 $\mathrm{GM2^+} \oplus \mathrm{GM5^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{E_u}$
N136.12.13 $\mathrm{GM2^+} \oplus \mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N136.12.14 $\mathrm{GM2^+} \oplus \mathrm{A2}$	$\surd$	1	1	$\times$	-	-
N136.12.15 $\mathrm{GM2^+} \oplus \mathrm{A3}$	$\surd$	1	1	$\times$	-	-
N136.12.16 $\mathrm{GM2^+} \oplus \mathrm{M5^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N136.12.17 $\mathrm{GM2^+} \oplus \mathrm{M5^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N136.12.18 $\mathrm{GM2^+} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N136.12.19 $\mathrm{GM2^+} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N136.12.20 $\mathrm{GM2^+} \oplus \mathrm{Z3}$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $P4_2/mnm$ (No. 136) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N136.12.21 $\mathrm{GM2}^{-} \oplus \mathrm{GM5}^{+}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	E
N136.12.22 $\mathrm{GM2}^{-} \oplus \mathrm{GM5}^{-}$	$\surd$	0	0	$\surd$	-	-
N136.12.23 $\mathrm{GM2}^{-} \oplus \mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N136.12.24 $\mathrm{GM2}^{-} \oplus \mathrm{A2}$	$\surd$	1	1	$\times$	-	-
N136.12.25 $\mathrm{GM2}^{-} \oplus \mathrm{A3}$	$\surd$	1	1	$\times$	-	-
N136.12.26 $\mathrm{GM2}^{-} \oplus \mathrm{M5}^{+}$	$\surd$	1	0	$\times$	-	-
N136.12.27 $\mathrm{GM2}^{-} \oplus \mathrm{M5}^{-}$	$\surd$	1	0	$\times$	-	-
N136.12.28 $\mathrm{GM2}^{-} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N136.12.29 $\mathrm{GM2}^{-} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N136.12.30 $\mathrm{GM2}^{-} \oplus \mathrm{Z3}$	$\surd$	1	1	$\times$	-	-
N136.12.31 $\mathrm{GM3}^{+} \oplus \mathrm{GM5}^{+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{E_g}$
N136.12.32 $\mathrm{GM3}^{+} \oplus \mathrm{GM5}^{-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{E_u}$
N136.12.33 $\mathrm{GM3}^{+} \oplus \mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N136.12.34 $\mathrm{GM3}^{+} \oplus \mathrm{A2}$	$\surd$	1	1	$\times$	-	-
N136.12.35 $\mathrm{GM3}^{+} \oplus \mathrm{A3}$	$\surd$	1	1	$\times$	-	-
N136.12.36 $\mathrm{GM3}^{+} \oplus \mathrm{M5}^{+}$	$\surd$	1	1	$\times$	-	-
N136.12.37 $\mathrm{GM3}^{+} \oplus \mathrm{M5}^{-}$	$\surd$	1	1	$\times$	-	-
N136.12.38 $\mathrm{GM3}^{+} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	422	A2
N136.12.39 $\mathrm{GM3}^{+} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	422	A2
N136.12.40 $\mathrm{GM3}^{+} \oplus \mathrm{Z3}$	$\surd$	1	1	$\times$	-	-
N136.12.41 $\mathrm{GM3}^{-} \oplus \mathrm{GM5}^{+}$	$\surd$	2	2	$\surd$	422	E
N136.12.42 $\mathrm{GM3}^{-} \oplus \mathrm{GM5}^{-}$	$\surd$	0	0	$\surd$	-	-
N136.12.43 $\mathrm{GM3}^{-} \oplus \mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N136.12.44 $\mathrm{GM3}^{-} \oplus \mathrm{A2}$	$\surd$	1	1	$\times$	-	-
N136.12.45 $\mathrm{GM3}^{-} \oplus \mathrm{A3}$	$\surd$	1	1	$\times$	-	-
N136.12.46 $\mathrm{GM3}^{-} \oplus \mathrm{M5}^{+}$	$\surd$	1	0	$\times$	-	-
N136.12.47 $\mathrm{GM3}^{-} \oplus \mathrm{M5}^{-}$	$\surd$	1	0	$\times$	-	-
N136.12.48 $\mathrm{GM3}^{-} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N136.12.49 $\mathrm{GM3}^{-} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N136.12.50 $\mathrm{GM3}^{-} \oplus \mathrm{Z3}$	$\surd$	1	1	$\times$	-	-
N136.12.51 $\mathrm{GM4}^{+} \oplus \mathrm{GM5}^{+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{E_g}$
N136.12.52 $\mathrm{GM4}^{+} \oplus \mathrm{GM5}^{-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{E_u}$
N136.12.53 $\mathrm{GM4}^{+} \oplus \mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N136.12.54 $\mathrm{GM4}^{+} \oplus \mathrm{A2}$	$\surd$	1	1	$\times$	-	-
N136.12.55 $\mathrm{GM4}^{+} \oplus \mathrm{A3}$	$\surd$	1	1	$\times$	-	-
N136.12.56 $\mathrm{GM4}^{+} \oplus \mathrm{M5}^{+}$	$\surd$	1	1	$\times$	-	-
N136.12.57 $\mathrm{GM4}^{+} \oplus \mathrm{M5}^{-}$	$\surd$	1	1	$\times$	-	-
N136.12.58 $\mathrm{GM4}^{+} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N136.12.59 $\mathrm{GM4}^{+} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N136.12.60 $\mathrm{GM4}^{+} \oplus \mathrm{Z3}$	$\surd$	1	1	$\times$	-	-
N136.12.61 $\mathrm{GM4}^{-} \oplus \mathrm{GM5}^{+}$	$\surd$	2	2	$\surd$	$\bar{4}2m$	E
N136.12.62 $\mathrm{GM4}^{-} \oplus \mathrm{GM5}^{-}$	$\surd$	0	0	$\surd$	-	-
N136.12.63 $\mathrm{GM4}^{-} \oplus \mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N136.12.64 $\mathrm{GM4}^{-} \oplus \mathrm{A2}$	$\surd$	1	1	$\times$	-	-
N136.12.65 $\mathrm{GM4}^{-} \oplus \mathrm{A3}$	$\surd$	1	1	$\times$	-	-
N136.12.66 $\mathrm{GM4}^{-} \oplus \mathrm{M5}^{+}$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $P4_2/mnm$ (No. 136) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N136.12.67 $\mathrm{GM4}^- \oplus \mathrm{M5}^-$	$\surd$	1	0	$\times$	-	-
N136.12.68 $\mathrm{GM4}^- \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N136.12.69 $\mathrm{GM4}^- \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N136.12.70 $\mathrm{GM4}^- \oplus \mathrm{Z3}$	$\surd$	1	1	$\times$	-	-
N136.14.1 $\mathrm{GM1}^- \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N136.14.2 $\mathrm{GM1}^- \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N136.14.3 $\mathrm{GM2}^+ \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N136.14.4 $\mathrm{GM2}^+ \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N136.14.5 $\mathrm{GM2}^- \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N136.14.6 $\mathrm{GM2}^- \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N136.14.7 $\mathrm{GM3}^+ \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	422	A2
N136.14.8 $\mathrm{GM3}^+ \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	422	A2
N136.14.9 $\mathrm{GM3}^- \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N136.14.10 $\mathrm{GM3}^- \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N136.14.11 $\mathrm{GM4}^+ \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N136.14.12 $\mathrm{GM4}^+ \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N136.14.13 $\mathrm{GM4}^- \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N136.14.14 $\mathrm{GM4}^- \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$

TABLE S409: Collinear SSGs with parent space group $P4_2/nmc$ (No. 137).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L137.1.1 $\mathrm{GM1}^+$	1	$4/mmm$	$\mathrm{A1_g}$
L137.2.1 $\mathrm{GM1}^-$	0	-	-
L137.2.2 $\mathrm{GM2}^+$	1	$4/mmm$	$\mathrm{B1_g}$
L137.2.3 $\mathrm{GM2}^-$	0	-	-
L137.2.4 $\mathrm{GM3}^+$	1	$4/mmm$	$\mathrm{A2_g}$
L137.2.5 $\mathrm{GM3}^-$	0	-	-
L137.2.6 $\mathrm{GM4}^+$	1	$4/mmm$	$\mathrm{B2_g}$
L137.2.7 $\mathrm{GM4}^-$	0	-	-

TABLE S410: Coplanar SSGs with parent space group $P4_2/nmc$ (No. 137).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P137.1.1 $\mathrm{GM1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g}$
P137.2.1 $\mathrm{GM1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u}$
P137.2.2 $\mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g}$
P137.2.3 $\mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u}$
P137.2.4 $\mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g}$
P137.2.5 $\mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_u}$
P137.2.6 $\mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_g}$
P137.2.7 $\mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_u}$
P137.3.1 $\mathrm{GM1}^- \oplus \mathrm{GM1}^-$	$\surd$	0	0	$\surd$	-	-
P137.3.2 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
P137.3.3 $\mathrm{GM1}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-

Coplanar SSGs with parent space group $P4_2/nmc$ (No. 137) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P137.3.4 $\mathrm{GM1^-} \oplus \mathrm{GM3^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u}$
P137.3.5 $\mathrm{GM1^-} \oplus \mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
P137.3.6 $\mathrm{GM1^-} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_u}$
P137.3.7 $\mathrm{GM1^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
P137.3.8 $\mathrm{GM2^+} \oplus \mathrm{GM2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
P137.3.9 $\mathrm{GM2^+} \oplus \mathrm{GM2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g}$
P137.3.10 $\mathrm{GM2^+} \oplus \mathrm{GM3^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g}$
P137.3.11 $\mathrm{GM2^+} \oplus \mathrm{GM3^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
P137.3.12 $\mathrm{GM2^+} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
P137.3.13 $\mathrm{GM2^+} \oplus \mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u}$
P137.3.14 $\mathrm{GM2^-} \oplus \mathrm{GM2^-}$	$\surd$	0	0	$\surd$	-	-
P137.3.15 $\mathrm{GM2^-} \oplus \mathrm{GM3^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_u}$
P137.3.16 $\mathrm{GM2^-} \oplus \mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
P137.3.17 $\mathrm{GM2^-} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g}$
P137.3.18 $\mathrm{GM2^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
P137.3.19 $\mathrm{GM3^+} \oplus \mathrm{GM3^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g}$
P137.3.20 $\mathrm{GM3^+} \oplus \mathrm{GM3^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g}$
P137.3.21 $\mathrm{GM3^+} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g}$
P137.3.22 $\mathrm{GM3^+} \oplus \mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g}$
P137.3.23 $\mathrm{GM3^-} \oplus \mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
P137.3.24 $\mathrm{GM3^-} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_g}$
P137.3.25 $\mathrm{GM3^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
P137.3.26 $\mathrm{GM4^+} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_g}$
P137.3.27 $\mathrm{GM4^+} \oplus \mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g}$
P137.3.28 $\mathrm{GM4^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
P137.6.1 $\mathrm{GM5^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_g}$
P137.6.2 $\mathrm{GM5^-}$	$\surd$	0	0	$\surd$	-	-
P137.6.3 A1	$\surd$	1	1	$\times$	-	-
P137.6.4 M1	$\surd$	1	1	$\times$	-	-
P137.6.5 M2	$\surd$	1	1	$\times$	-	-
P137.6.6 M3	$\surd$	1	1	$\times$	-	-
P137.6.7 M4	$\surd$	1	1	$\times$	-	-
P137.6.8 Z1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P137.6.9 Z2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P137.6.10 Z3	$\surd$	1	1	$\times$	-	-
P137.8.1 LD1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P137.8.2 LD3	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$

TABLE S411: Non-coplanar SSGs with parent space group $P4_2/nmc$ (No. 137).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N137.1.1 $\mathrm{GM1^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A1_g}$
N137.2.1 $\mathrm{GM1^-}$	$\surd$	2	2	$\surd$	422	$\mathrm{A1} \oplus \mathrm{A1}$
N137.2.2 $\mathrm{GM2^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{B1_g}$
N137.2.3 $\mathrm{GM2^-}$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{A1} \oplus \mathrm{A1}$
N137.2.4 $\mathrm{GM3^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A2_g}$

Non-coplanar SSGs with parent space group $P4_2/nmc$ (No. 137) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N137.2.5 $\mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{A1}\oplus\mathrm{A1}$
N137.2.6 $\mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{B2_g}$
N137.2.7 $\mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{A1}\oplus\mathrm{A1}$
N137.3.1 $\mathrm{GM1}^-\oplus\mathrm{GM1}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{A1_u}$
N137.3.2 $\mathrm{GM1}^-\oplus\mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{A1}\oplus\mathrm{B1}$
N137.3.3 $\mathrm{GM1}^-\oplus\mathrm{GM2}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{B1_u}$
N137.3.4 $\mathrm{GM1}^-\oplus\mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{A1}\oplus\mathrm{A2}$
N137.3.5 $\mathrm{GM1}^-\oplus\mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{A2_u}$
N137.3.6 $\mathrm{GM1}^-\oplus\mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{A1}\oplus\mathrm{A2}$
N137.3.7 $\mathrm{GM1}^-\oplus\mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{B2_u}$
N137.3.8 $\mathrm{GM2}^+\oplus\mathrm{GM2}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B1_g}$
N137.3.9 $\mathrm{GM2}^+\oplus\mathrm{GM2}^-$	$\surd$	2	2	$\surd$	422	$\mathrm{A1}\oplus\mathrm{B1}$
N137.3.10 $\mathrm{GM2}^+\oplus\mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}\oplus\mathrm{A2_g}$
N137.3.11 $\mathrm{GM2}^+\oplus\mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{A1}\oplus\mathrm{B1}$
N137.3.12 $\mathrm{GM2}^+\oplus\mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B2_g}$
N137.3.13 $\mathrm{GM2}^+\oplus\mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{A1}\oplus\mathrm{B1}$
N137.3.14 $\mathrm{GM2}^-\oplus\mathrm{GM2}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}\oplus\mathrm{B1_u}$
N137.3.15 $\mathrm{GM2}^-\oplus\mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{A1}\oplus\mathrm{B2}$
N137.3.16 $\mathrm{GM2}^-\oplus\mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}\oplus\mathrm{A2_u}$
N137.3.17 $\mathrm{GM2}^-\oplus\mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{A1}\oplus\mathrm{B2}$
N137.3.18 $\mathrm{GM2}^-\oplus\mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}\oplus\mathrm{B2_u}$
N137.3.19 $\mathrm{GM3}^+\oplus\mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_g}$
N137.3.20 $\mathrm{GM3}^+\oplus\mathrm{GM3}^-$	$\surd$	2	2	$\surd$	422	$\mathrm{A1}\oplus\mathrm{A2}$
N137.3.21 $\mathrm{GM3}^+\oplus\mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_g}\oplus\mathrm{B2_g}$
N137.3.22 $\mathrm{GM3}^+\oplus\mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{A1}\oplus\mathrm{A2}$
N137.3.23 $\mathrm{GM3}^-\oplus\mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_u}\oplus\mathrm{A2_u}$
N137.3.24 $\mathrm{GM3}^-\oplus\mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{A1}\oplus\mathrm{B2}$
N137.3.25 $\mathrm{GM3}^-\oplus\mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_u}\oplus\mathrm{B2_u}$
N137.3.26 $\mathrm{GM4}^+\oplus\mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_g}\oplus\mathrm{B2_g}$
N137.3.27 $\mathrm{GM4}^+\oplus\mathrm{GM4}^-$	$\surd$	2	2	$\surd$	422	$\mathrm{A1}\oplus\mathrm{B2}$
N137.3.28 $\mathrm{GM4}^-\oplus\mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_u}\oplus\mathrm{B2_u}$
N137.6.1 $\mathrm{GM5}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{E_g}$
N137.6.2 $\mathrm{GM5}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{E_u}$
N137.6.3 A1	$\surd$	1	1	$\surd$	$\bar{4}2m$	A1
N137.6.4 M1	$\surd$	1	1	$\surd$	422	A1
N137.6.5 M2	$\surd$	1	1	$\surd$	422	A1
N137.6.6 M3	$\surd$	1	1	$\surd$	$\bar{4}2m$	A1
N137.6.7 M4	$\surd$	1	1	$\surd$	$\bar{4}2m$	A1
N137.6.8 Z1	$\surd$	1	1	$\surd$	$4mm$	A1
N137.6.9 Z2	$\surd$	1	1	$\surd$	$4mm$	A1
N137.6.10 Z3	$\surd$	1	1	$\surd$	$\bar{4}2m$	A1
N137.8.1 LD1	$\surd$	1	1	$\surd$	$4mm$	A1
N137.8.2 LD3	$\surd$	1	1	$\surd$	$4mm$	A1
N137.9.1 $\mathrm{GM1}^-\oplus\mathrm{GM1}^-\oplus\mathrm{GM1}^-$	$\surd$	0	0	$\surd$	-	-
N137.9.2 $\mathrm{GM1}^-\oplus\mathrm{GM1}^-\oplus\mathrm{GM2}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_u}\oplus\mathrm{B1_u}$
N137.9.3 $\mathrm{GM1}^-\oplus\mathrm{GM1}^-\oplus\mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-

Non-coplanar SSGs with parent space group $P4_2/nmc$ (No. 137) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N137.9.4 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N137.9.5 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N137.9.6 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N137.9.7 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N137.9.8 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	2	2	$\surd$	422	$\mathrm{B1} \oplus \mathrm{B1}$
N137.9.9 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N137.9.10 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{B1} \oplus \mathrm{B2}$
N137.9.11 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_u}$
N137.9.12 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{B1} \oplus \mathrm{B2}$
N137.9.13 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{A2_u}$
N137.9.14 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
N137.9.15 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N137.9.16 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N137.9.17 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N137.9.18 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N137.9.19 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	422	$\mathrm{A2} \oplus \mathrm{A2}$
N137.9.20 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
N137.9.21 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B2} \oplus \mathrm{A2}$
N137.9.22 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
N137.9.23 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N137.9.24 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N137.9.25 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N137.9.26 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	422	$\mathrm{B2} \oplus \mathrm{B2}$
N137.9.27 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N137.9.28 $\mathrm{GM1}^- \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N137.9.29 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N137.9.30 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B1} \oplus \mathrm{B1}$
N137.9.31 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{A2_g}$
N137.9.32 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{B1} \oplus \mathrm{B1}$
N137.9.33 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B2_g}$
N137.9.34 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{B1} \oplus \mathrm{B1}$
N137.9.35 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{B1_g}$
N137.9.36 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{B1} \oplus \mathrm{A2}$
N137.9.37 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B2_u}$
N137.9.38 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{B1} \oplus \mathrm{A2}$
N137.9.39 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{A2_u}$
N137.9.40 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
N137.9.41 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B1} \oplus \mathrm{A2}$
N137.9.42 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g} \oplus \mathrm{B2_g}$
N137.9.43 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	422	$\mathrm{B1} \oplus \mathrm{A2}$
N137.9.44 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N137.9.45 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	422	$\mathrm{B1} \oplus \mathrm{B2}$
N137.9.46 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N137.9.47 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N137.9.48 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B1} \oplus \mathrm{B2}$
N137.9.49 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$

Non-coplanar SSGs with parent space group $P4_2/nmc$ (No. 137) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N137.9.50 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
N137.9.51 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N137.9.52 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N137.9.53 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$
N137.9.54 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N137.9.55 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{A2} \oplus \mathrm{A2}$
N137.9.56 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{B2_u}$
N137.9.57 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	422	$\mathrm{A2} \oplus \mathrm{B2}$
N137.9.58 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g} \oplus \mathrm{B2_u}$
N137.9.59 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N137.9.60 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$
N137.9.61 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N137.9.62 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B2} \oplus \mathrm{B2}$
N137.9.63 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$
N137.9.64 $\mathrm{GM2}^- \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N137.9.65 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
N137.9.66 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{A2} \oplus \mathrm{A2}$
N137.9.67 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{B2_g}$
N137.9.68 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{B2} \oplus \mathrm{B2}$
N137.9.69 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A2_g}$
N137.9.70 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{B2} \oplus \mathrm{A2}$
N137.9.71 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{A2_g}$
N137.9.72 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N137.9.73 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{B2} \oplus \mathrm{A2}$
N137.9.74 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{A2_g}$
N137.9.75 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N137.9.76 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B2_g}$
N137.9.77 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N137.9.78 $\mathrm{GM3}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{B2} \oplus \mathrm{B2}$
N137.9.79 $\mathrm{GM3}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B2_g}$
N137.9.80 $\mathrm{GM3}^- \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N137.9.81 $\mathrm{GM4}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N137.9.82 $\mathrm{GM4}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{A2} \oplus \mathrm{A2}$
N137.9.83 $\mathrm{GM4}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{B2_g}$
N137.9.84 $\mathrm{GM4}^- \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N137.12.1 $\mathrm{GM1}^- \oplus \mathrm{GM5}^+$	$\surd$	2	2	$\surd$	$4mm$	E
N137.12.2 $\mathrm{GM1}^- \oplus \mathrm{GM5}^-$	$\surd$	0	0	$\surd$	-	-
N137.12.3 $\mathrm{GM1}^- \oplus \mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N137.12.4 $\mathrm{GM1}^- \oplus \mathrm{M1}$	$\surd$	1	1	$\times$	-	-
N137.12.5 $\mathrm{GM1}^- \oplus \mathrm{M2}$	$\surd$	1	1	$\times$	-	-
N137.12.6 $\mathrm{GM1}^- \oplus \mathrm{M3}$	$\surd$	1	1	$\times$	-	-
N137.12.7 $\mathrm{GM1}^- \oplus \mathrm{M4}$	$\surd$	1	1	$\times$	-	-
N137.12.8 $\mathrm{GM1}^- \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N137.12.9 $\mathrm{GM1}^- \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N137.12.10 $\mathrm{GM1}^- \oplus \mathrm{Z3}$	$\surd$	1	1	$\times$	-	-
N137.12.11 $\mathrm{GM2}^+ \oplus \mathrm{GM5}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{E_g}$

Non-coplanar SSGs with parent space group $P4_2/nmc$ (No. 137) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N137.12.12 $\mathrm{GM2^+} \oplus \mathrm{GM5^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{E_u}$
N137.12.13 $\mathrm{GM2^+} \oplus \mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N137.12.14 $\mathrm{GM2^+} \oplus \mathrm{M1}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	B1
N137.12.15 $\mathrm{GM2^+} \oplus \mathrm{M2}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	B1
N137.12.16 $\mathrm{GM2^+} \oplus \mathrm{M3}$	$\surd$	1	1	$\surd$	422	B1
N137.12.17 $\mathrm{GM2^+} \oplus \mathrm{M4}$	$\surd$	1	1	$\surd$	422	B1
N137.12.18 $\mathrm{GM2^+} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N137.12.19 $\mathrm{GM2^+} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N137.12.20 $\mathrm{GM2^+} \oplus \mathrm{Z3}$	$\surd$	1	1	$\times$	-	-
N137.12.21 $\mathrm{GM2^-} \oplus \mathrm{GM5^+}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	E
N137.12.22 $\mathrm{GM2^-} \oplus \mathrm{GM5^-}$	$\surd$	0	0	$\surd$	-	-
N137.12.23 $\mathrm{GM2^-} \oplus \mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N137.12.24 $\mathrm{GM2^-} \oplus \mathrm{M1}$	$\surd$	1	1	$\times$	-	-
N137.12.25 $\mathrm{GM2^-} \oplus \mathrm{M2}$	$\surd$	1	1	$\times$	-	-
N137.12.26 $\mathrm{GM2^-} \oplus \mathrm{M3}$	$\surd$	1	1	$\times$	-	-
N137.12.27 $\mathrm{GM2^-} \oplus \mathrm{M4}$	$\surd$	1	1	$\times$	-	-
N137.12.28 $\mathrm{GM2^-} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N137.12.29 $\mathrm{GM2^-} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N137.12.30 $\mathrm{GM2^-} \oplus \mathrm{Z3}$	$\surd$	1	1	$\times$	-	-
N137.12.31 $\mathrm{GM3^+} \oplus \mathrm{GM5^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{E_g}$
N137.12.32 $\mathrm{GM3^+} \oplus \mathrm{GM5^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{E_u}$
N137.12.33 $\mathrm{GM3^+} \oplus \mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N137.12.34 $\mathrm{GM3^+} \oplus \mathrm{M1}$	$\surd$	1	1	$\times$	-	-
N137.12.35 $\mathrm{GM3^+} \oplus \mathrm{M2}$	$\surd$	1	1	$\times$	-	-
N137.12.36 $\mathrm{GM3^+} \oplus \mathrm{M3}$	$\surd$	1	1	$\times$	-	-
N137.12.37 $\mathrm{GM3^+} \oplus \mathrm{M4}$	$\surd$	1	1	$\times$	-	-
N137.12.38 $\mathrm{GM3^+} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	422	A2
N137.12.39 $\mathrm{GM3^+} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	422	A2
N137.12.40 $\mathrm{GM3^+} \oplus \mathrm{Z3}$	$\surd$	1	1	$\times$	-	-
N137.12.41 $\mathrm{GM3^-} \oplus \mathrm{GM5^+}$	$\surd$	2	2	$\surd$	422	E
N137.12.42 $\mathrm{GM3^-} \oplus \mathrm{GM5^-}$	$\surd$	0	0	$\surd$	-	-
N137.12.43 $\mathrm{GM3^-} \oplus \mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N137.12.44 $\mathrm{GM3^-} \oplus \mathrm{M1}$	$\surd$	1	1	$\times$	-	-
N137.12.45 $\mathrm{GM3^-} \oplus \mathrm{M2}$	$\surd$	1	1	$\times$	-	-
N137.12.46 $\mathrm{GM3^-} \oplus \mathrm{M3}$	$\surd$	1	1	$\times$	-	-
N137.12.47 $\mathrm{GM3^-} \oplus \mathrm{M4}$	$\surd$	1	1	$\times$	-	-
N137.12.48 $\mathrm{GM3^-} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N137.12.49 $\mathrm{GM3^-} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N137.12.50 $\mathrm{GM3^-} \oplus \mathrm{Z3}$	$\surd$	1	1	$\times$	-	-
N137.12.51 $\mathrm{GM4^+} \oplus \mathrm{GM5^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{E_g}$
N137.12.52 $\mathrm{GM4^+} \oplus \mathrm{GM5^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{E_u}$
N137.12.53 $\mathrm{GM4^+} \oplus \mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N137.12.54 $\mathrm{GM4^+} \oplus \mathrm{M1}$	$\surd$	1	1	$\times$	-	-
N137.12.55 $\mathrm{GM4^+} \oplus \mathrm{M2}$	$\surd$	1	1	$\times$	-	-
N137.12.56 $\mathrm{GM4^+} \oplus \mathrm{M3}$	$\surd$	1	1	$\times$	-	-
N137.12.57 $\mathrm{GM4^+} \oplus \mathrm{M4}$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $P4_2/nmc$ (No. 137) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N137.12.58 $\mathrm{GM4}^+ \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N137.12.59 $\mathrm{GM4}^+ \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N137.12.60 $\mathrm{GM4}^+ \oplus \mathrm{Z3}$	$\surd$	1	1	$\times$	-	-
N137.12.61 $\mathrm{GM4}^- \oplus \mathrm{GM5}^+$	$\surd$	2	2	$\surd$	$\bar{4}2m$	E
N137.12.62 $\mathrm{GM4}^- \oplus \mathrm{GM5}^-$	$\surd$	0	0	$\surd$	-	-
N137.12.63 $\mathrm{GM4}^- \oplus \mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N137.12.64 $\mathrm{GM4}^- \oplus \mathrm{M1}$	$\surd$	1	1	$\times$	-	-
N137.12.65 $\mathrm{GM4}^- \oplus \mathrm{M2}$	$\surd$	1	1	$\times$	-	-
N137.12.66 $\mathrm{GM4}^- \oplus \mathrm{M3}$	$\surd$	1	1	$\times$	-	-
N137.12.67 $\mathrm{GM4}^- \oplus \mathrm{M4}$	$\surd$	1	1	$\times$	-	-
N137.12.68 $\mathrm{GM4}^- \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N137.12.69 $\mathrm{GM4}^- \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N137.12.70 $\mathrm{GM4}^- \oplus \mathrm{Z3}$	$\surd$	1	1	$\times$	-	-
N137.14.1 $\mathrm{GM1}^- \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N137.14.2 $\mathrm{GM1}^- \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N137.14.3 $\mathrm{GM2}^+ \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N137.14.4 $\mathrm{GM2}^+ \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N137.14.5 $\mathrm{GM2}^- \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N137.14.6 $\mathrm{GM2}^- \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N137.14.7 $\mathrm{GM3}^+ \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	422	A2
N137.14.8 $\mathrm{GM3}^+ \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	422	A2
N137.14.9 $\mathrm{GM3}^- \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N137.14.10 $\mathrm{GM3}^- \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N137.14.11 $\mathrm{GM4}^+ \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N137.14.12 $\mathrm{GM4}^+ \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N137.14.13 $\mathrm{GM4}^- \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N137.14.14 $\mathrm{GM4}^- \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$

TABLE S412: Collinear SSGs with parent space group $P4_2/ncm$ (No. 138).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L138.1.1 $\mathrm{GM1}^+$	1	$4/mmm$	$\mathrm{A1_g}$
L138.2.1 $\mathrm{GM1}^-$	0	-	-
L138.2.2 $\mathrm{GM2}^+$	1	$4/mmm$	$\mathrm{B1_g}$
L138.2.3 $\mathrm{GM2}^-$	0	-	-
L138.2.4 $\mathrm{GM3}^+$	1	$4/mmm$	$\mathrm{A2_g}$
L138.2.5 $\mathrm{GM3}^-$	0	-	-
L138.2.6 $\mathrm{GM4}^+$	1	$4/mmm$	$\mathrm{B2_g}$
L138.2.7 $\mathrm{GM4}^-$	0	-	-

TABLE S413: Coplanar SSGs with parent space group $P4_2/ncm$ (No. 138).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P138.1.1 $\mathrm{GM1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g}$

Coplanar SSGs with parent space group $P4_2/ncm$ (No. 138) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P138.2.1 $\mathrm{GM1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u}$
P138.2.2 $\mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g}$
P138.2.3 $\mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u}$
P138.2.4 $\mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g}$
P138.2.5 $\mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_u}$
P138.2.6 $\mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_g}$
P138.2.7 $\mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_u}$
P138.3.1 $\mathrm{GM1}^- \oplus \mathrm{GM1}^-$	$\surd$	0	0	$\surd$	-	-
P138.3.2 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
P138.3.3 $\mathrm{GM1}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
P138.3.4 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u}$
P138.3.5 $\mathrm{GM1}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
P138.3.6 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_u}$
P138.3.7 $\mathrm{GM1}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
P138.3.8 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
P138.3.9 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g}$
P138.3.10 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g}$
P138.3.11 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
P138.3.12 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
P138.3.13 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u}$
P138.3.14 $\mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
P138.3.15 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_u}$
P138.3.16 $\mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
P138.3.17 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g}$
P138.3.18 $\mathrm{GM2}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
P138.3.19 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g}$
P138.3.20 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g}$
P138.3.21 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g}$
P138.3.22 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g}$
P138.3.23 $\mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
P138.3.24 $\mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_g}$
P138.3.25 $\mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
P138.3.26 $\mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_g}$
P138.3.27 $\mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g}$
P138.3.28 $\mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
P138.4.1 $\mathrm{A1}^+\mathrm{A4}^+$	$\surd$	1	0	$\times$	-	-
P138.4.2 $\mathrm{A1}^-\mathrm{A4}^-$	$\surd$	1	0	$\times$	-	-
P138.6.1 $\mathrm{GM5}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_g}$
P138.6.2 $\mathrm{GM5}^-$	$\surd$	0	0	$\surd$	-	-
P138.6.3 $\mathrm{A5}^+$	$\surd$	1	0	$\times$	-	-
P138.6.4 M1	$\surd$	1	1	$\times$	-	-
P138.6.5 M2	$\surd$	1	1	$\times$	-	-
P138.6.6 M3	$\surd$	1	1	$\times$	-	-
P138.6.7 M4	$\surd$	1	1	$\times$	-	-
P138.6.8 Z1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P138.6.9 Z2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$

Coplanar SSGs with parent space group $P4_2/ncm$ (No. 138) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P138.6.10 Z3	$\surd$	1	1	$\times$	-	-
P138.8.1 LD1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P138.8.2 LD2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$

TABLE S414: Non-coplanar SSGs with parent space group $P4_2/ncm$ (No. 138).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N138.1.1 $\mathrm{GM1^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g\oplus A1_g\oplus A1_g}$
N138.2.1 $\mathrm{GM1^-}$	$\surd$	2	2	$\surd$	422	$\mathrm{A1\oplus A1}$
N138.2.2 $\mathrm{GM2^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g\oplus A1_g\oplus B1_g}$
N138.2.3 $\mathrm{GM2^-}$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{A1\oplus A1}$
N138.2.4 $\mathrm{GM3^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g\oplus A1_g\oplus A2_g}$
N138.2.5 $\mathrm{GM3^-}$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{A1\oplus A1}$
N138.2.6 $\mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g\oplus A1_g\oplus B2_g}$
N138.2.7 $\mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{A1\oplus A1}$
N138.3.1 $\mathrm{GM1^-\oplus GM1^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g\oplus A1_u\oplus A1_u}$
N138.3.2 $\mathrm{GM1^-\oplus GM2^+}$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{A1\oplus B1}$
N138.3.3 $\mathrm{GM1^-\oplus GM2^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g\oplus A1_u\oplus B1_u}$
N138.3.4 $\mathrm{GM1^-\oplus GM3^+}$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{A1\oplus A2}$
N138.3.5 $\mathrm{GM1^-\oplus GM3^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g\oplus A1_u\oplus A2_u}$
N138.3.6 $\mathrm{GM1^-\oplus GM4^+}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{A1\oplus A2}$
N138.3.7 $\mathrm{GM1^-\oplus GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g\oplus A1_u\oplus B2_u}$
N138.3.8 $\mathrm{GM2^+\oplus GM2^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g\oplus B1_g\oplus B1_g}$
N138.3.9 $\mathrm{GM2^+\oplus GM2^-}$	$\surd$	2	2	$\surd$	422	$\mathrm{A1\oplus B1}$
N138.3.10 $\mathrm{GM2^+\oplus GM3^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g\oplus B1_g\oplus A2_g}$
N138.3.11 $\mathrm{GM2^+\oplus GM3^-}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{A1\oplus B1}$
N138.3.12 $\mathrm{GM2^+\oplus GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g\oplus B1_g\oplus B2_g}$
N138.3.13 $\mathrm{GM2^+\oplus GM4^-}$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{A1\oplus B1}$
N138.3.14 $\mathrm{GM2^-\oplus GM2^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g\oplus B1_u\oplus B1_u}$
N138.3.15 $\mathrm{GM2^-\oplus GM3^+}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{A1\oplus B2}$
N138.3.16 $\mathrm{GM2^-\oplus GM3^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g\oplus B1_u\oplus A2_u}$
N138.3.17 $\mathrm{GM2^-\oplus GM4^+}$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{A1\oplus B2}$
N138.3.18 $\mathrm{GM2^-\oplus GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g\oplus B1_u\oplus B2_u}$
N138.3.19 $\mathrm{GM3^+\oplus GM3^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g\oplus A2_g\oplus A2_g}$
N138.3.20 $\mathrm{GM3^+\oplus GM3^-}$	$\surd$	2	2	$\surd$	422	$\mathrm{A1\oplus A2}$
N138.3.21 $\mathrm{GM3^+\oplus GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g\oplus A2_g\oplus B2_g}$
N138.3.22 $\mathrm{GM3^+\oplus GM4^-}$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{A1\oplus A2}$
N138.3.23 $\mathrm{GM3^-\oplus GM3^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g\oplus A2_u\oplus A2_u}$
N138.3.24 $\mathrm{GM3^-\oplus GM4^+}$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{A1\oplus B2}$
N138.3.25 $\mathrm{GM3^-\oplus GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g\oplus A2_u\oplus B2_u}$
N138.3.26 $\mathrm{GM4^+\oplus GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g\oplus B2_g\oplus B2_g}$
N138.3.27 $\mathrm{GM4^+\oplus GM4^-}$	$\surd$	2	2	$\surd$	422	$\mathrm{A1\oplus B2}$
N138.3.28 $\mathrm{GM4^-\oplus GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g\oplus B2_u\oplus B2_u}$
N138.4.1 $\mathrm{A1^+A4^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N138.4.2 $\mathrm{A1^-A4^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$

Non-coplanar SSGs with parent space group $P4_2/ncm$ (No. 138) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N138.6.1 $\mathrm{GM5}^{+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{E_g}$
N138.6.2 $\mathrm{GM5}^{-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{E_u}$
N138.6.3 $\mathrm{A5}^{+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N138.6.4 M1	$\surd$	1	1	$\surd$	422	A1
N138.6.5 M2	$\surd$	1	1	$\surd$	422	A1
N138.6.6 M3	$\surd$	1	1	$\surd$	$\bar{4}2m$	A1
N138.6.7 M4	$\surd$	1	1	$\surd$	$\bar{4}2m$	A1
N138.6.8 Z1	$\surd$	1	1	$\surd$	$4mm$	A1
N138.6.9 Z2	$\surd$	1	1	$\surd$	$4mm$	A1
N138.6.10 Z3	$\surd$	1	1	$\surd$	$\bar{4}m2$	A1
N138.8.1 LD1	$\surd$	1	1	$\surd$	$4mm$	A1
N138.8.2 LD2	$\surd$	1	1	$\surd$	$4mm$	A1
N138.9.1 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-}$	$\surd$	0	0	$\surd$	-	-
N138.9.2 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-} \oplus \mathrm{GM2}^{+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N138.9.3 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-} \oplus \mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
N138.9.4 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-} \oplus \mathrm{GM3}^{+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N138.9.5 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-} \oplus \mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
N138.9.6 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-} \oplus \mathrm{GM4}^{+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N138.9.7 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-} \oplus \mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
N138.9.8 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{+} \oplus \mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	422	$\mathrm{B1} \oplus \mathrm{B1}$
N138.9.9 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{+} \oplus \mathrm{GM2}^{-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N138.9.10 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{+} \oplus \mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{B1} \oplus \mathrm{B2}$
N138.9.11 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{+} \oplus \mathrm{GM3}^{-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_u}$
N138.9.12 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{+} \oplus \mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{B1} \oplus \mathrm{B2}$
N138.9.13 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{+} \oplus \mathrm{GM4}^{-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{A2_u}$
N138.9.14 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{-} \oplus \mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
N138.9.15 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{-} \oplus \mathrm{GM3}^{+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N138.9.16 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{-} \oplus \mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
N138.9.17 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{-} \oplus \mathrm{GM4}^{+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N138.9.18 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{-} \oplus \mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
N138.9.19 $\mathrm{GM1}^{-} \oplus \mathrm{GM3}^{+} \oplus \mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	422	$\mathrm{A2} \oplus \mathrm{A2}$
N138.9.20 $\mathrm{GM1}^{-} \oplus \mathrm{GM3}^{+} \oplus \mathrm{GM3}^{-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
N138.9.21 $\mathrm{GM1}^{-} \oplus \mathrm{GM3}^{+} \oplus \mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B2} \oplus \mathrm{A2}$
N138.9.22 $\mathrm{GM1}^{-} \oplus \mathrm{GM3}^{+} \oplus \mathrm{GM4}^{-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
N138.9.23 $\mathrm{GM1}^{-} \oplus \mathrm{GM3}^{-} \oplus \mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
N138.9.24 $\mathrm{GM1}^{-} \oplus \mathrm{GM3}^{-} \oplus \mathrm{GM4}^{+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N138.9.25 $\mathrm{GM1}^{-} \oplus \mathrm{GM3}^{-} \oplus \mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
N138.9.26 $\mathrm{GM1}^{-} \oplus \mathrm{GM4}^{+} \oplus \mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	422	$\mathrm{B2} \oplus \mathrm{B2}$
N138.9.27 $\mathrm{GM1}^{-} \oplus \mathrm{GM4}^{+} \oplus \mathrm{GM4}^{-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N138.9.28 $\mathrm{GM1}^{-} \oplus \mathrm{GM4}^{-} \oplus \mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
N138.9.29 $\mathrm{GM2}^{+} \oplus \mathrm{GM2}^{+} \oplus \mathrm{GM2}^{+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N138.9.30 $\mathrm{GM2}^{+} \oplus \mathrm{GM2}^{+} \oplus \mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B1} \oplus \mathrm{B1}$
N138.9.31 $\mathrm{GM2}^{+} \oplus \mathrm{GM2}^{+} \oplus \mathrm{GM3}^{+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{A2_g}$
N138.9.32 $\mathrm{GM2}^{+} \oplus \mathrm{GM2}^{+} \oplus \mathrm{GM3}^{-}$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{B1} \oplus \mathrm{B1}$
N138.9.33 $\mathrm{GM2}^{+} \oplus \mathrm{GM2}^{+} \oplus \mathrm{GM4}^{+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B2_g}$
N138.9.34 $\mathrm{GM2}^{+} \oplus \mathrm{GM2}^{+} \oplus \mathrm{GM4}^{-}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{B1} \oplus \mathrm{B1}$

Non-coplanar SSGs with parent space group $P4_2/ncm$ (No. 138) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N138.9.35 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{B1_g}$
N138.9.36 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{B1} \oplus \mathrm{A2}$
N138.9.37 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B2_u}$
N138.9.38 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{B1} \oplus \mathrm{A2}$
N138.9.39 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{A2_u}$
N138.9.40 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
N138.9.41 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B1} \oplus \mathrm{A2}$
N138.9.42 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g} \oplus \mathrm{B2_g}$
N138.9.43 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	422	$\mathrm{B1} \oplus \mathrm{A2}$
N138.9.44 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N138.9.45 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	422	$\mathrm{B1} \oplus \mathrm{B2}$
N138.9.46 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N138.9.47 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N138.9.48 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B1} \oplus \mathrm{B2}$
N138.9.49 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N138.9.50 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
N138.9.51 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N138.9.52 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N138.9.53 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$
N138.9.54 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N138.9.55 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{A2} \oplus \mathrm{A2}$
N138.9.56 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{B2_u}$
N138.9.57 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	422	$\mathrm{A2} \oplus \mathrm{B2}$
N138.9.58 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g} \oplus \mathrm{B2_u}$
N138.9.59 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N138.9.60 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$
N138.9.61 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N138.9.62 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B2} \oplus \mathrm{B2}$
N138.9.63 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$
N138.9.64 $\mathrm{GM2}^- \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N138.9.65 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
N138.9.66 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{A2} \oplus \mathrm{A2}$
N138.9.67 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{B2_g}$
N138.9.68 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{B2} \oplus \mathrm{B2}$
N138.9.69 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A2_g}$
N138.9.70 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{B2} \oplus \mathrm{A2}$
N138.9.71 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{A2_g}$
N138.9.72 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N138.9.73 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{B2} \oplus \mathrm{A2}$
N138.9.74 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{A2_g}$
N138.9.75 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N138.9.76 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B2_g}$
N138.9.77 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N138.9.78 $\mathrm{GM3}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{B2} \oplus \mathrm{B2}$
N138.9.79 $\mathrm{GM3}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B2_g}$
N138.9.80 $\mathrm{GM3}^- \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-

Non-coplanar SSGs with parent space group $P4_2/ncm$ (No. 138) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N138.9.81 $\mathrm{GM4}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N138.9.82 $\mathrm{GM4}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{A2} \oplus \mathrm{A2}$
N138.9.83 $\mathrm{GM4}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{B2_g}$
N138.9.84 $\mathrm{GM4}^- \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N138.10.1 $\mathrm{GM1}^- \oplus \mathrm{A1}^+\mathrm{A4}^+$	$\surd$	1	0	$\times$	-	-
N138.10.2 $\mathrm{GM1}^- \oplus \mathrm{A1}^-\mathrm{A4}^-$	$\surd$	1	0	$\times$	-	-
N138.10.3 $\mathrm{GM2}^+ \oplus \mathrm{A1}^+\mathrm{A4}^+$	$\surd$	1	1	$\times$	-	-
N138.10.4 $\mathrm{GM2}^+ \oplus \mathrm{A1}^-\mathrm{A4}^-$	$\surd$	1	1	$\times$	-	-
N138.10.5 $\mathrm{GM2}^- \oplus \mathrm{A1}^+\mathrm{A4}^+$	$\surd$	1	0	$\times$	-	-
N138.10.6 $\mathrm{GM2}^- \oplus \mathrm{A1}^-\mathrm{A4}^-$	$\surd$	1	0	$\times$	-	-
N138.10.7 $\mathrm{GM3}^+ \oplus \mathrm{A1}^+\mathrm{A4}^+$	$\surd$	1	1	$\times$	-	-
N138.10.8 $\mathrm{GM3}^+ \oplus \mathrm{A1}^-\mathrm{A4}^-$	$\surd$	1	1	$\times$	-	-
N138.10.9 $\mathrm{GM3}^- \oplus \mathrm{A1}^+\mathrm{A4}^+$	$\surd$	1	0	$\times$	-	-
N138.10.10 $\mathrm{GM3}^- \oplus \mathrm{A1}^-\mathrm{A4}^-$	$\surd$	1	0	$\times$	-	-
N138.10.11 $\mathrm{GM4}^+ \oplus \mathrm{A1}^+\mathrm{A4}^+$	$\surd$	1	1	$\times$	-	-
N138.10.12 $\mathrm{GM4}^+ \oplus \mathrm{A1}^-\mathrm{A4}^-$	$\surd$	1	1	$\times$	-	-
N138.10.13 $\mathrm{GM4}^- \oplus \mathrm{A1}^+\mathrm{A4}^+$	$\surd$	1	0	$\times$	-	-
N138.10.14 $\mathrm{GM4}^- \oplus \mathrm{A1}^-\mathrm{A4}^-$	$\surd$	1	0	$\times$	-	-
N138.12.1 $\mathrm{GM1}^- \oplus \mathrm{GM5}^+$	$\surd$	2	2	$\surd$	$4mm$	E
N138.12.2 $\mathrm{GM1}^- \oplus \mathrm{GM5}^-$	$\surd$	0	0	$\surd$	-	-
N138.12.3 $\mathrm{GM1}^- \oplus \mathrm{A5}^+$	$\surd$	1	0	$\times$	-	-
N138.12.4 $\mathrm{GM1}^- \oplus \mathrm{M1}$	$\surd$	1	1	$\times$	-	-
N138.12.5 $\mathrm{GM1}^- \oplus \mathrm{M2}$	$\surd$	1	1	$\times$	-	-
N138.12.6 $\mathrm{GM1}^- \oplus \mathrm{M3}$	$\surd$	1	1	$\times$	-	-
N138.12.7 $\mathrm{GM1}^- \oplus \mathrm{M4}$	$\surd$	1	1	$\times$	-	-
N138.12.8 $\mathrm{GM1}^- \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N138.12.9 $\mathrm{GM1}^- \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N138.12.10 $\mathrm{GM1}^- \oplus \mathrm{Z3}$	$\surd$	1	1	$\times$	-	-
N138.12.11 $\mathrm{GM2}^+ \oplus \mathrm{GM5}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{E_g}$
N138.12.12 $\mathrm{GM2}^+ \oplus \mathrm{GM5}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{E_u}$
N138.12.13 $\mathrm{GM2}^+ \oplus \mathrm{A5}^+$	$\surd$	1	1	$\times$	-	-
N138.12.14 $\mathrm{GM2}^+ \oplus \mathrm{M1}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	B1
N138.12.15 $\mathrm{GM2}^+ \oplus \mathrm{M2}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	B1
N138.12.16 $\mathrm{GM2}^+ \oplus \mathrm{M3}$	$\surd$	1	1	$\surd$	422	B1
N138.12.17 $\mathrm{GM2}^+ \oplus \mathrm{M4}$	$\surd$	1	1	$\surd$	422	B1
N138.12.18 $\mathrm{GM2}^+ \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N138.12.19 $\mathrm{GM2}^+ \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N138.12.20 $\mathrm{GM2}^+ \oplus \mathrm{Z3}$	$\surd$	1	1	$\times$	-	-
N138.12.21 $\mathrm{GM2}^- \oplus \mathrm{GM5}^+$	$\surd$	2	2	$\surd$	$\bar{4}m2$	E
N138.12.22 $\mathrm{GM2}^- \oplus \mathrm{GM5}^-$	$\surd$	0	0	$\surd$	-	-
N138.12.23 $\mathrm{GM2}^- \oplus \mathrm{A5}^+$	$\surd$	1	0	$\times$	-	-
N138.12.24 $\mathrm{GM2}^- \oplus \mathrm{M1}$	$\surd$	1	1	$\times$	-	-
N138.12.25 $\mathrm{GM2}^- \oplus \mathrm{M2}$	$\surd$	1	1	$\times$	-	-
N138.12.26 $\mathrm{GM2}^- \oplus \mathrm{M3}$	$\surd$	1	1	$\times$	-	-
N138.12.27 $\mathrm{GM2}^- \oplus \mathrm{M4}$	$\surd$	1	1	$\times$	-	-
N138.12.28 $\mathrm{GM2}^- \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$

Non-coplanar SSGs with parent space group $P4_2/ncm$ (No. 138) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N138.12.29 $\mathrm{GM2}^{-} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N138.12.30 $\mathrm{GM2}^{-} \oplus \mathrm{Z3}$	$\surd$	1	1	$\times$	-	-
N138.12.31 $\mathrm{GM3}^{+} \oplus \mathrm{GM5}^{+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{E_g}$
N138.12.32 $\mathrm{GM3}^{+} \oplus \mathrm{GM5}^{-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{E_u}$
N138.12.33 $\mathrm{GM3}^{+} \oplus \mathrm{A5}^{+}$	$\surd$	1	1	$\times$	-	-
N138.12.34 $\mathrm{GM3}^{+} \oplus \mathrm{M1}$	$\surd$	1	1	$\times$	-	-
N138.12.35 $\mathrm{GM3}^{+} \oplus \mathrm{M2}$	$\surd$	1	1	$\times$	-	-
N138.12.36 $\mathrm{GM3}^{+} \oplus \mathrm{M3}$	$\surd$	1	1	$\times$	-	-
N138.12.37 $\mathrm{GM3}^{+} \oplus \mathrm{M4}$	$\surd$	1	1	$\times$	-	-
N138.12.38 $\mathrm{GM3}^{+} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	422	A2
N138.12.39 $\mathrm{GM3}^{+} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	422	A2
N138.12.40 $\mathrm{GM3}^{+} \oplus \mathrm{Z3}$	$\surd$	1	1	$\times$	-	-
N138.12.41 $\mathrm{GM3}^{-} \oplus \mathrm{GM5}^{+}$	$\surd$	2	2	$\surd$	422	E
N138.12.42 $\mathrm{GM3}^{-} \oplus \mathrm{GM5}^{-}$	$\surd$	0	0	$\surd$	-	-
N138.12.43 $\mathrm{GM3}^{-} \oplus \mathrm{A5}^{+}$	$\surd$	1	0	$\times$	-	-
N138.12.44 $\mathrm{GM3}^{-} \oplus \mathrm{M1}$	$\surd$	1	1	$\times$	-	-
N138.12.45 $\mathrm{GM3}^{-} \oplus \mathrm{M2}$	$\surd$	1	1	$\times$	-	-
N138.12.46 $\mathrm{GM3}^{-} \oplus \mathrm{M3}$	$\surd$	1	1	$\times$	-	-
N138.12.47 $\mathrm{GM3}^{-} \oplus \mathrm{M4}$	$\surd$	1	1	$\times$	-	-
N138.12.48 $\mathrm{GM3}^{-} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N138.12.49 $\mathrm{GM3}^{-} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N138.12.50 $\mathrm{GM3}^{-} \oplus \mathrm{Z3}$	$\surd$	1	1	$\times$	-	-
N138.12.51 $\mathrm{GM4}^{+} \oplus \mathrm{GM5}^{+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{E_g}$
N138.12.52 $\mathrm{GM4}^{+} \oplus \mathrm{GM5}^{-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{E_u}$
N138.12.53 $\mathrm{GM4}^{+} \oplus \mathrm{A5}^{+}$	$\surd$	1	1	$\times$	-	-
N138.12.54 $\mathrm{GM4}^{+} \oplus \mathrm{M1}$	$\surd$	1	1	$\times$	-	-
N138.12.55 $\mathrm{GM4}^{+} \oplus \mathrm{M2}$	$\surd$	1	1	$\times$	-	-
N138.12.56 $\mathrm{GM4}^{+} \oplus \mathrm{M3}$	$\surd$	1	1	$\times$	-	-
N138.12.57 $\mathrm{GM4}^{+} \oplus \mathrm{M4}$	$\surd$	1	1	$\times$	-	-
N138.12.58 $\mathrm{GM4}^{+} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N138.12.59 $\mathrm{GM4}^{+} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N138.12.60 $\mathrm{GM4}^{+} \oplus \mathrm{Z3}$	$\surd$	1	1	$\times$	-	-
N138.12.61 $\mathrm{GM4}^{-} \oplus \mathrm{GM5}^{+}$	$\surd$	2	2	$\surd$	$\bar{4}2m$	E
N138.12.62 $\mathrm{GM4}^{-} \oplus \mathrm{GM5}^{-}$	$\surd$	0	0	$\surd$	-	-
N138.12.63 $\mathrm{GM4}^{-} \oplus \mathrm{A5}^{+}$	$\surd$	1	0	$\times$	-	-
N138.12.64 $\mathrm{GM4}^{-} \oplus \mathrm{M1}$	$\surd$	1	1	$\times$	-	-
N138.12.65 $\mathrm{GM4}^{-} \oplus \mathrm{M2}$	$\surd$	1	1	$\times$	-	-
N138.12.66 $\mathrm{GM4}^{-} \oplus \mathrm{M3}$	$\surd$	1	1	$\times$	-	-
N138.12.67 $\mathrm{GM4}^{-} \oplus \mathrm{M4}$	$\surd$	1	1	$\times$	-	-
N138.12.68 $\mathrm{GM4}^{-} \oplus \mathrm{Z1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N138.12.69 $\mathrm{GM4}^{-} \oplus \mathrm{Z2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N138.12.70 $\mathrm{GM4}^{-} \oplus \mathrm{Z3}$	$\surd$	1	1	$\times$	-	-
N138.14.1 $\mathrm{GM1}^{-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N138.14.2 $\mathrm{GM1}^{-} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N138.14.3 $\mathrm{GM2}^{+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N138.14.4 $\mathrm{GM2}^{+} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1

Non-coplanar SSGs with parent space group $P4_2/ncm$ (No. 138) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N138.14.5 $\mathrm{GM2}^-\oplus\mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N138.14.6 $\mathrm{GM2}^-\oplus\mathrm{LD2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N138.14.7 $\mathrm{GM3}^+\oplus\mathrm{LD1}$	$\surd$	1	1	$\surd$	422	A2
N138.14.8 $\mathrm{GM3}^+\oplus\mathrm{LD2}$	$\surd$	1	1	$\surd$	422	A2
N138.14.9 $\mathrm{GM3}^-\oplus\mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N138.14.10 $\mathrm{GM3}^-\oplus\mathrm{LD2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N138.14.11 $\mathrm{GM4}^+\oplus\mathrm{LD1}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N138.14.12 $\mathrm{GM4}^+\oplus\mathrm{LD2}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N138.14.13 $\mathrm{GM4}^-\oplus\mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N138.14.14 $\mathrm{GM4}^-\oplus\mathrm{LD2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$

TABLE S415: Collinear SSGs with parent space group $I4/mmm$ (No. 139).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L139.1.1 $\mathrm{GM1}^+$	1	$4/mmm$	$\mathrm{A1_g}$
L139.2.1 $\mathrm{GM1}^-$	0	-	-
L139.2.2 $\mathrm{GM2}^+$	1	$4/mmm$	$\mathrm{B1_g}$
L139.2.3 $\mathrm{GM2}^-$	0	-	-
L139.2.4 $\mathrm{GM3}^+$	1	$4/mmm$	$\mathrm{A2_g}$
L139.2.5 $\mathrm{GM3}^-$	0	-	-
L139.2.6 $\mathrm{GM4}^+$	1	$4/mmm$	$\mathrm{B2_g}$
L139.2.7 $\mathrm{GM4}^-$	0	-	-
L139.2.8 $\mathrm{M1}^+$	0	-	-
L139.2.9 $\mathrm{M1}^-$	0	-	-
L139.2.10 $\mathrm{M2}^+$	0	-	-
L139.2.11 $\mathrm{M2}^-$	0	-	-
L139.2.12 $\mathrm{M3}^+$	0	-	-
L139.2.13 $\mathrm{M3}^-$	0	-	-
L139.2.14 $\mathrm{M4}^+$	0	-	-
L139.2.15 $\mathrm{M4}^-$	0	-	-

TABLE S416: Coplanar SSGs with parent space group $I4/mmm$ (No. 139).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P139.1.1 $\mathrm{GM1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}$
P139.2.1 $\mathrm{GM1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}$
P139.2.2 $\mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}$
P139.2.3 $\mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}$
P139.2.4 $\mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_g}$
P139.2.5 $\mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_u}$
P139.2.6 $\mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_g}$
P139.2.7 $\mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_u}$
P139.2.8 $\mathrm{M1}^+$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P139.2.9 $\mathrm{M1}^-$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P139.2.10 $\mathrm{M2}^+$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P139.2.11 $\mathrm{M2}^-$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$

Coplanar SSGs with parent space group $I4/mmm$ (No. 139) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P139.2.12 $\mathrm{M3}^{+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P139.2.13 $\mathrm{M3}^{-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P139.2.14 $\mathrm{M4}^{+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P139.2.15 $\mathrm{M4}^{-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P139.3.1 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-}$	$\surd$	0	0	$\surd$	-	-
P139.3.2 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
P139.3.3 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
P139.3.4 $\mathrm{GM1}^{-} \oplus \mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u}$
P139.3.5 $\mathrm{GM1}^{-} \oplus \mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
P139.3.6 $\mathrm{GM1}^{-} \oplus \mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_u}$
P139.3.7 $\mathrm{GM1}^{-} \oplus \mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
P139.3.8 $\mathrm{GM1}^{-} \oplus \mathrm{M1}^{+}$	$\surd$	1	1	$\times$	-	-
P139.3.9 $\mathrm{GM1}^{-} \oplus \mathrm{M1}^{-}$	$\surd$	1	1	$\times$	-	-
P139.3.10 $\mathrm{GM1}^{-} \oplus \mathrm{M2}^{+}$	$\surd$	1	1	$\times$	-	-
P139.3.11 $\mathrm{GM1}^{-} \oplus \mathrm{M2}^{-}$	$\surd$	1	1	$\times$	-	-
P139.3.12 $\mathrm{GM1}^{-} \oplus \mathrm{M3}^{+}$	$\surd$	1	1	$\times$	-	-
P139.3.13 $\mathrm{GM1}^{-} \oplus \mathrm{M3}^{-}$	$\surd$	1	1	$\times$	-	-
P139.3.14 $\mathrm{GM1}^{-} \oplus \mathrm{M4}^{+}$	$\surd$	1	1	$\times$	-	-
P139.3.15 $\mathrm{GM1}^{-} \oplus \mathrm{M4}^{-}$	$\surd$	1	1	$\times$	-	-
P139.3.16 $\mathrm{GM2}^{+} \oplus \mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
P139.3.17 $\mathrm{GM2}^{+} \oplus \mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g}$
P139.3.18 $\mathrm{GM2}^{+} \oplus \mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g}$
P139.3.19 $\mathrm{GM2}^{+} \oplus \mathrm{GM3}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
P139.3.20 $\mathrm{GM2}^{+} \oplus \mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
P139.3.21 $\mathrm{GM2}^{+} \oplus \mathrm{GM4}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u}$
P139.3.22 $\mathrm{GM2}^{+} \oplus \mathrm{M1}^{+}$	$\surd$	1	0	$\times$	-	-
P139.3.23 $\mathrm{GM2}^{+} \oplus \mathrm{M1}^{-}$	$\surd$	1	0	$\times$	-	-
P139.3.24 $\mathrm{GM2}^{+} \oplus \mathrm{M2}^{+}$	$\surd$	1	0	$\times$	-	-
P139.3.25 $\mathrm{GM2}^{+} \oplus \mathrm{M2}^{-}$	$\surd$	1	0	$\times$	-	-
P139.3.26 $\mathrm{GM2}^{+} \oplus \mathrm{M3}^{+}$	$\surd$	1	0	$\times$	-	-
P139.3.27 $\mathrm{GM2}^{+} \oplus \mathrm{M3}^{-}$	$\surd$	1	0	$\times$	-	-
P139.3.28 $\mathrm{GM2}^{+} \oplus \mathrm{M4}^{+}$	$\surd$	1	0	$\times$	-	-
P139.3.29 $\mathrm{GM2}^{+} \oplus \mathrm{M4}^{-}$	$\surd$	1	0	$\times$	-	-
P139.3.30 $\mathrm{GM2}^{-} \oplus \mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
P139.3.31 $\mathrm{GM2}^{-} \oplus \mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_u}$
P139.3.32 $\mathrm{GM2}^{-} \oplus \mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
P139.3.33 $\mathrm{GM2}^{-} \oplus \mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g}$
P139.3.34 $\mathrm{GM2}^{-} \oplus \mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
P139.3.35 $\mathrm{GM2}^{-} \oplus \mathrm{M1}^{+}$	$\surd$	1	1	$\times$	-	-
P139.3.36 $\mathrm{GM2}^{-} \oplus \mathrm{M1}^{-}$	$\surd$	1	1	$\times$	-	-
P139.3.37 $\mathrm{GM2}^{-} \oplus \mathrm{M2}^{+}$	$\surd$	1	1	$\times$	-	-
P139.3.38 $\mathrm{GM2}^{-} \oplus \mathrm{M2}^{-}$	$\surd$	1	1	$\times$	-	-
P139.3.39 $\mathrm{GM2}^{-} \oplus \mathrm{M3}^{+}$	$\surd$	1	1	$\times$	-	-
P139.3.40 $\mathrm{GM2}^{-} \oplus \mathrm{M3}^{-}$	$\surd$	1	1	$\times$	-	-
P139.3.41 $\mathrm{GM2}^{-} \oplus \mathrm{M4}^{+}$	$\surd$	1	1	$\times$	-	-
P139.3.42 $\mathrm{GM2}^{-} \oplus \mathrm{M4}^{-}$	$\surd$	1	1	$\times$	-	-

Coplanar SSGs with parent space group $I4/mmm$ (No. 139) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P139.3.43 $\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{A2_g}$
P139.3.44 $\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A2_g}$
P139.3.45 $\mathrm{GM3}^{+}\oplus\mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{B2_g}$
P139.3.46 $\mathrm{GM3}^{+}\oplus\mathrm{GM4}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{A2_g}$
P139.3.47 $\mathrm{GM3}^{+}\oplus\mathrm{M1}^{+}$	$\surd$	1	0	$\times$	-	-
P139.3.48 $\mathrm{GM3}^{+}\oplus\mathrm{M1}^{-}$	$\surd$	1	0	$\times$	-	-
P139.3.49 $\mathrm{GM3}^{+}\oplus\mathrm{M2}^{+}$	$\surd$	1	0	$\times$	-	-
P139.3.50 $\mathrm{GM3}^{+}\oplus\mathrm{M2}^{-}$	$\surd$	1	0	$\times$	-	-
P139.3.51 $\mathrm{GM3}^{+}\oplus\mathrm{M3}^{+}$	$\surd$	1	0	$\times$	-	-
P139.3.52 $\mathrm{GM3}^{+}\oplus\mathrm{M3}^{-}$	$\surd$	1	0	$\times$	-	-
P139.3.53 $\mathrm{GM3}^{+}\oplus\mathrm{M4}^{+}$	$\surd$	1	0	$\times$	-	-
P139.3.54 $\mathrm{GM3}^{+}\oplus\mathrm{M4}^{-}$	$\surd$	1	0	$\times$	-	-
P139.3.55 $\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
P139.3.56 $\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{B2_g}$
P139.3.57 $\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
P139.3.58 $\mathrm{GM3}^{-}\oplus\mathrm{M1}^{+}$	$\surd$	1	1	$\times$	-	-
P139.3.59 $\mathrm{GM3}^{-}\oplus\mathrm{M1}^{-}$	$\surd$	1	1	$\times$	-	-
P139.3.60 $\mathrm{GM3}^{-}\oplus\mathrm{M2}^{+}$	$\surd$	1	1	$\times$	-	-
P139.3.61 $\mathrm{GM3}^{-}\oplus\mathrm{M2}^{-}$	$\surd$	1	1	$\times$	-	-
P139.3.62 $\mathrm{GM3}^{-}\oplus\mathrm{M3}^{+}$	$\surd$	1	1	$\times$	-	-
P139.3.63 $\mathrm{GM3}^{-}\oplus\mathrm{M3}^{-}$	$\surd$	1	1	$\times$	-	-
P139.3.64 $\mathrm{GM3}^{-}\oplus\mathrm{M4}^{+}$	$\surd$	1	1	$\times$	-	-
P139.3.65 $\mathrm{GM3}^{-}\oplus\mathrm{M4}^{-}$	$\surd$	1	1	$\times$	-	-
P139.3.66 $\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g}\oplus\mathrm{B2_g}$
P139.3.67 $\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B2_g}$
P139.3.68 $\mathrm{GM4}^{+}\oplus\mathrm{M1}^{+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_g}$
P139.3.69 $\mathrm{GM4}^{+}\oplus\mathrm{M1}^{-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_g}$
P139.3.70 $\mathrm{GM4}^{+}\oplus\mathrm{M2}^{+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_g}$
P139.3.71 $\mathrm{GM4}^{+}\oplus\mathrm{M2}^{-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_g}$
P139.3.72 $\mathrm{GM4}^{+}\oplus\mathrm{M3}^{+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_g}$
P139.3.73 $\mathrm{GM4}^{+}\oplus\mathrm{M3}^{-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_g}$
P139.3.74 $\mathrm{GM4}^{+}\oplus\mathrm{M4}^{+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_g}$
P139.3.75 $\mathrm{GM4}^{+}\oplus\mathrm{M4}^{-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_g}$
P139.3.76 $\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
P139.3.77 $\mathrm{GM4}^{-}\oplus\mathrm{M1}^{+}$	$\surd$	1	1	$\times$	-	-
P139.3.78 $\mathrm{GM4}^{-}\oplus\mathrm{M1}^{-}$	$\surd$	1	1	$\times$	-	-
P139.3.79 $\mathrm{GM4}^{-}\oplus\mathrm{M2}^{+}$	$\surd$	1	1	$\times$	-	-
P139.3.80 $\mathrm{GM4}^{-}\oplus\mathrm{M2}^{-}$	$\surd$	1	1	$\times$	-	-
P139.3.81 $\mathrm{GM4}^{-}\oplus\mathrm{M3}^{+}$	$\surd$	1	1	$\times$	-	-
P139.3.82 $\mathrm{GM4}^{-}\oplus\mathrm{M3}^{-}$	$\surd$	1	1	$\times$	-	-
P139.3.83 $\mathrm{GM4}^{-}\oplus\mathrm{M4}^{+}$	$\surd$	1	1	$\times$	-	-
P139.3.84 $\mathrm{GM4}^{-}\oplus\mathrm{M4}^{-}$	$\surd$	1	1	$\times$	-	-
P139.3.85 $\mathrm{M1}^{+}\oplus\mathrm{M1}^{+}$	$\surd$	1	0	$\times$	-	-
P139.3.86 $\mathrm{M1}^{+}\oplus\mathrm{M1}^{-}$	$\surd$	1	1	$\times$	-	-
P139.3.87 $\mathrm{M1}^{+}\oplus\mathrm{M2}^{+}$	$\surd$	1	0	$\times$	-	-
P139.3.88 $\mathrm{M1}^{+}\oplus\mathrm{M2}^{-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_u}$

Coplanar SSGs with parent space group $I4/mmm$ (No. 139) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P139.3.89 $\mathrm{M1^+} \oplus \mathrm{M3^+}$	$\surd$	1	0	$\times$	-	-
P139.3.90 $\mathrm{M1^+} \oplus \mathrm{M3^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P139.3.91 $\mathrm{M1^+} \oplus \mathrm{M4^+}$	$\surd$	1	0	$\times$	-	-
P139.3.92 $\mathrm{M1^+} \oplus \mathrm{M4^-}$	$\surd$	1	1	$\times$	-	-
P139.3.93 $\mathrm{M1^-} \oplus \mathrm{M1^-}$	$\surd$	1	0	$\times$	-	-
P139.3.94 $\mathrm{M1^-} \oplus \mathrm{M2^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_u}$
P139.3.95 $\mathrm{M1^-} \oplus \mathrm{M2^-}$	$\surd$	1	0	$\times$	-	-
P139.3.96 $\mathrm{M1^-} \oplus \mathrm{M3^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P139.3.97 $\mathrm{M1^-} \oplus \mathrm{M3^-}$	$\surd$	1	0	$\times$	-	-
P139.3.98 $\mathrm{M1^-} \oplus \mathrm{M4^+}$	$\surd$	1	1	$\times$	-	-
P139.3.99 $\mathrm{M1^-} \oplus \mathrm{M4^-}$	$\surd$	1	0	$\times$	-	-
P139.3.100 $\mathrm{M2^+} \oplus \mathrm{M2^+}$	$\surd$	1	0	$\times$	-	-
P139.3.101 $\mathrm{M2^+} \oplus \mathrm{M2^-}$	$\surd$	1	1	$\times$	-	-
P139.3.102 $\mathrm{M2^+} \oplus \mathrm{M3^+}$	$\surd$	1	0	$\times$	-	-
P139.3.103 $\mathrm{M2^+} \oplus \mathrm{M3^-}$	$\surd$	1	1	$\times$	-	-
P139.3.104 $\mathrm{M2^+} \oplus \mathrm{M4^+}$	$\surd$	1	0	$\times$	-	-
P139.3.105 $\mathrm{M2^+} \oplus \mathrm{M4^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P139.3.106 $\mathrm{M2^-} \oplus \mathrm{M2^-}$	$\surd$	1	0	$\times$	-	-
P139.3.107 $\mathrm{M2^-} \oplus \mathrm{M3^+}$	$\surd$	1	1	$\times$	-	-
P139.3.108 $\mathrm{M2^-} \oplus \mathrm{M3^-}$	$\surd$	1	0	$\times$	-	-
P139.3.109 $\mathrm{M2^-} \oplus \mathrm{M4^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P139.3.110 $\mathrm{M2^-} \oplus \mathrm{M4^-}$	$\surd$	1	0	$\times$	-	-
P139.3.111 $\mathrm{M3^+} \oplus \mathrm{M3^+}$	$\surd$	1	0	$\times$	-	-
P139.3.112 $\mathrm{M3^+} \oplus \mathrm{M3^-}$	$\surd$	1	1	$\times$	-	-
P139.3.113 $\mathrm{M3^+} \oplus \mathrm{M4^+}$	$\surd$	1	0	$\times$	-	-
P139.3.114 $\mathrm{M3^+} \oplus \mathrm{M4^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_u}$
P139.3.115 $\mathrm{M3^-} \oplus \mathrm{M3^-}$	$\surd$	1	0	$\times$	-	-
P139.3.116 $\mathrm{M3^-} \oplus \mathrm{M4^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_u}$
P139.3.117 $\mathrm{M3^-} \oplus \mathrm{M4^-}$	$\surd$	1	0	$\times$	-	-
P139.3.118 $\mathrm{M4^+} \oplus \mathrm{M4^+}$	$\surd$	1	0	$\times$	-	-
P139.3.119 $\mathrm{M4^+} \oplus \mathrm{M4^-}$	$\surd$	1	1	$\times$	-	-
P139.3.120 $\mathrm{M4^-} \oplus \mathrm{M4^-}$	$\surd$	1	0	$\times$	-	-
P139.6.1 $\mathrm{GM5^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_g}$
P139.6.2 $\mathrm{GM5^-}$	$\surd$	0	0	$\surd$	-	-
P139.6.3 $\mathrm{M5^+}$	$\surd$	1	0	$\times$	-	-
P139.6.4 $\mathrm{M5^-}$	$\surd$	1	0	$\times$	-	-
P139.7.1 $\mathrm{X1^+}$	$\times$	-	-	-	-	-
P139.7.2 $\mathrm{X1^-}$	$\times$	-	-	-	-	-
P139.7.3 $\mathrm{X2^+}$	$\times$	-	-	-	-	-
P139.7.4 $\mathrm{X2^-}$	$\times$	-	-	-	-	-
P139.7.5 $\mathrm{X3^+}$	$\times$	-	-	-	-	-
P139.7.6 $\mathrm{X3^-}$	$\times$	-	-	-	-	-
P139.7.7 $\mathrm{X4^+}$	$\times$	-	-	-	-	-
P139.7.8 $\mathrm{X4^-}$	$\times$	-	-	-	-	-
P139.7.9 P1	$\surd$	1	1	$\times$	-	-
P139.7.10 P2	$\surd$	1	1	$\times$	-	-

Coplanar SSGs with parent space group $I4/mmm$ (No. 139) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P139.8.1 LD1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P139.8.2 LD2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P139.8.3 LD3	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P139.8.4 LD4	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$

TABLE S417: Non-coplanar SSGs with parent space group $I4/mmm$ (No. 139).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N139.1.1 $\mathrm{GM1^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g\oplus A1_g\oplus A1_g}$
N139.2.1 $\mathrm{GM1^-}$	$\surd$	2	2	$\surd$	422	$\mathrm{A1\oplus A1}$
N139.2.2 $\mathrm{GM2^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g\oplus A1_g\oplus B1_g}$
N139.2.3 $\mathrm{GM2^-}$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{A1\oplus A1}$
N139.2.4 $\mathrm{GM3^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g\oplus A1_g\oplus A2_g}$
N139.2.5 $\mathrm{GM3^-}$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{A1\oplus A1}$
N139.2.6 $\mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g\oplus A1_g\oplus B2_g}$
N139.2.7 $\mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{A1\oplus A1}$
N139.2.8 $\mathrm{M1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g\oplus A1_g}$
N139.2.9 $\mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g\oplus A1_g}$
N139.2.10 $\mathrm{M2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g\oplus A1_g}$
N139.2.11 $\mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g\oplus A1_g}$
N139.2.12 $\mathrm{M3^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g\oplus A1_g}$
N139.2.13 $\mathrm{M3^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g\oplus A1_g}$
N139.2.14 $\mathrm{M4^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g\oplus A1_g}$
N139.2.15 $\mathrm{M4^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g\oplus A1_g}$
N139.3.1 $\mathrm{GM1^-\oplus GM1^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g\oplus A1_u\oplus A1_u}$
N139.3.2 $\mathrm{GM1^-\oplus GM2^+}$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{A1\oplus B1}$
N139.3.3 $\mathrm{GM1^-\oplus GM2^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g\oplus A1_u\oplus B1_u}$
N139.3.4 $\mathrm{GM1^-\oplus GM3^+}$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{A1\oplus A2}$
N139.3.5 $\mathrm{GM1^-\oplus GM3^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g\oplus A1_u\oplus A2_u}$
N139.3.6 $\mathrm{GM1^-\oplus GM4^+}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{A1\oplus A2}$
N139.3.7 $\mathrm{GM1^-\oplus GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g\oplus A1_u\oplus B2_u}$
N139.3.8 $\mathrm{GM1^-\oplus M1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g\oplus A1_u}$
N139.3.9 $\mathrm{GM1^-\oplus M1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g\oplus A1_u}$
N139.3.10 $\mathrm{GM1^-\oplus M2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g\oplus A1_u}$
N139.3.11 $\mathrm{GM1^-\oplus M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g\oplus A1_u}$
N139.3.12 $\mathrm{GM1^-\oplus M3^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g\oplus A1_u}$
N139.3.13 $\mathrm{GM1^-\oplus M3^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g\oplus A1_u}$
N139.3.14 $\mathrm{GM1^-\oplus M4^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g\oplus A1_u}$
N139.3.15 $\mathrm{GM1^-\oplus M4^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g\oplus A1_u}$
N139.3.16 $\mathrm{GM2^+\oplus GM2^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g\oplus B1_g\oplus B1_g}$
N139.3.17 $\mathrm{GM2^+\oplus GM2^-}$	$\surd$	2	2	$\surd$	422	$\mathrm{A1\oplus B1}$
N139.3.18 $\mathrm{GM2^+\oplus GM3^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g\oplus B1_g\oplus A2_g}$
N139.3.19 $\mathrm{GM2^+\oplus GM3^-}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{A1\oplus B1}$
N139.3.20 $\mathrm{GM2^+\oplus GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g\oplus B1_g\oplus B2_g}$
N139.3.21 $\mathrm{GM2^+\oplus GM4^-}$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{A1\oplus B1}$
N139.3.22 $\mathrm{GM2^+\oplus M1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g\oplus B1_g}$

Non-coplanar SSGs with parent space group $I4/mmm$ (No. 139) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N139.3.23 $\mathrm{GM2}^{+}\oplus\mathrm{M1}^{-}$	√	2	2	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}$
N139.3.24 $\mathrm{GM2}^{+}\oplus\mathrm{M2}^{+}$	√	2	2	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}$
N139.3.25 $\mathrm{GM2}^{+}\oplus\mathrm{M2}^{-}$	√	2	2	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}$
N139.3.26 $\mathrm{GM2}^{+}\oplus\mathrm{M3}^{+}$	√	2	2	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}$
N139.3.27 $\mathrm{GM2}^{+}\oplus\mathrm{M3}^{-}$	√	2	2	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}$
N139.3.28 $\mathrm{GM2}^{+}\oplus\mathrm{M4}^{+}$	√	2	2	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}$
N139.3.29 $\mathrm{GM2}^{+}\oplus\mathrm{M4}^{-}$	√	2	2	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}$
N139.3.30 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}$	√	3	3	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}\oplus\mathrm{B1_u}$
N139.3.31 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{+}$	√	2	2	√	$\bar{4}m2$	$\mathrm{A1}\oplus\mathrm{B2}$
N139.3.32 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}$	√	3	3	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}\oplus\mathrm{A2_u}$
N139.3.33 $\mathrm{GM2}^{-}\oplus\mathrm{GM4}^{+}$	√	2	2	√	$4mm$	$\mathrm{A1}\oplus\mathrm{B2}$
N139.3.34 $\mathrm{GM2}^{-}\oplus\mathrm{GM4}^{-}$	√	3	3	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}\oplus\mathrm{B2_u}$
N139.3.35 $\mathrm{GM2}^{-}\oplus\mathrm{M1}^{+}$	√	2	2	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}$
N139.3.36 $\mathrm{GM2}^{-}\oplus\mathrm{M1}^{-}$	√	2	2	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}$
N139.3.37 $\mathrm{GM2}^{-}\oplus\mathrm{M2}^{+}$	√	2	2	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}$
N139.3.38 $\mathrm{GM2}^{-}\oplus\mathrm{M2}^{-}$	√	2	2	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}$
N139.3.39 $\mathrm{GM2}^{-}\oplus\mathrm{M3}^{+}$	√	2	2	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}$
N139.3.40 $\mathrm{GM2}^{-}\oplus\mathrm{M3}^{-}$	√	2	2	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}$
N139.3.41 $\mathrm{GM2}^{-}\oplus\mathrm{M4}^{+}$	√	2	2	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}$
N139.3.42 $\mathrm{GM2}^{-}\oplus\mathrm{M4}^{-}$	√	2	2	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}$
N139.3.43 $\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{+}$	√	3	3	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_g}$
N139.3.44 $\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{-}$	√	2	2	√	422	$\mathrm{A1}\oplus\mathrm{A2}$
N139.3.45 $\mathrm{GM3}^{+}\oplus\mathrm{GM4}^{+}$	√	3	3	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_g}\oplus\mathrm{B2_g}$
N139.3.46 $\mathrm{GM3}^{+}\oplus\mathrm{GM4}^{-}$	√	2	2	√	$\bar{4}2m$	$\mathrm{A1}\oplus\mathrm{A2}$
N139.3.47 $\mathrm{GM3}^{+}\oplus\mathrm{M1}^{+}$	√	2	2	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_g}$
N139.3.48 $\mathrm{GM3}^{+}\oplus\mathrm{M1}^{-}$	√	2	2	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_g}$
N139.3.49 $\mathrm{GM3}^{+}\oplus\mathrm{M2}^{+}$	√	2	2	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_g}$
N139.3.50 $\mathrm{GM3}^{+}\oplus\mathrm{M2}^{-}$	√	2	2	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_g}$
N139.3.51 $\mathrm{GM3}^{+}\oplus\mathrm{M3}^{+}$	√	2	2	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_g}$
N139.3.52 $\mathrm{GM3}^{+}\oplus\mathrm{M3}^{-}$	√	2	2	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_g}$
N139.3.53 $\mathrm{GM3}^{+}\oplus\mathrm{M4}^{+}$	√	2	2	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_g}$
N139.3.54 $\mathrm{GM3}^{+}\oplus\mathrm{M4}^{-}$	√	2	2	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_g}$
N139.3.55 $\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}$	√	3	3	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_u}\oplus\mathrm{A2_u}$
N139.3.56 $\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{+}$	√	2	2	√	$\bar{4}2m$	$\mathrm{A1}\oplus\mathrm{B2}$
N139.3.57 $\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{-}$	√	3	3	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_u}\oplus\mathrm{B2_u}$
N139.3.58 $\mathrm{GM3}^{-}\oplus\mathrm{M1}^{+}$	√	2	2	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_u}$
N139.3.59 $\mathrm{GM3}^{-}\oplus\mathrm{M1}^{-}$	√	2	2	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_u}$
N139.3.60 $\mathrm{GM3}^{-}\oplus\mathrm{M2}^{+}$	√	2	2	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_u}$
N139.3.61 $\mathrm{GM3}^{-}\oplus\mathrm{M2}^{-}$	√	2	2	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_u}$
N139.3.62 $\mathrm{GM3}^{-}\oplus\mathrm{M3}^{+}$	√	2	2	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_u}$
N139.3.63 $\mathrm{GM3}^{-}\oplus\mathrm{M3}^{-}$	√	2	2	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_u}$
N139.3.64 $\mathrm{GM3}^{-}\oplus\mathrm{M4}^{+}$	√	2	2	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_u}$
N139.3.65 $\mathrm{GM3}^{-}\oplus\mathrm{M4}^{-}$	√	2	2	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_u}$
N139.3.66 $\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{+}$	√	3	3	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_g}\oplus\mathrm{B2_g}$
N139.3.67 $\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{-}$	√	2	2	√	422	$\mathrm{A1}\oplus\mathrm{B2}$
N139.3.68 $\mathrm{GM4}^{+}\oplus\mathrm{M1}^{+}$	√	2	2	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_g}$

Non-coplanar SSGs with parent space group $I4/mmm$ (No. 139) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N139.3.69 $\mathrm{GM4}^{+}\oplus\mathrm{M1}^{-}$	√	2	2	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_g}$
N139.3.70 $\mathrm{GM4}^{+}\oplus\mathrm{M2}^{+}$	√	2	2	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_g}$
N139.3.71 $\mathrm{GM4}^{+}\oplus\mathrm{M2}^{-}$	√	2	2	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_g}$
N139.3.72 $\mathrm{GM4}^{+}\oplus\mathrm{M3}^{+}$	√	2	2	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_g}$
N139.3.73 $\mathrm{GM4}^{+}\oplus\mathrm{M3}^{-}$	√	2	2	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_g}$
N139.3.74 $\mathrm{GM4}^{+}\oplus\mathrm{M4}^{+}$	√	2	2	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_g}$
N139.3.75 $\mathrm{GM4}^{+}\oplus\mathrm{M4}^{-}$	√	2	2	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_g}$
N139.3.76 $\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}$	√	3	3	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_u}\oplus\mathrm{B2_u}$
N139.3.77 $\mathrm{GM4}^{-}\oplus\mathrm{M1}^{+}$	√	2	2	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_u}$
N139.3.78 $\mathrm{GM4}^{-}\oplus\mathrm{M1}^{-}$	√	2	2	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_u}$
N139.3.79 $\mathrm{GM4}^{-}\oplus\mathrm{M2}^{+}$	√	2	2	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_u}$
N139.3.80 $\mathrm{GM4}^{-}\oplus\mathrm{M2}^{-}$	√	2	2	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_u}$
N139.3.81 $\mathrm{GM4}^{-}\oplus\mathrm{M3}^{+}$	√	2	2	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_u}$
N139.3.82 $\mathrm{GM4}^{-}\oplus\mathrm{M3}^{-}$	√	2	2	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_u}$
N139.3.83 $\mathrm{GM4}^{-}\oplus\mathrm{M4}^{+}$	√	2	2	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_u}$
N139.3.84 $\mathrm{GM4}^{-}\oplus\mathrm{M4}^{-}$	√	2	2	√	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_u}$
N139.3.85 $\mathrm{M1}^{+}\oplus\mathrm{M1}^{+}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N139.3.86 $\mathrm{M1}^{+}\oplus\mathrm{M1}^{-}$	√	1	1	√	422	A1
N139.3.87 $\mathrm{M1}^{+}\oplus\mathrm{M2}^{+}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N139.3.88 $\mathrm{M1}^{+}\oplus\mathrm{M2}^{-}$	√	1	1	√	$\bar{4}2m$	A1
N139.3.89 $\mathrm{M1}^{+}\oplus\mathrm{M3}^{+}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N139.3.90 $\mathrm{M1}^{+}\oplus\mathrm{M3}^{-}$	√	1	1	√	$4mm$	A1
N139.3.91 $\mathrm{M1}^{+}\oplus\mathrm{M4}^{+}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N139.3.92 $\mathrm{M1}^{+}\oplus\mathrm{M4}^{-}$	√	1	1	√	$\bar{4}m2$	A1
N139.3.93 $\mathrm{M1}^{-}\oplus\mathrm{M1}^{-}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N139.3.94 $\mathrm{M1}^{-}\oplus\mathrm{M2}^{+}$	√	1	1	√	$\bar{4}2m$	A1
N139.3.95 $\mathrm{M1}^{-}\oplus\mathrm{M2}^{-}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N139.3.96 $\mathrm{M1}^{-}\oplus\mathrm{M3}^{+}$	√	1	1	√	$4mm$	A1
N139.3.97 $\mathrm{M1}^{-}\oplus\mathrm{M3}^{-}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N139.3.98 $\mathrm{M1}^{-}\oplus\mathrm{M4}^{+}$	√	1	1	√	$\bar{4}m2$	A1
N139.3.99 $\mathrm{M1}^{-}\oplus\mathrm{M4}^{-}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N139.3.100 $\mathrm{M2}^{+}\oplus\mathrm{M2}^{+}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N139.3.101 $\mathrm{M2}^{+}\oplus\mathrm{M2}^{-}$	√	1	1	√	422	A1
N139.3.102 $\mathrm{M2}^{+}\oplus\mathrm{M3}^{+}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N139.3.103 $\mathrm{M2}^{+}\oplus\mathrm{M3}^{-}$	√	1	1	√	$\bar{4}m2$	A1
N139.3.104 $\mathrm{M2}^{+}\oplus\mathrm{M4}^{+}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N139.3.105 $\mathrm{M2}^{+}\oplus\mathrm{M4}^{-}$	√	1	1	√	$4mm$	A1
N139.3.106 $\mathrm{M2}^{-}\oplus\mathrm{M2}^{-}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N139.3.107 $\mathrm{M2}^{-}\oplus\mathrm{M3}^{+}$	√	1	1	√	$\bar{4}m2$	A1
N139.3.108 $\mathrm{M2}^{-}\oplus\mathrm{M3}^{-}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N139.3.109 $\mathrm{M2}^{-}\oplus\mathrm{M4}^{+}$	√	1	1	√	$4mm$	A1
N139.3.110 $\mathrm{M2}^{-}\oplus\mathrm{M4}^{-}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N139.3.111 $\mathrm{M3}^{+}\oplus\mathrm{M3}^{+}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N139.3.112 $\mathrm{M3}^{+}\oplus\mathrm{M3}^{-}$	√	1	1	√	422	A1
N139.3.113 $\mathrm{M3}^{+}\oplus\mathrm{M4}^{+}$	√	1	1	√	$4/mmm$	$\mathrm{A1_g}$
N139.3.114 $\mathrm{M3}^{+}\oplus\mathrm{M4}^{-}$	√	1	1	√	$\bar{4}2m$	A1

Non-coplanar SSGs with parent space group $I4/mmm$ (No. 139) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N139.3.115 $\mathrm{M3}^{-} \oplus \mathrm{M3}^{-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N139.3.116 $\mathrm{M3}^{-} \oplus \mathrm{M4}^{+}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	A1
N139.3.117 $\mathrm{M3}^{-} \oplus \mathrm{M4}^{-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N139.3.118 $\mathrm{M4}^{+} \oplus \mathrm{M4}^{+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N139.3.119 $\mathrm{M4}^{+} \oplus \mathrm{M4}^{-}$	$\surd$	1	1	$\surd$	422	A1
N139.3.120 $\mathrm{M4}^{-} \oplus \mathrm{M4}^{-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N139.6.1 $\mathrm{GM5}^{+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{E_g}$
N139.6.2 $\mathrm{GM5}^{-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{E_u}$
N139.6.3 $\mathrm{M5}^{+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N139.6.4 $\mathrm{M5}^{-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N139.7.1 $\mathrm{X1}^{+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N139.7.2 $\mathrm{X1}^{-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N139.7.3 $\mathrm{X2}^{+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N139.7.4 $\mathrm{X2}^{-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N139.7.5 $\mathrm{X3}^{+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N139.7.6 $\mathrm{X3}^{-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N139.7.7 $\mathrm{X4}^{+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N139.7.8 $\mathrm{X4}^{-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N139.7.9 P1	$\surd$	1	1	$\surd$	$\bar{4}2m$	A1
N139.7.10 P2	$\surd$	1	1	$\surd$	$\bar{4}2m$	A1
N139.8.1 LD1	$\surd$	1	1	$\surd$	$4mm$	A1
N139.8.2 LD2	$\surd$	1	1	$\surd$	$4mm$	A1
N139.8.3 LD3	$\surd$	1	1	$\surd$	$4mm$	A1
N139.8.4 LD4	$\surd$	1	1	$\surd$	$4mm$	A1
N139.9.1 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-}$	$\surd$	0	0	$\surd$	-	-
N139.9.2 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-} \oplus \mathrm{GM2}^{+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N139.9.3 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-} \oplus \mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
N139.9.4 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-} \oplus \mathrm{GM3}^{+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N139.9.5 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-} \oplus \mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
N139.9.6 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-} \oplus \mathrm{GM4}^{+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N139.9.7 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-} \oplus \mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
N139.9.8 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-} \oplus \mathrm{M1}^{+}$	$\surd$	0	0	$\surd$	-	-
N139.9.9 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-} \oplus \mathrm{M1}^{-}$	$\surd$	0	0	$\surd$	-	-
N139.9.10 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-} \oplus \mathrm{M2}^{+}$	$\surd$	0	0	$\surd$	-	-
N139.9.11 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-} \oplus \mathrm{M2}^{-}$	$\surd$	0	0	$\surd$	-	-
N139.9.12 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-} \oplus \mathrm{M3}^{+}$	$\surd$	0	0	$\surd$	-	-
N139.9.13 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-} \oplus \mathrm{M3}^{-}$	$\surd$	0	0	$\surd$	-	-
N139.9.14 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-} \oplus \mathrm{M4}^{+}$	$\surd$	0	0	$\surd$	-	-
N139.9.15 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-} \oplus \mathrm{M4}^{-}$	$\surd$	0	0	$\surd$	-	-
N139.9.16 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{+} \oplus \mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	422	$\mathrm{B1} \oplus \mathrm{B1}$
N139.9.17 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{+} \oplus \mathrm{GM2}^{-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N139.9.18 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{+} \oplus \mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{B1} \oplus \mathrm{B2}$
N139.9.19 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{+} \oplus \mathrm{GM3}^{-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_u}$
N139.9.20 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{+} \oplus \mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{B1} \oplus \mathrm{B2}$
N139.9.21 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{+} \oplus \mathrm{GM4}^{-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{A2_u}$
N139.9.22 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{+} \oplus \mathrm{M1}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u}$

Non-coplanar SSGs with parent space group $I4/mmm$ (No. 139) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N139.9.23 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N139.9.24 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{M2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N139.9.25 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N139.9.26 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{M3^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N139.9.27 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{M3^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N139.9.28 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{M4^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N139.9.29 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{M4^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N139.9.30 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{GM2^-}$	$\surd$	0	0	$\surd$	-	-
N139.9.31 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{GM3^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N139.9.32 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
N139.9.33 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N139.9.34 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N139.9.35 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{M1^+}$	$\surd$	0	0	$\surd$	-	-
N139.9.36 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{M1^-}$	$\surd$	0	0	$\surd$	-	-
N139.9.37 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{M2^+}$	$\surd$	0	0	$\surd$	-	-
N139.9.38 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{M2^-}$	$\surd$	0	0	$\surd$	-	-
N139.9.39 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{M3^+}$	$\surd$	0	0	$\surd$	-	-
N139.9.40 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{M3^-}$	$\surd$	0	0	$\surd$	-	-
N139.9.41 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{M4^+}$	$\surd$	0	0	$\surd$	-	-
N139.9.42 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{M4^-}$	$\surd$	0	0	$\surd$	-	-
N139.9.43 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{GM3^+}$	$\surd$	2	2	$\surd$	422	$\mathrm{A2} \oplus \mathrm{A2}$
N139.9.44 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{GM3^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
N139.9.45 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B2} \oplus \mathrm{A2}$
N139.9.46 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
N139.9.47 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{M1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u}$
N139.9.48 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u}$
N139.9.49 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{M2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u}$
N139.9.50 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u}$
N139.9.51 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{M3^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u}$
N139.9.52 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{M3^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u}$
N139.9.53 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{M4^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u}$
N139.9.54 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{M4^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u}$
N139.9.55 $\mathrm{GM1^-} \oplus \mathrm{GM3^-} \oplus \mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
N139.9.56 $\mathrm{GM1^-} \oplus \mathrm{GM3^-} \oplus \mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N139.9.57 $\mathrm{GM1^-} \oplus \mathrm{GM3^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N139.9.58 $\mathrm{GM1^-} \oplus \mathrm{GM3^-} \oplus \mathrm{M1^+}$	$\surd$	0	0	$\surd$	-	-
N139.9.59 $\mathrm{GM1^-} \oplus \mathrm{GM3^-} \oplus \mathrm{M1^-}$	$\surd$	0	0	$\surd$	-	-
N139.9.60 $\mathrm{GM1^-} \oplus \mathrm{GM3^-} \oplus \mathrm{M2^+}$	$\surd$	0	0	$\surd$	-	-
N139.9.61 $\mathrm{GM1^-} \oplus \mathrm{GM3^-} \oplus \mathrm{M2^-}$	$\surd$	0	0	$\surd$	-	-
N139.9.62 $\mathrm{GM1^-} \oplus \mathrm{GM3^-} \oplus \mathrm{M3^+}$	$\surd$	0	0	$\surd$	-	-
N139.9.63 $\mathrm{GM1^-} \oplus \mathrm{GM3^-} \oplus \mathrm{M3^-}$	$\surd$	0	0	$\surd$	-	-
N139.9.64 $\mathrm{GM1^-} \oplus \mathrm{GM3^-} \oplus \mathrm{M4^+}$	$\surd$	0	0	$\surd$	-	-
N139.9.65 $\mathrm{GM1^-} \oplus \mathrm{GM3^-} \oplus \mathrm{M4^-}$	$\surd$	0	0	$\surd$	-	-
N139.9.66 $\mathrm{GM1^-} \oplus \mathrm{GM4^+} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	422	$\mathrm{B2} \oplus \mathrm{B2}$
N139.9.67 $\mathrm{GM1^-} \oplus \mathrm{GM4^+} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N139.9.68 $\mathrm{GM1^-} \oplus \mathrm{GM4^+} \oplus \mathrm{M1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_u}$

Non-coplanar SSGs with parent space group $I4/mmm$ (No. 139) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N139.9.69 $\mathrm{GM1^-}\oplus\mathrm{GM4^+}\oplus\mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g}\oplus\mathrm{B2_u}$
N139.9.70 $\mathrm{GM1^-}\oplus\mathrm{GM4^+}\oplus\mathrm{M2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g}\oplus\mathrm{B2_u}$
N139.9.71 $\mathrm{GM1^-}\oplus\mathrm{GM4^+}\oplus\mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g}\oplus\mathrm{B2_u}$
N139.9.72 $\mathrm{GM1^-}\oplus\mathrm{GM4^+}\oplus\mathrm{M3^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g}\oplus\mathrm{B2_u}$
N139.9.73 $\mathrm{GM1^-}\oplus\mathrm{GM4^+}\oplus\mathrm{M3^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g}\oplus\mathrm{B2_u}$
N139.9.74 $\mathrm{GM1^-}\oplus\mathrm{GM4^+}\oplus\mathrm{M4^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g}\oplus\mathrm{B2_u}$
N139.9.75 $\mathrm{GM1^-}\oplus\mathrm{GM4^+}\oplus\mathrm{M4^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g}\oplus\mathrm{B2_u}$
N139.9.76 $\mathrm{GM1^-}\oplus\mathrm{GM4^-}\oplus\mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N139.9.77 $\mathrm{GM1^-}\oplus\mathrm{GM4^-}\oplus\mathrm{M1^+}$	$\surd$	0	0	$\surd$	-	-
N139.9.78 $\mathrm{GM1^-}\oplus\mathrm{GM4^-}\oplus\mathrm{M1^-}$	$\surd$	0	0	$\surd$	-	-
N139.9.79 $\mathrm{GM1^-}\oplus\mathrm{GM4^-}\oplus\mathrm{M2^+}$	$\surd$	0	0	$\surd$	-	-
N139.9.80 $\mathrm{GM1^-}\oplus\mathrm{GM4^-}\oplus\mathrm{M2^-}$	$\surd$	0	0	$\surd$	-	-
N139.9.81 $\mathrm{GM1^-}\oplus\mathrm{GM4^-}\oplus\mathrm{M3^+}$	$\surd$	0	0	$\surd$	-	-
N139.9.82 $\mathrm{GM1^-}\oplus\mathrm{GM4^-}\oplus\mathrm{M3^-}$	$\surd$	0	0	$\surd$	-	-
N139.9.83 $\mathrm{GM1^-}\oplus\mathrm{GM4^-}\oplus\mathrm{M4^+}$	$\surd$	0	0	$\surd$	-	-
N139.9.84 $\mathrm{GM1^-}\oplus\mathrm{GM4^-}\oplus\mathrm{M4^-}$	$\surd$	0	0	$\surd$	-	-
N139.9.85 $\mathrm{GM1^-}\oplus\mathrm{M1^+}\oplus\mathrm{M1^+}$	$\surd$	1	0	$\times$	-	-
N139.9.86 $\mathrm{GM1^-}\oplus\mathrm{M1^+}\oplus\mathrm{M1^-}$	$\surd$	1	1	$\times$	-	-
N139.9.87 $\mathrm{GM1^-}\oplus\mathrm{M1^+}\oplus\mathrm{M2^+}$	$\surd$	1	0	$\times$	-	-
N139.9.88 $\mathrm{GM1^-}\oplus\mathrm{M1^+}\oplus\mathrm{M2^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_u}$
N139.9.89 $\mathrm{GM1^-}\oplus\mathrm{M1^+}\oplus\mathrm{M3^+}$	$\surd$	1	0	$\times$	-	-
N139.9.90 $\mathrm{GM1^-}\oplus\mathrm{M1^+}\oplus\mathrm{M3^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N139.9.91 $\mathrm{GM1^-}\oplus\mathrm{M1^+}\oplus\mathrm{M4^+}$	$\surd$	1	0	$\times$	-	-
N139.9.92 $\mathrm{GM1^-}\oplus\mathrm{M1^+}\oplus\mathrm{M4^-}$	$\surd$	1	1	$\times$	-	-
N139.9.93 $\mathrm{GM1^-}\oplus\mathrm{M1^-}\oplus\mathrm{M1^-}$	$\surd$	1	0	$\times$	-	-
N139.9.94 $\mathrm{GM1^-}\oplus\mathrm{M1^-}\oplus\mathrm{M2^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_u}$
N139.9.95 $\mathrm{GM1^-}\oplus\mathrm{M1^-}\oplus\mathrm{M2^-}$	$\surd$	1	0	$\times$	-	-
N139.9.96 $\mathrm{GM1^-}\oplus\mathrm{M1^-}\oplus\mathrm{M3^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N139.9.97 $\mathrm{GM1^-}\oplus\mathrm{M1^-}\oplus\mathrm{M3^-}$	$\surd$	1	0	$\times$	-	-
N139.9.98 $\mathrm{GM1^-}\oplus\mathrm{M1^-}\oplus\mathrm{M4^+}$	$\surd$	1	1	$\times$	-	-
N139.9.99 $\mathrm{GM1^-}\oplus\mathrm{M1^-}\oplus\mathrm{M4^-}$	$\surd$	1	0	$\times$	-	-
N139.9.100 $\mathrm{GM1^-}\oplus\mathrm{M2^+}\oplus\mathrm{M2^+}$	$\surd$	1	0	$\times$	-	-
N139.9.101 $\mathrm{GM1^-}\oplus\mathrm{M2^+}\oplus\mathrm{M2^-}$	$\surd$	1	1	$\times$	-	-
N139.9.102 $\mathrm{GM1^-}\oplus\mathrm{M2^+}\oplus\mathrm{M3^+}$	$\surd$	1	0	$\times$	-	-
N139.9.103 $\mathrm{GM1^-}\oplus\mathrm{M2^+}\oplus\mathrm{M3^-}$	$\surd$	1	1	$\times$	-	-
N139.9.104 $\mathrm{GM1^-}\oplus\mathrm{M2^+}\oplus\mathrm{M4^+}$	$\surd$	1	0	$\times$	-	-
N139.9.105 $\mathrm{GM1^-}\oplus\mathrm{M2^+}\oplus\mathrm{M4^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N139.9.106 $\mathrm{GM1^-}\oplus\mathrm{M2^-}\oplus\mathrm{M2^-}$	$\surd$	1	0	$\times$	-	-
N139.9.107 $\mathrm{GM1^-}\oplus\mathrm{M2^-}\oplus\mathrm{M3^+}$	$\surd$	1	1	$\times$	-	-
N139.9.108 $\mathrm{GM1^-}\oplus\mathrm{M2^-}\oplus\mathrm{M3^-}$	$\surd$	1	0	$\times$	-	-
N139.9.109 $\mathrm{GM1^-}\oplus\mathrm{M2^-}\oplus\mathrm{M4^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N139.9.110 $\mathrm{GM1^-}\oplus\mathrm{M2^-}\oplus\mathrm{M4^-}$	$\surd$	1	0	$\times$	-	-
N139.9.111 $\mathrm{GM1^-}\oplus\mathrm{M3^+}\oplus\mathrm{M3^+}$	$\surd$	1	0	$\times$	-	-
N139.9.112 $\mathrm{GM1^-}\oplus\mathrm{M3^+}\oplus\mathrm{M3^-}$	$\surd$	1	1	$\times$	-	-
N139.9.113 $\mathrm{GM1^-}\oplus\mathrm{M3^+}\oplus\mathrm{M4^+}$	$\surd$	1	0	$\times$	-	-
N139.9.114 $\mathrm{GM1^-}\oplus\mathrm{M3^+}\oplus\mathrm{M4^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_u}$

Non-coplanar SSGs with parent space group $I4/mmm$ (No. 139) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N139.9.115 $\mathrm{GM1^-}\oplus\mathrm{M3^-}\oplus\mathrm{M3^-}$	$\surd$	1	0	$\times$	-	-
N139.9.116 $\mathrm{GM1^-}\oplus\mathrm{M3^-}\oplus\mathrm{M4^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_u}$
N139.9.117 $\mathrm{GM1^-}\oplus\mathrm{M3^-}\oplus\mathrm{M4^-}$	$\surd$	1	0	$\times$	-	-
N139.9.118 $\mathrm{GM1^-}\oplus\mathrm{M4^+}\oplus\mathrm{M4^+}$	$\surd$	1	0	$\times$	-	-
N139.9.119 $\mathrm{GM1^-}\oplus\mathrm{M4^+}\oplus\mathrm{M4^-}$	$\surd$	1	1	$\times$	-	-
N139.9.120 $\mathrm{GM1^-}\oplus\mathrm{M4^-}\oplus\mathrm{M4^-}$	$\surd$	1	0	$\times$	-	-
N139.9.121 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{GM2^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B1_g}$
N139.9.122 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{GM2^-}$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B1}\oplus\mathrm{B1}$
N139.9.123 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{GM3^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_g}\oplus\mathrm{A2_g}$
N139.9.124 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{GM3^-}$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{B1}\oplus\mathrm{B1}$
N139.9.125 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B2_g}$
N139.9.126 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{B1}\oplus\mathrm{B1}$
N139.9.127 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{M1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_g}$
N139.9.128 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_g}$
N139.9.129 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{M2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_g}$
N139.9.130 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_g}$
N139.9.131 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{M3^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_g}$
N139.9.132 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{M3^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_g}$
N139.9.133 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{M4^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_g}$
N139.9.134 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{M4^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_g}$
N139.9.135 $\mathrm{GM2^+}\oplus\mathrm{GM2^-}\oplus\mathrm{GM2^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A1_u}\oplus\mathrm{B1_g}$
N139.9.136 $\mathrm{GM2^+}\oplus\mathrm{GM2^-}\oplus\mathrm{GM3^+}$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{B1}\oplus\mathrm{A2}$
N139.9.137 $\mathrm{GM2^+}\oplus\mathrm{GM2^-}\oplus\mathrm{GM3^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B1_g}\oplus\mathrm{B2_u}$
N139.9.138 $\mathrm{GM2^+}\oplus\mathrm{GM2^-}\oplus\mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{B1}\oplus\mathrm{A2}$
N139.9.139 $\mathrm{GM2^+}\oplus\mathrm{GM2^-}\oplus\mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B1_g}\oplus\mathrm{A2_u}$
N139.9.140 $\mathrm{GM2^+}\oplus\mathrm{GM2^-}\oplus\mathrm{M1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B1_g}$
N139.9.141 $\mathrm{GM2^+}\oplus\mathrm{GM2^-}\oplus\mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B1_g}$
N139.9.142 $\mathrm{GM2^+}\oplus\mathrm{GM2^-}\oplus\mathrm{M2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B1_g}$
N139.9.143 $\mathrm{GM2^+}\oplus\mathrm{GM2^-}\oplus\mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B1_g}$
N139.9.144 $\mathrm{GM2^+}\oplus\mathrm{GM2^-}\oplus\mathrm{M3^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B1_g}$
N139.9.145 $\mathrm{GM2^+}\oplus\mathrm{GM2^-}\oplus\mathrm{M3^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B1_g}$
N139.9.146 $\mathrm{GM2^+}\oplus\mathrm{GM2^-}\oplus\mathrm{M4^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B1_g}$
N139.9.147 $\mathrm{GM2^+}\oplus\mathrm{GM2^-}\oplus\mathrm{M4^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B1_g}$
N139.9.148 $\mathrm{GM2^+}\oplus\mathrm{GM3^+}\oplus\mathrm{GM3^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_g}$
N139.9.149 $\mathrm{GM2^+}\oplus\mathrm{GM3^+}\oplus\mathrm{GM3^-}$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B1}\oplus\mathrm{A2}$
N139.9.150 $\mathrm{GM2^+}\oplus\mathrm{GM3^+}\oplus\mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_g}\oplus\mathrm{B2_g}$
N139.9.151 $\mathrm{GM2^+}\oplus\mathrm{GM3^+}\oplus\mathrm{GM4^-}$	$\surd$	2	2	$\surd$	422	$\mathrm{B1}\oplus\mathrm{A2}$
N139.9.152 $\mathrm{GM2^+}\oplus\mathrm{GM3^+}\oplus\mathrm{M1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_g}$
N139.9.153 $\mathrm{GM2^+}\oplus\mathrm{GM3^+}\oplus\mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_g}$
N139.9.154 $\mathrm{GM2^+}\oplus\mathrm{GM3^+}\oplus\mathrm{M2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_g}$
N139.9.155 $\mathrm{GM2^+}\oplus\mathrm{GM3^+}\oplus\mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_g}$
N139.9.156 $\mathrm{GM2^+}\oplus\mathrm{GM3^+}\oplus\mathrm{M3^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_g}$
N139.9.157 $\mathrm{GM2^+}\oplus\mathrm{GM3^+}\oplus\mathrm{M3^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_g}$
N139.9.158 $\mathrm{GM2^+}\oplus\mathrm{GM3^+}\oplus\mathrm{M4^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_g}$
N139.9.159 $\mathrm{GM2^+}\oplus\mathrm{GM3^+}\oplus\mathrm{M4^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_g}$
N139.9.160 $\mathrm{GM2^+}\oplus\mathrm{GM3^-}\oplus\mathrm{GM3^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B2_u}\oplus\mathrm{B2_u}$

Non-coplanar SSGs with parent space group $I4/mmm$ (No. 139) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N139.9.161 $\mathrm{GM2^+} \oplus \mathrm{GM3^-} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	422	$\mathrm{B1} \oplus \mathrm{B2}$
N139.9.162 $\mathrm{GM2^+} \oplus \mathrm{GM3^-} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N139.9.163 $\mathrm{GM2^+} \oplus \mathrm{GM3^-} \oplus \mathrm{M1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N139.9.164 $\mathrm{GM2^+} \oplus \mathrm{GM3^-} \oplus \mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N139.9.165 $\mathrm{GM2^+} \oplus \mathrm{GM3^-} \oplus \mathrm{M2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N139.9.166 $\mathrm{GM2^+} \oplus \mathrm{GM3^-} \oplus \mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N139.9.167 $\mathrm{GM2^+} \oplus \mathrm{GM3^-} \oplus \mathrm{M3^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N139.9.168 $\mathrm{GM2^+} \oplus \mathrm{GM3^-} \oplus \mathrm{M3^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N139.9.169 $\mathrm{GM2^+} \oplus \mathrm{GM3^-} \oplus \mathrm{M4^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N139.9.170 $\mathrm{GM2^+} \oplus \mathrm{GM3^-} \oplus \mathrm{M4^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N139.9.171 $\mathrm{GM2^+} \oplus \mathrm{GM4^+} \oplus \mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N139.9.172 $\mathrm{GM2^+} \oplus \mathrm{GM4^+} \oplus \mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B1} \oplus \mathrm{B2}$
N139.9.173 $\mathrm{GM2^+} \oplus \mathrm{GM4^+} \oplus \mathrm{M1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
N139.9.174 $\mathrm{GM2^+} \oplus \mathrm{GM4^+} \oplus \mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
N139.9.175 $\mathrm{GM2^+} \oplus \mathrm{GM4^+} \oplus \mathrm{M2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
N139.9.176 $\mathrm{GM2^+} \oplus \mathrm{GM4^+} \oplus \mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
N139.9.177 $\mathrm{GM2^+} \oplus \mathrm{GM4^+} \oplus \mathrm{M3^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
N139.9.178 $\mathrm{GM2^+} \oplus \mathrm{GM4^+} \oplus \mathrm{M3^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
N139.9.179 $\mathrm{GM2^+} \oplus \mathrm{GM4^+} \oplus \mathrm{M4^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
N139.9.180 $\mathrm{GM2^+} \oplus \mathrm{GM4^+} \oplus \mathrm{M4^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
N139.9.181 $\mathrm{GM2^+} \oplus \mathrm{GM4^-} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N139.9.182 $\mathrm{GM2^+} \oplus \mathrm{GM4^-} \oplus \mathrm{M1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u}$
N139.9.183 $\mathrm{GM2^+} \oplus \mathrm{GM4^-} \oplus \mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u}$
N139.9.184 $\mathrm{GM2^+} \oplus \mathrm{GM4^-} \oplus \mathrm{M2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u}$
N139.9.185 $\mathrm{GM2^+} \oplus \mathrm{GM4^-} \oplus \mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u}$
N139.9.186 $\mathrm{GM2^+} \oplus \mathrm{GM4^-} \oplus \mathrm{M3^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u}$
N139.9.187 $\mathrm{GM2^+} \oplus \mathrm{GM4^-} \oplus \mathrm{M3^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u}$
N139.9.188 $\mathrm{GM2^+} \oplus \mathrm{GM4^-} \oplus \mathrm{M4^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u}$
N139.9.189 $\mathrm{GM2^+} \oplus \mathrm{GM4^-} \oplus \mathrm{M4^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u}$
N139.9.190 $\mathrm{GM2^+} \oplus \mathrm{M1^+} \oplus \mathrm{M1^+}$	$\surd$	1	1	$\times$	-	-
N139.9.191 $\mathrm{GM2^+} \oplus \mathrm{M1^+} \oplus \mathrm{M1^-}$	$\surd$	1	1	$\times$	-	-
N139.9.192 $\mathrm{GM2^+} \oplus \mathrm{M1^+} \oplus \mathrm{M2^+}$	$\surd$	1	1	$\times$	-	-
N139.9.193 $\mathrm{GM2^+} \oplus \mathrm{M1^+} \oplus \mathrm{M2^-}$	$\surd$	1	1	$\surd$	422	B1
N139.9.194 $\mathrm{GM2^+} \oplus \mathrm{M1^+} \oplus \mathrm{M3^+}$	$\surd$	1	1	$\times$	-	-
N139.9.195 $\mathrm{GM2^+} \oplus \mathrm{M1^+} \oplus \mathrm{M3^-}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N139.9.196 $\mathrm{GM2^+} \oplus \mathrm{M1^+} \oplus \mathrm{M4^+}$	$\surd$	1	1	$\times$	-	-
N139.9.197 $\mathrm{GM2^+} \oplus \mathrm{M1^+} \oplus \mathrm{M4^-}$	$\surd$	1	1	$\times$	-	-
N139.9.198 $\mathrm{GM2^+} \oplus \mathrm{M1^-} \oplus \mathrm{M1^-}$	$\surd$	1	1	$\times$	-	-
N139.9.199 $\mathrm{GM2^+} \oplus \mathrm{M1^-} \oplus \mathrm{M2^+}$	$\surd$	1	1	$\surd$	422	B1
N139.9.200 $\mathrm{GM2^+} \oplus \mathrm{M1^-} \oplus \mathrm{M2^-}$	$\surd$	1	1	$\times$	-	-
N139.9.201 $\mathrm{GM2^+} \oplus \mathrm{M1^-} \oplus \mathrm{M3^+}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N139.9.202 $\mathrm{GM2^+} \oplus \mathrm{M1^-} \oplus \mathrm{M3^-}$	$\surd$	1	1	$\times$	-	-
N139.9.203 $\mathrm{GM2^+} \oplus \mathrm{M1^-} \oplus \mathrm{M4^+}$	$\surd$	1	1	$\times$	-	-
N139.9.204 $\mathrm{GM2^+} \oplus \mathrm{M1^-} \oplus \mathrm{M4^-}$	$\surd$	1	1	$\times$	-	-
N139.9.205 $\mathrm{GM2^+} \oplus \mathrm{M2^+} \oplus \mathrm{M2^+}$	$\surd$	1	1	$\times$	-	-
N139.9.206 $\mathrm{GM2^+} \oplus \mathrm{M2^+} \oplus \mathrm{M2^-}$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $I4/mmm$ (No. 139) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N139.9.207 $\mathrm{GM2^+} \oplus \mathrm{M2^+} \oplus \mathrm{M3^+}$	$\surd$	1	1	$\times$	-	-
N139.9.208 $\mathrm{GM2^+} \oplus \mathrm{M2^+} \oplus \mathrm{M3^-}$	$\surd$	1	1	$\times$	-	-
N139.9.209 $\mathrm{GM2^+} \oplus \mathrm{M2^+} \oplus \mathrm{M4^+}$	$\surd$	1	1	$\times$	-	-
N139.9.210 $\mathrm{GM2^+} \oplus \mathrm{M2^+} \oplus \mathrm{M4^-}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N139.9.211 $\mathrm{GM2^+} \oplus \mathrm{M2^-} \oplus \mathrm{M2^-}$	$\surd$	1	1	$\times$	-	-
N139.9.212 $\mathrm{GM2^+} \oplus \mathrm{M2^-} \oplus \mathrm{M3^+}$	$\surd$	1	1	$\times$	-	-
N139.9.213 $\mathrm{GM2^+} \oplus \mathrm{M2^-} \oplus \mathrm{M3^-}$	$\surd$	1	1	$\times$	-	-
N139.9.214 $\mathrm{GM2^+} \oplus \mathrm{M2^-} \oplus \mathrm{M4^+}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N139.9.215 $\mathrm{GM2^+} \oplus \mathrm{M2^-} \oplus \mathrm{M4^-}$	$\surd$	1	1	$\times$	-	-
N139.9.216 $\mathrm{GM2^+} \oplus \mathrm{M3^+} \oplus \mathrm{M3^+}$	$\surd$	1	1	$\times$	-	-
N139.9.217 $\mathrm{GM2^+} \oplus \mathrm{M3^+} \oplus \mathrm{M3^-}$	$\surd$	1	1	$\times$	-	-
N139.9.218 $\mathrm{GM2^+} \oplus \mathrm{M3^+} \oplus \mathrm{M4^+}$	$\surd$	1	1	$\times$	-	-
N139.9.219 $\mathrm{GM2^+} \oplus \mathrm{M3^+} \oplus \mathrm{M4^-}$	$\surd$	1	1	$\surd$	422	B1
N139.9.220 $\mathrm{GM2^+} \oplus \mathrm{M3^-} \oplus \mathrm{M3^-}$	$\surd$	1	1	$\times$	-	-
N139.9.221 $\mathrm{GM2^+} \oplus \mathrm{M3^-} \oplus \mathrm{M4^+}$	$\surd$	1	1	$\surd$	422	B1
N139.9.222 $\mathrm{GM2^+} \oplus \mathrm{M3^-} \oplus \mathrm{M4^-}$	$\surd$	1	1	$\times$	-	-
N139.9.223 $\mathrm{GM2^+} \oplus \mathrm{M4^+} \oplus \mathrm{M4^+}$	$\surd$	1	1	$\times$	-	-
N139.9.224 $\mathrm{GM2^+} \oplus \mathrm{M4^+} \oplus \mathrm{M4^-}$	$\surd$	1	1	$\times$	-	-
N139.9.225 $\mathrm{GM2^+} \oplus \mathrm{M4^-} \oplus \mathrm{M4^-}$	$\surd$	1	1	$\times$	-	-
N139.9.226 $\mathrm{GM2^-} \oplus \mathrm{GM2^-} \oplus \mathrm{GM2^-}$	$\surd$	0	0	$\surd$	-	-
N139.9.227 $\mathrm{GM2^-} \oplus \mathrm{GM2^-} \oplus \mathrm{GM3^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N139.9.228 $\mathrm{GM2^-} \oplus \mathrm{GM2^-} \oplus \mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
N139.9.229 $\mathrm{GM2^-} \oplus \mathrm{GM2^-} \oplus \mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$
N139.9.230 $\mathrm{GM2^-} \oplus \mathrm{GM2^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N139.9.231 $\mathrm{GM2^-} \oplus \mathrm{GM2^-} \oplus \mathrm{M1^+}$	$\surd$	0	0	$\surd$	-	-
N139.9.232 $\mathrm{GM2^-} \oplus \mathrm{GM2^-} \oplus \mathrm{M1^-}$	$\surd$	0	0	$\surd$	-	-
N139.9.233 $\mathrm{GM2^-} \oplus \mathrm{GM2^-} \oplus \mathrm{M2^+}$	$\surd$	0	0	$\surd$	-	-
N139.9.234 $\mathrm{GM2^-} \oplus \mathrm{GM2^-} \oplus \mathrm{M2^-}$	$\surd$	0	0	$\surd$	-	-
N139.9.235 $\mathrm{GM2^-} \oplus \mathrm{GM2^-} \oplus \mathrm{M3^+}$	$\surd$	0	0	$\surd$	-	-
N139.9.236 $\mathrm{GM2^-} \oplus \mathrm{GM2^-} \oplus \mathrm{M3^-}$	$\surd$	0	0	$\surd$	-	-
N139.9.237 $\mathrm{GM2^-} \oplus \mathrm{GM2^-} \oplus \mathrm{M4^+}$	$\surd$	0	0	$\surd$	-	-
N139.9.238 $\mathrm{GM2^-} \oplus \mathrm{GM2^-} \oplus \mathrm{M4^-}$	$\surd$	0	0	$\surd$	-	-
N139.9.239 $\mathrm{GM2^-} \oplus \mathrm{GM3^+} \oplus \mathrm{GM3^+}$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{A2} \oplus \mathrm{A2}$
N139.9.240 $\mathrm{GM2^-} \oplus \mathrm{GM3^+} \oplus \mathrm{GM3^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{B2_u}$
N139.9.241 $\mathrm{GM2^-} \oplus \mathrm{GM3^+} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	422	$\mathrm{A2} \oplus \mathrm{B2}$
N139.9.242 $\mathrm{GM2^-} \oplus \mathrm{GM3^+} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g} \oplus \mathrm{B2_u}$
N139.9.243 $\mathrm{GM2^-} \oplus \mathrm{GM3^+} \oplus \mathrm{M1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_u}$
N139.9.244 $\mathrm{GM2^-} \oplus \mathrm{GM3^+} \oplus \mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_u}$
N139.9.245 $\mathrm{GM2^-} \oplus \mathrm{GM3^+} \oplus \mathrm{M2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_u}$
N139.9.246 $\mathrm{GM2^-} \oplus \mathrm{GM3^+} \oplus \mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_u}$
N139.9.247 $\mathrm{GM2^-} \oplus \mathrm{GM3^+} \oplus \mathrm{M3^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_u}$
N139.9.248 $\mathrm{GM2^-} \oplus \mathrm{GM3^+} \oplus \mathrm{M3^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_u}$
N139.9.249 $\mathrm{GM2^-} \oplus \mathrm{GM3^+} \oplus \mathrm{M4^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_u}$
N139.9.250 $\mathrm{GM2^-} \oplus \mathrm{GM3^+} \oplus \mathrm{M4^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_u}$
N139.9.251 $\mathrm{GM2^-} \oplus \mathrm{GM3^-} \oplus \mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
N139.9.252 $\mathrm{GM2^-} \oplus \mathrm{GM3^-} \oplus \mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$

Non-coplanar SSGs with parent space group $I4/mmm$ (No. 139) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N139.9.253 $\mathrm{GM2^-}\oplus\mathrm{GM3^-}\oplus\mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N139.9.254 $\mathrm{GM2^-}\oplus\mathrm{GM3^-}\oplus\mathrm{M1^+}$	$\surd$	0	0	$\surd$	-	-
N139.9.255 $\mathrm{GM2^-}\oplus\mathrm{GM3^-}\oplus\mathrm{M1^-}$	$\surd$	0	0	$\surd$	-	-
N139.9.256 $\mathrm{GM2^-}\oplus\mathrm{GM3^-}\oplus\mathrm{M2^+}$	$\surd$	0	0	$\surd$	-	-
N139.9.257 $\mathrm{GM2^-}\oplus\mathrm{GM3^-}\oplus\mathrm{M2^-}$	$\surd$	0	0	$\surd$	-	-
N139.9.258 $\mathrm{GM2^-}\oplus\mathrm{GM3^-}\oplus\mathrm{M3^+}$	$\surd$	0	0	$\surd$	-	-
N139.9.259 $\mathrm{GM2^-}\oplus\mathrm{GM3^-}\oplus\mathrm{M3^-}$	$\surd$	0	0	$\surd$	-	-
N139.9.260 $\mathrm{GM2^-}\oplus\mathrm{GM3^-}\oplus\mathrm{M4^+}$	$\surd$	0	0	$\surd$	-	-
N139.9.261 $\mathrm{GM2^-}\oplus\mathrm{GM3^-}\oplus\mathrm{M4^-}$	$\surd$	0	0	$\surd$	-	-
N139.9.262 $\mathrm{GM2^-}\oplus\mathrm{GM4^+}\oplus\mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B2}\oplus\mathrm{B2}$
N139.9.263 $\mathrm{GM2^-}\oplus\mathrm{GM4^+}\oplus\mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A2_u}\oplus\mathrm{B2_g}$
N139.9.264 $\mathrm{GM2^-}\oplus\mathrm{GM4^+}\oplus\mathrm{M1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u}\oplus\mathrm{B2_g}$
N139.9.265 $\mathrm{GM2^-}\oplus\mathrm{GM4^+}\oplus\mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u}\oplus\mathrm{B2_g}$
N139.9.266 $\mathrm{GM2^-}\oplus\mathrm{GM4^+}\oplus\mathrm{M2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u}\oplus\mathrm{B2_g}$
N139.9.267 $\mathrm{GM2^-}\oplus\mathrm{GM4^+}\oplus\mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u}\oplus\mathrm{B2_g}$
N139.9.268 $\mathrm{GM2^-}\oplus\mathrm{GM4^+}\oplus\mathrm{M3^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u}\oplus\mathrm{B2_g}$
N139.9.269 $\mathrm{GM2^-}\oplus\mathrm{GM4^+}\oplus\mathrm{M3^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u}\oplus\mathrm{B2_g}$
N139.9.270 $\mathrm{GM2^-}\oplus\mathrm{GM4^+}\oplus\mathrm{M4^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u}\oplus\mathrm{B2_g}$
N139.9.271 $\mathrm{GM2^-}\oplus\mathrm{GM4^+}\oplus\mathrm{M4^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u}\oplus\mathrm{B2_g}$
N139.9.272 $\mathrm{GM2^-}\oplus\mathrm{GM4^-}\oplus\mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N139.9.273 $\mathrm{GM2^-}\oplus\mathrm{GM4^-}\oplus\mathrm{M1^+}$	$\surd$	0	0	$\surd$	-	-
N139.9.274 $\mathrm{GM2^-}\oplus\mathrm{GM4^-}\oplus\mathrm{M1^-}$	$\surd$	0	0	$\surd$	-	-
N139.9.275 $\mathrm{GM2^-}\oplus\mathrm{GM4^-}\oplus\mathrm{M2^+}$	$\surd$	0	0	$\surd$	-	-
N139.9.276 $\mathrm{GM2^-}\oplus\mathrm{GM4^-}\oplus\mathrm{M2^-}$	$\surd$	0	0	$\surd$	-	-
N139.9.277 $\mathrm{GM2^-}\oplus\mathrm{GM4^-}\oplus\mathrm{M3^+}$	$\surd$	0	0	$\surd$	-	-
N139.9.278 $\mathrm{GM2^-}\oplus\mathrm{GM4^-}\oplus\mathrm{M3^-}$	$\surd$	0	0	$\surd$	-	-
N139.9.279 $\mathrm{GM2^-}\oplus\mathrm{GM4^-}\oplus\mathrm{M4^+}$	$\surd$	0	0	$\surd$	-	-
N139.9.280 $\mathrm{GM2^-}\oplus\mathrm{GM4^-}\oplus\mathrm{M4^-}$	$\surd$	0	0	$\surd$	-	-
N139.9.281 $\mathrm{GM2^-}\oplus\mathrm{M1^+}\oplus\mathrm{M1^+}$	$\surd$	1	0	$\times$	-	-
N139.9.282 $\mathrm{GM2^-}\oplus\mathrm{M1^+}\oplus\mathrm{M1^-}$	$\surd$	1	1	$\times$	-	-
N139.9.283 $\mathrm{GM2^-}\oplus\mathrm{M1^+}\oplus\mathrm{M2^+}$	$\surd$	1	0	$\times$	-	-
N139.9.284 $\mathrm{GM2^-}\oplus\mathrm{M1^+}\oplus\mathrm{M2^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_u}$
N139.9.285 $\mathrm{GM2^-}\oplus\mathrm{M1^+}\oplus\mathrm{M3^+}$	$\surd$	1	0	$\times$	-	-
N139.9.286 $\mathrm{GM2^-}\oplus\mathrm{M1^+}\oplus\mathrm{M3^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N139.9.287 $\mathrm{GM2^-}\oplus\mathrm{M1^+}\oplus\mathrm{M4^+}$	$\surd$	1	0	$\times$	-	-
N139.9.288 $\mathrm{GM2^-}\oplus\mathrm{M1^+}\oplus\mathrm{M4^-}$	$\surd$	1	1	$\times$	-	-
N139.9.289 $\mathrm{GM2^-}\oplus\mathrm{M1^-}\oplus\mathrm{M1^-}$	$\surd$	1	0	$\times$	-	-
N139.9.290 $\mathrm{GM2^-}\oplus\mathrm{M1^-}\oplus\mathrm{M2^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_u}$
N139.9.291 $\mathrm{GM2^-}\oplus\mathrm{M1^-}\oplus\mathrm{M2^-}$	$\surd$	1	0	$\times$	-	-
N139.9.292 $\mathrm{GM2^-}\oplus\mathrm{M1^-}\oplus\mathrm{M3^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N139.9.293 $\mathrm{GM2^-}\oplus\mathrm{M1^-}\oplus\mathrm{M3^-}$	$\surd$	1	0	$\times$	-	-
N139.9.294 $\mathrm{GM2^-}\oplus\mathrm{M1^-}\oplus\mathrm{M4^+}$	$\surd$	1	1	$\times$	-	-
N139.9.295 $\mathrm{GM2^-}\oplus\mathrm{M1^-}\oplus\mathrm{M4^-}$	$\surd$	1	0	$\times$	-	-
N139.9.296 $\mathrm{GM2^-}\oplus\mathrm{M2^+}\oplus\mathrm{M2^+}$	$\surd$	1	0	$\times$	-	-
N139.9.297 $\mathrm{GM2^-}\oplus\mathrm{M2^+}\oplus\mathrm{M2^-}$	$\surd$	1	1	$\times$	-	-
N139.9.298 $\mathrm{GM2^-}\oplus\mathrm{M2^+}\oplus\mathrm{M3^+}$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $I4/mmm$ (No. 139) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N139.9.299 $\mathrm{GM2^-}\oplus\mathrm{M2^+}\oplus\mathrm{M3^-}$	$\surd$	1	1	$\times$	-	-
N139.9.300 $\mathrm{GM2^-}\oplus\mathrm{M2^+}\oplus\mathrm{M4^+}$	$\surd$	1	0	$\times$	-	-
N139.9.301 $\mathrm{GM2^-}\oplus\mathrm{M2^+}\oplus\mathrm{M4^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N139.9.302 $\mathrm{GM2^-}\oplus\mathrm{M2^-}\oplus\mathrm{M2^-}$	$\surd$	1	0	$\times$	-	-
N139.9.303 $\mathrm{GM2^-}\oplus\mathrm{M2^-}\oplus\mathrm{M3^+}$	$\surd$	1	1	$\times$	-	-
N139.9.304 $\mathrm{GM2^-}\oplus\mathrm{M2^-}\oplus\mathrm{M3^-}$	$\surd$	1	0	$\times$	-	-
N139.9.305 $\mathrm{GM2^-}\oplus\mathrm{M2^-}\oplus\mathrm{M4^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N139.9.306 $\mathrm{GM2^-}\oplus\mathrm{M2^-}\oplus\mathrm{M4^-}$	$\surd$	1	0	$\times$	-	-
N139.9.307 $\mathrm{GM2^-}\oplus\mathrm{M3^+}\oplus\mathrm{M3^+}$	$\surd$	1	0	$\times$	-	-
N139.9.308 $\mathrm{GM2^-}\oplus\mathrm{M3^+}\oplus\mathrm{M3^-}$	$\surd$	1	1	$\times$	-	-
N139.9.309 $\mathrm{GM2^-}\oplus\mathrm{M3^+}\oplus\mathrm{M4^+}$	$\surd$	1	0	$\times$	-	-
N139.9.310 $\mathrm{GM2^-}\oplus\mathrm{M3^+}\oplus\mathrm{M4^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_u}$
N139.9.311 $\mathrm{GM2^-}\oplus\mathrm{M3^-}\oplus\mathrm{M3^-}$	$\surd$	1	0	$\times$	-	-
N139.9.312 $\mathrm{GM2^-}\oplus\mathrm{M3^-}\oplus\mathrm{M4^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_u}$
N139.9.313 $\mathrm{GM2^-}\oplus\mathrm{M3^-}\oplus\mathrm{M4^-}$	$\surd$	1	0	$\times$	-	-
N139.9.314 $\mathrm{GM2^-}\oplus\mathrm{M4^+}\oplus\mathrm{M4^+}$	$\surd$	1	0	$\times$	-	-
N139.9.315 $\mathrm{GM2^-}\oplus\mathrm{M4^+}\oplus\mathrm{M4^-}$	$\surd$	1	1	$\times$	-	-
N139.9.316 $\mathrm{GM2^-}\oplus\mathrm{M4^-}\oplus\mathrm{M4^-}$	$\surd$	1	0	$\times$	-	-
N139.9.317 $\mathrm{GM3^+}\oplus\mathrm{GM3^+}\oplus\mathrm{GM3^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_g}$
N139.9.318 $\mathrm{GM3^+}\oplus\mathrm{GM3^+}\oplus\mathrm{GM3^-}$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{A2}\oplus\mathrm{A2}$
N139.9.319 $\mathrm{GM3^+}\oplus\mathrm{GM3^+}\oplus\mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{A2_g}\oplus\mathrm{B2_g}$
N139.9.320 $\mathrm{GM3^+}\oplus\mathrm{GM3^+}\oplus\mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{B2}\oplus\mathrm{B2}$
N139.9.321 $\mathrm{GM3^+}\oplus\mathrm{GM3^+}\oplus\mathrm{M1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{A2_g}$
N139.9.322 $\mathrm{GM3^+}\oplus\mathrm{GM3^+}\oplus\mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{A2_g}$
N139.9.323 $\mathrm{GM3^+}\oplus\mathrm{GM3^+}\oplus\mathrm{M2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{A2_g}$
N139.9.324 $\mathrm{GM3^+}\oplus\mathrm{GM3^+}\oplus\mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{A2_g}$
N139.9.325 $\mathrm{GM3^+}\oplus\mathrm{GM3^+}\oplus\mathrm{M3^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{A2_g}$
N139.9.326 $\mathrm{GM3^+}\oplus\mathrm{GM3^+}\oplus\mathrm{M3^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{A2_g}$
N139.9.327 $\mathrm{GM3^+}\oplus\mathrm{GM3^+}\oplus\mathrm{M4^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{A2_g}$
N139.9.328 $\mathrm{GM3^+}\oplus\mathrm{GM3^+}\oplus\mathrm{M4^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{A2_g}$
N139.9.329 $\mathrm{GM3^+}\oplus\mathrm{GM3^-}\oplus\mathrm{GM3^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A1_u}\oplus\mathrm{A2_g}$
N139.9.330 $\mathrm{GM3^+}\oplus\mathrm{GM3^-}\oplus\mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{B2}\oplus\mathrm{A2}$
N139.9.331 $\mathrm{GM3^+}\oplus\mathrm{GM3^-}\oplus\mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B1_u}\oplus\mathrm{A2_g}$
N139.9.332 $\mathrm{GM3^+}\oplus\mathrm{GM3^-}\oplus\mathrm{M1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A2_g}$
N139.9.333 $\mathrm{GM3^+}\oplus\mathrm{GM3^-}\oplus\mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A2_g}$
N139.9.334 $\mathrm{GM3^+}\oplus\mathrm{GM3^-}\oplus\mathrm{M2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A2_g}$
N139.9.335 $\mathrm{GM3^+}\oplus\mathrm{GM3^-}\oplus\mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A2_g}$
N139.9.336 $\mathrm{GM3^+}\oplus\mathrm{GM3^-}\oplus\mathrm{M3^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A2_g}$
N139.9.337 $\mathrm{GM3^+}\oplus\mathrm{GM3^-}\oplus\mathrm{M3^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A2_g}$
N139.9.338 $\mathrm{GM3^+}\oplus\mathrm{GM3^-}\oplus\mathrm{M4^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A2_g}$
N139.9.339 $\mathrm{GM3^+}\oplus\mathrm{GM3^-}\oplus\mathrm{M4^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A2_g}$
N139.9.340 $\mathrm{GM3^+}\oplus\mathrm{GM4^+}\oplus\mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{B2_g}\oplus\mathrm{B2_g}$
N139.9.341 $\mathrm{GM3^+}\oplus\mathrm{GM4^+}\oplus\mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{B2}\oplus\mathrm{A2}$
N139.9.342 $\mathrm{GM3^+}\oplus\mathrm{GM4^+}\oplus\mathrm{M1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{B2_g}$
N139.9.343 $\mathrm{GM3^+}\oplus\mathrm{GM4^+}\oplus\mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{B2_g}$
N139.9.344 $\mathrm{GM3^+}\oplus\mathrm{GM4^+}\oplus\mathrm{M2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{B2_g}$

Non-coplanar SSGs with parent space group $I4/mmm$ (No. 139) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N139.9.345 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g}$
N139.9.346 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{M3^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g}$
N139.9.347 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{M3^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g}$
N139.9.348 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{M4^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g}$
N139.9.349 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{M4^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g}$
N139.9.350 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{A2_g}$
N139.9.351 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{M1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g}$
N139.9.352 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g}$
N139.9.353 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{M2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g}$
N139.9.354 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g}$
N139.9.355 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{M3^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g}$
N139.9.356 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{M3^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g}$
N139.9.357 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{M4^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g}$
N139.9.358 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{M4^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g}$
N139.9.359 $\mathrm{GM3^+} \oplus \mathrm{M1^+} \oplus \mathrm{M1^+}$	$\surd$	1	1	$\times$	-	-
N139.9.360 $\mathrm{GM3^+} \oplus \mathrm{M1^+} \oplus \mathrm{M1^-}$	$\surd$	1	1	$\times$	-	-
N139.9.361 $\mathrm{GM3^+} \oplus \mathrm{M1^+} \oplus \mathrm{M2^+}$	$\surd$	1	1	$\times$	-	-
N139.9.362 $\mathrm{GM3^+} \oplus \mathrm{M1^+} \oplus \mathrm{M2^-}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B2
N139.9.363 $\mathrm{GM3^+} \oplus \mathrm{M1^+} \oplus \mathrm{M3^+}$	$\surd$	1	1	$\times$	-	-
N139.9.364 $\mathrm{GM3^+} \oplus \mathrm{M1^+} \oplus \mathrm{M3^-}$	$\surd$	1	1	$\surd$	422	A2
N139.9.365 $\mathrm{GM3^+} \oplus \mathrm{M1^+} \oplus \mathrm{M4^+}$	$\surd$	1	1	$\times$	-	-
N139.9.366 $\mathrm{GM3^+} \oplus \mathrm{M1^+} \oplus \mathrm{M4^-}$	$\surd$	1	1	$\times$	-	-
N139.9.367 $\mathrm{GM3^+} \oplus \mathrm{M1^-} \oplus \mathrm{M1^-}$	$\surd$	1	1	$\times$	-	-
N139.9.368 $\mathrm{GM3^+} \oplus \mathrm{M1^-} \oplus \mathrm{M2^+}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B2
N139.9.369 $\mathrm{GM3^+} \oplus \mathrm{M1^-} \oplus \mathrm{M2^-}$	$\surd$	1	1	$\times$	-	-
N139.9.370 $\mathrm{GM3^+} \oplus \mathrm{M1^-} \oplus \mathrm{M3^+}$	$\surd$	1	1	$\surd$	422	A2
N139.9.371 $\mathrm{GM3^+} \oplus \mathrm{M1^-} \oplus \mathrm{M3^-}$	$\surd$	1	1	$\times$	-	-
N139.9.372 $\mathrm{GM3^+} \oplus \mathrm{M1^-} \oplus \mathrm{M4^+}$	$\surd$	1	1	$\times$	-	-
N139.9.373 $\mathrm{GM3^+} \oplus \mathrm{M1^-} \oplus \mathrm{M4^-}$	$\surd$	1	1	$\times$	-	-
N139.9.374 $\mathrm{GM3^+} \oplus \mathrm{M2^+} \oplus \mathrm{M2^+}$	$\surd$	1	1	$\times$	-	-
N139.9.375 $\mathrm{GM3^+} \oplus \mathrm{M2^+} \oplus \mathrm{M2^-}$	$\surd$	1	1	$\times$	-	-
N139.9.376 $\mathrm{GM3^+} \oplus \mathrm{M2^+} \oplus \mathrm{M3^+}$	$\surd$	1	1	$\times$	-	-
N139.9.377 $\mathrm{GM3^+} \oplus \mathrm{M2^+} \oplus \mathrm{M3^-}$	$\surd$	1	1	$\times$	-	-
N139.9.378 $\mathrm{GM3^+} \oplus \mathrm{M2^+} \oplus \mathrm{M4^+}$	$\surd$	1	1	$\times$	-	-
N139.9.379 $\mathrm{GM3^+} \oplus \mathrm{M2^+} \oplus \mathrm{M4^-}$	$\surd$	1	1	$\surd$	422	A2
N139.9.380 $\mathrm{GM3^+} \oplus \mathrm{M2^-} \oplus \mathrm{M2^-}$	$\surd$	1	1	$\times$	-	-
N139.9.381 $\mathrm{GM3^+} \oplus \mathrm{M2^-} \oplus \mathrm{M3^+}$	$\surd$	1	1	$\times$	-	-
N139.9.382 $\mathrm{GM3^+} \oplus \mathrm{M2^-} \oplus \mathrm{M3^-}$	$\surd$	1	1	$\times$	-	-
N139.9.383 $\mathrm{GM3^+} \oplus \mathrm{M2^-} \oplus \mathrm{M4^+}$	$\surd$	1	1	$\surd$	422	A2
N139.9.384 $\mathrm{GM3^+} \oplus \mathrm{M2^-} \oplus \mathrm{M4^-}$	$\surd$	1	1	$\times$	-	-
N139.9.385 $\mathrm{GM3^+} \oplus \mathrm{M3^+} \oplus \mathrm{M3^+}$	$\surd$	1	1	$\times$	-	-
N139.9.386 $\mathrm{GM3^+} \oplus \mathrm{M3^+} \oplus \mathrm{M3^-}$	$\surd$	1	1	$\times$	-	-
N139.9.387 $\mathrm{GM3^+} \oplus \mathrm{M3^+} \oplus \mathrm{M4^+}$	$\surd$	1	1	$\times$	-	-
N139.9.388 $\mathrm{GM3^+} \oplus \mathrm{M3^+} \oplus \mathrm{M4^-}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B2
N139.9.389 $\mathrm{GM3^+} \oplus \mathrm{M3^-} \oplus \mathrm{M3^-}$	$\surd$	1	1	$\times$	-	-
N139.9.390 $\mathrm{GM3^+} \oplus \mathrm{M3^-} \oplus \mathrm{M4^+}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B2

Non-coplanar SSGs with parent space group $I4/mmm$ (No. 139) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N139.9.391 $\mathrm{GM3^+} \oplus \mathrm{M3^-} \oplus \mathrm{M4^-}$	$\surd$	1	1	$\times$	-	-
N139.9.392 $\mathrm{GM3^+} \oplus \mathrm{M4^+} \oplus \mathrm{M4^+}$	$\surd$	1	1	$\times$	-	-
N139.9.393 $\mathrm{GM3^+} \oplus \mathrm{M4^+} \oplus \mathrm{M4^-}$	$\surd$	1	1	$\times$	-	-
N139.9.394 $\mathrm{GM3^+} \oplus \mathrm{M4^-} \oplus \mathrm{M4^-}$	$\surd$	1	1	$\times$	-	-
N139.9.395 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
N139.9.396 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B2_g}$
N139.9.397 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N139.9.398 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{M1^+}$	$\surd$	0	0	$\surd$	-	-
N139.9.399 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{M1^-}$	$\surd$	0	0	$\surd$	-	-
N139.9.400 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{M2^+}$	$\surd$	0	0	$\surd$	-	-
N139.9.401 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{M2^-}$	$\surd$	0	0	$\surd$	-	-
N139.9.402 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{M3^+}$	$\surd$	0	0	$\surd$	-	-
N139.9.403 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{M3^-}$	$\surd$	0	0	$\surd$	-	-
N139.9.404 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{M4^+}$	$\surd$	0	0	$\surd$	-	-
N139.9.405 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{M4^-}$	$\surd$	0	0	$\surd$	-	-
N139.9.406 $\mathrm{GM3^-} \oplus \mathrm{GM4^+} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{B2} \oplus \mathrm{B2}$
N139.9.407 $\mathrm{GM3^-} \oplus \mathrm{GM4^+} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B2_g}$
N139.9.408 $\mathrm{GM3^-} \oplus \mathrm{GM4^+} \oplus \mathrm{M1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_g}$
N139.9.409 $\mathrm{GM3^-} \oplus \mathrm{GM4^+} \oplus \mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_g}$
N139.9.410 $\mathrm{GM3^-} \oplus \mathrm{GM4^+} \oplus \mathrm{M2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_g}$
N139.9.411 $\mathrm{GM3^-} \oplus \mathrm{GM4^+} \oplus \mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_g}$
N139.9.412 $\mathrm{GM3^-} \oplus \mathrm{GM4^+} \oplus \mathrm{M3^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_g}$
N139.9.413 $\mathrm{GM3^-} \oplus \mathrm{GM4^+} \oplus \mathrm{M3^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_g}$
N139.9.414 $\mathrm{GM3^-} \oplus \mathrm{GM4^+} \oplus \mathrm{M4^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_g}$
N139.9.415 $\mathrm{GM3^-} \oplus \mathrm{GM4^+} \oplus \mathrm{M4^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_g}$
N139.9.416 $\mathrm{GM3^-} \oplus \mathrm{GM4^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N139.9.417 $\mathrm{GM3^-} \oplus \mathrm{GM4^-} \oplus \mathrm{M1^+}$	$\surd$	0	0	$\surd$	-	-
N139.9.418 $\mathrm{GM3^-} \oplus \mathrm{GM4^-} \oplus \mathrm{M1^-}$	$\surd$	0	0	$\surd$	-	-
N139.9.419 $\mathrm{GM3^-} \oplus \mathrm{GM4^-} \oplus \mathrm{M2^+}$	$\surd$	0	0	$\surd$	-	-
N139.9.420 $\mathrm{GM3^-} \oplus \mathrm{GM4^-} \oplus \mathrm{M2^-}$	$\surd$	0	0	$\surd$	-	-
N139.9.421 $\mathrm{GM3^-} \oplus \mathrm{GM4^-} \oplus \mathrm{M3^+}$	$\surd$	0	0	$\surd$	-	-
N139.9.422 $\mathrm{GM3^-} \oplus \mathrm{GM4^-} \oplus \mathrm{M3^-}$	$\surd$	0	0	$\surd$	-	-
N139.9.423 $\mathrm{GM3^-} \oplus \mathrm{GM4^-} \oplus \mathrm{M4^+}$	$\surd$	0	0	$\surd$	-	-
N139.9.424 $\mathrm{GM3^-} \oplus \mathrm{GM4^-} \oplus \mathrm{M4^-}$	$\surd$	0	0	$\surd$	-	-
N139.9.425 $\mathrm{GM3^-} \oplus \mathrm{M1^+} \oplus \mathrm{M1^+}$	$\surd$	1	0	$\times$	-	-
N139.9.426 $\mathrm{GM3^-} \oplus \mathrm{M1^+} \oplus \mathrm{M1^-}$	$\surd$	1	1	$\times$	-	-
N139.9.427 $\mathrm{GM3^-} \oplus \mathrm{M1^+} \oplus \mathrm{M2^+}$	$\surd$	1	0	$\times$	-	-
N139.9.428 $\mathrm{GM3^-} \oplus \mathrm{M1^+} \oplus \mathrm{M2^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_u}$
N139.9.429 $\mathrm{GM3^-} \oplus \mathrm{M1^+} \oplus \mathrm{M3^+}$	$\surd$	1	0	$\times$	-	-
N139.9.430 $\mathrm{GM3^-} \oplus \mathrm{M1^+} \oplus \mathrm{M3^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N139.9.431 $\mathrm{GM3^-} \oplus \mathrm{M1^+} \oplus \mathrm{M4^+}$	$\surd$	1	0	$\times$	-	-
N139.9.432 $\mathrm{GM3^-} \oplus \mathrm{M1^+} \oplus \mathrm{M4^-}$	$\surd$	1	1	$\times$	-	-
N139.9.433 $\mathrm{GM3^-} \oplus \mathrm{M1^-} \oplus \mathrm{M1^-}$	$\surd$	1	0	$\times$	-	-
N139.9.434 $\mathrm{GM3^-} \oplus \mathrm{M1^-} \oplus \mathrm{M2^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_u}$
N139.9.435 $\mathrm{GM3^-} \oplus \mathrm{M1^-} \oplus \mathrm{M2^-}$	$\surd$	1	0	$\times$	-	-
N139.9.436 $\mathrm{GM3^-} \oplus \mathrm{M1^-} \oplus \mathrm{M3^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$

Non-coplanar SSGs with parent space group $I4/mmm$ (No. 139) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N139.9.437 $\mathrm{GM3^-}\oplus\mathrm{M1^-}\oplus\mathrm{M3^-}$	$\surd$	1	0	$\times$	-	-
N139.9.438 $\mathrm{GM3^-}\oplus\mathrm{M1^-}\oplus\mathrm{M4^+}$	$\surd$	1	1	$\times$	-	-
N139.9.439 $\mathrm{GM3^-}\oplus\mathrm{M1^-}\oplus\mathrm{M4^-}$	$\surd$	1	0	$\times$	-	-
N139.9.440 $\mathrm{GM3^-}\oplus\mathrm{M2^+}\oplus\mathrm{M2^+}$	$\surd$	1	0	$\times$	-	-
N139.9.441 $\mathrm{GM3^-}\oplus\mathrm{M2^+}\oplus\mathrm{M2^-}$	$\surd$	1	1	$\times$	-	-
N139.9.442 $\mathrm{GM3^-}\oplus\mathrm{M2^+}\oplus\mathrm{M3^+}$	$\surd$	1	0	$\times$	-	-
N139.9.443 $\mathrm{GM3^-}\oplus\mathrm{M2^+}\oplus\mathrm{M3^-}$	$\surd$	1	1	$\times$	-	-
N139.9.444 $\mathrm{GM3^-}\oplus\mathrm{M2^+}\oplus\mathrm{M4^+}$	$\surd$	1	0	$\times$	-	-
N139.9.445 $\mathrm{GM3^-}\oplus\mathrm{M2^+}\oplus\mathrm{M4^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N139.9.446 $\mathrm{GM3^-}\oplus\mathrm{M2^-}\oplus\mathrm{M2^-}$	$\surd$	1	0	$\times$	-	-
N139.9.447 $\mathrm{GM3^-}\oplus\mathrm{M2^-}\oplus\mathrm{M3^+}$	$\surd$	1	1	$\times$	-	-
N139.9.448 $\mathrm{GM3^-}\oplus\mathrm{M2^-}\oplus\mathrm{M3^-}$	$\surd$	1	0	$\times$	-	-
N139.9.449 $\mathrm{GM3^-}\oplus\mathrm{M2^-}\oplus\mathrm{M4^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N139.9.450 $\mathrm{GM3^-}\oplus\mathrm{M2^-}\oplus\mathrm{M4^-}$	$\surd$	1	0	$\times$	-	-
N139.9.451 $\mathrm{GM3^-}\oplus\mathrm{M3^+}\oplus\mathrm{M3^+}$	$\surd$	1	0	$\times$	-	-
N139.9.452 $\mathrm{GM3^-}\oplus\mathrm{M3^+}\oplus\mathrm{M3^-}$	$\surd$	1	1	$\times$	-	-
N139.9.453 $\mathrm{GM3^-}\oplus\mathrm{M3^+}\oplus\mathrm{M4^+}$	$\surd$	1	0	$\times$	-	-
N139.9.454 $\mathrm{GM3^-}\oplus\mathrm{M3^+}\oplus\mathrm{M4^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_u}$
N139.9.455 $\mathrm{GM3^-}\oplus\mathrm{M3^-}\oplus\mathrm{M3^-}$	$\surd$	1	0	$\times$	-	-
N139.9.456 $\mathrm{GM3^-}\oplus\mathrm{M3^-}\oplus\mathrm{M4^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_u}$
N139.9.457 $\mathrm{GM3^-}\oplus\mathrm{M3^-}\oplus\mathrm{M4^-}$	$\surd$	1	0	$\times$	-	-
N139.9.458 $\mathrm{GM3^-}\oplus\mathrm{M4^+}\oplus\mathrm{M4^+}$	$\surd$	1	0	$\times$	-	-
N139.9.459 $\mathrm{GM3^-}\oplus\mathrm{M4^+}\oplus\mathrm{M4^-}$	$\surd$	1	1	$\times$	-	-
N139.9.460 $\mathrm{GM3^-}\oplus\mathrm{M4^-}\oplus\mathrm{M4^-}$	$\surd$	1	0	$\times$	-	-
N139.9.461 $\mathrm{GM4^+}\oplus\mathrm{GM4^+}\oplus\mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B2_g}\oplus\mathrm{B2_g}\oplus\mathrm{B2_g}$
N139.9.462 $\mathrm{GM4^+}\oplus\mathrm{GM4^+}\oplus\mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{A2}\oplus\mathrm{A2}$
N139.9.463 $\mathrm{GM4^+}\oplus\mathrm{GM4^+}\oplus\mathrm{M1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g}\oplus\mathrm{B2_g}$
N139.9.464 $\mathrm{GM4^+}\oplus\mathrm{GM4^+}\oplus\mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g}\oplus\mathrm{B2_g}$
N139.9.465 $\mathrm{GM4^+}\oplus\mathrm{GM4^+}\oplus\mathrm{M2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g}\oplus\mathrm{B2_g}$
N139.9.466 $\mathrm{GM4^+}\oplus\mathrm{GM4^+}\oplus\mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g}\oplus\mathrm{B2_g}$
N139.9.467 $\mathrm{GM4^+}\oplus\mathrm{GM4^+}\oplus\mathrm{M3^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g}\oplus\mathrm{B2_g}$
N139.9.468 $\mathrm{GM4^+}\oplus\mathrm{GM4^+}\oplus\mathrm{M3^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g}\oplus\mathrm{B2_g}$
N139.9.469 $\mathrm{GM4^+}\oplus\mathrm{GM4^+}\oplus\mathrm{M4^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g}\oplus\mathrm{B2_g}$
N139.9.470 $\mathrm{GM4^+}\oplus\mathrm{GM4^+}\oplus\mathrm{M4^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g}\oplus\mathrm{B2_g}$
N139.9.471 $\mathrm{GM4^+}\oplus\mathrm{GM4^-}\oplus\mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A1_u}\oplus\mathrm{B2_g}$
N139.9.472 $\mathrm{GM4^+}\oplus\mathrm{GM4^-}\oplus\mathrm{M1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B2_g}$
N139.9.473 $\mathrm{GM4^+}\oplus\mathrm{GM4^-}\oplus\mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B2_g}$
N139.9.474 $\mathrm{GM4^+}\oplus\mathrm{GM4^-}\oplus\mathrm{M2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B2_g}$
N139.9.475 $\mathrm{GM4^+}\oplus\mathrm{GM4^-}\oplus\mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B2_g}$
N139.9.476 $\mathrm{GM4^+}\oplus\mathrm{GM4^-}\oplus\mathrm{M3^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B2_g}$
N139.9.477 $\mathrm{GM4^+}\oplus\mathrm{GM4^-}\oplus\mathrm{M3^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B2_g}$
N139.9.478 $\mathrm{GM4^+}\oplus\mathrm{GM4^-}\oplus\mathrm{M4^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B2_g}$
N139.9.479 $\mathrm{GM4^+}\oplus\mathrm{GM4^-}\oplus\mathrm{M4^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B2_g}$
N139.9.480 $\mathrm{GM4^+}\oplus\mathrm{M1^+}\oplus\mathrm{M1^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_g}$
N139.9.481 $\mathrm{GM4^+}\oplus\mathrm{M1^+}\oplus\mathrm{M1^-}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	A2
N139.9.482 $\mathrm{GM4^+}\oplus\mathrm{M1^+}\oplus\mathrm{M2^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_g}$

Non-coplanar SSGs with parent space group $I4/mmm$ (No. 139) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N139.9.483 $\mathrm{GM4^+}\oplus\mathrm{M1^+}\oplus\mathrm{M2^-}$	$\surd$	1	1	$\surd$	$4mm$	B2
N139.9.484 $\mathrm{GM4^+}\oplus\mathrm{M1^+}\oplus\mathrm{M3^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_g}$
N139.9.485 $\mathrm{GM4^+}\oplus\mathrm{M1^+}\oplus\mathrm{M3^-}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N139.9.486 $\mathrm{GM4^+}\oplus\mathrm{M1^+}\oplus\mathrm{M4^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_g}$
N139.9.487 $\mathrm{GM4^+}\oplus\mathrm{M1^+}\oplus\mathrm{M4^-}$	$\surd$	1	1	$\surd$	422	B2
N139.9.488 $\mathrm{GM4^+}\oplus\mathrm{M1^-}\oplus\mathrm{M1^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_g}$
N139.9.489 $\mathrm{GM4^+}\oplus\mathrm{M1^-}\oplus\mathrm{M2^+}$	$\surd$	1	1	$\surd$	$4mm$	B2
N139.9.490 $\mathrm{GM4^+}\oplus\mathrm{M1^-}\oplus\mathrm{M2^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_g}$
N139.9.491 $\mathrm{GM4^+}\oplus\mathrm{M1^-}\oplus\mathrm{M3^+}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N139.9.492 $\mathrm{GM4^+}\oplus\mathrm{M1^-}\oplus\mathrm{M3^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_g}$
N139.9.493 $\mathrm{GM4^+}\oplus\mathrm{M1^-}\oplus\mathrm{M4^+}$	$\surd$	1	1	$\surd$	422	B2
N139.9.494 $\mathrm{GM4^+}\oplus\mathrm{M1^-}\oplus\mathrm{M4^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_g}$
N139.9.495 $\mathrm{GM4^+}\oplus\mathrm{M2^+}\oplus\mathrm{M2^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_g}$
N139.9.496 $\mathrm{GM4^+}\oplus\mathrm{M2^+}\oplus\mathrm{M2^-}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	A2
N139.9.497 $\mathrm{GM4^+}\oplus\mathrm{M2^+}\oplus\mathrm{M3^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_g}$
N139.9.498 $\mathrm{GM4^+}\oplus\mathrm{M2^+}\oplus\mathrm{M3^-}$	$\surd$	1	1	$\surd$	422	B2
N139.9.499 $\mathrm{GM4^+}\oplus\mathrm{M2^+}\oplus\mathrm{M4^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_g}$
N139.9.500 $\mathrm{GM4^+}\oplus\mathrm{M2^+}\oplus\mathrm{M4^-}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N139.9.501 $\mathrm{GM4^+}\oplus\mathrm{M2^-}\oplus\mathrm{M2^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_g}$
N139.9.502 $\mathrm{GM4^+}\oplus\mathrm{M2^-}\oplus\mathrm{M3^+}$	$\surd$	1	1	$\surd$	422	B2
N139.9.503 $\mathrm{GM4^+}\oplus\mathrm{M2^-}\oplus\mathrm{M3^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_g}$
N139.9.504 $\mathrm{GM4^+}\oplus\mathrm{M2^-}\oplus\mathrm{M4^+}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N139.9.505 $\mathrm{GM4^+}\oplus\mathrm{M2^-}\oplus\mathrm{M4^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_g}$
N139.9.506 $\mathrm{GM4^+}\oplus\mathrm{M3^+}\oplus\mathrm{M3^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_g}$
N139.9.507 $\mathrm{GM4^+}\oplus\mathrm{M3^+}\oplus\mathrm{M3^-}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	A2
N139.9.508 $\mathrm{GM4^+}\oplus\mathrm{M3^+}\oplus\mathrm{M4^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_g}$
N139.9.509 $\mathrm{GM4^+}\oplus\mathrm{M3^+}\oplus\mathrm{M4^-}$	$\surd$	1	1	$\surd$	$4mm$	B2
N139.9.510 $\mathrm{GM4^+}\oplus\mathrm{M3^-}\oplus\mathrm{M3^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_g}$
N139.9.511 $\mathrm{GM4^+}\oplus\mathrm{M3^-}\oplus\mathrm{M4^+}$	$\surd$	1	1	$\surd$	$4mm$	B2
N139.9.512 $\mathrm{GM4^+}\oplus\mathrm{M3^-}\oplus\mathrm{M4^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_g}$
N139.9.513 $\mathrm{GM4^+}\oplus\mathrm{M4^+}\oplus\mathrm{M4^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_g}$
N139.9.514 $\mathrm{GM4^+}\oplus\mathrm{M4^+}\oplus\mathrm{M4^-}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	A2
N139.9.515 $\mathrm{GM4^+}\oplus\mathrm{M4^-}\oplus\mathrm{M4^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_g}$
N139.9.516 $\mathrm{GM4^-}\oplus\mathrm{GM4^-}\oplus\mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N139.9.517 $\mathrm{GM4^-}\oplus\mathrm{GM4^-}\oplus\mathrm{M1^+}$	$\surd$	0	0	$\surd$	-	-
N139.9.518 $\mathrm{GM4^-}\oplus\mathrm{GM4^-}\oplus\mathrm{M1^-}$	$\surd$	0	0	$\surd$	-	-
N139.9.519 $\mathrm{GM4^-}\oplus\mathrm{GM4^-}\oplus\mathrm{M2^+}$	$\surd$	0	0	$\surd$	-	-
N139.9.520 $\mathrm{GM4^-}\oplus\mathrm{GM4^-}\oplus\mathrm{M2^-}$	$\surd$	0	0	$\surd$	-	-
N139.9.521 $\mathrm{GM4^-}\oplus\mathrm{GM4^-}\oplus\mathrm{M3^+}$	$\surd$	0	0	$\surd$	-	-
N139.9.522 $\mathrm{GM4^-}\oplus\mathrm{GM4^-}\oplus\mathrm{M3^-}$	$\surd$	0	0	$\surd$	-	-
N139.9.523 $\mathrm{GM4^-}\oplus\mathrm{GM4^-}\oplus\mathrm{M4^+}$	$\surd$	0	0	$\surd$	-	-
N139.9.524 $\mathrm{GM4^-}\oplus\mathrm{GM4^-}\oplus\mathrm{M4^-}$	$\surd$	0	0	$\surd$	-	-
N139.9.525 $\mathrm{GM4^-}\oplus\mathrm{M1^+}\oplus\mathrm{M1^+}$	$\surd$	1	0	$\times$	-	-
N139.9.526 $\mathrm{GM4^-}\oplus\mathrm{M1^+}\oplus\mathrm{M1^-}$	$\surd$	1	1	$\times$	-	-
N139.9.527 $\mathrm{GM4^-}\oplus\mathrm{M1^+}\oplus\mathrm{M2^+}$	$\surd$	1	0	$\times$	-	-
N139.9.528 $\mathrm{GM4^-}\oplus\mathrm{M1^+}\oplus\mathrm{M2^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_u}$

Non-coplanar SSGs with parent space group $I4/mmm$ (No. 139) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N139.9.529 $\mathrm{GM4^-} \oplus \mathrm{M1^+} \oplus \mathrm{M3^+}$	$\surd$	1	0	$\times$	-	-
N139.9.530 $\mathrm{GM4^-} \oplus \mathrm{M1^+} \oplus \mathrm{M3^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N139.9.531 $\mathrm{GM4^-} \oplus \mathrm{M1^+} \oplus \mathrm{M4^+}$	$\surd$	1	0	$\times$	-	-
N139.9.532 $\mathrm{GM4^-} \oplus \mathrm{M1^+} \oplus \mathrm{M4^-}$	$\surd$	1	1	$\times$	-	-
N139.9.533 $\mathrm{GM4^-} \oplus \mathrm{M1^-} \oplus \mathrm{M1^-}$	$\surd$	1	0	$\times$	-	-
N139.9.534 $\mathrm{GM4^-} \oplus \mathrm{M1^-} \oplus \mathrm{M2^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_u}$
N139.9.535 $\mathrm{GM4^-} \oplus \mathrm{M1^-} \oplus \mathrm{M2^-}$	$\surd$	1	0	$\times$	-	-
N139.9.536 $\mathrm{GM4^-} \oplus \mathrm{M1^-} \oplus \mathrm{M3^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N139.9.537 $\mathrm{GM4^-} \oplus \mathrm{M1^-} \oplus \mathrm{M3^-}$	$\surd$	1	0	$\times$	-	-
N139.9.538 $\mathrm{GM4^-} \oplus \mathrm{M1^-} \oplus \mathrm{M4^+}$	$\surd$	1	1	$\times$	-	-
N139.9.539 $\mathrm{GM4^-} \oplus \mathrm{M1^-} \oplus \mathrm{M4^-}$	$\surd$	1	0	$\times$	-	-
N139.9.540 $\mathrm{GM4^-} \oplus \mathrm{M2^+} \oplus \mathrm{M2^+}$	$\surd$	1	0	$\times$	-	-
N139.9.541 $\mathrm{GM4^-} \oplus \mathrm{M2^+} \oplus \mathrm{M2^-}$	$\surd$	1	1	$\times$	-	-
N139.9.542 $\mathrm{GM4^-} \oplus \mathrm{M2^+} \oplus \mathrm{M3^+}$	$\surd$	1	0	$\times$	-	-
N139.9.543 $\mathrm{GM4^-} \oplus \mathrm{M2^+} \oplus \mathrm{M3^-}$	$\surd$	1	1	$\times$	-	-
N139.9.544 $\mathrm{GM4^-} \oplus \mathrm{M2^+} \oplus \mathrm{M4^+}$	$\surd$	1	0	$\times$	-	-
N139.9.545 $\mathrm{GM4^-} \oplus \mathrm{M2^+} \oplus \mathrm{M4^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N139.9.546 $\mathrm{GM4^-} \oplus \mathrm{M2^-} \oplus \mathrm{M2^-}$	$\surd$	1	0	$\times$	-	-
N139.9.547 $\mathrm{GM4^-} \oplus \mathrm{M2^-} \oplus \mathrm{M3^+}$	$\surd$	1	1	$\times$	-	-
N139.9.548 $\mathrm{GM4^-} \oplus \mathrm{M2^-} \oplus \mathrm{M3^-}$	$\surd$	1	0	$\times$	-	-
N139.9.549 $\mathrm{GM4^-} \oplus \mathrm{M2^-} \oplus \mathrm{M4^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N139.9.550 $\mathrm{GM4^-} \oplus \mathrm{M2^-} \oplus \mathrm{M4^-}$	$\surd$	1	0	$\times$	-	-
N139.9.551 $\mathrm{GM4^-} \oplus \mathrm{M3^+} \oplus \mathrm{M3^+}$	$\surd$	1	0	$\times$	-	-
N139.9.552 $\mathrm{GM4^-} \oplus \mathrm{M3^+} \oplus \mathrm{M3^-}$	$\surd$	1	1	$\times$	-	-
N139.9.553 $\mathrm{GM4^-} \oplus \mathrm{M3^+} \oplus \mathrm{M4^+}$	$\surd$	1	0	$\times$	-	-
N139.9.554 $\mathrm{GM4^-} \oplus \mathrm{M3^+} \oplus \mathrm{M4^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_u}$
N139.9.555 $\mathrm{GM4^-} \oplus \mathrm{M3^-} \oplus \mathrm{M3^-}$	$\surd$	1	0	$\times$	-	-
N139.9.556 $\mathrm{GM4^-} \oplus \mathrm{M3^-} \oplus \mathrm{M4^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_u}$
N139.9.557 $\mathrm{GM4^-} \oplus \mathrm{M3^-} \oplus \mathrm{M4^-}$	$\surd$	1	0	$\times$	-	-
N139.9.558 $\mathrm{GM4^-} \oplus \mathrm{M4^+} \oplus \mathrm{M4^+}$	$\surd$	1	0	$\times$	-	-
N139.9.559 $\mathrm{GM4^-} \oplus \mathrm{M4^+} \oplus \mathrm{M4^-}$	$\surd$	1	1	$\times$	-	-
N139.9.560 $\mathrm{GM4^-} \oplus \mathrm{M4^-} \oplus \mathrm{M4^-}$	$\surd$	1	0	$\times$	-	-
N139.9.561 $\mathrm{M1^+} \oplus \mathrm{M1^+} \oplus \mathrm{M1^+}$	$\surd$	0	0	$\surd$	-	-
N139.9.562 $\mathrm{M1^+} \oplus \mathrm{M1^+} \oplus \mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u}$
N139.9.563 $\mathrm{M1^+} \oplus \mathrm{M1^+} \oplus \mathrm{M2^+}$	$\surd$	0	0	$\surd$	-	-
N139.9.564 $\mathrm{M1^+} \oplus \mathrm{M1^+} \oplus \mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N139.9.565 $\mathrm{M1^+} \oplus \mathrm{M1^+} \oplus \mathrm{M3^+}$	$\surd$	0	0	$\surd$	-	-
N139.9.566 $\mathrm{M1^+} \oplus \mathrm{M1^+} \oplus \mathrm{M3^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u}$
N139.9.567 $\mathrm{M1^+} \oplus \mathrm{M1^+} \oplus \mathrm{M4^+}$	$\surd$	0	0	$\surd$	-	-
N139.9.568 $\mathrm{M1^+} \oplus \mathrm{M1^+} \oplus \mathrm{M4^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_u} \oplus \mathrm{B2_u}$
N139.9.569 $\mathrm{M1^+} \oplus \mathrm{M1^-} \oplus \mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u}$
N139.9.570 $\mathrm{M1^+} \oplus \mathrm{M1^-} \oplus \mathrm{M2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u}$
N139.9.571 $\mathrm{M1^+} \oplus \mathrm{M1^-} \oplus \mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u}$
N139.9.572 $\mathrm{M1^+} \oplus \mathrm{M1^-} \oplus \mathrm{M3^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u}$
N139.9.573 $\mathrm{M1^+} \oplus \mathrm{M1^-} \oplus \mathrm{M3^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u}$
N139.9.574 $\mathrm{M1^+} \oplus \mathrm{M1^-} \oplus \mathrm{M4^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_u}$

Non-coplanar SSGs with parent space group $I4/mmm$ (No. 139) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N139.9.575 $\mathrm{M1}^{+}\oplus\mathrm{M1}^{-}\oplus\mathrm{M4}^{-}$	√	2	2	√	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B2_u}$
N139.9.576 $\mathrm{M1}^{+}\oplus\mathrm{M2}^{+}\oplus\mathrm{M2}^{+}$	√	0	0	√	-	-
N139.9.577 $\mathrm{M1}^{+}\oplus\mathrm{M2}^{+}\oplus\mathrm{M2}^{-}$	√	2	2	√	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B1_u}$
N139.9.578 $\mathrm{M1}^{+}\oplus\mathrm{M2}^{+}\oplus\mathrm{M3}^{+}$	√	0	0	√	-	-
N139.9.579 $\mathrm{M1}^{+}\oplus\mathrm{M2}^{+}\oplus\mathrm{M3}^{-}$	√	2	2	√	$4/mmm$	$\mathrm{A2_u}\oplus\mathrm{B2_u}$
N139.9.580 $\mathrm{M1}^{+}\oplus\mathrm{M2}^{+}\oplus\mathrm{M4}^{+}$	√	0	0	√	-	-
N139.9.581 $\mathrm{M1}^{+}\oplus\mathrm{M2}^{+}\oplus\mathrm{M4}^{-}$	√	2	2	√	$4/mmm$	$\mathrm{A2_u}\oplus\mathrm{B2_u}$
N139.9.582 $\mathrm{M1}^{+}\oplus\mathrm{M2}^{-}\oplus\mathrm{M2}^{-}$	√	2	2	√	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{B1_u}$
N139.9.583 $\mathrm{M1}^{+}\oplus\mathrm{M2}^{-}\oplus\mathrm{M3}^{+}$	√	2	2	√	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{B2_u}$
N139.9.584 $\mathrm{M1}^{+}\oplus\mathrm{M2}^{-}\oplus\mathrm{M3}^{-}$	√	2	2	√	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{A2_u}$
N139.9.585 $\mathrm{M1}^{+}\oplus\mathrm{M2}^{-}\oplus\mathrm{M4}^{+}$	√	2	2	√	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{A2_u}$
N139.9.586 $\mathrm{M1}^{+}\oplus\mathrm{M2}^{-}\oplus\mathrm{M4}^{-}$	√	2	2	√	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{B2_u}$
N139.9.587 $\mathrm{M1}^{+}\oplus\mathrm{M3}^{+}\oplus\mathrm{M3}^{+}$	√	0	0	√	-	-
N139.9.588 $\mathrm{M1}^{+}\oplus\mathrm{M3}^{+}\oplus\mathrm{M3}^{-}$	√	2	2	√	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A2_u}$
N139.9.589 $\mathrm{M1}^{+}\oplus\mathrm{M3}^{+}\oplus\mathrm{M4}^{+}$	√	0	0	√	-	-
N139.9.590 $\mathrm{M1}^{+}\oplus\mathrm{M3}^{+}\oplus\mathrm{M4}^{-}$	√	2	2	√	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{B2_u}$
N139.9.591 $\mathrm{M1}^{+}\oplus\mathrm{M3}^{-}\oplus\mathrm{M3}^{-}$	√	2	2	√	$4/mmm$	$\mathrm{A2_u}\oplus\mathrm{A2_u}$
N139.9.592 $\mathrm{M1}^{+}\oplus\mathrm{M3}^{-}\oplus\mathrm{M4}^{+}$	√	2	2	√	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{A2_u}$
N139.9.593 $\mathrm{M1}^{+}\oplus\mathrm{M3}^{-}\oplus\mathrm{M4}^{-}$	√	2	2	√	$4/mmm$	$\mathrm{A2_u}\oplus\mathrm{B2_u}$
N139.9.594 $\mathrm{M1}^{+}\oplus\mathrm{M4}^{+}\oplus\mathrm{M4}^{+}$	√	0	0	√	-	-
N139.9.595 $\mathrm{M1}^{+}\oplus\mathrm{M4}^{+}\oplus\mathrm{M4}^{-}$	√	2	2	√	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B2_u}$
N139.9.596 $\mathrm{M1}^{+}\oplus\mathrm{M4}^{-}\oplus\mathrm{M4}^{-}$	√	2	2	√	$4/mmm$	$\mathrm{B2_u}\oplus\mathrm{B2_u}$
N139.9.597 $\mathrm{M1}^{-}\oplus\mathrm{M1}^{-}\oplus\mathrm{M1}^{-}$	√	0	0	√	-	-
N139.9.598 $\mathrm{M1}^{-}\oplus\mathrm{M1}^{-}\oplus\mathrm{M2}^{+}$	√	2	2	√	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{B1_u}$
N139.9.599 $\mathrm{M1}^{-}\oplus\mathrm{M1}^{-}\oplus\mathrm{M2}^{-}$	√	0	0	√	-	-
N139.9.600 $\mathrm{M1}^{-}\oplus\mathrm{M1}^{-}\oplus\mathrm{M3}^{+}$	√	2	2	√	$4/mmm$	$\mathrm{A2_u}\oplus\mathrm{A2_u}$
N139.9.601 $\mathrm{M1}^{-}\oplus\mathrm{M1}^{-}\oplus\mathrm{M3}^{-}$	√	0	0	√	-	-
N139.9.602 $\mathrm{M1}^{-}\oplus\mathrm{M1}^{-}\oplus\mathrm{M4}^{+}$	√	2	2	√	$4/mmm$	$\mathrm{B2_u}\oplus\mathrm{B2_u}$
N139.9.603 $\mathrm{M1}^{-}\oplus\mathrm{M1}^{-}\oplus\mathrm{M4}^{-}$	√	0	0	√	-	-
N139.9.604 $\mathrm{M1}^{-}\oplus\mathrm{M2}^{+}\oplus\mathrm{M2}^{+}$	√	2	2	√	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{B1_u}$
N139.9.605 $\mathrm{M1}^{-}\oplus\mathrm{M2}^{+}\oplus\mathrm{M2}^{-}$	√	2	2	√	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B1_u}$
N139.9.606 $\mathrm{M1}^{-}\oplus\mathrm{M2}^{+}\oplus\mathrm{M3}^{+}$	√	2	2	√	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{A2_u}$
N139.9.607 $\mathrm{M1}^{-}\oplus\mathrm{M2}^{+}\oplus\mathrm{M3}^{-}$	√	2	2	√	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{B2_u}$
N139.9.608 $\mathrm{M1}^{-}\oplus\mathrm{M2}^{+}\oplus\mathrm{M4}^{+}$	√	2	2	√	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{B2_u}$
N139.9.609 $\mathrm{M1}^{-}\oplus\mathrm{M2}^{+}\oplus\mathrm{M4}^{-}$	√	2	2	√	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{A2_u}$
N139.9.610 $\mathrm{M1}^{-}\oplus\mathrm{M2}^{-}\oplus\mathrm{M2}^{-}$	√	0	0	√	-	-
N139.9.611 $\mathrm{M1}^{-}\oplus\mathrm{M2}^{-}\oplus\mathrm{M3}^{+}$	√	2	2	√	$4/mmm$	$\mathrm{A2_u}\oplus\mathrm{B2_u}$
N139.9.612 $\mathrm{M1}^{-}\oplus\mathrm{M2}^{-}\oplus\mathrm{M3}^{-}$	√	0	0	√	-	-
N139.9.613 $\mathrm{M1}^{-}\oplus\mathrm{M2}^{-}\oplus\mathrm{M4}^{+}$	√	2	2	√	$4/mmm$	$\mathrm{A2_u}\oplus\mathrm{B2_u}$
N139.9.614 $\mathrm{M1}^{-}\oplus\mathrm{M2}^{-}\oplus\mathrm{M4}^{-}$	√	0	0	√	-	-
N139.9.615 $\mathrm{M1}^{-}\oplus\mathrm{M3}^{+}\oplus\mathrm{M3}^{+}$	√	2	2	√	$4/mmm$	$\mathrm{A2_u}\oplus\mathrm{A2_u}$
N139.9.616 $\mathrm{M1}^{-}\oplus\mathrm{M3}^{+}\oplus\mathrm{M3}^{-}$	√	2	2	√	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A2_u}$
N139.9.617 $\mathrm{M1}^{-}\oplus\mathrm{M3}^{+}\oplus\mathrm{M4}^{+}$	√	2	2	√	$4/mmm$	$\mathrm{A2_u}\oplus\mathrm{B2_u}$
N139.9.618 $\mathrm{M1}^{-}\oplus\mathrm{M3}^{+}\oplus\mathrm{M4}^{-}$	√	2	2	√	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{A2_u}$
N139.9.619 $\mathrm{M1}^{-}\oplus\mathrm{M3}^{-}\oplus\mathrm{M3}^{-}$	√	0	0	√	-	-
N139.9.620 $\mathrm{M1}^{-}\oplus\mathrm{M3}^{-}\oplus\mathrm{M4}^{+}$	√	2	2	√	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{B2_u}$

Non-coplanar SSGs with parent space group $I4/mmm$ (No. 139) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N139.9.621 $\mathrm{M1}^{-}\oplus\mathrm{M3}^{-}\oplus\mathrm{M4}^{-}$	√	0	0	√	-	-
N139.9.622 $\mathrm{M1}^{-}\oplus\mathrm{M4}^{+}\oplus\mathrm{M4}^{+}$	√	2	2	√	$4/mmm$	$\mathrm{B2_u}\oplus\mathrm{B2_u}$
N139.9.623 $\mathrm{M1}^{-}\oplus\mathrm{M4}^{+}\oplus\mathrm{M4}^{-}$	√	2	2	√	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B2_u}$
N139.9.624 $\mathrm{M1}^{-}\oplus\mathrm{M4}^{-}\oplus\mathrm{M4}^{-}$	√	0	0	√	-	-
N139.9.625 $\mathrm{M2}^{+}\oplus\mathrm{M2}^{+}\oplus\mathrm{M2}^{+}$	√	0	0	√	-	-
N139.9.626 $\mathrm{M2}^{+}\oplus\mathrm{M2}^{+}\oplus\mathrm{M2}^{-}$	√	2	2	√	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A1_u}$
N139.9.627 $\mathrm{M2}^{+}\oplus\mathrm{M2}^{+}\oplus\mathrm{M3}^{+}$	√	0	0	√	-	-
N139.9.628 $\mathrm{M2}^{+}\oplus\mathrm{M2}^{+}\oplus\mathrm{M3}^{-}$	√	2	2	√	$4/mmm$	$\mathrm{B2_u}\oplus\mathrm{B2_u}$
N139.9.629 $\mathrm{M2}^{+}\oplus\mathrm{M2}^{+}\oplus\mathrm{M4}^{+}$	√	0	0	√	-	-
N139.9.630 $\mathrm{M2}^{+}\oplus\mathrm{M2}^{+}\oplus\mathrm{M4}^{-}$	√	2	2	√	$4/mmm$	$\mathrm{A2_u}\oplus\mathrm{A2_u}$
N139.9.631 $\mathrm{M2}^{+}\oplus\mathrm{M2}^{-}\oplus\mathrm{M2}^{-}$	√	2	2	√	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A1_u}$
N139.9.632 $\mathrm{M2}^{+}\oplus\mathrm{M2}^{-}\oplus\mathrm{M3}^{+}$	√	2	2	√	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B2_u}$
N139.9.633 $\mathrm{M2}^{+}\oplus\mathrm{M2}^{-}\oplus\mathrm{M3}^{-}$	√	2	2	√	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B2_u}$
N139.9.634 $\mathrm{M2}^{+}\oplus\mathrm{M2}^{-}\oplus\mathrm{M4}^{+}$	√	2	2	√	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A2_u}$
N139.9.635 $\mathrm{M2}^{+}\oplus\mathrm{M2}^{-}\oplus\mathrm{M4}^{-}$	√	2	2	√	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A2_u}$
N139.9.636 $\mathrm{M2}^{+}\oplus\mathrm{M3}^{+}\oplus\mathrm{M3}^{+}$	√	0	0	√	-	-
N139.9.637 $\mathrm{M2}^{+}\oplus\mathrm{M3}^{+}\oplus\mathrm{M3}^{-}$	√	2	2	√	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B2_u}$
N139.9.638 $\mathrm{M2}^{+}\oplus\mathrm{M3}^{+}\oplus\mathrm{M4}^{+}$	√	0	0	√	-	-
N139.9.639 $\mathrm{M2}^{+}\oplus\mathrm{M3}^{+}\oplus\mathrm{M4}^{-}$	√	2	2	√	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{A2_u}$
N139.9.640 $\mathrm{M2}^{+}\oplus\mathrm{M3}^{-}\oplus\mathrm{M3}^{-}$	√	2	2	√	$4/mmm$	$\mathrm{B2_u}\oplus\mathrm{B2_u}$
N139.9.641 $\mathrm{M2}^{+}\oplus\mathrm{M3}^{-}\oplus\mathrm{M4}^{+}$	√	2	2	√	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{B2_u}$
N139.9.642 $\mathrm{M2}^{+}\oplus\mathrm{M3}^{-}\oplus\mathrm{M4}^{-}$	√	2	2	√	$4/mmm$	$\mathrm{A2_u}\oplus\mathrm{B2_u}$
N139.9.643 $\mathrm{M2}^{+}\oplus\mathrm{M4}^{+}\oplus\mathrm{M4}^{+}$	√	0	0	√	-	-
N139.9.644 $\mathrm{M2}^{+}\oplus\mathrm{M4}^{+}\oplus\mathrm{M4}^{-}$	√	2	2	√	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A2_u}$
N139.9.645 $\mathrm{M2}^{+}\oplus\mathrm{M4}^{-}\oplus\mathrm{M4}^{-}$	√	2	2	√	$4/mmm$	$\mathrm{A2_u}\oplus\mathrm{A2_u}$
N139.9.646 $\mathrm{M2}^{-}\oplus\mathrm{M2}^{-}\oplus\mathrm{M2}^{-}$	√	0	0	√	-	-
N139.9.647 $\mathrm{M2}^{-}\oplus\mathrm{M2}^{-}\oplus\mathrm{M3}^{+}$	√	2	2	√	$4/mmm$	$\mathrm{B2_u}\oplus\mathrm{B2_u}$
N139.9.648 $\mathrm{M2}^{-}\oplus\mathrm{M2}^{-}\oplus\mathrm{M3}^{-}$	√	0	0	√	-	-
N139.9.649 $\mathrm{M2}^{-}\oplus\mathrm{M2}^{-}\oplus\mathrm{M4}^{+}$	√	2	2	√	$4/mmm$	$\mathrm{A2_u}\oplus\mathrm{A2_u}$
N139.9.650 $\mathrm{M2}^{-}\oplus\mathrm{M2}^{-}\oplus\mathrm{M4}^{-}$	√	0	0	√	-	-
N139.9.651 $\mathrm{M2}^{-}\oplus\mathrm{M3}^{+}\oplus\mathrm{M3}^{+}$	√	2	2	√	$4/mmm$	$\mathrm{B2_u}\oplus\mathrm{B2_u}$
N139.9.652 $\mathrm{M2}^{-}\oplus\mathrm{M3}^{+}\oplus\mathrm{M3}^{-}$	√	2	2	√	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B2_u}$
N139.9.653 $\mathrm{M2}^{-}\oplus\mathrm{M3}^{+}\oplus\mathrm{M4}^{+}$	√	2	2	√	$4/mmm$	$\mathrm{A2_u}\oplus\mathrm{B2_u}$
N139.9.654 $\mathrm{M2}^{-}\oplus\mathrm{M3}^{+}\oplus\mathrm{M4}^{-}$	√	2	2	√	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{B2_u}$
N139.9.655 $\mathrm{M2}^{-}\oplus\mathrm{M3}^{-}\oplus\mathrm{M3}^{-}$	√	0	0	√	-	-
N139.9.656 $\mathrm{M2}^{-}\oplus\mathrm{M3}^{-}\oplus\mathrm{M4}^{+}$	√	2	2	√	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{A2_u}$
N139.9.657 $\mathrm{M2}^{-}\oplus\mathrm{M3}^{-}\oplus\mathrm{M4}^{-}$	√	0	0	√	-	-
N139.9.658 $\mathrm{M2}^{-}\oplus\mathrm{M4}^{+}\oplus\mathrm{M4}^{+}$	√	2	2	√	$4/mmm$	$\mathrm{A2_u}\oplus\mathrm{A2_u}$
N139.9.659 $\mathrm{M2}^{-}\oplus\mathrm{M4}^{+}\oplus\mathrm{M4}^{-}$	√	2	2	√	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A2_u}$
N139.9.660 $\mathrm{M2}^{-}\oplus\mathrm{M4}^{-}\oplus\mathrm{M4}^{-}$	√	0	0	√	-	-
N139.9.661 $\mathrm{M3}^{+}\oplus\mathrm{M3}^{+}\oplus\mathrm{M3}^{+}$	√	0	0	√	-	-
N139.9.662 $\mathrm{M3}^{+}\oplus\mathrm{M3}^{+}\oplus\mathrm{M3}^{-}$	√	2	2	√	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A1_u}$
N139.9.663 $\mathrm{M3}^{+}\oplus\mathrm{M3}^{+}\oplus\mathrm{M4}^{+}$	√	0	0	√	-	-
N139.9.664 $\mathrm{M3}^{+}\oplus\mathrm{M3}^{+}\oplus\mathrm{M4}^{-}$	√	2	2	√	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{B1_u}$
N139.9.665 $\mathrm{M3}^{+}\oplus\mathrm{M3}^{-}\oplus\mathrm{M3}^{-}$	√	2	2	√	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A1_u}$
N139.9.666 $\mathrm{M3}^{+}\oplus\mathrm{M3}^{-}\oplus\mathrm{M4}^{+}$	√	2	2	√	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B1_u}$

Non-coplanar SSGs with parent space group $I4/mmm$ (No. 139) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N139.9.667 $\mathrm{M3^+} \oplus \mathrm{M3^-} \oplus \mathrm{M4^-}$	√	2	2	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u}$
N139.9.668 $\mathrm{M3^+} \oplus \mathrm{M4^+} \oplus \mathrm{M4^+}$	√	0	0	√	-	-
N139.9.669 $\mathrm{M3^+} \oplus \mathrm{M4^+} \oplus \mathrm{M4^-}$	√	2	2	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u}$
N139.9.670 $\mathrm{M3^+} \oplus \mathrm{M4^-} \oplus \mathrm{M4^-}$	√	2	2	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N139.9.671 $\mathrm{M3^-} \oplus \mathrm{M3^-} \oplus \mathrm{M3^-}$	√	0	0	√	-	-
N139.9.672 $\mathrm{M3^-} \oplus \mathrm{M3^-} \oplus \mathrm{M4^+}$	√	2	2	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N139.9.673 $\mathrm{M3^-} \oplus \mathrm{M3^-} \oplus \mathrm{M4^-}$	√	0	0	√	-	-
N139.9.674 $\mathrm{M3^-} \oplus \mathrm{M4^+} \oplus \mathrm{M4^+}$	√	2	2	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N139.9.675 $\mathrm{M3^-} \oplus \mathrm{M4^+} \oplus \mathrm{M4^-}$	√	2	2	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u}$
N139.9.676 $\mathrm{M3^-} \oplus \mathrm{M4^-} \oplus \mathrm{M4^-}$	√	0	0	√	-	-
N139.9.677 $\mathrm{M4^+} \oplus \mathrm{M4^+} \oplus \mathrm{M4^+}$	√	0	0	√	-	-
N139.9.678 $\mathrm{M4^+} \oplus \mathrm{M4^+} \oplus \mathrm{M4^-}$	√	2	2	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u}$
N139.9.679 $\mathrm{M4^+} \oplus \mathrm{M4^-} \oplus \mathrm{M4^-}$	√	2	2	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u}$
N139.9.680 $\mathrm{M4^-} \oplus \mathrm{M4^-} \oplus \mathrm{M4^-}$	√	0	0	√	-	-
N139.12.1 $\mathrm{GM1^-} \oplus \mathrm{GM5^+}$	√	2	2	√	$4mm$	E
N139.12.2 $\mathrm{GM1^-} \oplus \mathrm{GM5^-}$	√	0	0	√	-	-
N139.12.3 $\mathrm{GM1^-} \oplus \mathrm{M5^+}$	√	1	0	×	-	-
N139.12.4 $\mathrm{GM1^-} \oplus \mathrm{M5^-}$	√	1	0	×	-	-
N139.12.5 $\mathrm{GM2^+} \oplus \mathrm{GM5^+}$	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{E_g}$
N139.12.6 $\mathrm{GM2^+} \oplus \mathrm{GM5^-}$	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{E_u}$
N139.12.7 $\mathrm{GM2^+} \oplus \mathrm{M5^+}$	√	1	1	×	-	-
N139.12.8 $\mathrm{GM2^+} \oplus \mathrm{M5^-}$	√	1	1	×	-	-
N139.12.9 $\mathrm{GM2^-} \oplus \mathrm{GM5^+}$	√	2	2	√	$\bar{4}m2$	E
N139.12.10 $\mathrm{GM2^-} \oplus \mathrm{GM5^-}$	√	0	0	√	-	-
N139.12.11 $\mathrm{GM2^-} \oplus \mathrm{M5^+}$	√	1	0	×	-	-
N139.12.12 $\mathrm{GM2^-} \oplus \mathrm{M5^-}$	√	1	0	×	-	-
N139.12.13 $\mathrm{GM3^+} \oplus \mathrm{GM5^+}$	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{E_g}$
N139.12.14 $\mathrm{GM3^+} \oplus \mathrm{GM5^-}$	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{E_u}$
N139.12.15 $\mathrm{GM3^+} \oplus \mathrm{M5^+}$	√	1	1	×	-	-
N139.12.16 $\mathrm{GM3^+} \oplus \mathrm{M5^-}$	√	1	1	×	-	-
N139.12.17 $\mathrm{GM3^-} \oplus \mathrm{GM5^+}$	√	2	2	√	422	E
N139.12.18 $\mathrm{GM3^-} \oplus \mathrm{GM5^-}$	√	0	0	√	-	-
N139.12.19 $\mathrm{GM3^-} \oplus \mathrm{M5^+}$	√	1	0	×	-	-
N139.12.20 $\mathrm{GM3^-} \oplus \mathrm{M5^-}$	√	1	0	×	-	-
N139.12.21 $\mathrm{GM4^+} \oplus \mathrm{GM5^+}$	√	3	3	√	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{E_g}$
N139.12.22 $\mathrm{GM4^+} \oplus \mathrm{GM5^-}$	√	3	3	√	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{E_u}$
N139.12.23 $\mathrm{GM4^+} \oplus \mathrm{M5^+}$	√	1	1	√	$4/mmm$	$\mathrm{B2_g}$
N139.12.24 $\mathrm{GM4^+} \oplus \mathrm{M5^-}$	√	1	1	√	$4/mmm$	$\mathrm{B2_g}$
N139.12.25 $\mathrm{GM4^-} \oplus \mathrm{GM5^+}$	√	2	2	√	$\bar{4}2m$	E
N139.12.26 $\mathrm{GM4^-} \oplus \mathrm{GM5^-}$	√	0	0	√	-	-
N139.12.27 $\mathrm{GM4^-} \oplus \mathrm{M5^+}$	√	1	0	×	-	-
N139.12.28 $\mathrm{GM4^-} \oplus \mathrm{M5^-}$	√	1	0	×	-	-
N139.12.29 $\mathrm{M1^+} \oplus \mathrm{GM5^+}$	√	2	2	√	$4/mmm$	$\mathrm{E_g}$
N139.12.30 $\mathrm{M1^+} \oplus \mathrm{GM5^-}$	√	0	0	√	-	-
N139.12.31 $\mathrm{M1^+} \oplus \mathrm{M5^+}$	√	0	0	√	-	-
N139.12.32 $\mathrm{M1^+} \oplus \mathrm{M5^-}$	√	2	2	√	$4/mmm$	$\mathrm{E_u}$

Non-coplanar SSGs with parent space group $I4/mmm$ (No. 139) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N139.12.33 $\mathrm{M1^-} \oplus \mathrm{GM5^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_g}$
N139.12.34 $\mathrm{M1^-} \oplus \mathrm{GM5^-}$	$\surd$	0	0	$\surd$	-	-
N139.12.35 $\mathrm{M1^-} \oplus \mathrm{M5^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_u}$
N139.12.36 $\mathrm{M1^-} \oplus \mathrm{M5^-}$	$\surd$	0	0	$\surd$	-	-
N139.12.37 $\mathrm{M2^+} \oplus \mathrm{GM5^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_g}$
N139.12.38 $\mathrm{M2^+} \oplus \mathrm{GM5^-}$	$\surd$	0	0	$\surd$	-	-
N139.12.39 $\mathrm{M2^+} \oplus \mathrm{M5^+}$	$\surd$	0	0	$\surd$	-	-
N139.12.40 $\mathrm{M2^+} \oplus \mathrm{M5^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_u}$
N139.12.41 $\mathrm{M2^-} \oplus \mathrm{GM5^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_g}$
N139.12.42 $\mathrm{M2^-} \oplus \mathrm{GM5^-}$	$\surd$	0	0	$\surd$	-	-
N139.12.43 $\mathrm{M2^-} \oplus \mathrm{M5^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_u}$
N139.12.44 $\mathrm{M2^-} \oplus \mathrm{M5^-}$	$\surd$	0	0	$\surd$	-	-
N139.12.45 $\mathrm{M3^+} \oplus \mathrm{GM5^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_g}$
N139.12.46 $\mathrm{M3^+} \oplus \mathrm{GM5^-}$	$\surd$	0	0	$\surd$	-	-
N139.12.47 $\mathrm{M3^+} \oplus \mathrm{M5^+}$	$\surd$	0	0	$\surd$	-	-
N139.12.48 $\mathrm{M3^+} \oplus \mathrm{M5^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_u}$
N139.12.49 $\mathrm{M3^-} \oplus \mathrm{GM5^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_g}$
N139.12.50 $\mathrm{M3^-} \oplus \mathrm{GM5^-}$	$\surd$	0	0	$\surd$	-	-
N139.12.51 $\mathrm{M3^-} \oplus \mathrm{M5^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_u}$
N139.12.52 $\mathrm{M3^-} \oplus \mathrm{M5^-}$	$\surd$	0	0	$\surd$	-	-
N139.12.53 $\mathrm{M4^+} \oplus \mathrm{GM5^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_g}$
N139.12.54 $\mathrm{M4^+} \oplus \mathrm{GM5^-}$	$\surd$	0	0	$\surd$	-	-
N139.12.55 $\mathrm{M4^+} \oplus \mathrm{M5^+}$	$\surd$	0	0	$\surd$	-	-
N139.12.56 $\mathrm{M4^+} \oplus \mathrm{M5^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_u}$
N139.12.57 $\mathrm{M4^-} \oplus \mathrm{GM5^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_g}$
N139.12.58 $\mathrm{M4^-} \oplus \mathrm{GM5^-}$	$\surd$	0	0	$\surd$	-	-
N139.12.59 $\mathrm{M4^-} \oplus \mathrm{M5^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_u}$
N139.12.60 $\mathrm{M4^-} \oplus \mathrm{M5^-}$	$\surd$	0	0	$\surd$	-	-
N139.13.1 $\mathrm{GM1^-} \oplus \mathrm{X1^+}$	$\surd$	1	0	$\times$	-	-
N139.13.2 $\mathrm{GM1^-} \oplus \mathrm{X1^-}$	$\surd$	1	0	$\times$	-	-
N139.13.3 $\mathrm{GM1^-} \oplus \mathrm{X2^+}$	$\surd$	1	0	$\times$	-	-
N139.13.4 $\mathrm{GM1^-} \oplus \mathrm{X2^-}$	$\surd$	1	0	$\times$	-	-
N139.13.5 $\mathrm{GM1^-} \oplus \mathrm{X3^+}$	$\surd$	1	0	$\times$	-	-
N139.13.6 $\mathrm{GM1^-} \oplus \mathrm{X3^-}$	$\surd$	1	0	$\times$	-	-
N139.13.7 $\mathrm{GM1^-} \oplus \mathrm{X4^+}$	$\surd$	1	0	$\times$	-	-
N139.13.8 $\mathrm{GM1^-} \oplus \mathrm{X4^-}$	$\surd$	1	0	$\times$	-	-
N139.13.9 $\mathrm{GM1^-} \oplus \mathrm{P1}$	$\surd$	1	1	$\times$	-	-
N139.13.10 $\mathrm{GM1^-} \oplus \mathrm{P2}$	$\surd$	1	1	$\times$	-	-
N139.13.11 $\mathrm{GM2^+} \oplus \mathrm{X1^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N139.13.12 $\mathrm{GM2^+} \oplus \mathrm{X1^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N139.13.13 $\mathrm{GM2^+} \oplus \mathrm{X2^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N139.13.14 $\mathrm{GM2^+} \oplus \mathrm{X2^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N139.13.15 $\mathrm{GM2^+} \oplus \mathrm{X3^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N139.13.16 $\mathrm{GM2^+} \oplus \mathrm{X3^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N139.13.17 $\mathrm{GM2^+} \oplus \mathrm{X4^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N139.13.18 $\mathrm{GM2^+} \oplus \mathrm{X4^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$

Non-coplanar SSGs with parent space group $I4/mmm$ (No. 139) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N139.13.19 $\mathrm{GM2^+} \oplus \mathrm{P1}$	$\surd$	1	1	$\times$	-	-
N139.13.20 $\mathrm{GM2^+} \oplus \mathrm{P2}$	$\surd$	1	1	$\times$	-	-
N139.13.21 $\mathrm{GM2^-} \oplus \mathrm{X1^+}$	$\surd$	1	0	$\times$	-	-
N139.13.22 $\mathrm{GM2^-} \oplus \mathrm{X1^-}$	$\surd$	1	0	$\times$	-	-
N139.13.23 $\mathrm{GM2^-} \oplus \mathrm{X2^+}$	$\surd$	1	0	$\times$	-	-
N139.13.24 $\mathrm{GM2^-} \oplus \mathrm{X2^-}$	$\surd$	1	0	$\times$	-	-
N139.13.25 $\mathrm{GM2^-} \oplus \mathrm{X3^+}$	$\surd$	1	0	$\times$	-	-
N139.13.26 $\mathrm{GM2^-} \oplus \mathrm{X3^-}$	$\surd$	1	0	$\times$	-	-
N139.13.27 $\mathrm{GM2^-} \oplus \mathrm{X4^+}$	$\surd$	1	0	$\times$	-	-
N139.13.28 $\mathrm{GM2^-} \oplus \mathrm{X4^-}$	$\surd$	1	0	$\times$	-	-
N139.13.29 $\mathrm{GM2^-} \oplus \mathrm{P1}$	$\surd$	1	1	$\times$	-	-
N139.13.30 $\mathrm{GM2^-} \oplus \mathrm{P2}$	$\surd$	1	1	$\times$	-	-
N139.13.31 $\mathrm{GM3^+} \oplus \mathrm{X1^+}$	$\surd$	1	1	$\times$	-	-
N139.13.32 $\mathrm{GM3^+} \oplus \mathrm{X1^-}$	$\surd$	1	1	$\times$	-	-
N139.13.33 $\mathrm{GM3^+} \oplus \mathrm{X2^+}$	$\surd$	1	1	$\times$	-	-
N139.13.34 $\mathrm{GM3^+} \oplus \mathrm{X2^-}$	$\surd$	1	1	$\times$	-	-
N139.13.35 $\mathrm{GM3^+} \oplus \mathrm{X3^+}$	$\surd$	1	1	$\times$	-	-
N139.13.36 $\mathrm{GM3^+} \oplus \mathrm{X3^-}$	$\surd$	1	1	$\times$	-	-
N139.13.37 $\mathrm{GM3^+} \oplus \mathrm{X4^+}$	$\surd$	1	1	$\times$	-	-
N139.13.38 $\mathrm{GM3^+} \oplus \mathrm{X4^-}$	$\surd$	1	1	$\times$	-	-
N139.13.39 $\mathrm{GM3^+} \oplus \mathrm{P1}$	$\surd$	1	1	$\times$	-	-
N139.13.40 $\mathrm{GM3^+} \oplus \mathrm{P2}$	$\surd$	1	1	$\times$	-	-
N139.13.41 $\mathrm{GM3^-} \oplus \mathrm{X1^+}$	$\surd$	1	0	$\times$	-	-
N139.13.42 $\mathrm{GM3^-} \oplus \mathrm{X1^-}$	$\surd$	1	0	$\times$	-	-
N139.13.43 $\mathrm{GM3^-} \oplus \mathrm{X2^+}$	$\surd$	1	0	$\times$	-	-
N139.13.44 $\mathrm{GM3^-} \oplus \mathrm{X2^-}$	$\surd$	1	0	$\times$	-	-
N139.13.45 $\mathrm{GM3^-} \oplus \mathrm{X3^+}$	$\surd$	1	0	$\times$	-	-
N139.13.46 $\mathrm{GM3^-} \oplus \mathrm{X3^-}$	$\surd$	1	0	$\times$	-	-
N139.13.47 $\mathrm{GM3^-} \oplus \mathrm{X4^+}$	$\surd$	1	0	$\times$	-	-
N139.13.48 $\mathrm{GM3^-} \oplus \mathrm{X4^-}$	$\surd$	1	0	$\times$	-	-
N139.13.49 $\mathrm{GM3^-} \oplus \mathrm{P1}$	$\surd$	1	1	$\times$	-	-
N139.13.50 $\mathrm{GM3^-} \oplus \mathrm{P2}$	$\surd$	1	1	$\times$	-	-
N139.13.51 $\mathrm{GM4^+} \oplus \mathrm{X1^+}$	$\surd$	1	1	$\times$	-	-
N139.13.52 $\mathrm{GM4^+} \oplus \mathrm{X1^-}$	$\surd$	1	1	$\times$	-	-
N139.13.53 $\mathrm{GM4^+} \oplus \mathrm{X2^+}$	$\surd$	1	1	$\times$	-	-
N139.13.54 $\mathrm{GM4^+} \oplus \mathrm{X2^-}$	$\surd$	1	1	$\times$	-	-
N139.13.55 $\mathrm{GM4^+} \oplus \mathrm{X3^+}$	$\surd$	1	1	$\times$	-	-
N139.13.56 $\mathrm{GM4^+} \oplus \mathrm{X3^-}$	$\surd$	1	1	$\times$	-	-
N139.13.57 $\mathrm{GM4^+} \oplus \mathrm{X4^+}$	$\surd$	1	1	$\times$	-	-
N139.13.58 $\mathrm{GM4^+} \oplus \mathrm{X4^-}$	$\surd$	1	1	$\times$	-	-
N139.13.59 $\mathrm{GM4^+} \oplus \mathrm{P1}$	$\surd$	1	1	$\times$	-	-
N139.13.60 $\mathrm{GM4^+} \oplus \mathrm{P2}$	$\surd$	1	1	$\times$	-	-
N139.13.61 $\mathrm{GM4^-} \oplus \mathrm{X1^+}$	$\surd$	1	0	$\times$	-	-
N139.13.62 $\mathrm{GM4^-} \oplus \mathrm{X1^-}$	$\surd$	1	0	$\times$	-	-
N139.13.63 $\mathrm{GM4^-} \oplus \mathrm{X2^+}$	$\surd$	1	0	$\times$	-	-
N139.13.64 $\mathrm{GM4^-} \oplus \mathrm{X2^-}$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $I4/mmm$ (No. 139) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N139.13.65 $\mathrm{GM4^-} \oplus \mathrm{X3^+}$	$\surd$	1	0	$\times$	-	-
N139.13.66 $\mathrm{GM4^-} \oplus \mathrm{X3^-}$	$\surd$	1	0	$\times$	-	-
N139.13.67 $\mathrm{GM4^-} \oplus \mathrm{X4^+}$	$\surd$	1	0	$\times$	-	-
N139.13.68 $\mathrm{GM4^-} \oplus \mathrm{X4^-}$	$\surd$	1	0	$\times$	-	-
N139.13.69 $\mathrm{GM4^-} \oplus \mathrm{P1}$	$\surd$	1	1	$\times$	-	-
N139.13.70 $\mathrm{GM4^-} \oplus \mathrm{P2}$	$\surd$	1	1	$\times$	-	-
N139.13.71 $\mathrm{M1^+} \oplus \mathrm{X1^+}$	$\times$	-	-	-	-	-
N139.13.72 $\mathrm{M1^+} \oplus \mathrm{X1^-}$	$\times$	-	-	-	-	-
N139.13.73 $\mathrm{M1^+} \oplus \mathrm{X2^+}$	$\times$	-	-	-	-	-
N139.13.74 $\mathrm{M1^+} \oplus \mathrm{X2^-}$	$\times$	-	-	-	-	-
N139.13.75 $\mathrm{M1^+} \oplus \mathrm{X3^+}$	$\times$	-	-	-	-	-
N139.13.76 $\mathrm{M1^+} \oplus \mathrm{X3^-}$	$\times$	-	-	-	-	-
N139.13.77 $\mathrm{M1^+} \oplus \mathrm{X4^+}$	$\times$	-	-	-	-	-
N139.13.78 $\mathrm{M1^+} \oplus \mathrm{X4^-}$	$\times$	-	-	-	-	-
N139.13.79 $\mathrm{M1^+} \oplus \mathrm{P1}$	$\surd$	1	1	$\times$	-	-
N139.13.80 $\mathrm{M1^+} \oplus \mathrm{P2}$	$\surd$	1	1	$\times$	-	-
N139.13.81 $\mathrm{M1^-} \oplus \mathrm{X1^+}$	$\times$	-	-	-	-	-
N139.13.82 $\mathrm{M1^-} \oplus \mathrm{X1^-}$	$\times$	-	-	-	-	-
N139.13.83 $\mathrm{M1^-} \oplus \mathrm{X2^+}$	$\times$	-	-	-	-	-
N139.13.84 $\mathrm{M1^-} \oplus \mathrm{X2^-}$	$\times$	-	-	-	-	-
N139.13.85 $\mathrm{M1^-} \oplus \mathrm{X3^+}$	$\times$	-	-	-	-	-
N139.13.86 $\mathrm{M1^-} \oplus \mathrm{X3^-}$	$\times$	-	-	-	-	-
N139.13.87 $\mathrm{M1^-} \oplus \mathrm{X4^+}$	$\times$	-	-	-	-	-
N139.13.88 $\mathrm{M1^-} \oplus \mathrm{X4^-}$	$\times$	-	-	-	-	-
N139.13.89 $\mathrm{M1^-} \oplus \mathrm{P1}$	$\surd$	1	1	$\times$	-	-
N139.13.90 $\mathrm{M1^-} \oplus \mathrm{P2}$	$\surd$	1	1	$\times$	-	-
N139.13.91 $\mathrm{M2^+} \oplus \mathrm{X1^+}$	$\times$	-	-	-	-	-
N139.13.92 $\mathrm{M2^+} \oplus \mathrm{X1^-}$	$\times$	-	-	-	-	-
N139.13.93 $\mathrm{M2^+} \oplus \mathrm{X2^+}$	$\times$	-	-	-	-	-
N139.13.94 $\mathrm{M2^+} \oplus \mathrm{X2^-}$	$\times$	-	-	-	-	-
N139.13.95 $\mathrm{M2^+} \oplus \mathrm{X3^+}$	$\times$	-	-	-	-	-
N139.13.96 $\mathrm{M2^+} \oplus \mathrm{X3^-}$	$\times$	-	-	-	-	-
N139.13.97 $\mathrm{M2^+} \oplus \mathrm{X4^+}$	$\times$	-	-	-	-	-
N139.13.98 $\mathrm{M2^+} \oplus \mathrm{X4^-}$	$\times$	-	-	-	-	-
N139.13.99 $\mathrm{M2^+} \oplus \mathrm{P1}$	$\surd$	1	1	$\times$	-	-
N139.13.100 $\mathrm{M2^+} \oplus \mathrm{P2}$	$\surd$	1	1	$\times$	-	-
N139.13.101 $\mathrm{M2^-} \oplus \mathrm{X1^+}$	$\times$	-	-	-	-	-
N139.13.102 $\mathrm{M2^-} \oplus \mathrm{X1^-}$	$\times$	-	-	-	-	-
N139.13.103 $\mathrm{M2^-} \oplus \mathrm{X2^+}$	$\times$	-	-	-	-	-
N139.13.104 $\mathrm{M2^-} \oplus \mathrm{X2^-}$	$\times$	-	-	-	-	-
N139.13.105 $\mathrm{M2^-} \oplus \mathrm{X3^+}$	$\times$	-	-	-	-	-
N139.13.106 $\mathrm{M2^-} \oplus \mathrm{X3^-}$	$\times$	-	-	-	-	-
N139.13.107 $\mathrm{M2^-} \oplus \mathrm{X4^+}$	$\times$	-	-	-	-	-
N139.13.108 $\mathrm{M2^-} \oplus \mathrm{X4^-}$	$\times$	-	-	-	-	-
N139.13.109 $\mathrm{M2^-} \oplus \mathrm{P1}$	$\surd$	1	1	$\times$	-	-
N139.13.110 $\mathrm{M2^-} \oplus \mathrm{P2}$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $I4/mmm$ (No. 139) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N139.13.111 $\mathrm{M3}^{+} \oplus \mathrm{X1}^{+}$	$\times$	-	-	-	-	-
N139.13.112 $\mathrm{M3}^{+} \oplus \mathrm{X1}^{-}$	$\times$	-	-	-	-	-
N139.13.113 $\mathrm{M3}^{+} \oplus \mathrm{X2}^{+}$	$\times$	-	-	-	-	-
N139.13.114 $\mathrm{M3}^{+} \oplus \mathrm{X2}^{-}$	$\times$	-	-	-	-	-
N139.13.115 $\mathrm{M3}^{+} \oplus \mathrm{X3}^{+}$	$\times$	-	-	-	-	-
N139.13.116 $\mathrm{M3}^{+} \oplus \mathrm{X3}^{-}$	$\times$	-	-	-	-	-
N139.13.117 $\mathrm{M3}^{+} \oplus \mathrm{X4}^{+}$	$\times$	-	-	-	-	-
N139.13.118 $\mathrm{M3}^{+} \oplus \mathrm{X4}^{-}$	$\times$	-	-	-	-	-
N139.13.119 $\mathrm{M3}^{+} \oplus \mathrm{P1}$	$\surd$	1	1	$\times$	-	-
N139.13.120 $\mathrm{M3}^{+} \oplus \mathrm{P2}$	$\surd$	1	1	$\times$	-	-
N139.13.121 $\mathrm{M3}^{-} \oplus \mathrm{X1}^{+}$	$\times$	-	-	-	-	-
N139.13.122 $\mathrm{M3}^{-} \oplus \mathrm{X1}^{-}$	$\times$	-	-	-	-	-
N139.13.123 $\mathrm{M3}^{-} \oplus \mathrm{X2}^{+}$	$\times$	-	-	-	-	-
N139.13.124 $\mathrm{M3}^{-} \oplus \mathrm{X2}^{-}$	$\times$	-	-	-	-	-
N139.13.125 $\mathrm{M3}^{-} \oplus \mathrm{X3}^{+}$	$\times$	-	-	-	-	-
N139.13.126 $\mathrm{M3}^{-} \oplus \mathrm{X3}^{-}$	$\times$	-	-	-	-	-
N139.13.127 $\mathrm{M3}^{-} \oplus \mathrm{X4}^{+}$	$\times$	-	-	-	-	-
N139.13.128 $\mathrm{M3}^{-} \oplus \mathrm{X4}^{-}$	$\times$	-	-	-	-	-
N139.13.129 $\mathrm{M3}^{-} \oplus \mathrm{P1}$	$\surd$	1	1	$\times$	-	-
N139.13.130 $\mathrm{M3}^{-} \oplus \mathrm{P2}$	$\surd$	1	1	$\times$	-	-
N139.13.131 $\mathrm{M4}^{+} \oplus \mathrm{X1}^{+}$	$\times$	-	-	-	-	-
N139.13.132 $\mathrm{M4}^{+} \oplus \mathrm{X1}^{-}$	$\times$	-	-	-	-	-
N139.13.133 $\mathrm{M4}^{+} \oplus \mathrm{X2}^{+}$	$\times$	-	-	-	-	-
N139.13.134 $\mathrm{M4}^{+} \oplus \mathrm{X2}^{-}$	$\times$	-	-	-	-	-
N139.13.135 $\mathrm{M4}^{+} \oplus \mathrm{X3}^{+}$	$\times$	-	-	-	-	-
N139.13.136 $\mathrm{M4}^{+} \oplus \mathrm{X3}^{-}$	$\times$	-	-	-	-	-
N139.13.137 $\mathrm{M4}^{+} \oplus \mathrm{X4}^{+}$	$\times$	-	-	-	-	-
N139.13.138 $\mathrm{M4}^{+} \oplus \mathrm{X4}^{-}$	$\times$	-	-	-	-	-
N139.13.139 $\mathrm{M4}^{+} \oplus \mathrm{P1}$	$\surd$	1	1	$\times$	-	-
N139.13.140 $\mathrm{M4}^{+} \oplus \mathrm{P2}$	$\surd$	1	1	$\times$	-	-
N139.13.141 $\mathrm{M4}^{-} \oplus \mathrm{X1}^{+}$	$\times$	-	-	-	-	-
N139.13.142 $\mathrm{M4}^{-} \oplus \mathrm{X1}^{-}$	$\times$	-	-	-	-	-
N139.13.143 $\mathrm{M4}^{-} \oplus \mathrm{X2}^{+}$	$\times$	-	-	-	-	-
N139.13.144 $\mathrm{M4}^{-} \oplus \mathrm{X2}^{-}$	$\times$	-	-	-	-	-
N139.13.145 $\mathrm{M4}^{-} \oplus \mathrm{X3}^{+}$	$\times$	-	-	-	-	-
N139.13.146 $\mathrm{M4}^{-} \oplus \mathrm{X3}^{-}$	$\times$	-	-	-	-	-
N139.13.147 $\mathrm{M4}^{-} \oplus \mathrm{X4}^{+}$	$\times$	-	-	-	-	-
N139.13.148 $\mathrm{M4}^{-} \oplus \mathrm{X4}^{-}$	$\times$	-	-	-	-	-
N139.13.149 $\mathrm{M4}^{-} \oplus \mathrm{P1}$	$\surd$	1	1	$\times$	-	-
N139.13.150 $\mathrm{M4}^{-} \oplus \mathrm{P2}$	$\surd$	1	1	$\times$	-	-
N139.14.1 $\mathrm{GM1}^{-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N139.14.2 $\mathrm{GM1}^{-} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N139.14.3 $\mathrm{GM1}^{-} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N139.14.4 $\mathrm{GM1}^{-} \oplus \mathrm{LD4}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N139.14.5 $\mathrm{GM2}^{+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N139.14.6 $\mathrm{GM2}^{+} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1

Non-coplanar SSGs with parent space group $I4/mmm$ (No. 139) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N139.14.7 GM2$^+$ ⊕ LD3	√	1	1	√	$\bar{4}m2$	B1
N139.14.8 GM2$^+$ ⊕ LD4	√	1	1	√	$\bar{4}m2$	B1
N139.14.9 GM2$^-$ ⊕ LD1	√	1	1	√	$4/mmm$	A2$_{\mathrm{u}}$
N139.14.10 GM2$^-$ ⊕ LD2	√	1	1	√	$4/mmm$	A2$_{\mathrm{u}}$
N139.14.11 GM2$^-$ ⊕ LD3	√	1	1	√	$4/mmm$	A2$_{\mathrm{u}}$
N139.14.12 GM2$^-$ ⊕ LD4	√	1	1	√	$4/mmm$	A2$_{\mathrm{u}}$
N139.14.13 GM3$^+$ ⊕ LD1	√	1	1	√	422	A2
N139.14.14 GM3$^+$ ⊕ LD2	√	1	1	√	422	A2
N139.14.15 GM3$^+$ ⊕ LD3	√	1	1	√	422	A2
N139.14.16 GM3$^+$ ⊕ LD4	√	1	1	√	422	A2
N139.14.17 GM3$^-$ ⊕ LD1	√	1	1	√	$4/mmm$	A2$_{\mathrm{u}}$
N139.14.18 GM3$^-$ ⊕ LD2	√	1	1	√	$4/mmm$	A2$_{\mathrm{u}}$
N139.14.19 GM3$^-$ ⊕ LD3	√	1	1	√	$4/mmm$	A2$_{\mathrm{u}}$
N139.14.20 GM3$^-$ ⊕ LD4	√	1	1	√	$4/mmm$	A2$_{\mathrm{u}}$
N139.14.21 GM4$^+$ ⊕ LD1	√	1	1	√	$\bar{4}2m$	B2
N139.14.22 GM4$^+$ ⊕ LD2	√	1	1	√	$\bar{4}2m$	B2
N139.14.23 GM4$^+$ ⊕ LD3	√	1	1	√	$\bar{4}2m$	B2
N139.14.24 GM4$^+$ ⊕ LD4	√	1	1	√	$\bar{4}2m$	B2
N139.14.25 GM4$^-$ ⊕ LD1	√	1	1	√	$4/mmm$	A2$_{\mathrm{u}}$
N139.14.26 GM4$^-$ ⊕ LD2	√	1	1	√	$4/mmm$	A2$_{\mathrm{u}}$
N139.14.27 GM4$^-$ ⊕ LD3	√	1	1	√	$4/mmm$	A2$_{\mathrm{u}}$
N139.14.28 GM4$^-$ ⊕ LD4	√	1	1	√	$4/mmm$	A2$_{\mathrm{u}}$
N139.14.29 M1$^+$ ⊕ LD1	√	1	1	√	$4/mmm$	A2$_{\mathrm{u}}$
N139.14.30 M1$^+$ ⊕ LD2	√	1	1	√	$4/mmm$	A2$_{\mathrm{u}}$
N139.14.31 M1$^+$ ⊕ LD3	√	1	1	√	$4/mmm$	A2$_{\mathrm{u}}$
N139.14.32 M1$^+$ ⊕ LD4	√	1	1	√	$4/mmm$	A2$_{\mathrm{u}}$
N139.14.33 M1$^-$ ⊕ LD1	√	1	1	√	$4/mmm$	A2$_{\mathrm{u}}$
N139.14.34 M1$^-$ ⊕ LD2	√	1	1	√	$4/mmm$	A2$_{\mathrm{u}}$
N139.14.35 M1$^-$ ⊕ LD3	√	1	1	√	$4/mmm$	A2$_{\mathrm{u}}$
N139.14.36 M1$^-$ ⊕ LD4	√	1	1	√	$4/mmm$	A2$_{\mathrm{u}}$
N139.14.37 M2$^+$ ⊕ LD1	√	1	1	√	$4/mmm$	A2$_{\mathrm{u}}$
N139.14.38 M2$^+$ ⊕ LD2	√	1	1	√	$4/mmm$	A2$_{\mathrm{u}}$
N139.14.39 M2$^+$ ⊕ LD3	√	1	1	√	$4/mmm$	A2$_{\mathrm{u}}$
N139.14.40 M2$^+$ ⊕ LD4	√	1	1	√	$4/mmm$	A2$_{\mathrm{u}}$
N139.14.41 M2$^-$ ⊕ LD1	√	1	1	√	$4/mmm$	A2$_{\mathrm{u}}$
N139.14.42 M2$^-$ ⊕ LD2	√	1	1	√	$4/mmm$	A2$_{\mathrm{u}}$
N139.14.43 M2$^-$ ⊕ LD3	√	1	1	√	$4/mmm$	A2$_{\mathrm{u}}$
N139.14.44 M2$^-$ ⊕ LD4	√	1	1	√	$4/mmm$	A2$_{\mathrm{u}}$
N139.14.45 M3$^+$ ⊕ LD1	√	1	1	√	$4/mmm$	A2$_{\mathrm{u}}$
N139.14.46 M3$^+$ ⊕ LD2	√	1	1	√	$4/mmm$	A2$_{\mathrm{u}}$
N139.14.47 M3$^+$ ⊕ LD3	√	1	1	√	$4/mmm$	A2$_{\mathrm{u}}$
N139.14.48 M3$^+$ ⊕ LD4	√	1	1	√	$4/mmm$	A2$_{\mathrm{u}}$
N139.14.49 M3$^-$ ⊕ LD1	√	1	1	√	$4/mmm$	A2$_{\mathrm{u}}$
N139.14.50 M3$^-$ ⊕ LD2	√	1	1	√	$4/mmm$	A2$_{\mathrm{u}}$
N139.14.51 M3$^-$ ⊕ LD3	√	1	1	√	$4/mmm$	A2$_{\mathrm{u}}$
N139.14.52 M3$^-$ ⊕ LD4	√	1	1	√	$4/mmm$	A2$_{\mathrm{u}}$

Non-coplanar SSGs with parent space group $I4/mmm$ (No. 139) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N139.14.53 $\mathrm{M4}^{+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N139.14.54 $\mathrm{M4}^{+} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N139.14.55 $\mathrm{M4}^{+} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N139.14.56 $\mathrm{M4}^{+} \oplus \mathrm{LD4}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N139.14.57 $\mathrm{M4}^{-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N139.14.58 $\mathrm{M4}^{-} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N139.14.59 $\mathrm{M4}^{-} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N139.14.60 $\mathrm{M4}^{-} \oplus \mathrm{LD4}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$

TABLE S418: Collinear SSGs with parent space group $I4/mcm$ (No. 140).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L140.1.1 $\mathrm{GM1}^{+}$	1	$4/mmm$	$\mathrm{A1_g}$
L140.2.1 $\mathrm{GM1}^{-}$	0	-	-
L140.2.2 $\mathrm{GM2}^{+}$	1	$4/mmm$	$\mathrm{B1_g}$
L140.2.3 $\mathrm{GM2}^{-}$	0	-	-
L140.2.4 $\mathrm{GM3}^{+}$	1	$4/mmm$	$\mathrm{A2_g}$
L140.2.5 $\mathrm{GM3}^{-}$	0	-	-
L140.2.6 $\mathrm{GM4}^{+}$	1	$4/mmm$	$\mathrm{B2_g}$
L140.2.7 $\mathrm{GM4}^{-}$	0	-	-
L140.2.8 $\mathrm{M1}^{+}$	0	-	-
L140.2.9 $\mathrm{M1}^{-}$	0	-	-
L140.2.10 $\mathrm{M2}^{+}$	0	-	-
L140.2.11 $\mathrm{M2}^{-}$	0	-	-
L140.2.12 $\mathrm{M3}^{+}$	0	-	-
L140.2.13 $\mathrm{M3}^{-}$	0	-	-
L140.2.14 $\mathrm{M4}^{+}$	0	-	-
L140.2.15 $\mathrm{M4}^{-}$	0	-	-

TABLE S419: Coplanar SSGs with parent space group $I4/mcm$ (No. 140).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P140.1.1 $\mathrm{GM1}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g}$
P140.2.1 $\mathrm{GM1}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u}$
P140.2.2 $\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g}$
P140.2.3 $\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u}$
P140.2.4 $\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g}$
P140.2.5 $\mathrm{GM3}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_u}$
P140.2.6 $\mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_g}$
P140.2.7 $\mathrm{GM4}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_u}$
P140.2.8 $\mathrm{M1}^{+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P140.2.9 $\mathrm{M1}^{-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P140.2.10 $\mathrm{M2}^{+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P140.2.11 $\mathrm{M2}^{-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P140.2.12 $\mathrm{M3}^{+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P140.2.13 $\mathrm{M3}^{-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$

Coplanar SSGs with parent space group $I4/mcm$ (No. 140) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P140.2.14 $\mathrm{M4}^{+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P140.2.15 $\mathrm{M4}^{-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
P140.3.1 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-}$	$\surd$	0	0	$\surd$	-	-
P140.3.2 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
P140.3.3 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
P140.3.4 $\mathrm{GM1}^{-} \oplus \mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u}$
P140.3.5 $\mathrm{GM1}^{-} \oplus \mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
P140.3.6 $\mathrm{GM1}^{-} \oplus \mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_u}$
P140.3.7 $\mathrm{GM1}^{-} \oplus \mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
P140.3.8 $\mathrm{GM1}^{-} \oplus \mathrm{M1}^{+}$	$\surd$	1	1	$\times$	-	-
P140.3.9 $\mathrm{GM1}^{-} \oplus \mathrm{M1}^{-}$	$\surd$	1	1	$\times$	-	-
P140.3.10 $\mathrm{GM1}^{-} \oplus \mathrm{M2}^{+}$	$\surd$	1	1	$\times$	-	-
P140.3.11 $\mathrm{GM1}^{-} \oplus \mathrm{M2}^{-}$	$\surd$	1	1	$\times$	-	-
P140.3.12 $\mathrm{GM1}^{-} \oplus \mathrm{M3}^{+}$	$\surd$	1	1	$\times$	-	-
P140.3.13 $\mathrm{GM1}^{-} \oplus \mathrm{M3}^{-}$	$\surd$	1	1	$\times$	-	-
P140.3.14 $\mathrm{GM1}^{-} \oplus \mathrm{M4}^{+}$	$\surd$	1	1	$\times$	-	-
P140.3.15 $\mathrm{GM1}^{-} \oplus \mathrm{M4}^{-}$	$\surd$	1	1	$\times$	-	-
P140.3.16 $\mathrm{GM2}^{+} \oplus \mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
P140.3.17 $\mathrm{GM2}^{+} \oplus \mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g}$
P140.3.18 $\mathrm{GM2}^{+} \oplus \mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g}$
P140.3.19 $\mathrm{GM2}^{+} \oplus \mathrm{GM3}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
P140.3.20 $\mathrm{GM2}^{+} \oplus \mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
P140.3.21 $\mathrm{GM2}^{+} \oplus \mathrm{GM4}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u}$
P140.3.22 $\mathrm{GM2}^{+} \oplus \mathrm{M1}^{+}$	$\surd$	1	0	$\times$	-	-
P140.3.23 $\mathrm{GM2}^{+} \oplus \mathrm{M1}^{-}$	$\surd$	1	0	$\times$	-	-
P140.3.24 $\mathrm{GM2}^{+} \oplus \mathrm{M2}^{+}$	$\surd$	1	0	$\times$	-	-
P140.3.25 $\mathrm{GM2}^{+} \oplus \mathrm{M2}^{-}$	$\surd$	1	0	$\times$	-	-
P140.3.26 $\mathrm{GM2}^{+} \oplus \mathrm{M3}^{+}$	$\surd$	1	0	$\times$	-	-
P140.3.27 $\mathrm{GM2}^{+} \oplus \mathrm{M3}^{-}$	$\surd$	1	0	$\times$	-	-
P140.3.28 $\mathrm{GM2}^{+} \oplus \mathrm{M4}^{+}$	$\surd$	1	0	$\times$	-	-
P140.3.29 $\mathrm{GM2}^{+} \oplus \mathrm{M4}^{-}$	$\surd$	1	0	$\times$	-	-
P140.3.30 $\mathrm{GM2}^{-} \oplus \mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
P140.3.31 $\mathrm{GM2}^{-} \oplus \mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_u}$
P140.3.32 $\mathrm{GM2}^{-} \oplus \mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
P140.3.33 $\mathrm{GM2}^{-} \oplus \mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g}$
P140.3.34 $\mathrm{GM2}^{-} \oplus \mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
P140.3.35 $\mathrm{GM2}^{-} \oplus \mathrm{M1}^{+}$	$\surd$	1	1	$\times$	-	-
P140.3.36 $\mathrm{GM2}^{-} \oplus \mathrm{M1}^{-}$	$\surd$	1	1	$\times$	-	-
P140.3.37 $\mathrm{GM2}^{-} \oplus \mathrm{M2}^{+}$	$\surd$	1	1	$\times$	-	-
P140.3.38 $\mathrm{GM2}^{-} \oplus \mathrm{M2}^{-}$	$\surd$	1	1	$\times$	-	-
P140.3.39 $\mathrm{GM2}^{-} \oplus \mathrm{M3}^{+}$	$\surd$	1	1	$\times$	-	-
P140.3.40 $\mathrm{GM2}^{-} \oplus \mathrm{M3}^{-}$	$\surd$	1	1	$\times$	-	-
P140.3.41 $\mathrm{GM2}^{-} \oplus \mathrm{M4}^{+}$	$\surd$	1	1	$\times$	-	-
P140.3.42 $\mathrm{GM2}^{-} \oplus \mathrm{M4}^{-}$	$\surd$	1	1	$\times$	-	-
P140.3.43 $\mathrm{GM3}^{+} \oplus \mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g}$
P140.3.44 $\mathrm{GM3}^{+} \oplus \mathrm{GM3}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g}$

Coplanar SSGs with parent space group $I4/mcm$ (No. 140) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P140.3.45 $\mathrm{GM3^+} \oplus \mathrm{GM4^+}$	√	2	2	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g}$
P140.3.46 $\mathrm{GM3^+} \oplus \mathrm{GM4^-}$	√	2	2	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g}$
P140.3.47 $\mathrm{GM3^+} \oplus \mathrm{M1^+}$	√	1	0	×	-	-
P140.3.48 $\mathrm{GM3^+} \oplus \mathrm{M1^-}$	√	1	0	×	-	-
P140.3.49 $\mathrm{GM3^+} \oplus \mathrm{M2^+}$	√	1	0	×	-	-
P140.3.50 $\mathrm{GM3^+} \oplus \mathrm{M2^-}$	√	1	0	×	-	-
P140.3.51 $\mathrm{GM3^+} \oplus \mathrm{M3^+}$	√	1	0	×	-	-
P140.3.52 $\mathrm{GM3^+} \oplus \mathrm{M3^-}$	√	1	0	×	-	-
P140.3.53 $\mathrm{GM3^+} \oplus \mathrm{M4^+}$	√	1	0	×	-	-
P140.3.54 $\mathrm{GM3^+} \oplus \mathrm{M4^-}$	√	1	0	×	-	-
P140.3.55 $\mathrm{GM3^-} \oplus \mathrm{GM3^-}$	√	0	0	√	-	-
P140.3.56 $\mathrm{GM3^-} \oplus \mathrm{GM4^+}$	√	2	2	√	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_g}$
P140.3.57 $\mathrm{GM3^-} \oplus \mathrm{GM4^-}$	√	0	0	√	-	-
P140.3.58 $\mathrm{GM3^-} \oplus \mathrm{M1^+}$	√	1	1	×	-	-
P140.3.59 $\mathrm{GM3^-} \oplus \mathrm{M1^-}$	√	1	1	×	-	-
P140.3.60 $\mathrm{GM3^-} \oplus \mathrm{M2^+}$	√	1	1	×	-	-
P140.3.61 $\mathrm{GM3^-} \oplus \mathrm{M2^-}$	√	1	1	×	-	-
P140.3.62 $\mathrm{GM3^-} \oplus \mathrm{M3^+}$	√	1	1	×	-	-
P140.3.63 $\mathrm{GM3^-} \oplus \mathrm{M3^-}$	√	1	1	×	-	-
P140.3.64 $\mathrm{GM3^-} \oplus \mathrm{M4^+}$	√	1	1	×	-	-
P140.3.65 $\mathrm{GM3^-} \oplus \mathrm{M4^-}$	√	1	1	×	-	-
P140.3.66 $\mathrm{GM4^+} \oplus \mathrm{GM4^+}$	√	2	2	√	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_g}$
P140.3.67 $\mathrm{GM4^+} \oplus \mathrm{GM4^-}$	√	2	2	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g}$
P140.3.68 $\mathrm{GM4^+} \oplus \mathrm{M1^+}$	√	1	1	√	$4/mmm$	$\mathrm{B2_g}$
P140.3.69 $\mathrm{GM4^+} \oplus \mathrm{M1^-}$	√	1	1	√	$4/mmm$	$\mathrm{B2_g}$
P140.3.70 $\mathrm{GM4^+} \oplus \mathrm{M2^+}$	√	1	1	√	$4/mmm$	$\mathrm{B2_g}$
P140.3.71 $\mathrm{GM4^+} \oplus \mathrm{M2^-}$	√	1	1	√	$4/mmm$	$\mathrm{B2_g}$
P140.3.72 $\mathrm{GM4^+} \oplus \mathrm{M3^+}$	√	1	1	√	$4/mmm$	$\mathrm{B2_g}$
P140.3.73 $\mathrm{GM4^+} \oplus \mathrm{M3^-}$	√	1	1	√	$4/mmm$	$\mathrm{B2_g}$
P140.3.74 $\mathrm{GM4^+} \oplus \mathrm{M4^+}$	√	1	1	√	$4/mmm$	$\mathrm{B2_g}$
P140.3.75 $\mathrm{GM4^+} \oplus \mathrm{M4^-}$	√	1	1	√	$4/mmm$	$\mathrm{B2_g}$
P140.3.76 $\mathrm{GM4^-} \oplus \mathrm{GM4^-}$	√	0	0	√	-	-
P140.3.77 $\mathrm{GM4^-} \oplus \mathrm{M1^+}$	√	1	1	×	-	-
P140.3.78 $\mathrm{GM4^-} \oplus \mathrm{M1^-}$	√	1	1	×	-	-
P140.3.79 $\mathrm{GM4^-} \oplus \mathrm{M2^+}$	√	1	1	×	-	-
P140.3.80 $\mathrm{GM4^-} \oplus \mathrm{M2^-}$	√	1	1	×	-	-
P140.3.81 $\mathrm{GM4^-} \oplus \mathrm{M3^+}$	√	1	1	×	-	-
P140.3.82 $\mathrm{GM4^-} \oplus \mathrm{M3^-}$	√	1	1	×	-	-
P140.3.83 $\mathrm{GM4^-} \oplus \mathrm{M4^+}$	√	1	1	×	-	-
P140.3.84 $\mathrm{GM4^-} \oplus \mathrm{M4^-}$	√	1	1	×	-	-
P140.3.85 $\mathrm{M1^+} \oplus \mathrm{M1^+}$	√	1	0	×	-	-
P140.3.86 $\mathrm{M1^+} \oplus \mathrm{M1^-}$	√	1	1	×	-	-
P140.3.87 $\mathrm{M1^+} \oplus \mathrm{M2^+}$	√	1	0	×	-	-
P140.3.88 $\mathrm{M1^+} \oplus \mathrm{M2^-}$	√	1	1	√	$4/mmm$	$\mathrm{B1_u}$
P140.3.89 $\mathrm{M1^+} \oplus \mathrm{M3^+}$	√	1	0	×	-	-
P140.3.90 $\mathrm{M1^+} \oplus \mathrm{M3^-}$	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$

Coplanar SSGs with parent space group $I4/mcm$ (No. 140) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P140.3.91 $\mathrm{M1^+ \oplus M4^+}$	$\surd$	1	0	$\times$	-	-
P140.3.92 $\mathrm{M1^+ \oplus M4^-}$	$\surd$	1	1	$\times$	-	-
P140.3.93 $\mathrm{M1^- \oplus M1^-}$	$\surd$	1	0	$\times$	-	-
P140.3.94 $\mathrm{M1^- \oplus M2^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_u}$
P140.3.95 $\mathrm{M1^- \oplus M2^-}$	$\surd$	1	0	$\times$	-	-
P140.3.96 $\mathrm{M1^- \oplus M3^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P140.3.97 $\mathrm{M1^- \oplus M3^-}$	$\surd$	1	0	$\times$	-	-
P140.3.98 $\mathrm{M1^- \oplus M4^+}$	$\surd$	1	1	$\times$	-	-
P140.3.99 $\mathrm{M1^- \oplus M4^-}$	$\surd$	1	0	$\times$	-	-
P140.3.100 $\mathrm{M2^+ \oplus M2^+}$	$\surd$	1	0	$\times$	-	-
P140.3.101 $\mathrm{M2^+ \oplus M2^-}$	$\surd$	1	1	$\times$	-	-
P140.3.102 $\mathrm{M2^+ \oplus M3^+}$	$\surd$	1	0	$\times$	-	-
P140.3.103 $\mathrm{M2^+ \oplus M3^-}$	$\surd$	1	1	$\times$	-	-
P140.3.104 $\mathrm{M2^+ \oplus M4^+}$	$\surd$	1	0	$\times$	-	-
P140.3.105 $\mathrm{M2^+ \oplus M4^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P140.3.106 $\mathrm{M2^- \oplus M2^-}$	$\surd$	1	0	$\times$	-	-
P140.3.107 $\mathrm{M2^- \oplus M3^+}$	$\surd$	1	1	$\times$	-	-
P140.3.108 $\mathrm{M2^- \oplus M3^-}$	$\surd$	1	0	$\times$	-	-
P140.3.109 $\mathrm{M2^- \oplus M4^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P140.3.110 $\mathrm{M2^- \oplus M4^-}$	$\surd$	1	0	$\times$	-	-
P140.3.111 $\mathrm{M3^+ \oplus M3^+}$	$\surd$	1	0	$\times$	-	-
P140.3.112 $\mathrm{M3^+ \oplus M3^-}$	$\surd$	1	1	$\times$	-	-
P140.3.113 $\mathrm{M3^+ \oplus M4^+}$	$\surd$	1	0	$\times$	-	-
P140.3.114 $\mathrm{M3^+ \oplus M4^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_u}$
P140.3.115 $\mathrm{M3^- \oplus M3^-}$	$\surd$	1	0	$\times$	-	-
P140.3.116 $\mathrm{M3^- \oplus M4^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_u}$
P140.3.117 $\mathrm{M3^- \oplus M4^-}$	$\surd$	1	0	$\times$	-	-
P140.3.118 $\mathrm{M4^+ \oplus M4^+}$	$\surd$	1	0	$\times$	-	-
P140.3.119 $\mathrm{M4^+ \oplus M4^-}$	$\surd$	1	1	$\times$	-	-
P140.3.120 $\mathrm{M4^- \oplus M4^-}$	$\surd$	1	0	$\times$	-	-
P140.6.1 $\mathrm{GM5^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_g}$
P140.6.2 $\mathrm{GM5^-}$	$\surd$	0	0	$\surd$	-	-
P140.6.3 $\mathrm{M5^+}$	$\surd$	1	0	$\times$	-	-
P140.6.4 $\mathrm{M5^-}$	$\surd$	1	0	$\times$	-	-
P140.7.1 $\mathrm{X1^+}$	$\times$	-	-	-	-	-
P140.7.2 $\mathrm{X1^-}$	$\times$	-	-	-	-	-
P140.7.3 $\mathrm{X2^+}$	$\times$	-	-	-	-	-
P140.7.4 $\mathrm{X2^-}$	$\times$	-	-	-	-	-
P140.7.5 $\mathrm{X3^+}$	$\times$	-	-	-	-	-
P140.7.6 $\mathrm{X3^-}$	$\times$	-	-	-	-	-
P140.7.7 $\mathrm{X4^+}$	$\times$	-	-	-	-	-
P140.7.8 $\mathrm{X4^-}$	$\times$	-	-	-	-	-
P140.8.1 LD1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P140.8.2 LD2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P140.8.3 LD3	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P140.8.4 LD4	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$

Non-coplanar SSGs with parent space group $I4/mcm$ (No. 140) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation

TABLE S420: Non-coplanar SSGs with parent space group $I4/mcm$ (No. 140).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N140.1.1 GM1$^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A1_g}$
N140.2.1 GM1$^-$	$\surd$	2	2	$\surd$	422	$\mathrm{A1}\oplus\mathrm{A1}$
N140.2.2 GM2$^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{B1_g}$
N140.2.3 GM2$^-$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{A1}\oplus\mathrm{A1}$
N140.2.4 GM3$^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A2_g}$
N140.2.5 GM3$^-$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{A1}\oplus\mathrm{A1}$
N140.2.6 GM4$^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{B2_g}$
N140.2.7 GM4$^-$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{A1}\oplus\mathrm{A1}$
N140.2.8 M1$^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}$
N140.2.9 M1$^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}$
N140.2.10 M2$^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}$
N140.2.11 M2$^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}$
N140.2.12 M3$^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}$
N140.2.13 M3$^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}$
N140.2.14 M4$^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}$
N140.2.15 M4$^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}$
N140.3.1 GM1$^-\oplus$GM1$^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{A1_u}$
N140.3.2 GM1$^-\oplus$GM2$^+$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{A1}\oplus\mathrm{B1}$
N140.3.3 GM1$^-\oplus$GM2$^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{B1_u}$
N140.3.4 GM1$^-\oplus$GM3$^+$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{A1}\oplus\mathrm{A2}$
N140.3.5 GM1$^-\oplus$GM3$^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{A2_u}$
N140.3.6 GM1$^-\oplus$GM4$^+$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{A1}\oplus\mathrm{A2}$
N140.3.7 GM1$^-\oplus$GM4$^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{B2_u}$
N140.3.8 GM1$^-\oplus$M1$^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}$
N140.3.9 GM1$^-\oplus$M1$^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}$
N140.3.10 GM1$^-\oplus$M2$^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}$
N140.3.11 GM1$^-\oplus$M2$^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}$
N140.3.12 GM1$^-\oplus$M3$^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}$
N140.3.13 GM1$^-\oplus$M3$^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}$
N140.3.14 GM1$^-\oplus$M4$^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}$
N140.3.15 GM1$^-\oplus$M4$^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}$
N140.3.16 GM2$^+\oplus$GM2$^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B1_g}$
N140.3.17 GM2$^+\oplus$GM2$^-$	$\surd$	2	2	$\surd$	422	$\mathrm{A1}\oplus\mathrm{B1}$
N140.3.18 GM2$^+\oplus$GM3$^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}\oplus\mathrm{A2_g}$
N140.3.19 GM2$^+\oplus$GM3$^-$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{A1}\oplus\mathrm{B1}$
N140.3.20 GM2$^+\oplus$GM4$^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B2_g}$
N140.3.21 GM2$^+\oplus$GM4$^-$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{A1}\oplus\mathrm{B1}$
N140.3.22 GM2$^+\oplus$M1$^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}$
N140.3.23 GM2$^+\oplus$M1$^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}$
N140.3.24 GM2$^+\oplus$M2$^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}$
N140.3.25 GM2$^+\oplus$M2$^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}$
N140.3.26 GM2$^+\oplus$M3$^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}$

Non-coplanar SSGs with parent space group $I4/mcm$ (No. 140) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N140.3.27 $\mathrm{GM2}^{+}\oplus\mathrm{M3}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}$
N140.3.28 $\mathrm{GM2}^{+}\oplus\mathrm{M4}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}$
N140.3.29 $\mathrm{GM2}^{+}\oplus\mathrm{M4}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}$
N140.3.30 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}\oplus\mathrm{B1_u}$
N140.3.31 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{A1}\oplus\mathrm{B2}$
N140.3.32 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}\oplus\mathrm{A2_u}$
N140.3.33 $\mathrm{GM2}^{-}\oplus\mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{A1}\oplus\mathrm{B2}$
N140.3.34 $\mathrm{GM2}^{-}\oplus\mathrm{GM4}^{-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}\oplus\mathrm{B2_u}$
N140.3.35 $\mathrm{GM2}^{-}\oplus\mathrm{M1}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}$
N140.3.36 $\mathrm{GM2}^{-}\oplus\mathrm{M1}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}$
N140.3.37 $\mathrm{GM2}^{-}\oplus\mathrm{M2}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}$
N140.3.38 $\mathrm{GM2}^{-}\oplus\mathrm{M2}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}$
N140.3.39 $\mathrm{GM2}^{-}\oplus\mathrm{M3}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}$
N140.3.40 $\mathrm{GM2}^{-}\oplus\mathrm{M3}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}$
N140.3.41 $\mathrm{GM2}^{-}\oplus\mathrm{M4}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}$
N140.3.42 $\mathrm{GM2}^{-}\oplus\mathrm{M4}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}$
N140.3.43 $\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_g}$
N140.3.44 $\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{-}$	$\surd$	2	2	$\surd$	422	$\mathrm{A1}\oplus\mathrm{A2}$
N140.3.45 $\mathrm{GM3}^{+}\oplus\mathrm{GM4}^{+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_g}\oplus\mathrm{B2_g}$
N140.3.46 $\mathrm{GM3}^{+}\oplus\mathrm{GM4}^{-}$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{A1}\oplus\mathrm{A2}$
N140.3.47 $\mathrm{GM3}^{+}\oplus\mathrm{M1}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_g}$
N140.3.48 $\mathrm{GM3}^{+}\oplus\mathrm{M1}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_g}$
N140.3.49 $\mathrm{GM3}^{+}\oplus\mathrm{M2}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_g}$
N140.3.50 $\mathrm{GM3}^{+}\oplus\mathrm{M2}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_g}$
N140.3.51 $\mathrm{GM3}^{+}\oplus\mathrm{M3}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_g}$
N140.3.52 $\mathrm{GM3}^{+}\oplus\mathrm{M3}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_g}$
N140.3.53 $\mathrm{GM3}^{+}\oplus\mathrm{M4}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_g}$
N140.3.54 $\mathrm{GM3}^{+}\oplus\mathrm{M4}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_g}$
N140.3.55 $\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_u}\oplus\mathrm{A2_u}$
N140.3.56 $\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{A1}\oplus\mathrm{B2}$
N140.3.57 $\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_u}\oplus\mathrm{B2_u}$
N140.3.58 $\mathrm{GM3}^{-}\oplus\mathrm{M1}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_u}$
N140.3.59 $\mathrm{GM3}^{-}\oplus\mathrm{M1}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_u}$
N140.3.60 $\mathrm{GM3}^{-}\oplus\mathrm{M2}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_u}$
N140.3.61 $\mathrm{GM3}^{-}\oplus\mathrm{M2}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_u}$
N140.3.62 $\mathrm{GM3}^{-}\oplus\mathrm{M3}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_u}$
N140.3.63 $\mathrm{GM3}^{-}\oplus\mathrm{M3}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_u}$
N140.3.64 $\mathrm{GM3}^{-}\oplus\mathrm{M4}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_u}$
N140.3.65 $\mathrm{GM3}^{-}\oplus\mathrm{M4}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_u}$
N140.3.66 $\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_g}\oplus\mathrm{B2_g}$
N140.3.67 $\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{-}$	$\surd$	2	2	$\surd$	422	$\mathrm{A1}\oplus\mathrm{B2}$
N140.3.68 $\mathrm{GM4}^{+}\oplus\mathrm{M1}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_g}$
N140.3.69 $\mathrm{GM4}^{+}\oplus\mathrm{M1}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_g}$
N140.3.70 $\mathrm{GM4}^{+}\oplus\mathrm{M2}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_g}$
N140.3.71 $\mathrm{GM4}^{+}\oplus\mathrm{M2}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_g}$
N140.3.72 $\mathrm{GM4}^{+}\oplus\mathrm{M3}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_g}$

Non-coplanar SSGs with parent space group $I4/mcm$ (No. 140) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N140.3.73 $\mathrm{GM4^+} \oplus \mathrm{M3^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_g}$
N140.3.74 $\mathrm{GM4^+} \oplus \mathrm{M4^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_g}$
N140.3.75 $\mathrm{GM4^+} \oplus \mathrm{M4^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_g}$
N140.3.76 $\mathrm{GM4^-} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N140.3.77 $\mathrm{GM4^-} \oplus \mathrm{M1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_u}$
N140.3.78 $\mathrm{GM4^-} \oplus \mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_u}$
N140.3.79 $\mathrm{GM4^-} \oplus \mathrm{M2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_u}$
N140.3.80 $\mathrm{GM4^-} \oplus \mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_u}$
N140.3.81 $\mathrm{GM4^-} \oplus \mathrm{M3^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_u}$
N140.3.82 $\mathrm{GM4^-} \oplus \mathrm{M3^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_u}$
N140.3.83 $\mathrm{GM4^-} \oplus \mathrm{M4^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_u}$
N140.3.84 $\mathrm{GM4^-} \oplus \mathrm{M4^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_u}$
N140.3.85 $\mathrm{M1^+} \oplus \mathrm{M1^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N140.3.86 $\mathrm{M1^+} \oplus \mathrm{M1^-}$	$\surd$	1	1	$\surd$	422	$\mathrm{A1}$
N140.3.87 $\mathrm{M1^+} \oplus \mathrm{M2^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N140.3.88 $\mathrm{M1^+} \oplus \mathrm{M2^-}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	$\mathrm{A1}$
N140.3.89 $\mathrm{M1^+} \oplus \mathrm{M3^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N140.3.90 $\mathrm{M1^+} \oplus \mathrm{M3^-}$	$\surd$	1	1	$\surd$	$4mm$	$\mathrm{A1}$
N140.3.91 $\mathrm{M1^+} \oplus \mathrm{M4^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N140.3.92 $\mathrm{M1^+} \oplus \mathrm{M4^-}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	$\mathrm{A1}$
N140.3.93 $\mathrm{M1^-} \oplus \mathrm{M1^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N140.3.94 $\mathrm{M1^-} \oplus \mathrm{M2^+}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	$\mathrm{A1}$
N140.3.95 $\mathrm{M1^-} \oplus \mathrm{M2^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N140.3.96 $\mathrm{M1^-} \oplus \mathrm{M3^+}$	$\surd$	1	1	$\surd$	$4mm$	$\mathrm{A1}$
N140.3.97 $\mathrm{M1^-} \oplus \mathrm{M3^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N140.3.98 $\mathrm{M1^-} \oplus \mathrm{M4^+}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	$\mathrm{A1}$
N140.3.99 $\mathrm{M1^-} \oplus \mathrm{M4^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N140.3.100 $\mathrm{M2^+} \oplus \mathrm{M2^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N140.3.101 $\mathrm{M2^+} \oplus \mathrm{M2^-}$	$\surd$	1	1	$\surd$	422	$\mathrm{A1}$
N140.3.102 $\mathrm{M2^+} \oplus \mathrm{M3^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N140.3.103 $\mathrm{M2^+} \oplus \mathrm{M3^-}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	$\mathrm{A1}$
N140.3.104 $\mathrm{M2^+} \oplus \mathrm{M4^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N140.3.105 $\mathrm{M2^+} \oplus \mathrm{M4^-}$	$\surd$	1	1	$\surd$	$4mm$	$\mathrm{A1}$
N140.3.106 $\mathrm{M2^-} \oplus \mathrm{M2^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N140.3.107 $\mathrm{M2^-} \oplus \mathrm{M3^+}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	$\mathrm{A1}$
N140.3.108 $\mathrm{M2^-} \oplus \mathrm{M3^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N140.3.109 $\mathrm{M2^-} \oplus \mathrm{M4^+}$	$\surd$	1	1	$\surd$	$4mm$	$\mathrm{A1}$
N140.3.110 $\mathrm{M2^-} \oplus \mathrm{M4^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N140.3.111 $\mathrm{M3^+} \oplus \mathrm{M3^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N140.3.112 $\mathrm{M3^+} \oplus \mathrm{M3^-}$	$\surd$	1	1	$\surd$	422	$\mathrm{A1}$
N140.3.113 $\mathrm{M3^+} \oplus \mathrm{M4^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N140.3.114 $\mathrm{M3^+} \oplus \mathrm{M4^-}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	$\mathrm{A1}$
N140.3.115 $\mathrm{M3^-} \oplus \mathrm{M3^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N140.3.116 $\mathrm{M3^-} \oplus \mathrm{M4^+}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	$\mathrm{A1}$
N140.3.117 $\mathrm{M3^-} \oplus \mathrm{M4^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N140.3.118 $\mathrm{M4^+} \oplus \mathrm{M4^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$

Non-coplanar SSGs with parent space group $I4/mcm$ (No. 140) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N140.3.119 $\mathrm{M4^+} \oplus \mathrm{M4^-}$	$\surd$	1	1	$\surd$	422	$\mathrm{A1}$
N140.3.120 $\mathrm{M4^-} \oplus \mathrm{M4^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N140.6.1 $\mathrm{GM5^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{E_g}$
N140.6.2 $\mathrm{GM5^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{E_u}$
N140.6.3 $\mathrm{M5^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N140.6.4 $\mathrm{M5^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N140.7.1 $\mathrm{X1^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N140.7.2 $\mathrm{X1^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N140.7.3 $\mathrm{X2^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N140.7.4 $\mathrm{X2^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N140.7.5 $\mathrm{X3^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N140.7.6 $\mathrm{X3^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N140.7.7 $\mathrm{X4^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N140.7.8 $\mathrm{X4^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A1_g}$
N140.8.1 LD1	$\surd$	1	1	$\surd$	$4mm$	$\mathrm{A1}$
N140.8.2 LD2	$\surd$	1	1	$\surd$	$4mm$	$\mathrm{A1}$
N140.8.3 LD3	$\surd$	1	1	$\surd$	$4mm$	$\mathrm{A1}$
N140.8.4 LD4	$\surd$	1	1	$\surd$	$4mm$	$\mathrm{A1}$
N140.9.1 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM1^-}$	$\surd$	0	0	$\surd$	-	-
N140.9.2 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM2^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N140.9.3 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM2^-}$	$\surd$	0	0	$\surd$	-	-
N140.9.4 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM3^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N140.9.5 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
N140.9.6 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N140.9.7 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N140.9.8 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{M1^+}$	$\surd$	0	0	$\surd$	-	-
N140.9.9 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{M1^-}$	$\surd$	0	0	$\surd$	-	-
N140.9.10 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{M2^+}$	$\surd$	0	0	$\surd$	-	-
N140.9.11 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{M2^-}$	$\surd$	0	0	$\surd$	-	-
N140.9.12 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{M3^+}$	$\surd$	0	0	$\surd$	-	-
N140.9.13 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{M3^-}$	$\surd$	0	0	$\surd$	-	-
N140.9.14 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{M4^+}$	$\surd$	0	0	$\surd$	-	-
N140.9.15 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{M4^-}$	$\surd$	0	0	$\surd$	-	-
N140.9.16 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{GM2^+}$	$\surd$	2	2	$\surd$	422	$\mathrm{B1} \oplus \mathrm{B1}$
N140.9.17 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{GM2^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N140.9.18 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{GM3^+}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{B1} \oplus \mathrm{B2}$
N140.9.19 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{GM3^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_u}$
N140.9.20 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{B1} \oplus \mathrm{B2}$
N140.9.21 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{A2_u}$
N140.9.22 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{M1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N140.9.23 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N140.9.24 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{M2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N140.9.25 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N140.9.26 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{M3^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N140.9.27 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{M3^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N140.9.28 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{M4^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u}$

Non-coplanar SSGs with parent space group $I4/mcm$ (No. 140) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N140.9.29 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{M4^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N140.9.30 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{GM2^-}$	$\surd$	0	0	$\surd$	-	-
N140.9.31 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{GM3^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N140.9.32 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
N140.9.33 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N140.9.34 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N140.9.35 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{M1^+}$	$\surd$	0	0	$\surd$	-	-
N140.9.36 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{M1^-}$	$\surd$	0	0	$\surd$	-	-
N140.9.37 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{M2^+}$	$\surd$	0	0	$\surd$	-	-
N140.9.38 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{M2^-}$	$\surd$	0	0	$\surd$	-	-
N140.9.39 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{M3^+}$	$\surd$	0	0	$\surd$	-	-
N140.9.40 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{M3^-}$	$\surd$	0	0	$\surd$	-	-
N140.9.41 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{M4^+}$	$\surd$	0	0	$\surd$	-	-
N140.9.42 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{M4^-}$	$\surd$	0	0	$\surd$	-	-
N140.9.43 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{GM3^+}$	$\surd$	2	2	$\surd$	422	$\mathrm{A2} \oplus \mathrm{A2}$
N140.9.44 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{GM3^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
N140.9.45 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B2} \oplus \mathrm{A2}$
N140.9.46 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
N140.9.47 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{M1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u}$
N140.9.48 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u}$
N140.9.49 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{M2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u}$
N140.9.50 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u}$
N140.9.51 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{M3^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u}$
N140.9.52 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{M3^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u}$
N140.9.53 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{M4^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u}$
N140.9.54 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{M4^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u}$
N140.9.55 $\mathrm{GM1^-} \oplus \mathrm{GM3^-} \oplus \mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
N140.9.56 $\mathrm{GM1^-} \oplus \mathrm{GM3^-} \oplus \mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N140.9.57 $\mathrm{GM1^-} \oplus \mathrm{GM3^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N140.9.58 $\mathrm{GM1^-} \oplus \mathrm{GM3^-} \oplus \mathrm{M1^+}$	$\surd$	0	0	$\surd$	-	-
N140.9.59 $\mathrm{GM1^-} \oplus \mathrm{GM3^-} \oplus \mathrm{M1^-}$	$\surd$	0	0	$\surd$	-	-
N140.9.60 $\mathrm{GM1^-} \oplus \mathrm{GM3^-} \oplus \mathrm{M2^+}$	$\surd$	0	0	$\surd$	-	-
N140.9.61 $\mathrm{GM1^-} \oplus \mathrm{GM3^-} \oplus \mathrm{M2^-}$	$\surd$	0	0	$\surd$	-	-
N140.9.62 $\mathrm{GM1^-} \oplus \mathrm{GM3^-} \oplus \mathrm{M3^+}$	$\surd$	0	0	$\surd$	-	-
N140.9.63 $\mathrm{GM1^-} \oplus \mathrm{GM3^-} \oplus \mathrm{M3^-}$	$\surd$	0	0	$\surd$	-	-
N140.9.64 $\mathrm{GM1^-} \oplus \mathrm{GM3^-} \oplus \mathrm{M4^+}$	$\surd$	0	0	$\surd$	-	-
N140.9.65 $\mathrm{GM1^-} \oplus \mathrm{GM3^-} \oplus \mathrm{M4^-}$	$\surd$	0	0	$\surd$	-	-
N140.9.66 $\mathrm{GM1^-} \oplus \mathrm{GM4^+} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	422	$\mathrm{B2} \oplus \mathrm{B2}$
N140.9.67 $\mathrm{GM1^-} \oplus \mathrm{GM4^+} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N140.9.68 $\mathrm{GM1^-} \oplus \mathrm{GM4^+} \oplus \mathrm{M1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_u}$
N140.9.69 $\mathrm{GM1^-} \oplus \mathrm{GM4^+} \oplus \mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_u}$
N140.9.70 $\mathrm{GM1^-} \oplus \mathrm{GM4^+} \oplus \mathrm{M2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_u}$
N140.9.71 $\mathrm{GM1^-} \oplus \mathrm{GM4^+} \oplus \mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_u}$
N140.9.72 $\mathrm{GM1^-} \oplus \mathrm{GM4^+} \oplus \mathrm{M3^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_u}$
N140.9.73 $\mathrm{GM1^-} \oplus \mathrm{GM4^+} \oplus \mathrm{M3^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_u}$
N140.9.74 $\mathrm{GM1^-} \oplus \mathrm{GM4^+} \oplus \mathrm{M4^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_u}$

Non-coplanar SSGs with parent space group $I4/mcm$ (No. 140) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N140.9.75 $\mathrm{GM1^-}\oplus\mathrm{GM4^+}\oplus\mathrm{M4^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g}\oplus\mathrm{B2_u}$
N140.9.76 $\mathrm{GM1^-}\oplus\mathrm{GM4^-}\oplus\mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N140.9.77 $\mathrm{GM1^-}\oplus\mathrm{GM4^-}\oplus\mathrm{M1^+}$	$\surd$	0	0	$\surd$	-	-
N140.9.78 $\mathrm{GM1^-}\oplus\mathrm{GM4^-}\oplus\mathrm{M1^-}$	$\surd$	0	0	$\surd$	-	-
N140.9.79 $\mathrm{GM1^-}\oplus\mathrm{GM4^-}\oplus\mathrm{M2^+}$	$\surd$	0	0	$\surd$	-	-
N140.9.80 $\mathrm{GM1^-}\oplus\mathrm{GM4^-}\oplus\mathrm{M2^-}$	$\surd$	0	0	$\surd$	-	-
N140.9.81 $\mathrm{GM1^-}\oplus\mathrm{GM4^-}\oplus\mathrm{M3^+}$	$\surd$	0	0	$\surd$	-	-
N140.9.82 $\mathrm{GM1^-}\oplus\mathrm{GM4^-}\oplus\mathrm{M3^-}$	$\surd$	0	0	$\surd$	-	-
N140.9.83 $\mathrm{GM1^-}\oplus\mathrm{GM4^-}\oplus\mathrm{M4^+}$	$\surd$	0	0	$\surd$	-	-
N140.9.84 $\mathrm{GM1^-}\oplus\mathrm{GM4^-}\oplus\mathrm{M4^-}$	$\surd$	0	0	$\surd$	-	-
N140.9.85 $\mathrm{GM1^-}\oplus\mathrm{M1^+}\oplus\mathrm{M1^+}$	$\surd$	1	0	$\times$	-	-
N140.9.86 $\mathrm{GM1^-}\oplus\mathrm{M1^+}\oplus\mathrm{M1^-}$	$\surd$	1	1	$\times$	-	-
N140.9.87 $\mathrm{GM1^-}\oplus\mathrm{M1^+}\oplus\mathrm{M2^+}$	$\surd$	1	0	$\times$	-	-
N140.9.88 $\mathrm{GM1^-}\oplus\mathrm{M1^+}\oplus\mathrm{M2^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_u}$
N140.9.89 $\mathrm{GM1^-}\oplus\mathrm{M1^+}\oplus\mathrm{M3^+}$	$\surd$	1	0	$\times$	-	-
N140.9.90 $\mathrm{GM1^-}\oplus\mathrm{M1^+}\oplus\mathrm{M3^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N140.9.91 $\mathrm{GM1^-}\oplus\mathrm{M1^+}\oplus\mathrm{M4^+}$	$\surd$	1	0	$\times$	-	-
N140.9.92 $\mathrm{GM1^-}\oplus\mathrm{M1^+}\oplus\mathrm{M4^-}$	$\surd$	1	1	$\times$	-	-
N140.9.93 $\mathrm{GM1^-}\oplus\mathrm{M1^-}\oplus\mathrm{M1^-}$	$\surd$	1	0	$\times$	-	-
N140.9.94 $\mathrm{GM1^-}\oplus\mathrm{M1^-}\oplus\mathrm{M2^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_u}$
N140.9.95 $\mathrm{GM1^-}\oplus\mathrm{M1^-}\oplus\mathrm{M2^-}$	$\surd$	1	0	$\times$	-	-
N140.9.96 $\mathrm{GM1^-}\oplus\mathrm{M1^-}\oplus\mathrm{M3^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N140.9.97 $\mathrm{GM1^-}\oplus\mathrm{M1^-}\oplus\mathrm{M3^-}$	$\surd$	1	0	$\times$	-	-
N140.9.98 $\mathrm{GM1^-}\oplus\mathrm{M1^-}\oplus\mathrm{M4^+}$	$\surd$	1	1	$\times$	-	-
N140.9.99 $\mathrm{GM1^-}\oplus\mathrm{M1^-}\oplus\mathrm{M4^-}$	$\surd$	1	0	$\times$	-	-
N140.9.100 $\mathrm{GM1^-}\oplus\mathrm{M2^+}\oplus\mathrm{M2^+}$	$\surd$	1	0	$\times$	-	-
N140.9.101 $\mathrm{GM1^-}\oplus\mathrm{M2^+}\oplus\mathrm{M2^-}$	$\surd$	1	1	$\times$	-	-
N140.9.102 $\mathrm{GM1^-}\oplus\mathrm{M2^+}\oplus\mathrm{M3^+}$	$\surd$	1	0	$\times$	-	-
N140.9.103 $\mathrm{GM1^-}\oplus\mathrm{M2^+}\oplus\mathrm{M3^-}$	$\surd$	1	1	$\times$	-	-
N140.9.104 $\mathrm{GM1^-}\oplus\mathrm{M2^+}\oplus\mathrm{M4^+}$	$\surd$	1	0	$\times$	-	-
N140.9.105 $\mathrm{GM1^-}\oplus\mathrm{M2^+}\oplus\mathrm{M4^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N140.9.106 $\mathrm{GM1^-}\oplus\mathrm{M2^-}\oplus\mathrm{M2^-}$	$\surd$	1	0	$\times$	-	-
N140.9.107 $\mathrm{GM1^-}\oplus\mathrm{M2^-}\oplus\mathrm{M3^+}$	$\surd$	1	1	$\times$	-	-
N140.9.108 $\mathrm{GM1^-}\oplus\mathrm{M2^-}\oplus\mathrm{M3^-}$	$\surd$	1	0	$\times$	-	-
N140.9.109 $\mathrm{GM1^-}\oplus\mathrm{M2^-}\oplus\mathrm{M4^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N140.9.110 $\mathrm{GM1^-}\oplus\mathrm{M2^-}\oplus\mathrm{M4^-}$	$\surd$	1	0	$\times$	-	-
N140.9.111 $\mathrm{GM1^-}\oplus\mathrm{M3^+}\oplus\mathrm{M3^+}$	$\surd$	1	0	$\times$	-	-
N140.9.112 $\mathrm{GM1^-}\oplus\mathrm{M3^+}\oplus\mathrm{M3^-}$	$\surd$	1	1	$\times$	-	-
N140.9.113 $\mathrm{GM1^-}\oplus\mathrm{M3^+}\oplus\mathrm{M4^+}$	$\surd$	1	0	$\times$	-	-
N140.9.114 $\mathrm{GM1^-}\oplus\mathrm{M3^+}\oplus\mathrm{M4^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_u}$
N140.9.115 $\mathrm{GM1^-}\oplus\mathrm{M3^-}\oplus\mathrm{M3^-}$	$\surd$	1	0	$\times$	-	-
N140.9.116 $\mathrm{GM1^-}\oplus\mathrm{M3^-}\oplus\mathrm{M4^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_u}$
N140.9.117 $\mathrm{GM1^-}\oplus\mathrm{M3^-}\oplus\mathrm{M4^-}$	$\surd$	1	0	$\times$	-	-
N140.9.118 $\mathrm{GM1^-}\oplus\mathrm{M4^+}\oplus\mathrm{M4^+}$	$\surd$	1	0	$\times$	-	-
N140.9.119 $\mathrm{GM1^-}\oplus\mathrm{M4^+}\oplus\mathrm{M4^-}$	$\surd$	1	1	$\times$	-	-
N140.9.120 $\mathrm{GM1^-}\oplus\mathrm{M4^-}\oplus\mathrm{M4^-}$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $I4/mcm$ (No. 140) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N140.9.121 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N140.9.122 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B1} \oplus \mathrm{B1}$
N140.9.123 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{A2_g}$
N140.9.124 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{B1} \oplus \mathrm{B1}$
N140.9.125 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B2_g}$
N140.9.126 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{B1} \oplus \mathrm{B1}$
N140.9.127 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{M1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N140.9.128 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{M1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N140.9.129 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{M2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N140.9.130 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{M2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N140.9.131 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{M3}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N140.9.132 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{M3}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N140.9.133 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{M4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N140.9.134 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{M4}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N140.9.135 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{B1_g}$
N140.9.136 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{B1} \oplus \mathrm{A2}$
N140.9.137 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B2_u}$
N140.9.138 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{B1} \oplus \mathrm{A2}$
N140.9.139 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{A2_u}$
N140.9.140 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{M1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g}$
N140.9.141 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{M1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g}$
N140.9.142 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{M2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g}$
N140.9.143 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{M2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g}$
N140.9.144 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{M3}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g}$
N140.9.145 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{M3}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g}$
N140.9.146 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{M4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g}$
N140.9.147 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{M4}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g}$
N140.9.148 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
N140.9.149 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B1} \oplus \mathrm{A2}$
N140.9.150 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g} \oplus \mathrm{B2_g}$
N140.9.151 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	422	$\mathrm{B1} \oplus \mathrm{A2}$
N140.9.152 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{M1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g}$
N140.9.153 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{M1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g}$
N140.9.154 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{M2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g}$
N140.9.155 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{M2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g}$
N140.9.156 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{M3}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g}$
N140.9.157 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{M3}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g}$
N140.9.158 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{M4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g}$
N140.9.159 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{M4}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g}$
N140.9.160 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N140.9.161 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	422	$\mathrm{B1} \oplus \mathrm{B2}$
N140.9.162 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N140.9.163 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{M1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N140.9.164 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{M1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N140.9.165 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{M2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N140.9.166 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{M2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_u}$

Non-coplanar SSGs with parent space group $I4/mcm$ (No. 140) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N140.9.167 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{M3}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N140.9.168 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{M3}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N140.9.169 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{M4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N140.9.170 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{M4}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
N140.9.171 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N140.9.172 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B1} \oplus \mathrm{B2}$
N140.9.173 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{M1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
N140.9.174 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{M1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
N140.9.175 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{M2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
N140.9.176 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{M2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
N140.9.177 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{M3}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
N140.9.178 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{M3}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
N140.9.179 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{M4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
N140.9.180 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{M4}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
N140.9.181 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N140.9.182 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{M1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u}$
N140.9.183 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{M1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u}$
N140.9.184 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{M2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u}$
N140.9.185 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{M2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u}$
N140.9.186 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{M3}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u}$
N140.9.187 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{M3}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u}$
N140.9.188 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{M4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u}$
N140.9.189 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{M4}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u}$
N140.9.190 $\mathrm{GM2}^+ \oplus \mathrm{M1}^+ \oplus \mathrm{M1}^+$	$\surd$	1	1	$\times$	-	-
N140.9.191 $\mathrm{GM2}^+ \oplus \mathrm{M1}^+ \oplus \mathrm{M1}^-$	$\surd$	1	1	$\times$	-	-
N140.9.192 $\mathrm{GM2}^+ \oplus \mathrm{M1}^+ \oplus \mathrm{M2}^+$	$\surd$	1	1	$\times$	-	-
N140.9.193 $\mathrm{GM2}^+ \oplus \mathrm{M1}^+ \oplus \mathrm{M2}^-$	$\surd$	1	1	$\surd$	422	B1
N140.9.194 $\mathrm{GM2}^+ \oplus \mathrm{M1}^+ \oplus \mathrm{M3}^+$	$\surd$	1	1	$\times$	-	-
N140.9.195 $\mathrm{GM2}^+ \oplus \mathrm{M1}^+ \oplus \mathrm{M3}^-$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N140.9.196 $\mathrm{GM2}^+ \oplus \mathrm{M1}^+ \oplus \mathrm{M4}^+$	$\surd$	1	1	$\times$	-	-
N140.9.197 $\mathrm{GM2}^+ \oplus \mathrm{M1}^+ \oplus \mathrm{M4}^-$	$\surd$	1	1	$\times$	-	-
N140.9.198 $\mathrm{GM2}^+ \oplus \mathrm{M1}^- \oplus \mathrm{M1}^-$	$\surd$	1	1	$\times$	-	-
N140.9.199 $\mathrm{GM2}^+ \oplus \mathrm{M1}^- \oplus \mathrm{M2}^+$	$\surd$	1	1	$\surd$	422	B1
N140.9.200 $\mathrm{GM2}^+ \oplus \mathrm{M1}^- \oplus \mathrm{M2}^-$	$\surd$	1	1	$\times$	-	-
N140.9.201 $\mathrm{GM2}^+ \oplus \mathrm{M1}^- \oplus \mathrm{M3}^+$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N140.9.202 $\mathrm{GM2}^+ \oplus \mathrm{M1}^- \oplus \mathrm{M3}^-$	$\surd$	1	1	$\times$	-	-
N140.9.203 $\mathrm{GM2}^+ \oplus \mathrm{M1}^- \oplus \mathrm{M4}^+$	$\surd$	1	1	$\times$	-	-
N140.9.204 $\mathrm{GM2}^+ \oplus \mathrm{M1}^- \oplus \mathrm{M4}^-$	$\surd$	1	1	$\times$	-	-
N140.9.205 $\mathrm{GM2}^+ \oplus \mathrm{M2}^+ \oplus \mathrm{M2}^+$	$\surd$	1	1	$\times$	-	-
N140.9.206 $\mathrm{GM2}^+ \oplus \mathrm{M2}^+ \oplus \mathrm{M2}^-$	$\surd$	1	1	$\times$	-	-
N140.9.207 $\mathrm{GM2}^+ \oplus \mathrm{M2}^+ \oplus \mathrm{M3}^+$	$\surd$	1	1	$\times$	-	-
N140.9.208 $\mathrm{GM2}^+ \oplus \mathrm{M2}^+ \oplus \mathrm{M3}^-$	$\surd$	1	1	$\times$	-	-
N140.9.209 $\mathrm{GM2}^+ \oplus \mathrm{M2}^+ \oplus \mathrm{M4}^+$	$\surd$	1	1	$\times$	-	-
N140.9.210 $\mathrm{GM2}^+ \oplus \mathrm{M2}^+ \oplus \mathrm{M4}^-$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N140.9.211 $\mathrm{GM2}^+ \oplus \mathrm{M2}^- \oplus \mathrm{M2}^-$	$\surd$	1	1	$\times$	-	-
N140.9.212 $\mathrm{GM2}^+ \oplus \mathrm{M2}^- \oplus \mathrm{M3}^+$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $I4/mcm$ (No. 140) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N140.9.213 $\mathrm{GM2^+} \oplus \mathrm{M2^-} \oplus \mathrm{M3^-}$	$\surd$	1	1	$\times$	-	-
N140.9.214 $\mathrm{GM2^+} \oplus \mathrm{M2^-} \oplus \mathrm{M4^+}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	$\mathrm{B1}$
N140.9.215 $\mathrm{GM2^+} \oplus \mathrm{M2^-} \oplus \mathrm{M4^-}$	$\surd$	1	1	$\times$	-	-
N140.9.216 $\mathrm{GM2^+} \oplus \mathrm{M3^+} \oplus \mathrm{M3^+}$	$\surd$	1	1	$\times$	-	-
N140.9.217 $\mathrm{GM2^+} \oplus \mathrm{M3^+} \oplus \mathrm{M3^-}$	$\surd$	1	1	$\times$	-	-
N140.9.218 $\mathrm{GM2^+} \oplus \mathrm{M3^+} \oplus \mathrm{M4^+}$	$\surd$	1	1	$\times$	-	-
N140.9.219 $\mathrm{GM2^+} \oplus \mathrm{M3^+} \oplus \mathrm{M4^-}$	$\surd$	1	1	$\surd$	422	$\mathrm{B1}$
N140.9.220 $\mathrm{GM2^+} \oplus \mathrm{M3^-} \oplus \mathrm{M3^-}$	$\surd$	1	1	$\times$	-	-
N140.9.221 $\mathrm{GM2^+} \oplus \mathrm{M3^-} \oplus \mathrm{M4^+}$	$\surd$	1	1	$\surd$	422	$\mathrm{B1}$
N140.9.222 $\mathrm{GM2^+} \oplus \mathrm{M3^-} \oplus \mathrm{M4^-}$	$\surd$	1	1	$\times$	-	-
N140.9.223 $\mathrm{GM2^+} \oplus \mathrm{M4^+} \oplus \mathrm{M4^+}$	$\surd$	1	1	$\times$	-	-
N140.9.224 $\mathrm{GM2^+} \oplus \mathrm{M4^+} \oplus \mathrm{M4^-}$	$\surd$	1	1	$\times$	-	-
N140.9.225 $\mathrm{GM2^+} \oplus \mathrm{M4^-} \oplus \mathrm{M4^-}$	$\surd$	1	1	$\times$	-	-
N140.9.226 $\mathrm{GM2^-} \oplus \mathrm{GM2^-} \oplus \mathrm{GM2^-}$	$\surd$	0	0	$\surd$	-	-
N140.9.227 $\mathrm{GM2^-} \oplus \mathrm{GM2^-} \oplus \mathrm{GM3^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N140.9.228 $\mathrm{GM2^-} \oplus \mathrm{GM2^-} \oplus \mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
N140.9.229 $\mathrm{GM2^-} \oplus \mathrm{GM2^-} \oplus \mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$
N140.9.230 $\mathrm{GM2^-} \oplus \mathrm{GM2^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N140.9.231 $\mathrm{GM2^-} \oplus \mathrm{GM2^-} \oplus \mathrm{M1^+}$	$\surd$	0	0	$\surd$	-	-
N140.9.232 $\mathrm{GM2^-} \oplus \mathrm{GM2^-} \oplus \mathrm{M1^-}$	$\surd$	0	0	$\surd$	-	-
N140.9.233 $\mathrm{GM2^-} \oplus \mathrm{GM2^-} \oplus \mathrm{M2^+}$	$\surd$	0	0	$\surd$	-	-
N140.9.234 $\mathrm{GM2^-} \oplus \mathrm{GM2^-} \oplus \mathrm{M2^-}$	$\surd$	0	0	$\surd$	-	-
N140.9.235 $\mathrm{GM2^-} \oplus \mathrm{GM2^-} \oplus \mathrm{M3^+}$	$\surd$	0	0	$\surd$	-	-
N140.9.236 $\mathrm{GM2^-} \oplus \mathrm{GM2^-} \oplus \mathrm{M3^-}$	$\surd$	0	0	$\surd$	-	-
N140.9.237 $\mathrm{GM2^-} \oplus \mathrm{GM2^-} \oplus \mathrm{M4^+}$	$\surd$	0	0	$\surd$	-	-
N140.9.238 $\mathrm{GM2^-} \oplus \mathrm{GM2^-} \oplus \mathrm{M4^-}$	$\surd$	0	0	$\surd$	-	-
N140.9.239 $\mathrm{GM2^-} \oplus \mathrm{GM3^+} \oplus \mathrm{GM3^+}$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{A2} \oplus \mathrm{A2}$
N140.9.240 $\mathrm{GM2^-} \oplus \mathrm{GM3^+} \oplus \mathrm{GM3^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{B2_u}$
N140.9.241 $\mathrm{GM2^-} \oplus \mathrm{GM3^+} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	422	$\mathrm{A2} \oplus \mathrm{B2}$
N140.9.242 $\mathrm{GM2^-} \oplus \mathrm{GM3^+} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g} \oplus \mathrm{B2_u}$
N140.9.243 $\mathrm{GM2^-} \oplus \mathrm{GM3^+} \oplus \mathrm{M1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_u}$
N140.9.244 $\mathrm{GM2^-} \oplus \mathrm{GM3^+} \oplus \mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_u}$
N140.9.245 $\mathrm{GM2^-} \oplus \mathrm{GM3^+} \oplus \mathrm{M2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_u}$
N140.9.246 $\mathrm{GM2^-} \oplus \mathrm{GM3^+} \oplus \mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_u}$
N140.9.247 $\mathrm{GM2^-} \oplus \mathrm{GM3^+} \oplus \mathrm{M3^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_u}$
N140.9.248 $\mathrm{GM2^-} \oplus \mathrm{GM3^+} \oplus \mathrm{M3^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_u}$
N140.9.249 $\mathrm{GM2^-} \oplus \mathrm{GM3^+} \oplus \mathrm{M4^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_u}$
N140.9.250 $\mathrm{GM2^-} \oplus \mathrm{GM3^+} \oplus \mathrm{M4^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_u}$
N140.9.251 $\mathrm{GM2^-} \oplus \mathrm{GM3^-} \oplus \mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
N140.9.252 $\mathrm{GM2^-} \oplus \mathrm{GM3^-} \oplus \mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$
N140.9.253 $\mathrm{GM2^-} \oplus \mathrm{GM3^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N140.9.254 $\mathrm{GM2^-} \oplus \mathrm{GM3^-} \oplus \mathrm{M1^+}$	$\surd$	0	0	$\surd$	-	-
N140.9.255 $\mathrm{GM2^-} \oplus \mathrm{GM3^-} \oplus \mathrm{M1^-}$	$\surd$	0	0	$\surd$	-	-
N140.9.256 $\mathrm{GM2^-} \oplus \mathrm{GM3^-} \oplus \mathrm{M2^+}$	$\surd$	0	0	$\surd$	-	-
N140.9.257 $\mathrm{GM2^-} \oplus \mathrm{GM3^-} \oplus \mathrm{M2^-}$	$\surd$	0	0	$\surd$	-	-
N140.9.258 $\mathrm{GM2^-} \oplus \mathrm{GM3^-} \oplus \mathrm{M3^+}$	$\surd$	0	0	$\surd$	-	-

Non-coplanar SSGs with parent space group $I4/mcm$ (No. 140) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N140.9.259 $\mathrm{GM2^-} \oplus \mathrm{GM3^-} \oplus \mathrm{M3^-}$	$\surd$	0	0	$\surd$	-	-
N140.9.260 $\mathrm{GM2^-} \oplus \mathrm{GM3^-} \oplus \mathrm{M4^+}$	$\surd$	0	0	$\surd$	-	-
N140.9.261 $\mathrm{GM2^-} \oplus \mathrm{GM3^-} \oplus \mathrm{M4^-}$	$\surd$	0	0	$\surd$	-	-
N140.9.262 $\mathrm{GM2^-} \oplus \mathrm{GM4^+} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B2} \oplus \mathrm{B2}$
N140.9.263 $\mathrm{GM2^-} \oplus \mathrm{GM4^+} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$
N140.9.264 $\mathrm{GM2^-} \oplus \mathrm{GM4^+} \oplus \mathrm{M1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g}$
N140.9.265 $\mathrm{GM2^-} \oplus \mathrm{GM4^+} \oplus \mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g}$
N140.9.266 $\mathrm{GM2^-} \oplus \mathrm{GM4^+} \oplus \mathrm{M2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g}$
N140.9.267 $\mathrm{GM2^-} \oplus \mathrm{GM4^+} \oplus \mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g}$
N140.9.268 $\mathrm{GM2^-} \oplus \mathrm{GM4^+} \oplus \mathrm{M3^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g}$
N140.9.269 $\mathrm{GM2^-} \oplus \mathrm{GM4^+} \oplus \mathrm{M3^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g}$
N140.9.270 $\mathrm{GM2^-} \oplus \mathrm{GM4^+} \oplus \mathrm{M4^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g}$
N140.9.271 $\mathrm{GM2^-} \oplus \mathrm{GM4^+} \oplus \mathrm{M4^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g}$
N140.9.272 $\mathrm{GM2^-} \oplus \mathrm{GM4^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N140.9.273 $\mathrm{GM2^-} \oplus \mathrm{GM4^-} \oplus \mathrm{M1^+}$	$\surd$	0	0	$\surd$	-	-
N140.9.274 $\mathrm{GM2^-} \oplus \mathrm{GM4^-} \oplus \mathrm{M1^-}$	$\surd$	0	0	$\surd$	-	-
N140.9.275 $\mathrm{GM2^-} \oplus \mathrm{GM4^-} \oplus \mathrm{M2^+}$	$\surd$	0	0	$\surd$	-	-
N140.9.276 $\mathrm{GM2^-} \oplus \mathrm{GM4^-} \oplus \mathrm{M2^-}$	$\surd$	0	0	$\surd$	-	-
N140.9.277 $\mathrm{GM2^-} \oplus \mathrm{GM4^-} \oplus \mathrm{M3^+}$	$\surd$	0	0	$\surd$	-	-
N140.9.278 $\mathrm{GM2^-} \oplus \mathrm{GM4^-} \oplus \mathrm{M3^-}$	$\surd$	0	0	$\surd$	-	-
N140.9.279 $\mathrm{GM2^-} \oplus \mathrm{GM4^-} \oplus \mathrm{M4^+}$	$\surd$	0	0	$\surd$	-	-
N140.9.280 $\mathrm{GM2^-} \oplus \mathrm{GM4^-} \oplus \mathrm{M4^-}$	$\surd$	0	0	$\surd$	-	-
N140.9.281 $\mathrm{GM2^-} \oplus \mathrm{M1^+} \oplus \mathrm{M1^+}$	$\surd$	1	0	$\times$	-	-
N140.9.282 $\mathrm{GM2^-} \oplus \mathrm{M1^+} \oplus \mathrm{M1^-}$	$\surd$	1	1	$\times$	-	-
N140.9.283 $\mathrm{GM2^-} \oplus \mathrm{M1^+} \oplus \mathrm{M2^+}$	$\surd$	1	0	$\times$	-	-
N140.9.284 $\mathrm{GM2^-} \oplus \mathrm{M1^+} \oplus \mathrm{M2^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_u}$
N140.9.285 $\mathrm{GM2^-} \oplus \mathrm{M1^+} \oplus \mathrm{M3^+}$	$\surd$	1	0	$\times$	-	-
N140.9.286 $\mathrm{GM2^-} \oplus \mathrm{M1^+} \oplus \mathrm{M3^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N140.9.287 $\mathrm{GM2^-} \oplus \mathrm{M1^+} \oplus \mathrm{M4^+}$	$\surd$	1	0	$\times$	-	-
N140.9.288 $\mathrm{GM2^-} \oplus \mathrm{M1^+} \oplus \mathrm{M4^-}$	$\surd$	1	1	$\times$	-	-
N140.9.289 $\mathrm{GM2^-} \oplus \mathrm{M1^-} \oplus \mathrm{M1^-}$	$\surd$	1	0	$\times$	-	-
N140.9.290 $\mathrm{GM2^-} \oplus \mathrm{M1^-} \oplus \mathrm{M2^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_u}$
N140.9.291 $\mathrm{GM2^-} \oplus \mathrm{M1^-} \oplus \mathrm{M2^-}$	$\surd$	1	0	$\times$	-	-
N140.9.292 $\mathrm{GM2^-} \oplus \mathrm{M1^-} \oplus \mathrm{M3^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N140.9.293 $\mathrm{GM2^-} \oplus \mathrm{M1^-} \oplus \mathrm{M3^-}$	$\surd$	1	0	$\times$	-	-
N140.9.294 $\mathrm{GM2^-} \oplus \mathrm{M1^-} \oplus \mathrm{M4^+}$	$\surd$	1	1	$\times$	-	-
N140.9.295 $\mathrm{GM2^-} \oplus \mathrm{M1^-} \oplus \mathrm{M4^-}$	$\surd$	1	0	$\times$	-	-
N140.9.296 $\mathrm{GM2^-} \oplus \mathrm{M2^+} \oplus \mathrm{M2^+}$	$\surd$	1	0	$\times$	-	-
N140.9.297 $\mathrm{GM2^-} \oplus \mathrm{M2^+} \oplus \mathrm{M2^-}$	$\surd$	1	1	$\times$	-	-
N140.9.298 $\mathrm{GM2^-} \oplus \mathrm{M2^+} \oplus \mathrm{M3^+}$	$\surd$	1	0	$\times$	-	-
N140.9.299 $\mathrm{GM2^-} \oplus \mathrm{M2^+} \oplus \mathrm{M3^-}$	$\surd$	1	1	$\times$	-	-
N140.9.300 $\mathrm{GM2^-} \oplus \mathrm{M2^+} \oplus \mathrm{M4^+}$	$\surd$	1	0	$\times$	-	-
N140.9.301 $\mathrm{GM2^-} \oplus \mathrm{M2^+} \oplus \mathrm{M4^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N140.9.302 $\mathrm{GM2^-} \oplus \mathrm{M2^-} \oplus \mathrm{M2^-}$	$\surd$	1	0	$\times$	-	-
N140.9.303 $\mathrm{GM2^-} \oplus \mathrm{M2^-} \oplus \mathrm{M3^+}$	$\surd$	1	1	$\times$	-	-
N140.9.304 $\mathrm{GM2^-} \oplus \mathrm{M2^-} \oplus \mathrm{M3^-}$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $I4/mcm$ (No. 140) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N140.9.305 $\mathrm{GM2^-} \oplus \mathrm{M2^-} \oplus \mathrm{M4^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N140.9.306 $\mathrm{GM2^-} \oplus \mathrm{M2^-} \oplus \mathrm{M4^-}$	$\surd$	1	0	$\times$	-	-
N140.9.307 $\mathrm{GM2^-} \oplus \mathrm{M3^+} \oplus \mathrm{M3^+}$	$\surd$	1	0	$\times$	-	-
N140.9.308 $\mathrm{GM2^-} \oplus \mathrm{M3^+} \oplus \mathrm{M3^-}$	$\surd$	1	1	$\times$	-	-
N140.9.309 $\mathrm{GM2^-} \oplus \mathrm{M3^+} \oplus \mathrm{M4^+}$	$\surd$	1	0	$\times$	-	-
N140.9.310 $\mathrm{GM2^-} \oplus \mathrm{M3^+} \oplus \mathrm{M4^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_u}$
N140.9.311 $\mathrm{GM2^-} \oplus \mathrm{M3^-} \oplus \mathrm{M3^-}$	$\surd$	1	0	$\times$	-	-
N140.9.312 $\mathrm{GM2^-} \oplus \mathrm{M3^-} \oplus \mathrm{M4^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_u}$
N140.9.313 $\mathrm{GM2^-} \oplus \mathrm{M3^-} \oplus \mathrm{M4^-}$	$\surd$	1	0	$\times$	-	-
N140.9.314 $\mathrm{GM2^-} \oplus \mathrm{M4^+} \oplus \mathrm{M4^+}$	$\surd$	1	0	$\times$	-	-
N140.9.315 $\mathrm{GM2^-} \oplus \mathrm{M4^+} \oplus \mathrm{M4^-}$	$\surd$	1	1	$\times$	-	-
N140.9.316 $\mathrm{GM2^-} \oplus \mathrm{M4^-} \oplus \mathrm{M4^-}$	$\surd$	1	0	$\times$	-	-
N140.9.317 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{GM3^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
N140.9.318 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{GM3^-}$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{A2} \oplus \mathrm{A2}$
N140.9.319 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{B2_g}$
N140.9.320 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{B2} \oplus \mathrm{B2}$
N140.9.321 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{M1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g}$
N140.9.322 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g}$
N140.9.323 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{M2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g}$
N140.9.324 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g}$
N140.9.325 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{M3^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g}$
N140.9.326 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{M3^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g}$
N140.9.327 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{M4^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g}$
N140.9.328 $\mathrm{GM3^+} \oplus \mathrm{GM3^+} \oplus \mathrm{M4^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g}$
N140.9.329 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{GM3^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A2_g}$
N140.9.330 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{B2} \oplus \mathrm{A2}$
N140.9.331 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{A2_g}$
N140.9.332 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{M1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g}$
N140.9.333 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g}$
N140.9.334 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{M2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g}$
N140.9.335 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g}$
N140.9.336 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{M3^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g}$
N140.9.337 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{M3^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g}$
N140.9.338 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{M4^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g}$
N140.9.339 $\mathrm{GM3^+} \oplus \mathrm{GM3^-} \oplus \mathrm{M4^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g}$
N140.9.340 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N140.9.341 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{B2} \oplus \mathrm{A2}$
N140.9.342 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{M1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g}$
N140.9.343 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g}$
N140.9.344 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{M2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g}$
N140.9.345 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g}$
N140.9.346 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{M3^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g}$
N140.9.347 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{M3^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g}$
N140.9.348 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{M4^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g}$
N140.9.349 $\mathrm{GM3^+} \oplus \mathrm{GM4^+} \oplus \mathrm{M4^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g}$
N140.9.350 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{A2_g}$

Non-coplanar SSGs with parent space group $I4/mcm$ (No. 140) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N140.9.351 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{M1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g}$
N140.9.352 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g}$
N140.9.353 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{M2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g}$
N140.9.354 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g}$
N140.9.355 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{M3^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g}$
N140.9.356 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{M3^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g}$
N140.9.357 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{M4^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g}$
N140.9.358 $\mathrm{GM3^+} \oplus \mathrm{GM4^-} \oplus \mathrm{M4^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g}$
N140.9.359 $\mathrm{GM3^+} \oplus \mathrm{M1^+} \oplus \mathrm{M1^+}$	$\surd$	1	1	$\times$	-	-
N140.9.360 $\mathrm{GM3^+} \oplus \mathrm{M1^+} \oplus \mathrm{M1^-}$	$\surd$	1	1	$\times$	-	-
N140.9.361 $\mathrm{GM3^+} \oplus \mathrm{M1^+} \oplus \mathrm{M2^+}$	$\surd$	1	1	$\times$	-	-
N140.9.362 $\mathrm{GM3^+} \oplus \mathrm{M1^+} \oplus \mathrm{M2^-}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B2
N140.9.363 $\mathrm{GM3^+} \oplus \mathrm{M1^+} \oplus \mathrm{M3^+}$	$\surd$	1	1	$\times$	-	-
N140.9.364 $\mathrm{GM3^+} \oplus \mathrm{M1^+} \oplus \mathrm{M3^-}$	$\surd$	1	1	$\surd$	422	A2
N140.9.365 $\mathrm{GM3^+} \oplus \mathrm{M1^+} \oplus \mathrm{M4^+}$	$\surd$	1	1	$\times$	-	-
N140.9.366 $\mathrm{GM3^+} \oplus \mathrm{M1^+} \oplus \mathrm{M4^-}$	$\surd$	1	1	$\times$	-	-
N140.9.367 $\mathrm{GM3^+} \oplus \mathrm{M1^-} \oplus \mathrm{M1^-}$	$\surd$	1	1	$\times$	-	-
N140.9.368 $\mathrm{GM3^+} \oplus \mathrm{M1^-} \oplus \mathrm{M2^+}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B2
N140.9.369 $\mathrm{GM3^+} \oplus \mathrm{M1^-} \oplus \mathrm{M2^-}$	$\surd$	1	1	$\times$	-	-
N140.9.370 $\mathrm{GM3^+} \oplus \mathrm{M1^-} \oplus \mathrm{M3^+}$	$\surd$	1	1	$\surd$	422	A2
N140.9.371 $\mathrm{GM3^+} \oplus \mathrm{M1^-} \oplus \mathrm{M3^-}$	$\surd$	1	1	$\times$	-	-
N140.9.372 $\mathrm{GM3^+} \oplus \mathrm{M1^-} \oplus \mathrm{M4^+}$	$\surd$	1	1	$\times$	-	-
N140.9.373 $\mathrm{GM3^+} \oplus \mathrm{M1^-} \oplus \mathrm{M4^-}$	$\surd$	1	1	$\times$	-	-
N140.9.374 $\mathrm{GM3^+} \oplus \mathrm{M2^+} \oplus \mathrm{M2^+}$	$\surd$	1	1	$\times$	-	-
N140.9.375 $\mathrm{GM3^+} \oplus \mathrm{M2^+} \oplus \mathrm{M2^-}$	$\surd$	1	1	$\times$	-	-
N140.9.376 $\mathrm{GM3^+} \oplus \mathrm{M2^+} \oplus \mathrm{M3^+}$	$\surd$	1	1	$\times$	-	-
N140.9.377 $\mathrm{GM3^+} \oplus \mathrm{M2^+} \oplus \mathrm{M3^-}$	$\surd$	1	1	$\times$	-	-
N140.9.378 $\mathrm{GM3^+} \oplus \mathrm{M2^+} \oplus \mathrm{M4^+}$	$\surd$	1	1	$\times$	-	-
N140.9.379 $\mathrm{GM3^+} \oplus \mathrm{M2^+} \oplus \mathrm{M4^-}$	$\surd$	1	1	$\surd$	422	A2
N140.9.380 $\mathrm{GM3^+} \oplus \mathrm{M2^-} \oplus \mathrm{M2^-}$	$\surd$	1	1	$\times$	-	-
N140.9.381 $\mathrm{GM3^+} \oplus \mathrm{M2^-} \oplus \mathrm{M3^+}$	$\surd$	1	1	$\times$	-	-
N140.9.382 $\mathrm{GM3^+} \oplus \mathrm{M2^-} \oplus \mathrm{M3^-}$	$\surd$	1	1	$\times$	-	-
N140.9.383 $\mathrm{GM3^+} \oplus \mathrm{M2^-} \oplus \mathrm{M4^+}$	$\surd$	1	1	$\surd$	422	A2
N140.9.384 $\mathrm{GM3^+} \oplus \mathrm{M2^-} \oplus \mathrm{M4^-}$	$\surd$	1	1	$\times$	-	-
N140.9.385 $\mathrm{GM3^+} \oplus \mathrm{M3^+} \oplus \mathrm{M3^+}$	$\surd$	1	1	$\times$	-	-
N140.9.386 $\mathrm{GM3^+} \oplus \mathrm{M3^+} \oplus \mathrm{M3^-}$	$\surd$	1	1	$\times$	-	-
N140.9.387 $\mathrm{GM3^+} \oplus \mathrm{M3^+} \oplus \mathrm{M4^+}$	$\surd$	1	1	$\times$	-	-
N140.9.388 $\mathrm{GM3^+} \oplus \mathrm{M3^+} \oplus \mathrm{M4^-}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B2
N140.9.389 $\mathrm{GM3^+} \oplus \mathrm{M3^-} \oplus \mathrm{M3^-}$	$\surd$	1	1	$\times$	-	-
N140.9.390 $\mathrm{GM3^+} \oplus \mathrm{M3^-} \oplus \mathrm{M4^+}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B2
N140.9.391 $\mathrm{GM3^+} \oplus \mathrm{M3^-} \oplus \mathrm{M4^-}$	$\surd$	1	1	$\times$	-	-
N140.9.392 $\mathrm{GM3^+} \oplus \mathrm{M4^+} \oplus \mathrm{M4^+}$	$\surd$	1	1	$\times$	-	-
N140.9.393 $\mathrm{GM3^+} \oplus \mathrm{M4^+} \oplus \mathrm{M4^-}$	$\surd$	1	1	$\times$	-	-
N140.9.394 $\mathrm{GM3^+} \oplus \mathrm{M4^-} \oplus \mathrm{M4^-}$	$\surd$	1	1	$\times$	-	-
N140.9.395 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
N140.9.396 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B2_g}$

Non-coplanar SSGs with parent space group $I4/mcm$ (No. 140) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N140.9.397 $\mathrm{GM3^-}\oplus\mathrm{GM3^-}\oplus\mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N140.9.398 $\mathrm{GM3^-}\oplus\mathrm{GM3^-}\oplus\mathrm{M1^+}$	$\surd$	0	0	$\surd$	-	-
N140.9.399 $\mathrm{GM3^-}\oplus\mathrm{GM3^-}\oplus\mathrm{M1^-}$	$\surd$	0	0	$\surd$	-	-
N140.9.400 $\mathrm{GM3^-}\oplus\mathrm{GM3^-}\oplus\mathrm{M2^+}$	$\surd$	0	0	$\surd$	-	-
N140.9.401 $\mathrm{GM3^-}\oplus\mathrm{GM3^-}\oplus\mathrm{M2^-}$	$\surd$	0	0	$\surd$	-	-
N140.9.402 $\mathrm{GM3^-}\oplus\mathrm{GM3^-}\oplus\mathrm{M3^+}$	$\surd$	0	0	$\surd$	-	-
N140.9.403 $\mathrm{GM3^-}\oplus\mathrm{GM3^-}\oplus\mathrm{M3^-}$	$\surd$	0	0	$\surd$	-	-
N140.9.404 $\mathrm{GM3^-}\oplus\mathrm{GM3^-}\oplus\mathrm{M4^+}$	$\surd$	0	0	$\surd$	-	-
N140.9.405 $\mathrm{GM3^-}\oplus\mathrm{GM3^-}\oplus\mathrm{M4^-}$	$\surd$	0	0	$\surd$	-	-
N140.9.406 $\mathrm{GM3^-}\oplus\mathrm{GM4^+}\oplus\mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{B2}\oplus\mathrm{B2}$
N140.9.407 $\mathrm{GM3^-}\oplus\mathrm{GM4^+}\oplus\mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B1_u}\oplus\mathrm{B2_g}$
N140.9.408 $\mathrm{GM3^-}\oplus\mathrm{GM4^+}\oplus\mathrm{M1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{B2_g}$
N140.9.409 $\mathrm{GM3^-}\oplus\mathrm{GM4^+}\oplus\mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{B2_g}$
N140.9.410 $\mathrm{GM3^-}\oplus\mathrm{GM4^+}\oplus\mathrm{M2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{B2_g}$
N140.9.411 $\mathrm{GM3^-}\oplus\mathrm{GM4^+}\oplus\mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{B2_g}$
N140.9.412 $\mathrm{GM3^-}\oplus\mathrm{GM4^+}\oplus\mathrm{M3^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{B2_g}$
N140.9.413 $\mathrm{GM3^-}\oplus\mathrm{GM4^+}\oplus\mathrm{M3^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{B2_g}$
N140.9.414 $\mathrm{GM3^-}\oplus\mathrm{GM4^+}\oplus\mathrm{M4^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{B2_g}$
N140.9.415 $\mathrm{GM3^-}\oplus\mathrm{GM4^+}\oplus\mathrm{M4^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{B2_g}$
N140.9.416 $\mathrm{GM3^-}\oplus\mathrm{GM4^-}\oplus\mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N140.9.417 $\mathrm{GM3^-}\oplus\mathrm{GM4^-}\oplus\mathrm{M1^+}$	$\surd$	0	0	$\surd$	-	-
N140.9.418 $\mathrm{GM3^-}\oplus\mathrm{GM4^-}\oplus\mathrm{M1^-}$	$\surd$	0	0	$\surd$	-	-
N140.9.419 $\mathrm{GM3^-}\oplus\mathrm{GM4^-}\oplus\mathrm{M2^+}$	$\surd$	0	0	$\surd$	-	-
N140.9.420 $\mathrm{GM3^-}\oplus\mathrm{GM4^-}\oplus\mathrm{M2^-}$	$\surd$	0	0	$\surd$	-	-
N140.9.421 $\mathrm{GM3^-}\oplus\mathrm{GM4^-}\oplus\mathrm{M3^+}$	$\surd$	0	0	$\surd$	-	-
N140.9.422 $\mathrm{GM3^-}\oplus\mathrm{GM4^-}\oplus\mathrm{M3^-}$	$\surd$	0	0	$\surd$	-	-
N140.9.423 $\mathrm{GM3^-}\oplus\mathrm{GM4^-}\oplus\mathrm{M4^+}$	$\surd$	0	0	$\surd$	-	-
N140.9.424 $\mathrm{GM3^-}\oplus\mathrm{GM4^-}\oplus\mathrm{M4^-}$	$\surd$	0	0	$\surd$	-	-
N140.9.425 $\mathrm{GM3^-}\oplus\mathrm{M1^+}\oplus\mathrm{M1^+}$	$\surd$	1	0	$\times$	-	-
N140.9.426 $\mathrm{GM3^-}\oplus\mathrm{M1^+}\oplus\mathrm{M1^-}$	$\surd$	1	1	$\times$	-	-
N140.9.427 $\mathrm{GM3^-}\oplus\mathrm{M1^+}\oplus\mathrm{M2^+}$	$\surd$	1	0	$\times$	-	-
N140.9.428 $\mathrm{GM3^-}\oplus\mathrm{M1^+}\oplus\mathrm{M2^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_u}$
N140.9.429 $\mathrm{GM3^-}\oplus\mathrm{M1^+}\oplus\mathrm{M3^+}$	$\surd$	1	0	$\times$	-	-
N140.9.430 $\mathrm{GM3^-}\oplus\mathrm{M1^+}\oplus\mathrm{M3^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N140.9.431 $\mathrm{GM3^-}\oplus\mathrm{M1^+}\oplus\mathrm{M4^+}$	$\surd$	1	0	$\times$	-	-
N140.9.432 $\mathrm{GM3^-}\oplus\mathrm{M1^+}\oplus\mathrm{M4^-}$	$\surd$	1	1	$\times$	-	-
N140.9.433 $\mathrm{GM3^-}\oplus\mathrm{M1^-}\oplus\mathrm{M1^-}$	$\surd$	1	0	$\times$	-	-
N140.9.434 $\mathrm{GM3^-}\oplus\mathrm{M1^-}\oplus\mathrm{M2^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_u}$
N140.9.435 $\mathrm{GM3^-}\oplus\mathrm{M1^-}\oplus\mathrm{M2^-}$	$\surd$	1	0	$\times$	-	-
N140.9.436 $\mathrm{GM3^-}\oplus\mathrm{M1^-}\oplus\mathrm{M3^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N140.9.437 $\mathrm{GM3^-}\oplus\mathrm{M1^-}\oplus\mathrm{M3^-}$	$\surd$	1	0	$\times$	-	-
N140.9.438 $\mathrm{GM3^-}\oplus\mathrm{M1^-}\oplus\mathrm{M4^+}$	$\surd$	1	1	$\times$	-	-
N140.9.439 $\mathrm{GM3^-}\oplus\mathrm{M1^-}\oplus\mathrm{M4^-}$	$\surd$	1	0	$\times$	-	-
N140.9.440 $\mathrm{GM3^-}\oplus\mathrm{M2^+}\oplus\mathrm{M2^+}$	$\surd$	1	0	$\times$	-	-
N140.9.441 $\mathrm{GM3^-}\oplus\mathrm{M2^+}\oplus\mathrm{M2^-}$	$\surd$	1	1	$\times$	-	-
N140.9.442 $\mathrm{GM3^-}\oplus\mathrm{M2^+}\oplus\mathrm{M3^+}$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $I4/mcm$ (No. 140) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N140.9.443 $\mathrm{GM3^-}\oplus\mathrm{M2^+}\oplus\mathrm{M3^-}$	$\surd$	1	1	$\times$	-	-
N140.9.444 $\mathrm{GM3^-}\oplus\mathrm{M2^+}\oplus\mathrm{M4^+}$	$\surd$	1	0	$\times$	-	-
N140.9.445 $\mathrm{GM3^-}\oplus\mathrm{M2^+}\oplus\mathrm{M4^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N140.9.446 $\mathrm{GM3^-}\oplus\mathrm{M2^-}\oplus\mathrm{M2^-}$	$\surd$	1	0	$\times$	-	-
N140.9.447 $\mathrm{GM3^-}\oplus\mathrm{M2^-}\oplus\mathrm{M3^+}$	$\surd$	1	1	$\times$	-	-
N140.9.448 $\mathrm{GM3^-}\oplus\mathrm{M2^-}\oplus\mathrm{M3^-}$	$\surd$	1	0	$\times$	-	-
N140.9.449 $\mathrm{GM3^-}\oplus\mathrm{M2^-}\oplus\mathrm{M4^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N140.9.450 $\mathrm{GM3^-}\oplus\mathrm{M2^-}\oplus\mathrm{M4^-}$	$\surd$	1	0	$\times$	-	-
N140.9.451 $\mathrm{GM3^-}\oplus\mathrm{M3^+}\oplus\mathrm{M3^+}$	$\surd$	1	0	$\times$	-	-
N140.9.452 $\mathrm{GM3^-}\oplus\mathrm{M3^+}\oplus\mathrm{M3^-}$	$\surd$	1	1	$\times$	-	-
N140.9.453 $\mathrm{GM3^-}\oplus\mathrm{M3^+}\oplus\mathrm{M4^+}$	$\surd$	1	0	$\times$	-	-
N140.9.454 $\mathrm{GM3^-}\oplus\mathrm{M3^+}\oplus\mathrm{M4^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_u}$
N140.9.455 $\mathrm{GM3^-}\oplus\mathrm{M3^-}\oplus\mathrm{M3^-}$	$\surd$	1	0	$\times$	-	-
N140.9.456 $\mathrm{GM3^-}\oplus\mathrm{M3^-}\oplus\mathrm{M4^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_u}$
N140.9.457 $\mathrm{GM3^-}\oplus\mathrm{M3^-}\oplus\mathrm{M4^-}$	$\surd$	1	0	$\times$	-	-
N140.9.458 $\mathrm{GM3^-}\oplus\mathrm{M4^+}\oplus\mathrm{M4^+}$	$\surd$	1	0	$\times$	-	-
N140.9.459 $\mathrm{GM3^-}\oplus\mathrm{M4^+}\oplus\mathrm{M4^-}$	$\surd$	1	1	$\times$	-	-
N140.9.460 $\mathrm{GM3^-}\oplus\mathrm{M4^-}\oplus\mathrm{M4^-}$	$\surd$	1	0	$\times$	-	-
N140.9.461 $\mathrm{GM4^+}\oplus\mathrm{GM4^+}\oplus\mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B2_g}\oplus\mathrm{B2_g}\oplus\mathrm{B2_g}$
N140.9.462 $\mathrm{GM4^+}\oplus\mathrm{GM4^+}\oplus\mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{A2}\oplus\mathrm{A2}$
N140.9.463 $\mathrm{GM4^+}\oplus\mathrm{GM4^+}\oplus\mathrm{M1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g}\oplus\mathrm{B2_g}$
N140.9.464 $\mathrm{GM4^+}\oplus\mathrm{GM4^+}\oplus\mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g}\oplus\mathrm{B2_g}$
N140.9.465 $\mathrm{GM4^+}\oplus\mathrm{GM4^+}\oplus\mathrm{M2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g}\oplus\mathrm{B2_g}$
N140.9.466 $\mathrm{GM4^+}\oplus\mathrm{GM4^+}\oplus\mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g}\oplus\mathrm{B2_g}$
N140.9.467 $\mathrm{GM4^+}\oplus\mathrm{GM4^+}\oplus\mathrm{M3^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g}\oplus\mathrm{B2_g}$
N140.9.468 $\mathrm{GM4^+}\oplus\mathrm{GM4^+}\oplus\mathrm{M3^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g}\oplus\mathrm{B2_g}$
N140.9.469 $\mathrm{GM4^+}\oplus\mathrm{GM4^+}\oplus\mathrm{M4^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g}\oplus\mathrm{B2_g}$
N140.9.470 $\mathrm{GM4^+}\oplus\mathrm{GM4^+}\oplus\mathrm{M4^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g}\oplus\mathrm{B2_g}$
N140.9.471 $\mathrm{GM4^+}\oplus\mathrm{GM4^-}\oplus\mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A1_u}\oplus\mathrm{B2_g}$
N140.9.472 $\mathrm{GM4^+}\oplus\mathrm{GM4^-}\oplus\mathrm{M1^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B2_g}$
N140.9.473 $\mathrm{GM4^+}\oplus\mathrm{GM4^-}\oplus\mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B2_g}$
N140.9.474 $\mathrm{GM4^+}\oplus\mathrm{GM4^-}\oplus\mathrm{M2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B2_g}$
N140.9.475 $\mathrm{GM4^+}\oplus\mathrm{GM4^-}\oplus\mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B2_g}$
N140.9.476 $\mathrm{GM4^+}\oplus\mathrm{GM4^-}\oplus\mathrm{M3^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B2_g}$
N140.9.477 $\mathrm{GM4^+}\oplus\mathrm{GM4^-}\oplus\mathrm{M3^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B2_g}$
N140.9.478 $\mathrm{GM4^+}\oplus\mathrm{GM4^-}\oplus\mathrm{M4^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B2_g}$
N140.9.479 $\mathrm{GM4^+}\oplus\mathrm{GM4^-}\oplus\mathrm{M4^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B2_g}$
N140.9.480 $\mathrm{GM4^+}\oplus\mathrm{M1^+}\oplus\mathrm{M1^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_g}$
N140.9.481 $\mathrm{GM4^+}\oplus\mathrm{M1^+}\oplus\mathrm{M1^-}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	A2
N140.9.482 $\mathrm{GM4^+}\oplus\mathrm{M1^+}\oplus\mathrm{M2^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_g}$
N140.9.483 $\mathrm{GM4^+}\oplus\mathrm{M1^+}\oplus\mathrm{M2^-}$	$\surd$	1	1	$\surd$	$4mm$	B2
N140.9.484 $\mathrm{GM4^+}\oplus\mathrm{M1^+}\oplus\mathrm{M3^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_g}$
N140.9.485 $\mathrm{GM4^+}\oplus\mathrm{M1^+}\oplus\mathrm{M3^-}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N140.9.486 $\mathrm{GM4^+}\oplus\mathrm{M1^+}\oplus\mathrm{M4^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_g}$
N140.9.487 $\mathrm{GM4^+}\oplus\mathrm{M1^+}\oplus\mathrm{M4^-}$	$\surd$	1	1	$\surd$	422	B2
N140.9.488 $\mathrm{GM4^+}\oplus\mathrm{M1^-}\oplus\mathrm{M1^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_g}$

Non-coplanar SSGs with parent space group $I4/mcm$ (No. 140) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N140.9.489 $\mathrm{GM4}^{+}\oplus\mathrm{M1}^{-}\oplus\mathrm{M2}^{+}$	$\surd$	1	1	$\surd$	$4mm$	B2
N140.9.490 $\mathrm{GM4}^{+}\oplus\mathrm{M1}^{-}\oplus\mathrm{M2}^{-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_g}$
N140.9.491 $\mathrm{GM4}^{+}\oplus\mathrm{M1}^{-}\oplus\mathrm{M3}^{+}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N140.9.492 $\mathrm{GM4}^{+}\oplus\mathrm{M1}^{-}\oplus\mathrm{M3}^{-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_g}$
N140.9.493 $\mathrm{GM4}^{+}\oplus\mathrm{M1}^{-}\oplus\mathrm{M4}^{+}$	$\surd$	1	1	$\surd$	422	B2
N140.9.494 $\mathrm{GM4}^{+}\oplus\mathrm{M1}^{-}\oplus\mathrm{M4}^{-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_g}$
N140.9.495 $\mathrm{GM4}^{+}\oplus\mathrm{M2}^{+}\oplus\mathrm{M2}^{+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_g}$
N140.9.496 $\mathrm{GM4}^{+}\oplus\mathrm{M2}^{+}\oplus\mathrm{M2}^{-}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	A2
N140.9.497 $\mathrm{GM4}^{+}\oplus\mathrm{M2}^{+}\oplus\mathrm{M3}^{+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_g}$
N140.9.498 $\mathrm{GM4}^{+}\oplus\mathrm{M2}^{+}\oplus\mathrm{M3}^{-}$	$\surd$	1	1	$\surd$	422	B2
N140.9.499 $\mathrm{GM4}^{+}\oplus\mathrm{M2}^{+}\oplus\mathrm{M4}^{+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_g}$
N140.9.500 $\mathrm{GM4}^{+}\oplus\mathrm{M2}^{+}\oplus\mathrm{M4}^{-}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N140.9.501 $\mathrm{GM4}^{+}\oplus\mathrm{M2}^{-}\oplus\mathrm{M2}^{-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_g}$
N140.9.502 $\mathrm{GM4}^{+}\oplus\mathrm{M2}^{-}\oplus\mathrm{M3}^{+}$	$\surd$	1	1	$\surd$	422	B2
N140.9.503 $\mathrm{GM4}^{+}\oplus\mathrm{M2}^{-}\oplus\mathrm{M3}^{-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_g}$
N140.9.504 $\mathrm{GM4}^{+}\oplus\mathrm{M2}^{-}\oplus\mathrm{M4}^{+}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N140.9.505 $\mathrm{GM4}^{+}\oplus\mathrm{M2}^{-}\oplus\mathrm{M4}^{-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_g}$
N140.9.506 $\mathrm{GM4}^{+}\oplus\mathrm{M3}^{+}\oplus\mathrm{M3}^{+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_g}$
N140.9.507 $\mathrm{GM4}^{+}\oplus\mathrm{M3}^{+}\oplus\mathrm{M3}^{-}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	A2
N140.9.508 $\mathrm{GM4}^{+}\oplus\mathrm{M3}^{+}\oplus\mathrm{M4}^{+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_g}$
N140.9.509 $\mathrm{GM4}^{+}\oplus\mathrm{M3}^{+}\oplus\mathrm{M4}^{-}$	$\surd$	1	1	$\surd$	$4mm$	B2
N140.9.510 $\mathrm{GM4}^{+}\oplus\mathrm{M3}^{-}\oplus\mathrm{M3}^{-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_g}$
N140.9.511 $\mathrm{GM4}^{+}\oplus\mathrm{M3}^{-}\oplus\mathrm{M4}^{+}$	$\surd$	1	1	$\surd$	$4mm$	B2
N140.9.512 $\mathrm{GM4}^{+}\oplus\mathrm{M3}^{-}\oplus\mathrm{M4}^{-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_g}$
N140.9.513 $\mathrm{GM4}^{+}\oplus\mathrm{M4}^{+}\oplus\mathrm{M4}^{+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_g}$
N140.9.514 $\mathrm{GM4}^{+}\oplus\mathrm{M4}^{+}\oplus\mathrm{M4}^{-}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	A2
N140.9.515 $\mathrm{GM4}^{+}\oplus\mathrm{M4}^{-}\oplus\mathrm{M4}^{-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_g}$
N140.9.516 $\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
N140.9.517 $\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}\oplus\mathrm{M1}^{+}$	$\surd$	0	0	$\surd$	-	-
N140.9.518 $\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}\oplus\mathrm{M1}^{-}$	$\surd$	0	0	$\surd$	-	-
N140.9.519 $\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}\oplus\mathrm{M2}^{+}$	$\surd$	0	0	$\surd$	-	-
N140.9.520 $\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}\oplus\mathrm{M2}^{-}$	$\surd$	0	0	$\surd$	-	-
N140.9.521 $\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}\oplus\mathrm{M3}^{+}$	$\surd$	0	0	$\surd$	-	-
N140.9.522 $\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}\oplus\mathrm{M3}^{-}$	$\surd$	0	0	$\surd$	-	-
N140.9.523 $\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}\oplus\mathrm{M4}^{+}$	$\surd$	0	0	$\surd$	-	-
N140.9.524 $\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}\oplus\mathrm{M4}^{-}$	$\surd$	0	0	$\surd$	-	-
N140.9.525 $\mathrm{GM4}^{-}\oplus\mathrm{M1}^{+}\oplus\mathrm{M1}^{+}$	$\surd$	1	0	$\times$	-	-
N140.9.526 $\mathrm{GM4}^{-}\oplus\mathrm{M1}^{+}\oplus\mathrm{M1}^{-}$	$\surd$	1	1	$\times$	-	-
N140.9.527 $\mathrm{GM4}^{-}\oplus\mathrm{M1}^{+}\oplus\mathrm{M2}^{+}$	$\surd$	1	0	$\times$	-	-
N140.9.528 $\mathrm{GM4}^{-}\oplus\mathrm{M1}^{+}\oplus\mathrm{M2}^{-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_u}$
N140.9.529 $\mathrm{GM4}^{-}\oplus\mathrm{M1}^{+}\oplus\mathrm{M3}^{+}$	$\surd$	1	0	$\times$	-	-
N140.9.530 $\mathrm{GM4}^{-}\oplus\mathrm{M1}^{+}\oplus\mathrm{M3}^{-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N140.9.531 $\mathrm{GM4}^{-}\oplus\mathrm{M1}^{+}\oplus\mathrm{M4}^{+}$	$\surd$	1	0	$\times$	-	-
N140.9.532 $\mathrm{GM4}^{-}\oplus\mathrm{M1}^{+}\oplus\mathrm{M4}^{-}$	$\surd$	1	1	$\times$	-	-
N140.9.533 $\mathrm{GM4}^{-}\oplus\mathrm{M1}^{-}\oplus\mathrm{M1}^{-}$	$\surd$	1	0	$\times$	-	-
N140.9.534 $\mathrm{GM4}^{-}\oplus\mathrm{M1}^{-}\oplus\mathrm{M2}^{+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_u}$

Non-coplanar SSGs with parent space group $I4/mcm$ (No. 140) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N140.9.535 $\mathrm{GM4^-} \oplus \mathrm{M1^-} \oplus \mathrm{M2^-}$	$\surd$	1	0	$\times$	-	-
N140.9.536 $\mathrm{GM4^-} \oplus \mathrm{M1^-} \oplus \mathrm{M3^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N140.9.537 $\mathrm{GM4^-} \oplus \mathrm{M1^-} \oplus \mathrm{M3^-}$	$\surd$	1	0	$\times$	-	-
N140.9.538 $\mathrm{GM4^-} \oplus \mathrm{M1^-} \oplus \mathrm{M4^+}$	$\surd$	1	1	$\times$	-	-
N140.9.539 $\mathrm{GM4^-} \oplus \mathrm{M1^-} \oplus \mathrm{M4^-}$	$\surd$	1	0	$\times$	-	-
N140.9.540 $\mathrm{GM4^-} \oplus \mathrm{M2^+} \oplus \mathrm{M2^+}$	$\surd$	1	0	$\times$	-	-
N140.9.541 $\mathrm{GM4^-} \oplus \mathrm{M2^+} \oplus \mathrm{M2^-}$	$\surd$	1	1	$\times$	-	-
N140.9.542 $\mathrm{GM4^-} \oplus \mathrm{M2^+} \oplus \mathrm{M3^+}$	$\surd$	1	0	$\times$	-	-
N140.9.543 $\mathrm{GM4^-} \oplus \mathrm{M2^+} \oplus \mathrm{M3^-}$	$\surd$	1	1	$\times$	-	-
N140.9.544 $\mathrm{GM4^-} \oplus \mathrm{M2^+} \oplus \mathrm{M4^+}$	$\surd$	1	0	$\times$	-	-
N140.9.545 $\mathrm{GM4^-} \oplus \mathrm{M2^+} \oplus \mathrm{M4^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N140.9.546 $\mathrm{GM4^-} \oplus \mathrm{M2^-} \oplus \mathrm{M2^-}$	$\surd$	1	0	$\times$	-	-
N140.9.547 $\mathrm{GM4^-} \oplus \mathrm{M2^-} \oplus \mathrm{M3^+}$	$\surd$	1	1	$\times$	-	-
N140.9.548 $\mathrm{GM4^-} \oplus \mathrm{M2^-} \oplus \mathrm{M3^-}$	$\surd$	1	0	$\times$	-	-
N140.9.549 $\mathrm{GM4^-} \oplus \mathrm{M2^-} \oplus \mathrm{M4^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N140.9.550 $\mathrm{GM4^-} \oplus \mathrm{M2^-} \oplus \mathrm{M4^-}$	$\surd$	1	0	$\times$	-	-
N140.9.551 $\mathrm{GM4^-} \oplus \mathrm{M3^+} \oplus \mathrm{M3^+}$	$\surd$	1	0	$\times$	-	-
N140.9.552 $\mathrm{GM4^-} \oplus \mathrm{M3^+} \oplus \mathrm{M3^-}$	$\surd$	1	1	$\times$	-	-
N140.9.553 $\mathrm{GM4^-} \oplus \mathrm{M3^+} \oplus \mathrm{M4^+}$	$\surd$	1	0	$\times$	-	-
N140.9.554 $\mathrm{GM4^-} \oplus \mathrm{M3^+} \oplus \mathrm{M4^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_u}$
N140.9.555 $\mathrm{GM4^-} \oplus \mathrm{M3^-} \oplus \mathrm{M3^-}$	$\surd$	1	0	$\times$	-	-
N140.9.556 $\mathrm{GM4^-} \oplus \mathrm{M3^-} \oplus \mathrm{M4^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_u}$
N140.9.557 $\mathrm{GM4^-} \oplus \mathrm{M3^-} \oplus \mathrm{M4^-}$	$\surd$	1	0	$\times$	-	-
N140.9.558 $\mathrm{GM4^-} \oplus \mathrm{M4^+} \oplus \mathrm{M4^+}$	$\surd$	1	0	$\times$	-	-
N140.9.559 $\mathrm{GM4^-} \oplus \mathrm{M4^+} \oplus \mathrm{M4^-}$	$\surd$	1	1	$\times$	-	-
N140.9.560 $\mathrm{GM4^-} \oplus \mathrm{M4^-} \oplus \mathrm{M4^-}$	$\surd$	1	0	$\times$	-	-
N140.9.561 $\mathrm{M1^+} \oplus \mathrm{M1^+} \oplus \mathrm{M1^+}$	$\surd$	0	0	$\surd$	-	-
N140.9.562 $\mathrm{M1^+} \oplus \mathrm{M1^+} \oplus \mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u}$
N140.9.563 $\mathrm{M1^+} \oplus \mathrm{M1^+} \oplus \mathrm{M2^+}$	$\surd$	0	0	$\surd$	-	-
N140.9.564 $\mathrm{M1^+} \oplus \mathrm{M1^+} \oplus \mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N140.9.565 $\mathrm{M1^+} \oplus \mathrm{M1^+} \oplus \mathrm{M3^+}$	$\surd$	0	0	$\surd$	-	-
N140.9.566 $\mathrm{M1^+} \oplus \mathrm{M1^+} \oplus \mathrm{M3^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u}$
N140.9.567 $\mathrm{M1^+} \oplus \mathrm{M1^+} \oplus \mathrm{M4^+}$	$\surd$	0	0	$\surd$	-	-
N140.9.568 $\mathrm{M1^+} \oplus \mathrm{M1^+} \oplus \mathrm{M4^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_u} \oplus \mathrm{B2_u}$
N140.9.569 $\mathrm{M1^+} \oplus \mathrm{M1^-} \oplus \mathrm{M1^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u}$
N140.9.570 $\mathrm{M1^+} \oplus \mathrm{M1^-} \oplus \mathrm{M2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u}$
N140.9.571 $\mathrm{M1^+} \oplus \mathrm{M1^-} \oplus \mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u}$
N140.9.572 $\mathrm{M1^+} \oplus \mathrm{M1^-} \oplus \mathrm{M3^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u}$
N140.9.573 $\mathrm{M1^+} \oplus \mathrm{M1^-} \oplus \mathrm{M3^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u}$
N140.9.574 $\mathrm{M1^+} \oplus \mathrm{M1^-} \oplus \mathrm{M4^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_u}$
N140.9.575 $\mathrm{M1^+} \oplus \mathrm{M1^-} \oplus \mathrm{M4^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_u}$
N140.9.576 $\mathrm{M1^+} \oplus \mathrm{M2^+} \oplus \mathrm{M2^+}$	$\surd$	0	0	$\surd$	-	-
N140.9.577 $\mathrm{M1^+} \oplus \mathrm{M2^+} \oplus \mathrm{M2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u}$
N140.9.578 $\mathrm{M1^+} \oplus \mathrm{M2^+} \oplus \mathrm{M3^+}$	$\surd$	0	0	$\surd$	-	-
N140.9.579 $\mathrm{M1^+} \oplus \mathrm{M2^+} \oplus \mathrm{M3^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_u}$
N140.9.580 $\mathrm{M1^+} \oplus \mathrm{M2^+} \oplus \mathrm{M4^+}$	$\surd$	0	0	$\surd$	-	-

Non-coplanar SSGs with parent space group $I4/mcm$ (No. 140) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N140.9.581 $\mathrm{M1}^{+}\oplus\mathrm{M2}^{+}\oplus\mathrm{M4}^{-}$	√	2	2	√	$4/mmm$	$\mathrm{A2_u}\oplus\mathrm{B2_u}$
N140.9.582 $\mathrm{M1}^{+}\oplus\mathrm{M2}^{-}\oplus\mathrm{M2}^{-}$	√	2	2	√	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{B1_u}$
N140.9.583 $\mathrm{M1}^{+}\oplus\mathrm{M2}^{-}\oplus\mathrm{M3}^{+}$	√	2	2	√	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{B2_u}$
N140.9.584 $\mathrm{M1}^{+}\oplus\mathrm{M2}^{-}\oplus\mathrm{M3}^{-}$	√	2	2	√	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{A2_u}$
N140.9.585 $\mathrm{M1}^{+}\oplus\mathrm{M2}^{-}\oplus\mathrm{M4}^{+}$	√	2	2	√	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{A2_u}$
N140.9.586 $\mathrm{M1}^{+}\oplus\mathrm{M2}^{-}\oplus\mathrm{M4}^{-}$	√	2	2	√	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{B2_u}$
N140.9.587 $\mathrm{M1}^{+}\oplus\mathrm{M3}^{+}\oplus\mathrm{M3}^{+}$	√	0	0	√	-	-
N140.9.588 $\mathrm{M1}^{+}\oplus\mathrm{M3}^{+}\oplus\mathrm{M3}^{-}$	√	2	2	√	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A2_u}$
N140.9.589 $\mathrm{M1}^{+}\oplus\mathrm{M3}^{+}\oplus\mathrm{M4}^{+}$	√	0	0	√	-	-
N140.9.590 $\mathrm{M1}^{+}\oplus\mathrm{M3}^{+}\oplus\mathrm{M4}^{-}$	√	2	2	√	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{B2_u}$
N140.9.591 $\mathrm{M1}^{+}\oplus\mathrm{M3}^{-}\oplus\mathrm{M3}^{-}$	√	2	2	√	$4/mmm$	$\mathrm{A2_u}\oplus\mathrm{A2_u}$
N140.9.592 $\mathrm{M1}^{+}\oplus\mathrm{M3}^{-}\oplus\mathrm{M4}^{+}$	√	2	2	√	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{A2_u}$
N140.9.593 $\mathrm{M1}^{+}\oplus\mathrm{M3}^{-}\oplus\mathrm{M4}^{-}$	√	2	2	√	$4/mmm$	$\mathrm{A2_u}\oplus\mathrm{B2_u}$
N140.9.594 $\mathrm{M1}^{+}\oplus\mathrm{M4}^{+}\oplus\mathrm{M4}^{+}$	√	0	0	√	-	-
N140.9.595 $\mathrm{M1}^{+}\oplus\mathrm{M4}^{+}\oplus\mathrm{M4}^{-}$	√	2	2	√	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B2_u}$
N140.9.596 $\mathrm{M1}^{+}\oplus\mathrm{M4}^{-}\oplus\mathrm{M4}^{-}$	√	2	2	√	$4/mmm$	$\mathrm{B2_u}\oplus\mathrm{B2_u}$
N140.9.597 $\mathrm{M1}^{-}\oplus\mathrm{M1}^{-}\oplus\mathrm{M1}^{-}$	√	0	0	√	-	-
N140.9.598 $\mathrm{M1}^{-}\oplus\mathrm{M1}^{-}\oplus\mathrm{M2}^{+}$	√	2	2	√	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{B1_u}$
N140.9.599 $\mathrm{M1}^{-}\oplus\mathrm{M1}^{-}\oplus\mathrm{M2}^{-}$	√	0	0	√	-	-
N140.9.600 $\mathrm{M1}^{-}\oplus\mathrm{M1}^{-}\oplus\mathrm{M3}^{+}$	√	2	2	√	$4/mmm$	$\mathrm{A2_u}\oplus\mathrm{A2_u}$
N140.9.601 $\mathrm{M1}^{-}\oplus\mathrm{M1}^{-}\oplus\mathrm{M3}^{-}$	√	0	0	√	-	-
N140.9.602 $\mathrm{M1}^{-}\oplus\mathrm{M1}^{-}\oplus\mathrm{M4}^{+}$	√	2	2	√	$4/mmm$	$\mathrm{B2_u}\oplus\mathrm{B2_u}$
N140.9.603 $\mathrm{M1}^{-}\oplus\mathrm{M1}^{-}\oplus\mathrm{M4}^{-}$	√	0	0	√	-	-
N140.9.604 $\mathrm{M1}^{-}\oplus\mathrm{M2}^{+}\oplus\mathrm{M2}^{+}$	√	2	2	√	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{B1_u}$
N140.9.605 $\mathrm{M1}^{-}\oplus\mathrm{M2}^{+}\oplus\mathrm{M2}^{-}$	√	2	2	√	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B1_u}$
N140.9.606 $\mathrm{M1}^{-}\oplus\mathrm{M2}^{+}\oplus\mathrm{M3}^{+}$	√	2	2	√	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{A2_u}$
N140.9.607 $\mathrm{M1}^{-}\oplus\mathrm{M2}^{+}\oplus\mathrm{M3}^{-}$	√	2	2	√	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{B2_u}$
N140.9.608 $\mathrm{M1}^{-}\oplus\mathrm{M2}^{+}\oplus\mathrm{M4}^{+}$	√	2	2	√	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{B2_u}$
N140.9.609 $\mathrm{M1}^{-}\oplus\mathrm{M2}^{+}\oplus\mathrm{M4}^{-}$	√	2	2	√	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{A2_u}$
N140.9.610 $\mathrm{M1}^{-}\oplus\mathrm{M2}^{-}\oplus\mathrm{M2}^{-}$	√	0	0	√	-	-
N140.9.611 $\mathrm{M1}^{-}\oplus\mathrm{M2}^{-}\oplus\mathrm{M3}^{+}$	√	2	2	√	$4/mmm$	$\mathrm{A2_u}\oplus\mathrm{B2_u}$
N140.9.612 $\mathrm{M1}^{-}\oplus\mathrm{M2}^{-}\oplus\mathrm{M3}^{-}$	√	0	0	√	-	-
N140.9.613 $\mathrm{M1}^{-}\oplus\mathrm{M2}^{-}\oplus\mathrm{M4}^{+}$	√	2	2	√	$4/mmm$	$\mathrm{A2_u}\oplus\mathrm{B2_u}$
N140.9.614 $\mathrm{M1}^{-}\oplus\mathrm{M2}^{-}\oplus\mathrm{M4}^{-}$	√	0	0	√	-	-
N140.9.615 $\mathrm{M1}^{-}\oplus\mathrm{M3}^{+}\oplus\mathrm{M3}^{+}$	√	2	2	√	$4/mmm$	$\mathrm{A2_u}\oplus\mathrm{A2_u}$
N140.9.616 $\mathrm{M1}^{-}\oplus\mathrm{M3}^{+}\oplus\mathrm{M3}^{-}$	√	2	2	√	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A2_u}$
N140.9.617 $\mathrm{M1}^{-}\oplus\mathrm{M3}^{+}\oplus\mathrm{M4}^{+}$	√	2	2	√	$4/mmm$	$\mathrm{A2_u}\oplus\mathrm{B2_u}$
N140.9.618 $\mathrm{M1}^{-}\oplus\mathrm{M3}^{+}\oplus\mathrm{M4}^{-}$	√	2	2	√	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{A2_u}$
N140.9.619 $\mathrm{M1}^{-}\oplus\mathrm{M3}^{-}\oplus\mathrm{M3}^{-}$	√	0	0	√	-	-
N140.9.620 $\mathrm{M1}^{-}\oplus\mathrm{M3}^{-}\oplus\mathrm{M4}^{+}$	√	2	2	√	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{B2_u}$
N140.9.621 $\mathrm{M1}^{-}\oplus\mathrm{M3}^{-}\oplus\mathrm{M4}^{-}$	√	0	0	√	-	-
N140.9.622 $\mathrm{M1}^{-}\oplus\mathrm{M4}^{+}\oplus\mathrm{M4}^{+}$	√	2	2	√	$4/mmm$	$\mathrm{B2_u}\oplus\mathrm{B2_u}$
N140.9.623 $\mathrm{M1}^{-}\oplus\mathrm{M4}^{+}\oplus\mathrm{M4}^{-}$	√	2	2	√	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B2_u}$
N140.9.624 $\mathrm{M1}^{-}\oplus\mathrm{M4}^{-}\oplus\mathrm{M4}^{-}$	√	0	0	√	-	-
N140.9.625 $\mathrm{M2}^{+}\oplus\mathrm{M2}^{+}\oplus\mathrm{M2}^{+}$	√	0	0	√	-	-
N140.9.626 $\mathrm{M2}^{+}\oplus\mathrm{M2}^{+}\oplus\mathrm{M2}^{-}$	√	2	2	√	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A1_u}$

Non-coplanar SSGs with parent space group $I4/mcm$ (No. 140) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N140.9.627 $\mathrm{M2}^{+}\oplus\mathrm{M2}^{+}\oplus\mathrm{M3}^{+}$	$\surd$	0	0	$\surd$	-	-
N140.9.628 $\mathrm{M2}^{+}\oplus\mathrm{M2}^{+}\oplus\mathrm{M3}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_u}\oplus\mathrm{B2_u}$
N140.9.629 $\mathrm{M2}^{+}\oplus\mathrm{M2}^{+}\oplus\mathrm{M4}^{+}$	$\surd$	0	0	$\surd$	-	-
N140.9.630 $\mathrm{M2}^{+}\oplus\mathrm{M2}^{+}\oplus\mathrm{M4}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u}\oplus\mathrm{A2_u}$
N140.9.631 $\mathrm{M2}^{+}\oplus\mathrm{M2}^{-}\oplus\mathrm{M2}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A1_u}$
N140.9.632 $\mathrm{M2}^{+}\oplus\mathrm{M2}^{-}\oplus\mathrm{M3}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B2_u}$
N140.9.633 $\mathrm{M2}^{+}\oplus\mathrm{M2}^{-}\oplus\mathrm{M3}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B2_u}$
N140.9.634 $\mathrm{M2}^{+}\oplus\mathrm{M2}^{-}\oplus\mathrm{M4}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A2_u}$
N140.9.635 $\mathrm{M2}^{+}\oplus\mathrm{M2}^{-}\oplus\mathrm{M4}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A2_u}$
N140.9.636 $\mathrm{M2}^{+}\oplus\mathrm{M3}^{+}\oplus\mathrm{M3}^{+}$	$\surd$	0	0	$\surd$	-	-
N140.9.637 $\mathrm{M2}^{+}\oplus\mathrm{M3}^{+}\oplus\mathrm{M3}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B2_u}$
N140.9.638 $\mathrm{M2}^{+}\oplus\mathrm{M3}^{+}\oplus\mathrm{M4}^{+}$	$\surd$	0	0	$\surd$	-	-
N140.9.639 $\mathrm{M2}^{+}\oplus\mathrm{M3}^{+}\oplus\mathrm{M4}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{A2_u}$
N140.9.640 $\mathrm{M2}^{+}\oplus\mathrm{M3}^{-}\oplus\mathrm{M3}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_u}\oplus\mathrm{B2_u}$
N140.9.641 $\mathrm{M2}^{+}\oplus\mathrm{M3}^{-}\oplus\mathrm{M4}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{B2_u}$
N140.9.642 $\mathrm{M2}^{+}\oplus\mathrm{M3}^{-}\oplus\mathrm{M4}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u}\oplus\mathrm{B2_u}$
N140.9.643 $\mathrm{M2}^{+}\oplus\mathrm{M4}^{+}\oplus\mathrm{M4}^{+}$	$\surd$	0	0	$\surd$	-	-
N140.9.644 $\mathrm{M2}^{+}\oplus\mathrm{M4}^{+}\oplus\mathrm{M4}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A2_u}$
N140.9.645 $\mathrm{M2}^{+}\oplus\mathrm{M4}^{-}\oplus\mathrm{M4}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u}\oplus\mathrm{A2_u}$
N140.9.646 $\mathrm{M2}^{-}\oplus\mathrm{M2}^{-}\oplus\mathrm{M2}^{-}$	$\surd$	0	0	$\surd$	-	-
N140.9.647 $\mathrm{M2}^{-}\oplus\mathrm{M2}^{-}\oplus\mathrm{M3}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_u}\oplus\mathrm{B2_u}$
N140.9.648 $\mathrm{M2}^{-}\oplus\mathrm{M2}^{-}\oplus\mathrm{M3}^{-}$	$\surd$	0	0	$\surd$	-	-
N140.9.649 $\mathrm{M2}^{-}\oplus\mathrm{M2}^{-}\oplus\mathrm{M4}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u}\oplus\mathrm{A2_u}$
N140.9.650 $\mathrm{M2}^{-}\oplus\mathrm{M2}^{-}\oplus\mathrm{M4}^{-}$	$\surd$	0	0	$\surd$	-	-
N140.9.651 $\mathrm{M2}^{-}\oplus\mathrm{M3}^{+}\oplus\mathrm{M3}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_u}\oplus\mathrm{B2_u}$
N140.9.652 $\mathrm{M2}^{-}\oplus\mathrm{M3}^{+}\oplus\mathrm{M3}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B2_u}$
N140.9.653 $\mathrm{M2}^{-}\oplus\mathrm{M3}^{+}\oplus\mathrm{M4}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u}\oplus\mathrm{B2_u}$
N140.9.654 $\mathrm{M2}^{-}\oplus\mathrm{M3}^{+}\oplus\mathrm{M4}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{B2_u}$
N140.9.655 $\mathrm{M2}^{-}\oplus\mathrm{M3}^{-}\oplus\mathrm{M3}^{-}$	$\surd$	0	0	$\surd$	-	-
N140.9.656 $\mathrm{M2}^{-}\oplus\mathrm{M3}^{-}\oplus\mathrm{M4}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{A2_u}$
N140.9.657 $\mathrm{M2}^{-}\oplus\mathrm{M3}^{-}\oplus\mathrm{M4}^{-}$	$\surd$	0	0	$\surd$	-	-
N140.9.658 $\mathrm{M2}^{-}\oplus\mathrm{M4}^{+}\oplus\mathrm{M4}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u}\oplus\mathrm{A2_u}$
N140.9.659 $\mathrm{M2}^{-}\oplus\mathrm{M4}^{+}\oplus\mathrm{M4}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A2_u}$
N140.9.660 $\mathrm{M2}^{-}\oplus\mathrm{M4}^{-}\oplus\mathrm{M4}^{-}$	$\surd$	0	0	$\surd$	-	-
N140.9.661 $\mathrm{M3}^{+}\oplus\mathrm{M3}^{+}\oplus\mathrm{M3}^{+}$	$\surd$	0	0	$\surd$	-	-
N140.9.662 $\mathrm{M3}^{+}\oplus\mathrm{M3}^{+}\oplus\mathrm{M3}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A1_u}$
N140.9.663 $\mathrm{M3}^{+}\oplus\mathrm{M3}^{+}\oplus\mathrm{M4}^{+}$	$\surd$	0	0	$\surd$	-	-
N140.9.664 $\mathrm{M3}^{+}\oplus\mathrm{M3}^{+}\oplus\mathrm{M4}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{B1_u}$
N140.9.665 $\mathrm{M3}^{+}\oplus\mathrm{M3}^{-}\oplus\mathrm{M3}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A1_u}$
N140.9.666 $\mathrm{M3}^{+}\oplus\mathrm{M3}^{-}\oplus\mathrm{M4}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B1_u}$
N140.9.667 $\mathrm{M3}^{+}\oplus\mathrm{M3}^{-}\oplus\mathrm{M4}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B1_u}$
N140.9.668 $\mathrm{M3}^{+}\oplus\mathrm{M4}^{+}\oplus\mathrm{M4}^{+}$	$\surd$	0	0	$\surd$	-	-
N140.9.669 $\mathrm{M3}^{+}\oplus\mathrm{M4}^{+}\oplus\mathrm{M4}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B1_u}$
N140.9.670 $\mathrm{M3}^{+}\oplus\mathrm{M4}^{-}\oplus\mathrm{M4}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{B1_u}$
N140.9.671 $\mathrm{M3}^{-}\oplus\mathrm{M3}^{-}\oplus\mathrm{M3}^{-}$	$\surd$	0	0	$\surd$	-	-
N140.9.672 $\mathrm{M3}^{-}\oplus\mathrm{M3}^{-}\oplus\mathrm{M4}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{B1_u}$

Non-coplanar SSGs with parent space group $I4/mcm$ (No. 140) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N140.9.673 $\mathrm{M3}^{-} \oplus \mathrm{M3}^{-} \oplus \mathrm{M4}^{-}$	$\surd$	0	0	$\surd$	-	-
N140.9.674 $\mathrm{M3}^{-} \oplus \mathrm{M4}^{+} \oplus \mathrm{M4}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N140.9.675 $\mathrm{M3}^{-} \oplus \mathrm{M4}^{+} \oplus \mathrm{M4}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u}$
N140.9.676 $\mathrm{M3}^{-} \oplus \mathrm{M4}^{-} \oplus \mathrm{M4}^{-}$	$\surd$	0	0	$\surd$	-	-
N140.9.677 $\mathrm{M4}^{+} \oplus \mathrm{M4}^{+} \oplus \mathrm{M4}^{+}$	$\surd$	0	0	$\surd$	-	-
N140.9.678 $\mathrm{M4}^{+} \oplus \mathrm{M4}^{+} \oplus \mathrm{M4}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u}$
N140.9.679 $\mathrm{M4}^{+} \oplus \mathrm{M4}^{-} \oplus \mathrm{M4}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u}$
N140.9.680 $\mathrm{M4}^{-} \oplus \mathrm{M4}^{-} \oplus \mathrm{M4}^{-}$	$\surd$	0	0	$\surd$	-	-
N140.12.1 $\mathrm{GM1}^{-} \oplus \mathrm{GM5}^{+}$	$\surd$	2	2	$\surd$	$4mm$	E
N140.12.2 $\mathrm{GM1}^{-} \oplus \mathrm{GM5}^{-}$	$\surd$	0	0	$\surd$	-	-
N140.12.3 $\mathrm{GM1}^{-} \oplus \mathrm{M5}^{+}$	$\surd$	1	0	$\times$	-	-
N140.12.4 $\mathrm{GM1}^{-} \oplus \mathrm{M5}^{-}$	$\surd$	1	0	$\times$	-	-
N140.12.5 $\mathrm{GM2}^{+} \oplus \mathrm{GM5}^{+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{E_g}$
N140.12.6 $\mathrm{GM2}^{+} \oplus \mathrm{GM5}^{-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{E_u}$
N140.12.7 $\mathrm{GM2}^{+} \oplus \mathrm{M5}^{+}$	$\surd$	1	1	$\times$	-	-
N140.12.8 $\mathrm{GM2}^{+} \oplus \mathrm{M5}^{-}$	$\surd$	1	1	$\times$	-	-
N140.12.9 $\mathrm{GM2}^{-} \oplus \mathrm{GM5}^{+}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	E
N140.12.10 $\mathrm{GM2}^{-} \oplus \mathrm{GM5}^{-}$	$\surd$	0	0	$\surd$	-	-
N140.12.11 $\mathrm{GM2}^{-} \oplus \mathrm{M5}^{+}$	$\surd$	1	0	$\times$	-	-
N140.12.12 $\mathrm{GM2}^{-} \oplus \mathrm{M5}^{-}$	$\surd$	1	0	$\times$	-	-
N140.12.13 $\mathrm{GM3}^{+} \oplus \mathrm{GM5}^{+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{E_g}$
N140.12.14 $\mathrm{GM3}^{+} \oplus \mathrm{GM5}^{-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{E_u}$
N140.12.15 $\mathrm{GM3}^{+} \oplus \mathrm{M5}^{+}$	$\surd$	1	1	$\times$	-	-
N140.12.16 $\mathrm{GM3}^{+} \oplus \mathrm{M5}^{-}$	$\surd$	1	1	$\times$	-	-
N140.12.17 $\mathrm{GM3}^{-} \oplus \mathrm{GM5}^{+}$	$\surd$	2	2	$\surd$	422	E
N140.12.18 $\mathrm{GM3}^{-} \oplus \mathrm{GM5}^{-}$	$\surd$	0	0	$\surd$	-	-
N140.12.19 $\mathrm{GM3}^{-} \oplus \mathrm{M5}^{+}$	$\surd$	1	0	$\times$	-	-
N140.12.20 $\mathrm{GM3}^{-} \oplus \mathrm{M5}^{-}$	$\surd$	1	0	$\times$	-	-
N140.12.21 $\mathrm{GM4}^{+} \oplus \mathrm{GM5}^{+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{E_g}$
N140.12.22 $\mathrm{GM4}^{+} \oplus \mathrm{GM5}^{-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{E_u}$
N140.12.23 $\mathrm{GM4}^{+} \oplus \mathrm{M5}^{+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_g}$
N140.12.24 $\mathrm{GM4}^{+} \oplus \mathrm{M5}^{-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B2_g}$
N140.12.25 $\mathrm{GM4}^{-} \oplus \mathrm{GM5}^{+}$	$\surd$	2	2	$\surd$	$\bar{4}2m$	E
N140.12.26 $\mathrm{GM4}^{-} \oplus \mathrm{GM5}^{-}$	$\surd$	0	0	$\surd$	-	-
N140.12.27 $\mathrm{GM4}^{-} \oplus \mathrm{M5}^{+}$	$\surd$	1	0	$\times$	-	-
N140.12.28 $\mathrm{GM4}^{-} \oplus \mathrm{M5}^{-}$	$\surd$	1	0	$\times$	-	-
N140.12.29 $\mathrm{M1}^{+} \oplus \mathrm{GM5}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_g}$
N140.12.30 $\mathrm{M1}^{+} \oplus \mathrm{GM5}^{-}$	$\surd$	0	0	$\surd$	-	-
N140.12.31 $\mathrm{M1}^{+} \oplus \mathrm{M5}^{+}$	$\surd$	0	0	$\surd$	-	-
N140.12.32 $\mathrm{M1}^{+} \oplus \mathrm{M5}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_u}$
N140.12.33 $\mathrm{M1}^{-} \oplus \mathrm{GM5}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_g}$
N140.12.34 $\mathrm{M1}^{-} \oplus \mathrm{GM5}^{-}$	$\surd$	0	0	$\surd$	-	-
N140.12.35 $\mathrm{M1}^{-} \oplus \mathrm{M5}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_u}$
N140.12.36 $\mathrm{M1}^{-} \oplus \mathrm{M5}^{-}$	$\surd$	0	0	$\surd$	-	-
N140.12.37 $\mathrm{M2}^{+} \oplus \mathrm{GM5}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_g}$
N140.12.38 $\mathrm{M2}^{+} \oplus \mathrm{GM5}^{-}$	$\surd$	0	0	$\surd$	-	-

Non-coplanar SSGs with parent space group $I4/mcm$ (No. 140) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N140.12.39 $\mathrm{M2^+} \oplus \mathrm{M5^+}$	$\surd$	0	0	$\surd$	-	-
N140.12.40 $\mathrm{M2^+} \oplus \mathrm{M5^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_u}$
N140.12.41 $\mathrm{M2^-} \oplus \mathrm{GM5^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_g}$
N140.12.42 $\mathrm{M2^-} \oplus \mathrm{GM5^-}$	$\surd$	0	0	$\surd$	-	-
N140.12.43 $\mathrm{M2^-} \oplus \mathrm{M5^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_u}$
N140.12.44 $\mathrm{M2^-} \oplus \mathrm{M5^-}$	$\surd$	0	0	$\surd$	-	-
N140.12.45 $\mathrm{M3^+} \oplus \mathrm{GM5^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_g}$
N140.12.46 $\mathrm{M3^+} \oplus \mathrm{GM5^-}$	$\surd$	0	0	$\surd$	-	-
N140.12.47 $\mathrm{M3^+} \oplus \mathrm{M5^+}$	$\surd$	0	0	$\surd$	-	-
N140.12.48 $\mathrm{M3^+} \oplus \mathrm{M5^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_u}$
N140.12.49 $\mathrm{M3^-} \oplus \mathrm{GM5^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_g}$
N140.12.50 $\mathrm{M3^-} \oplus \mathrm{GM5^-}$	$\surd$	0	0	$\surd$	-	-
N140.12.51 $\mathrm{M3^-} \oplus \mathrm{M5^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_u}$
N140.12.52 $\mathrm{M3^-} \oplus \mathrm{M5^-}$	$\surd$	0	0	$\surd$	-	-
N140.12.53 $\mathrm{M4^+} \oplus \mathrm{GM5^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_g}$
N140.12.54 $\mathrm{M4^+} \oplus \mathrm{GM5^-}$	$\surd$	0	0	$\surd$	-	-
N140.12.55 $\mathrm{M4^+} \oplus \mathrm{M5^+}$	$\surd$	0	0	$\surd$	-	-
N140.12.56 $\mathrm{M4^+} \oplus \mathrm{M5^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_u}$
N140.12.57 $\mathrm{M4^-} \oplus \mathrm{GM5^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_g}$
N140.12.58 $\mathrm{M4^-} \oplus \mathrm{GM5^-}$	$\surd$	0	0	$\surd$	-	-
N140.12.59 $\mathrm{M4^-} \oplus \mathrm{M5^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_u}$
N140.12.60 $\mathrm{M4^-} \oplus \mathrm{M5^-}$	$\surd$	0	0	$\surd$	-	-
N140.13.1 $\mathrm{GM1^-} \oplus \mathrm{X1^+}$	$\surd$	1	0	$\times$	-	-
N140.13.2 $\mathrm{GM1^-} \oplus \mathrm{X1^-}$	$\surd$	1	0	$\times$	-	-
N140.13.3 $\mathrm{GM1^-} \oplus \mathrm{X2^+}$	$\surd$	1	0	$\times$	-	-
N140.13.4 $\mathrm{GM1^-} \oplus \mathrm{X2^-}$	$\surd$	1	0	$\times$	-	-
N140.13.5 $\mathrm{GM1^-} \oplus \mathrm{X3^+}$	$\surd$	1	0	$\times$	-	-
N140.13.6 $\mathrm{GM1^-} \oplus \mathrm{X3^-}$	$\surd$	1	0	$\times$	-	-
N140.13.7 $\mathrm{GM1^-} \oplus \mathrm{X4^+}$	$\surd$	1	0	$\times$	-	-
N140.13.8 $\mathrm{GM1^-} \oplus \mathrm{X4^-}$	$\surd$	1	0	$\times$	-	-
N140.13.9 $\mathrm{GM2^+} \oplus \mathrm{X1^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N140.13.10 $\mathrm{GM2^+} \oplus \mathrm{X1^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N140.13.11 $\mathrm{GM2^+} \oplus \mathrm{X2^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N140.13.12 $\mathrm{GM2^+} \oplus \mathrm{X2^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N140.13.13 $\mathrm{GM2^+} \oplus \mathrm{X3^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N140.13.14 $\mathrm{GM2^+} \oplus \mathrm{X3^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N140.13.15 $\mathrm{GM2^+} \oplus \mathrm{X4^+}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N140.13.16 $\mathrm{GM2^+} \oplus \mathrm{X4^-}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_g}$
N140.13.17 $\mathrm{GM2^-} \oplus \mathrm{X1^+}$	$\surd$	1	0	$\times$	-	-
N140.13.18 $\mathrm{GM2^-} \oplus \mathrm{X1^-}$	$\surd$	1	0	$\times$	-	-
N140.13.19 $\mathrm{GM2^-} \oplus \mathrm{X2^+}$	$\surd$	1	0	$\times$	-	-
N140.13.20 $\mathrm{GM2^-} \oplus \mathrm{X2^-}$	$\surd$	1	0	$\times$	-	-
N140.13.21 $\mathrm{GM2^-} \oplus \mathrm{X3^+}$	$\surd$	1	0	$\times$	-	-
N140.13.22 $\mathrm{GM2^-} \oplus \mathrm{X3^-}$	$\surd$	1	0	$\times$	-	-
N140.13.23 $\mathrm{GM2^-} \oplus \mathrm{X4^+}$	$\surd$	1	0	$\times$	-	-
N140.13.24 $\mathrm{GM2^-} \oplus \mathrm{X4^-}$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $I4/mcm$ (No. 140) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N140.13.25 $\mathrm{GM3}^{+}\oplus\mathrm{X1}^{+}$	$\surd$	1	1	$\times$	-	-
N140.13.26 $\mathrm{GM3}^{+}\oplus\mathrm{X1}^{-}$	$\surd$	1	1	$\times$	-	-
N140.13.27 $\mathrm{GM3}^{+}\oplus\mathrm{X2}^{+}$	$\surd$	1	1	$\times$	-	-
N140.13.28 $\mathrm{GM3}^{+}\oplus\mathrm{X2}^{-}$	$\surd$	1	1	$\times$	-	-
N140.13.29 $\mathrm{GM3}^{+}\oplus\mathrm{X3}^{+}$	$\surd$	1	1	$\times$	-	-
N140.13.30 $\mathrm{GM3}^{+}\oplus\mathrm{X3}^{-}$	$\surd$	1	1	$\times$	-	-
N140.13.31 $\mathrm{GM3}^{+}\oplus\mathrm{X4}^{+}$	$\surd$	1	1	$\times$	-	-
N140.13.32 $\mathrm{GM3}^{+}\oplus\mathrm{X4}^{-}$	$\surd$	1	1	$\times$	-	-
N140.13.33 $\mathrm{GM3}^{-}\oplus\mathrm{X1}^{+}$	$\surd$	1	0	$\times$	-	-
N140.13.34 $\mathrm{GM3}^{-}\oplus\mathrm{X1}^{-}$	$\surd$	1	0	$\times$	-	-
N140.13.35 $\mathrm{GM3}^{-}\oplus\mathrm{X2}^{+}$	$\surd$	1	0	$\times$	-	-
N140.13.36 $\mathrm{GM3}^{-}\oplus\mathrm{X2}^{-}$	$\surd$	1	0	$\times$	-	-
N140.13.37 $\mathrm{GM3}^{-}\oplus\mathrm{X3}^{+}$	$\surd$	1	0	$\times$	-	-
N140.13.38 $\mathrm{GM3}^{-}\oplus\mathrm{X3}^{-}$	$\surd$	1	0	$\times$	-	-
N140.13.39 $\mathrm{GM3}^{-}\oplus\mathrm{X4}^{+}$	$\surd$	1	0	$\times$	-	-
N140.13.40 $\mathrm{GM3}^{-}\oplus\mathrm{X4}^{-}$	$\surd$	1	0	$\times$	-	-
N140.13.41 $\mathrm{GM4}^{+}\oplus\mathrm{X1}^{+}$	$\surd$	1	1	$\times$	-	-
N140.13.42 $\mathrm{GM4}^{+}\oplus\mathrm{X1}^{-}$	$\surd$	1	1	$\times$	-	-
N140.13.43 $\mathrm{GM4}^{+}\oplus\mathrm{X2}^{+}$	$\surd$	1	1	$\times$	-	-
N140.13.44 $\mathrm{GM4}^{+}\oplus\mathrm{X2}^{-}$	$\surd$	1	1	$\times$	-	-
N140.13.45 $\mathrm{GM4}^{+}\oplus\mathrm{X3}^{+}$	$\surd$	1	1	$\times$	-	-
N140.13.46 $\mathrm{GM4}^{+}\oplus\mathrm{X3}^{-}$	$\surd$	1	1	$\times$	-	-
N140.13.47 $\mathrm{GM4}^{+}\oplus\mathrm{X4}^{+}$	$\surd$	1	1	$\times$	-	-
N140.13.48 $\mathrm{GM4}^{+}\oplus\mathrm{X4}^{-}$	$\surd$	1	1	$\times$	-	-
N140.13.49 $\mathrm{GM4}^{-}\oplus\mathrm{X1}^{+}$	$\surd$	1	0	$\times$	-	-
N140.13.50 $\mathrm{GM4}^{-}\oplus\mathrm{X1}^{-}$	$\surd$	1	0	$\times$	-	-
N140.13.51 $\mathrm{GM4}^{-}\oplus\mathrm{X2}^{+}$	$\surd$	1	0	$\times$	-	-
N140.13.52 $\mathrm{GM4}^{-}\oplus\mathrm{X2}^{-}$	$\surd$	1	0	$\times$	-	-
N140.13.53 $\mathrm{GM4}^{-}\oplus\mathrm{X3}^{+}$	$\surd$	1	0	$\times$	-	-
N140.13.54 $\mathrm{GM4}^{-}\oplus\mathrm{X3}^{-}$	$\surd$	1	0	$\times$	-	-
N140.13.55 $\mathrm{GM4}^{-}\oplus\mathrm{X4}^{+}$	$\surd$	1	0	$\times$	-	-
N140.13.56 $\mathrm{GM4}^{-}\oplus\mathrm{X4}^{-}$	$\surd$	1	0	$\times$	-	-
N140.13.57 $\mathrm{M1}^{+}\oplus\mathrm{X1}^{+}$	$\times$	-	-	-	-	-
N140.13.58 $\mathrm{M1}^{+}\oplus\mathrm{X1}^{-}$	$\times$	-	-	-	-	-
N140.13.59 $\mathrm{M1}^{+}\oplus\mathrm{X2}^{+}$	$\times$	-	-	-	-	-
N140.13.60 $\mathrm{M1}^{+}\oplus\mathrm{X2}^{-}$	$\times$	-	-	-	-	-
N140.13.61 $\mathrm{M1}^{+}\oplus\mathrm{X3}^{+}$	$\times$	-	-	-	-	-
N140.13.62 $\mathrm{M1}^{+}\oplus\mathrm{X3}^{-}$	$\times$	-	-	-	-	-
N140.13.63 $\mathrm{M1}^{+}\oplus\mathrm{X4}^{+}$	$\times$	-	-	-	-	-
N140.13.64 $\mathrm{M1}^{+}\oplus\mathrm{X4}^{-}$	$\times$	-	-	-	-	-
N140.13.65 $\mathrm{M1}^{-}\oplus\mathrm{X1}^{+}$	$\times$	-	-	-	-	-
N140.13.66 $\mathrm{M1}^{-}\oplus\mathrm{X1}^{-}$	$\times$	-	-	-	-	-
N140.13.67 $\mathrm{M1}^{-}\oplus\mathrm{X2}^{+}$	$\times$	-	-	-	-	-
N140.13.68 $\mathrm{M1}^{-}\oplus\mathrm{X2}^{-}$	$\times$	-	-	-	-	-
N140.13.69 $\mathrm{M1}^{-}\oplus\mathrm{X3}^{+}$	$\times$	-	-	-	-	-
N140.13.70 $\mathrm{M1}^{-}\oplus\mathrm{X3}^{-}$	$\times$	-	-	-	-	-

Non-coplanar SSGs with parent space group $I4/mcm$ (No. 140) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N140.13.71 $\mathrm{M1}^{-} \oplus \mathrm{X4}^{+}$	×	-	-	-	-	-
N140.13.72 $\mathrm{M1}^{-} \oplus \mathrm{X4}^{-}$	×	-	-	-	-	-
N140.13.73 $\mathrm{M2}^{+} \oplus \mathrm{X1}^{+}$	×	-	-	-	-	-
N140.13.74 $\mathrm{M2}^{+} \oplus \mathrm{X1}^{-}$	×	-	-	-	-	-
N140.13.75 $\mathrm{M2}^{+} \oplus \mathrm{X2}^{+}$	×	-	-	-	-	-
N140.13.76 $\mathrm{M2}^{+} \oplus \mathrm{X2}^{-}$	×	-	-	-	-	-
N140.13.77 $\mathrm{M2}^{+} \oplus \mathrm{X3}^{+}$	×	-	-	-	-	-
N140.13.78 $\mathrm{M2}^{+} \oplus \mathrm{X3}^{-}$	×	-	-	-	-	-
N140.13.79 $\mathrm{M2}^{+} \oplus \mathrm{X4}^{+}$	×	-	-	-	-	-
N140.13.80 $\mathrm{M2}^{+} \oplus \mathrm{X4}^{-}$	×	-	-	-	-	-
N140.13.81 $\mathrm{M2}^{-} \oplus \mathrm{X1}^{+}$	×	-	-	-	-	-
N140.13.82 $\mathrm{M2}^{-} \oplus \mathrm{X1}^{-}$	×	-	-	-	-	-
N140.13.83 $\mathrm{M2}^{-} \oplus \mathrm{X2}^{+}$	×	-	-	-	-	-
N140.13.84 $\mathrm{M2}^{-} \oplus \mathrm{X2}^{-}$	×	-	-	-	-	-
N140.13.85 $\mathrm{M2}^{-} \oplus \mathrm{X3}^{+}$	×	-	-	-	-	-
N140.13.86 $\mathrm{M2}^{-} \oplus \mathrm{X3}^{-}$	×	-	-	-	-	-
N140.13.87 $\mathrm{M2}^{-} \oplus \mathrm{X4}^{+}$	×	-	-	-	-	-
N140.13.88 $\mathrm{M2}^{-} \oplus \mathrm{X4}^{-}$	×	-	-	-	-	-
N140.13.89 $\mathrm{M3}^{+} \oplus \mathrm{X1}^{+}$	×	-	-	-	-	-
N140.13.90 $\mathrm{M3}^{+} \oplus \mathrm{X1}^{-}$	×	-	-	-	-	-
N140.13.91 $\mathrm{M3}^{+} \oplus \mathrm{X2}^{+}$	×	-	-	-	-	-
N140.13.92 $\mathrm{M3}^{+} \oplus \mathrm{X2}^{-}$	×	-	-	-	-	-
N140.13.93 $\mathrm{M3}^{+} \oplus \mathrm{X3}^{+}$	×	-	-	-	-	-
N140.13.94 $\mathrm{M3}^{+} \oplus \mathrm{X3}^{-}$	×	-	-	-	-	-
N140.13.95 $\mathrm{M3}^{+} \oplus \mathrm{X4}^{+}$	×	-	-	-	-	-
N140.13.96 $\mathrm{M3}^{+} \oplus \mathrm{X4}^{-}$	×	-	-	-	-	-
N140.13.97 $\mathrm{M3}^{-} \oplus \mathrm{X1}^{+}$	×	-	-	-	-	-
N140.13.98 $\mathrm{M3}^{-} \oplus \mathrm{X1}^{-}$	×	-	-	-	-	-
N140.13.99 $\mathrm{M3}^{-} \oplus \mathrm{X2}^{+}$	×	-	-	-	-	-
N140.13.100 $\mathrm{M3}^{-} \oplus \mathrm{X2}^{-}$	×	-	-	-	-	-
N140.13.101 $\mathrm{M3}^{-} \oplus \mathrm{X3}^{+}$	×	-	-	-	-	-
N140.13.102 $\mathrm{M3}^{-} \oplus \mathrm{X3}^{-}$	×	-	-	-	-	-
N140.13.103 $\mathrm{M3}^{-} \oplus \mathrm{X4}^{+}$	×	-	-	-	-	-
N140.13.104 $\mathrm{M3}^{-} \oplus \mathrm{X4}^{-}$	×	-	-	-	-	-
N140.13.105 $\mathrm{M4}^{+} \oplus \mathrm{X1}^{+}$	×	-	-	-	-	-
N140.13.106 $\mathrm{M4}^{+} \oplus \mathrm{X1}^{-}$	×	-	-	-	-	-
N140.13.107 $\mathrm{M4}^{+} \oplus \mathrm{X2}^{+}$	×	-	-	-	-	-
N140.13.108 $\mathrm{M4}^{+} \oplus \mathrm{X2}^{-}$	×	-	-	-	-	-
N140.13.109 $\mathrm{M4}^{+} \oplus \mathrm{X3}^{+}$	×	-	-	-	-	-
N140.13.110 $\mathrm{M4}^{+} \oplus \mathrm{X3}^{-}$	×	-	-	-	-	-
N140.13.111 $\mathrm{M4}^{+} \oplus \mathrm{X4}^{+}$	×	-	-	-	-	-
N140.13.112 $\mathrm{M4}^{+} \oplus \mathrm{X4}^{-}$	×	-	-	-	-	-
N140.13.113 $\mathrm{M4}^{-} \oplus \mathrm{X1}^{+}$	×	-	-	-	-	-
N140.13.114 $\mathrm{M4}^{-} \oplus \mathrm{X1}^{-}$	×	-	-	-	-	-
N140.13.115 $\mathrm{M4}^{-} \oplus \mathrm{X2}^{+}$	×	-	-	-	-	-
N140.13.116 $\mathrm{M4}^{-} \oplus \mathrm{X2}^{-}$	×	-	-	-	-	-

Non-coplanar SSGs with parent space group $I4/mcm$ (No. 140) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N140.13.117 $\mathrm{M4^-} \oplus \mathrm{X3^+}$	$\times$	-	-	-	-	-
N140.13.118 $\mathrm{M4^-} \oplus \mathrm{X3^-}$	$\times$	-	-	-	-	-
N140.13.119 $\mathrm{M4^-} \oplus \mathrm{X4^+}$	$\times$	-	-	-	-	-
N140.13.120 $\mathrm{M4^-} \oplus \mathrm{X4^-}$	$\times$	-	-	-	-	-
N140.14.1 $\mathrm{GM1^-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N140.14.2 $\mathrm{GM1^-} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N140.14.3 $\mathrm{GM1^-} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N140.14.4 $\mathrm{GM1^-} \oplus \mathrm{LD4}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N140.14.5 $\mathrm{GM2^+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N140.14.6 $\mathrm{GM2^+} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N140.14.7 $\mathrm{GM2^+} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N140.14.8 $\mathrm{GM2^+} \oplus \mathrm{LD4}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N140.14.9 $\mathrm{GM2^-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N140.14.10 $\mathrm{GM2^-} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N140.14.11 $\mathrm{GM2^-} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N140.14.12 $\mathrm{GM2^-} \oplus \mathrm{LD4}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N140.14.13 $\mathrm{GM3^+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	422	A2
N140.14.14 $\mathrm{GM3^+} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	422	A2
N140.14.15 $\mathrm{GM3^+} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	422	A2
N140.14.16 $\mathrm{GM3^+} \oplus \mathrm{LD4}$	$\surd$	1	1	$\surd$	422	A2
N140.14.17 $\mathrm{GM3^-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N140.14.18 $\mathrm{GM3^-} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N140.14.19 $\mathrm{GM3^-} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N140.14.20 $\mathrm{GM3^-} \oplus \mathrm{LD4}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N140.14.21 $\mathrm{GM4^+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N140.14.22 $\mathrm{GM4^+} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N140.14.23 $\mathrm{GM4^+} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N140.14.24 $\mathrm{GM4^+} \oplus \mathrm{LD4}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N140.14.25 $\mathrm{GM4^-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N140.14.26 $\mathrm{GM4^-} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N140.14.27 $\mathrm{GM4^-} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N140.14.28 $\mathrm{GM4^-} \oplus \mathrm{LD4}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N140.14.29 $\mathrm{M1^+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N140.14.30 $\mathrm{M1^+} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N140.14.31 $\mathrm{M1^+} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N140.14.32 $\mathrm{M1^+} \oplus \mathrm{LD4}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N140.14.33 $\mathrm{M1^-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N140.14.34 $\mathrm{M1^-} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N140.14.35 $\mathrm{M1^-} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N140.14.36 $\mathrm{M1^-} \oplus \mathrm{LD4}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N140.14.37 $\mathrm{M2^+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N140.14.38 $\mathrm{M2^+} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N140.14.39 $\mathrm{M2^+} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N140.14.40 $\mathrm{M2^+} \oplus \mathrm{LD4}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N140.14.41 $\mathrm{M2^-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N140.14.42 $\mathrm{M2^-} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$

Non-coplanar SSGs with parent space group $I4/mcm$ (No. 140) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N140.14.43 $\mathrm{M2}^{-} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N140.14.44 $\mathrm{M2}^{-} \oplus \mathrm{LD4}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N140.14.45 $\mathrm{M3}^{+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N140.14.46 $\mathrm{M3}^{+} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N140.14.47 $\mathrm{M3}^{+} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N140.14.48 $\mathrm{M3}^{+} \oplus \mathrm{LD4}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N140.14.49 $\mathrm{M3}^{-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N140.14.50 $\mathrm{M3}^{-} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N140.14.51 $\mathrm{M3}^{-} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N140.14.52 $\mathrm{M3}^{-} \oplus \mathrm{LD4}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N140.14.53 $\mathrm{M4}^{+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N140.14.54 $\mathrm{M4}^{+} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N140.14.55 $\mathrm{M4}^{+} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N140.14.56 $\mathrm{M4}^{+} \oplus \mathrm{LD4}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N140.14.57 $\mathrm{M4}^{-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N140.14.58 $\mathrm{M4}^{-} \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N140.14.59 $\mathrm{M4}^{-} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N140.14.60 $\mathrm{M4}^{-} \oplus \mathrm{LD4}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$

TABLE S421: Collinear SSGs with parent space group $I4_1/amd$ (No. 141).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L141.1.1 $\mathrm{GM1}^{+}$	1	$4/mmm$	$\mathrm{A1_g}$
L141.2.1 $\mathrm{GM1}^{-}$	0	-	-
L141.2.2 $\mathrm{GM2}^{+}$	1	$4/mmm$	$\mathrm{B1_g}$
L141.2.3 $\mathrm{GM2}^{-}$	0	-	-
L141.2.4 $\mathrm{GM3}^{+}$	1	$4/mmm$	$\mathrm{A2_g}$
L141.2.5 $\mathrm{GM3}^{-}$	0	-	-
L141.2.6 $\mathrm{GM4}^{+}$	1	$4/mmm$	$\mathrm{B2_g}$
L141.2.7 $\mathrm{GM4}^{-}$	0	-	-

TABLE S422: Coplanar SSGs with parent space group $I4_1/amd$ (No. 141).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P141.1.1 $\mathrm{GM1}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g}$
P141.2.1 $\mathrm{GM1}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u}$
P141.2.2 $\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g}$
P141.2.3 $\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u}$
P141.2.4 $\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g}$
P141.2.5 $\mathrm{GM3}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_u}$
P141.2.6 $\mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_g}$
P141.2.7 $\mathrm{GM4}^{-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_u}$
P141.3.1 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-}$	$\surd$	0	0	$\surd$	-	-
P141.3.2 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
P141.3.3 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-

Coplanar SSGs with parent space group $I4_1/amd$ (No. 141) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P141.3.4 $\mathrm{GM1^-} \oplus \mathrm{GM3^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u}$
P141.3.5 $\mathrm{GM1^-} \oplus \mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
P141.3.6 $\mathrm{GM1^-} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_u}$
P141.3.7 $\mathrm{GM1^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
P141.3.8 $\mathrm{GM2^+} \oplus \mathrm{GM2^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
P141.3.9 $\mathrm{GM2^+} \oplus \mathrm{GM2^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g}$
P141.3.10 $\mathrm{GM2^+} \oplus \mathrm{GM3^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g}$
P141.3.11 $\mathrm{GM2^+} \oplus \mathrm{GM3^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_u}$
P141.3.12 $\mathrm{GM2^+} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_g}$
P141.3.13 $\mathrm{GM2^+} \oplus \mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u}$
P141.3.14 $\mathrm{GM2^-} \oplus \mathrm{GM2^-}$	$\surd$	0	0	$\surd$	-	-
P141.3.15 $\mathrm{GM2^-} \oplus \mathrm{GM3^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_u}$
P141.3.16 $\mathrm{GM2^-} \oplus \mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
P141.3.17 $\mathrm{GM2^-} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g}$
P141.3.18 $\mathrm{GM2^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
P141.3.19 $\mathrm{GM3^+} \oplus \mathrm{GM3^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g}$
P141.3.20 $\mathrm{GM3^+} \oplus \mathrm{GM3^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g}$
P141.3.21 $\mathrm{GM3^+} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g}$
P141.3.22 $\mathrm{GM3^+} \oplus \mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g}$
P141.3.23 $\mathrm{GM3^-} \oplus \mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
P141.3.24 $\mathrm{GM3^-} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_g}$
P141.3.25 $\mathrm{GM3^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
P141.3.26 $\mathrm{GM4^+} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_g}$
P141.3.27 $\mathrm{GM4^+} \oplus \mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g}$
P141.3.28 $\mathrm{GM4^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
P141.6.1 $\mathrm{GM5^+}$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_g}$
P141.6.2 $\mathrm{GM5^-}$	$\surd$	0	0	$\surd$	-	-
P141.6.3 M1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P141.6.4 M2	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P141.6.5 M3	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_u}$
P141.6.6 M4	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_u}$
P141.8.1 LD1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
P141.8.2 LD3	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$

TABLE S423: Non-coplanar SSGs with parent space group $I4_1/amd$ (No. 141).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N141.1.1 $\mathrm{GM1^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A1_g}$
N141.2.1 $\mathrm{GM1^-}$	$\surd$	2	2	$\surd$	422	$\mathrm{A1} \oplus \mathrm{A1}$
N141.2.2 $\mathrm{GM2^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{B1_g}$
N141.2.3 $\mathrm{GM2^-}$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{A1} \oplus \mathrm{A1}$
N141.2.4 $\mathrm{GM3^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A2_g}$
N141.2.5 $\mathrm{GM3^-}$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{A1} \oplus \mathrm{A1}$
N141.2.6 $\mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{B2_g}$
N141.2.7 $\mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{A1} \oplus \mathrm{A1}$

Non-coplanar SSGs with parent space group $I4_1/amd$ (No. 141) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N141.3.1 $\mathrm{GM1^-} \oplus \mathrm{GM1^-}$	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{A1_u}$
N141.3.2 $\mathrm{GM1^-} \oplus \mathrm{GM2^+}$	√	2	2	√	$\bar{4}2m$	$\mathrm{A1} \oplus \mathrm{B1}$
N141.3.3 $\mathrm{GM1^-} \oplus \mathrm{GM2^-}$	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{B1_u}$
N141.3.4 $\mathrm{GM1^-} \oplus \mathrm{GM3^+}$	√	2	2	√	$4mm$	$\mathrm{A1} \oplus \mathrm{A2}$
N141.3.5 $\mathrm{GM1^-} \oplus \mathrm{GM3^-}$	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{A2_u}$
N141.3.6 $\mathrm{GM1^-} \oplus \mathrm{GM4^+}$	√	2	2	√	$\bar{4}m2$	$\mathrm{A1} \oplus \mathrm{A2}$
N141.3.7 $\mathrm{GM1^-} \oplus \mathrm{GM4^-}$	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{B2_u}$
N141.3.8 $\mathrm{GM2^+} \oplus \mathrm{GM2^+}$	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N141.3.9 $\mathrm{GM2^+} \oplus \mathrm{GM2^-}$	√	2	2	√	422	$\mathrm{A1} \oplus \mathrm{B1}$
N141.3.10 $\mathrm{GM2^+} \oplus \mathrm{GM3^+}$	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g} \oplus \mathrm{A2_g}$
N141.3.11 $\mathrm{GM2^+} \oplus \mathrm{GM3^-}$	√	2	2	√	$\bar{4}m2$	$\mathrm{A1} \oplus \mathrm{B1}$
N141.3.12 $\mathrm{GM2^+} \oplus \mathrm{GM4^+}$	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B2_g}$
N141.3.13 $\mathrm{GM2^+} \oplus \mathrm{GM4^-}$	√	2	2	√	$4mm$	$\mathrm{A1} \oplus \mathrm{B1}$
N141.3.14 $\mathrm{GM2^-} \oplus \mathrm{GM2^-}$	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N141.3.15 $\mathrm{GM2^-} \oplus \mathrm{GM3^+}$	√	2	2	√	$\bar{4}m2$	$\mathrm{A1} \oplus \mathrm{B2}$
N141.3.16 $\mathrm{GM2^-} \oplus \mathrm{GM3^-}$	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u} \oplus \mathrm{A2_u}$
N141.3.17 $\mathrm{GM2^-} \oplus \mathrm{GM4^+}$	√	2	2	√	$4mm$	$\mathrm{A1} \oplus \mathrm{B2}$
N141.3.18 $\mathrm{GM2^-} \oplus \mathrm{GM4^-}$	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_u}$
N141.3.19 $\mathrm{GM3^+} \oplus \mathrm{GM3^+}$	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
N141.3.20 $\mathrm{GM3^+} \oplus \mathrm{GM3^-}$	√	2	2	√	422	$\mathrm{A1} \oplus \mathrm{A2}$
N141.3.21 $\mathrm{GM3^+} \oplus \mathrm{GM4^+}$	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g} \oplus \mathrm{B2_g}$
N141.3.22 $\mathrm{GM3^+} \oplus \mathrm{GM4^-}$	√	2	2	√	$\bar{4}2m$	$\mathrm{A1} \oplus \mathrm{A2}$
N141.3.23 $\mathrm{GM3^-} \oplus \mathrm{GM3^-}$	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N141.3.24 $\mathrm{GM3^-} \oplus \mathrm{GM4^+}$	√	2	2	√	$\bar{4}2m$	$\mathrm{A1} \oplus \mathrm{B2}$
N141.3.25 $\mathrm{GM3^-} \oplus \mathrm{GM4^-}$	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N141.3.26 $\mathrm{GM4^+} \oplus \mathrm{GM4^+}$	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N141.3.27 $\mathrm{GM4^+} \oplus \mathrm{GM4^-}$	√	2	2	√	422	$\mathrm{A1} \oplus \mathrm{B2}$
N141.3.28 $\mathrm{GM4^-} \oplus \mathrm{GM4^-}$	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N141.6.1 $\mathrm{GM5^+}$	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{E_g}$
N141.6.2 $\mathrm{GM5^-}$	√	3	3	√	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{E_u}$
N141.6.3 M1	√	1	1	√	$4mm$	A1
N141.6.4 M2	√	1	1	√	$4mm$	A1
N141.6.5 M3	√	1	1	√	$\bar{4}2m$	A1
N141.6.6 M4	√	1	1	√	$\bar{4}2m$	A1
N141.8.1 LD1	√	1	1	√	$4mm$	A1
N141.8.2 LD3	√	1	1	√	$4mm$	A1
N141.9.1 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM1^-}$	√	0	0	√	-	-
N141.9.2 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM2^+}$	√	3	3	√	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N141.9.3 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM2^-}$	√	0	0	√	-	-
N141.9.4 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM3^+}$	√	3	3	√	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N141.9.5 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM3^-}$	√	0	0	√	-	-
N141.9.6 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM4^+}$	√	3	3	√	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N141.9.7 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM4^-}$	√	0	0	√	-	-
N141.9.8 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{GM2^+}$	√	2	2	√	422	$\mathrm{B1} \oplus \mathrm{B1}$
N141.9.9 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{GM2^-}$	√	3	3	√	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N141.9.10 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{GM3^+}$	√	2	2	√	$\bar{4}m2$	$\mathrm{B1} \oplus \mathrm{B2}$

Non-coplanar SSGs with parent space group $I4_1/amd$ (No. 141) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N141.9.11 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_u}$
N141.9.12 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{B1} \oplus \mathrm{B2}$
N141.9.13 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{A2_u}$
N141.9.14 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
N141.9.15 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N141.9.16 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N141.9.17 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N141.9.18 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N141.9.19 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	422	$\mathrm{A2} \oplus \mathrm{A2}$
N141.9.20 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
N141.9.21 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B2} \oplus \mathrm{A2}$
N141.9.22 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
N141.9.23 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N141.9.24 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N141.9.25 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N141.9.26 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	422	$\mathrm{B2} \oplus \mathrm{B2}$
N141.9.27 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N141.9.28 $\mathrm{GM1}^- \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N141.9.29 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N141.9.30 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B1} \oplus \mathrm{B1}$
N141.9.31 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{A2_g}$
N141.9.32 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{B1} \oplus \mathrm{B1}$
N141.9.33 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B2_g}$
N141.9.34 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{B1} \oplus \mathrm{B1}$
N141.9.35 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{B1_g}$
N141.9.36 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{B1} \oplus \mathrm{A2}$
N141.9.37 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B2_u}$
N141.9.38 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{B1} \oplus \mathrm{A2}$
N141.9.39 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{A2_u}$
N141.9.40 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
N141.9.41 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B1} \oplus \mathrm{A2}$
N141.9.42 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g} \oplus \mathrm{B2_g}$
N141.9.43 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	422	$\mathrm{B1} \oplus \mathrm{A2}$
N141.9.44 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N141.9.45 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	422	$\mathrm{B1} \oplus \mathrm{B2}$
N141.9.46 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N141.9.47 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N141.9.48 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B1} \oplus \mathrm{B2}$
N141.9.49 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N141.9.50 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
N141.9.51 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N141.9.52 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N141.9.53 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$
N141.9.54 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N141.9.55 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{A2} \oplus \mathrm{A2}$
N141.9.56 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{B2_u}$

Non-coplanar SSGs with parent space group $I4_1/amd$ (No. 141) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N141.9.57 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	422	$\mathrm{A2} \oplus \mathrm{B2}$
N141.9.58 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g} \oplus \mathrm{B2_u}$
N141.9.59 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N141.9.60 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$
N141.9.61 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N141.9.62 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B2} \oplus \mathrm{B2}$
N141.9.63 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$
N141.9.64 $\mathrm{GM2}^- \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N141.9.65 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
N141.9.66 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{A2} \oplus \mathrm{A2}$
N141.9.67 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{B2_g}$
N141.9.68 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{B2} \oplus \mathrm{B2}$
N141.9.69 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A2_g}$
N141.9.70 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{B2} \oplus \mathrm{A2}$
N141.9.71 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{A2_g}$
N141.9.72 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N141.9.73 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{B2} \oplus \mathrm{A2}$
N141.9.74 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{A2_g}$
N141.9.75 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N141.9.76 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B2_g}$
N141.9.77 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N141.9.78 $\mathrm{GM3}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{B2} \oplus \mathrm{B2}$
N141.9.79 $\mathrm{GM3}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B2_g}$
N141.9.80 $\mathrm{GM3}^- \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N141.9.81 $\mathrm{GM4}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N141.9.82 $\mathrm{GM4}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{A2} \oplus \mathrm{A2}$
N141.9.83 $\mathrm{GM4}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{B2_g}$
N141.9.84 $\mathrm{GM4}^- \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N141.12.1 $\mathrm{GM1}^- \oplus \mathrm{GM5}^+$	$\surd$	2	2	$\surd$	$4mm$	E
N141.12.2 $\mathrm{GM1}^- \oplus \mathrm{GM5}^-$	$\surd$	0	0	$\surd$	-	-
N141.12.3 $\mathrm{GM1}^- \oplus \mathrm{M1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N141.12.4 $\mathrm{GM1}^- \oplus \mathrm{M2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N141.12.5 $\mathrm{GM1}^- \oplus \mathrm{M3}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_u}$
N141.12.6 $\mathrm{GM1}^- \oplus \mathrm{M4}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_u}$
N141.12.7 $\mathrm{GM2}^+ \oplus \mathrm{GM5}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{E_g}$
N141.12.8 $\mathrm{GM2}^+ \oplus \mathrm{GM5}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{E_u}$
N141.12.9 $\mathrm{GM2}^+ \oplus \mathrm{M1}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	$\mathrm{B1}$
N141.12.10 $\mathrm{GM2}^+ \oplus \mathrm{M2}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	$\mathrm{B1}$
N141.12.11 $\mathrm{GM2}^+ \oplus \mathrm{M3}$	$\surd$	1	1	$\surd$	422	$\mathrm{B1}$
N141.12.12 $\mathrm{GM2}^+ \oplus \mathrm{M4}$	$\surd$	1	1	$\surd$	422	$\mathrm{B1}$
N141.12.13 $\mathrm{GM2}^- \oplus \mathrm{GM5}^+$	$\surd$	2	2	$\surd$	$\bar{4}m2$	E
N141.12.14 $\mathrm{GM2}^- \oplus \mathrm{GM5}^-$	$\surd$	0	0	$\surd$	-	-
N141.12.15 $\mathrm{GM2}^- \oplus \mathrm{M1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N141.12.16 $\mathrm{GM2}^- \oplus \mathrm{M2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N141.12.17 $\mathrm{GM2}^- \oplus \mathrm{M3}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_u}$
N141.12.18 $\mathrm{GM2}^- \oplus \mathrm{M4}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_u}$

Non-coplanar SSGs with parent space group $I4_1/amd$ (No. 141) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N141.12.19 $\mathrm{GM3^+} \oplus \mathrm{GM5^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{E_g}$
N141.12.20 $\mathrm{GM3^+} \oplus \mathrm{GM5^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{E_u}$
N141.12.21 $\mathrm{GM3^+} \oplus \mathrm{M1}$	$\surd$	1	1	$\surd$	422	A2
N141.12.22 $\mathrm{GM3^+} \oplus \mathrm{M2}$	$\surd$	1	1	$\surd$	422	A2
N141.12.23 $\mathrm{GM3^+} \oplus \mathrm{M3}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B2
N141.12.24 $\mathrm{GM3^+} \oplus \mathrm{M4}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B2
N141.12.25 $\mathrm{GM3^-} \oplus \mathrm{GM5^+}$	$\surd$	2	2	$\surd$	422	E
N141.12.26 $\mathrm{GM3^-} \oplus \mathrm{GM5^-}$	$\surd$	0	0	$\surd$	-	-
N141.12.27 $\mathrm{GM3^-} \oplus \mathrm{M1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N141.12.28 $\mathrm{GM3^-} \oplus \mathrm{M2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N141.12.29 $\mathrm{GM3^-} \oplus \mathrm{M3}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_u}$
N141.12.30 $\mathrm{GM3^-} \oplus \mathrm{M4}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_u}$
N141.12.31 $\mathrm{GM4^+} \oplus \mathrm{GM5^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{E_g}$
N141.12.32 $\mathrm{GM4^+} \oplus \mathrm{GM5^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{E_u}$
N141.12.33 $\mathrm{GM4^+} \oplus \mathrm{M1}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N141.12.34 $\mathrm{GM4^+} \oplus \mathrm{M2}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N141.12.35 $\mathrm{GM4^+} \oplus \mathrm{M3}$	$\surd$	1	1	$\surd$	$4mm$	B2
N141.12.36 $\mathrm{GM4^+} \oplus \mathrm{M4}$	$\surd$	1	1	$\surd$	$4mm$	B2
N141.12.37 $\mathrm{GM4^-} \oplus \mathrm{GM5^+}$	$\surd$	2	2	$\surd$	$\bar{4}2m$	E
N141.12.38 $\mathrm{GM4^-} \oplus \mathrm{GM5^-}$	$\surd$	0	0	$\surd$	-	-
N141.12.39 $\mathrm{GM4^-} \oplus \mathrm{M1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N141.12.40 $\mathrm{GM4^-} \oplus \mathrm{M2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N141.12.41 $\mathrm{GM4^-} \oplus \mathrm{M3}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_u}$
N141.12.42 $\mathrm{GM4^-} \oplus \mathrm{M4}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_u}$
N141.14.1 $\mathrm{GM1^-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N141.14.2 $\mathrm{GM1^-} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N141.14.3 $\mathrm{GM2^+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N141.14.4 $\mathrm{GM2^+} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N141.14.5 $\mathrm{GM2^-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N141.14.6 $\mathrm{GM2^-} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N141.14.7 $\mathrm{GM3^+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	422	A2
N141.14.8 $\mathrm{GM3^+} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	422	A2
N141.14.9 $\mathrm{GM3^-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N141.14.10 $\mathrm{GM3^-} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N141.14.11 $\mathrm{GM4^+} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N141.14.12 $\mathrm{GM4^+} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N141.14.13 $\mathrm{GM4^-} \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N141.14.14 $\mathrm{GM4^-} \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$

TABLE S424: Collinear SSGs with parent space group $I4_1/acd$ (No. 142).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L142.1.1 $\mathrm{GM1^+}$	1	$4/mmm$	$\mathrm{A1_g}$
L142.2.1 $\mathrm{GM1^-}$	0	-	-
L142.2.2 $\mathrm{GM2^+}$	1	$4/mmm$	$\mathrm{B1_g}$
L142.2.3 $\mathrm{GM2^-}$	0	-	-

Collinear SSGs with parent space group $I4_1/acd$ (No. 142)(continued)

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L142.2.4 $\mathrm{GM3}^+$	1	$4/mmm$	$\mathrm{A2_g}$
L142.2.5 $\mathrm{GM3}^-$	0	-	-
L142.2.6 $\mathrm{GM4}^+$	1	$4/mmm$	$\mathrm{B2_g}$
L142.2.7 $\mathrm{GM4}^-$	0	-	-

TABLE S425: Coplanar SSGs with parent space group $I4_1/acd$ (No. 142).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P142.1.1 $\mathrm{GM1}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}$
P142.2.1 $\mathrm{GM1}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}$
P142.2.2 $\mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}$
P142.2.3 $\mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}$
P142.2.4 $\mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_g}$
P142.2.5 $\mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_u}$
P142.2.6 $\mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_g}$
P142.2.7 $\mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_u}$
P142.3.1 $\mathrm{GM1}^-\oplus\mathrm{GM1}^-$	$\surd$	0	0	$\surd$	-	-
P142.3.2 $\mathrm{GM1}^-\oplus\mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_u}$
P142.3.3 $\mathrm{GM1}^-\oplus\mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
P142.3.4 $\mathrm{GM1}^-\oplus\mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{A2_u}$
P142.3.5 $\mathrm{GM1}^-\oplus\mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
P142.3.6 $\mathrm{GM1}^-\oplus\mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g}\oplus\mathrm{B2_u}$
P142.3.7 $\mathrm{GM1}^-\oplus\mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
P142.3.8 $\mathrm{GM2}^+\oplus\mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_g}$
P142.3.9 $\mathrm{GM2}^+\oplus\mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B1_g}$
P142.3.10 $\mathrm{GM2}^+\oplus\mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_g}$
P142.3.11 $\mathrm{GM2}^+\oplus\mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B2_u}$
P142.3.12 $\mathrm{GM2}^+\oplus\mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{B2_g}$
P142.3.13 $\mathrm{GM2}^+\oplus\mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_g}\oplus\mathrm{A2_u}$
P142.3.14 $\mathrm{GM2}^-\oplus\mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
P142.3.15 $\mathrm{GM2}^-\oplus\mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{B2_u}$
P142.3.16 $\mathrm{GM2}^-\oplus\mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
P142.3.17 $\mathrm{GM2}^-\oplus\mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_u}\oplus\mathrm{B2_g}$
P142.3.18 $\mathrm{GM2}^-\oplus\mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
P142.3.19 $\mathrm{GM3}^+\oplus\mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{A2_g}$
P142.3.20 $\mathrm{GM3}^+\oplus\mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{A2_g}$
P142.3.21 $\mathrm{GM3}^+\oplus\mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A2_g}\oplus\mathrm{B2_g}$
P142.3.22 $\mathrm{GM3}^+\oplus\mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{A2_g}$
P142.3.23 $\mathrm{GM3}^-\oplus\mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
P142.3.24 $\mathrm{GM3}^-\oplus\mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B1_u}\oplus\mathrm{B2_g}$
P142.3.25 $\mathrm{GM3}^-\oplus\mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
P142.3.26 $\mathrm{GM4}^+\oplus\mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{B2_g}\oplus\mathrm{B2_g}$
P142.3.27 $\mathrm{GM4}^+\oplus\mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{A1_u}\oplus\mathrm{B2_g}$
P142.3.28 $\mathrm{GM4}^-\oplus\mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
P142.6.1 $\mathrm{GM5}^+$	$\surd$	2	2	$\surd$	$4/mmm$	$\mathrm{E_g}$
P142.6.2 $\mathrm{GM5}^-$	$\surd$	0	0	$\surd$	-	-

Coplanar SSGs with parent space group $I4_1/acd$ (No. 142) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P142.6.3 M1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
P142.6.4 M2	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
P142.6.5 M3	√	1	1	√	$4/mmm$	$\mathrm{B1_u}$
P142.6.6 M4	√	1	1	√	$4/mmm$	$\mathrm{B1_u}$
P142.8.1 LD1	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$
P142.8.2 LD3	√	1	1	√	$4/mmm$	$\mathrm{A2_u}$

TABLE S426: Non-coplanar SSGs with parent space group $I4_1/acd$ (No. 142).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N142.1.1 $\mathrm{GM1^+}$	√	3	3	√	$4/mmm$	$\mathrm{A1_g \oplus A1_g \oplus A1_g}$
N142.2.1 $\mathrm{GM1^-}$	√	2	2	√	422	$\mathrm{A1 \oplus A1}$
N142.2.2 $\mathrm{GM2^+}$	√	3	3	√	$4/mmm$	$\mathrm{A1_g \oplus A1_g \oplus B1_g}$
N142.2.3 $\mathrm{GM2^-}$	√	2	2	√	$\bar{4}2m$	$\mathrm{A1 \oplus A1}$
N142.2.4 $\mathrm{GM3^+}$	√	3	3	√	$4/mmm$	$\mathrm{A1_g \oplus A1_g \oplus A2_g}$
N142.2.5 $\mathrm{GM3^-}$	√	2	2	√	$4mm$	$\mathrm{A1 \oplus A1}$
N142.2.6 $\mathrm{GM4^+}$	√	3	3	√	$4/mmm$	$\mathrm{A1_g \oplus A1_g \oplus B2_g}$
N142.2.7 $\mathrm{GM4^-}$	√	2	2	√	$\bar{4}m2$	$\mathrm{A1 \oplus A1}$
N142.3.1 $\mathrm{GM1^- \oplus GM1^-}$	√	3	3	√	$4/mmm$	$\mathrm{A1_g \oplus A1_u \oplus A1_u}$
N142.3.2 $\mathrm{GM1^- \oplus GM2^+}$	√	2	2	√	$\bar{4}2m$	$\mathrm{A1 \oplus B1}$
N142.3.3 $\mathrm{GM1^- \oplus GM2^-}$	√	3	3	√	$4/mmm$	$\mathrm{A1_g \oplus A1_u \oplus B1_u}$
N142.3.4 $\mathrm{GM1^- \oplus GM3^+}$	√	2	2	√	$4mm$	$\mathrm{A1 \oplus A2}$
N142.3.5 $\mathrm{GM1^- \oplus GM3^-}$	√	3	3	√	$4/mmm$	$\mathrm{A1_g \oplus A1_u \oplus A2_u}$
N142.3.6 $\mathrm{GM1^- \oplus GM4^+}$	√	2	2	√	$\bar{4}m2$	$\mathrm{A1 \oplus A2}$
N142.3.7 $\mathrm{GM1^- \oplus GM4^-}$	√	3	3	√	$4/mmm$	$\mathrm{A1_g \oplus A1_u \oplus B2_u}$
N142.3.8 $\mathrm{GM2^+ \oplus GM2^+}$	√	3	3	√	$4/mmm$	$\mathrm{A1_g \oplus B1_g \oplus B1_g}$
N142.3.9 $\mathrm{GM2^+ \oplus GM2^-}$	√	2	2	√	422	$\mathrm{A1 \oplus B1}$
N142.3.10 $\mathrm{GM2^+ \oplus GM3^+}$	√	3	3	√	$4/mmm$	$\mathrm{A1_g \oplus B1_g \oplus A2_g}$
N142.3.11 $\mathrm{GM2^+ \oplus GM3^-}$	√	2	2	√	$\bar{4}m2$	$\mathrm{A1 \oplus B1}$
N142.3.12 $\mathrm{GM2^+ \oplus GM4^+}$	√	3	3	√	$4/mmm$	$\mathrm{A1_g \oplus B1_g \oplus B2_g}$
N142.3.13 $\mathrm{GM2^+ \oplus GM4^-}$	√	2	2	√	$4mm$	$\mathrm{A1 \oplus B1}$
N142.3.14 $\mathrm{GM2^- \oplus GM2^-}$	√	3	3	√	$4/mmm$	$\mathrm{A1_g \oplus B1_u \oplus B1_u}$
N142.3.15 $\mathrm{GM2^- \oplus GM3^+}$	√	2	2	√	$\bar{4}m2$	$\mathrm{A1 \oplus B2}$
N142.3.16 $\mathrm{GM2^- \oplus GM3^-}$	√	3	3	√	$4/mmm$	$\mathrm{A1_g \oplus B1_u \oplus A2_u}$
N142.3.17 $\mathrm{GM2^- \oplus GM4^+}$	√	2	2	√	$4mm$	$\mathrm{A1 \oplus B2}$
N142.3.18 $\mathrm{GM2^- \oplus GM4^-}$	√	3	3	√	$4/mmm$	$\mathrm{A1_g \oplus B1_u \oplus B2_u}$
N142.3.19 $\mathrm{GM3^+ \oplus GM3^+}$	√	3	3	√	$4/mmm$	$\mathrm{A1_g \oplus A2_g \oplus A2_g}$
N142.3.20 $\mathrm{GM3^+ \oplus GM3^-}$	√	2	2	√	422	$\mathrm{A1 \oplus A2}$
N142.3.21 $\mathrm{GM3^+ \oplus GM4^+}$	√	3	3	√	$4/mmm$	$\mathrm{A1_g \oplus A2_g \oplus B2_g}$
N142.3.22 $\mathrm{GM3^+ \oplus GM4^-}$	√	2	2	√	$\bar{4}2m$	$\mathrm{A1 \oplus A2}$
N142.3.23 $\mathrm{GM3^- \oplus GM3^-}$	√	3	3	√	$4/mmm$	$\mathrm{A1_g \oplus A2_u \oplus A2_u}$
N142.3.24 $\mathrm{GM3^- \oplus GM4^+}$	√	2	2	√	$\bar{4}2m$	$\mathrm{A1 \oplus B2}$
N142.3.25 $\mathrm{GM3^- \oplus GM4^-}$	√	3	3	√	$4/mmm$	$\mathrm{A1_g \oplus A2_u \oplus B2_u}$
N142.3.26 $\mathrm{GM4^+ \oplus GM4^+}$	√	3	3	√	$4/mmm$	$\mathrm{A1_g \oplus B2_g \oplus B2_g}$
N142.3.27 $\mathrm{GM4^+ \oplus GM4^-}$	√	2	2	√	422	$\mathrm{A1 \oplus B2}$
N142.3.28 $\mathrm{GM4^- \oplus GM4^-}$	√	3	3	√	$4/mmm$	$\mathrm{A1_g \oplus B2_u \oplus B2_u}$

Non-coplanar SSGs with parent space group $I4_1/acd$ (No. 142) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N142.6.1 $\mathrm{GM5^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{E_g}$
N142.6.2 $\mathrm{GM5^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_g} \oplus \mathrm{E_u}$
N142.6.3 M1	$\surd$	1	1	$\surd$	$4mm$	A1
N142.6.4 M2	$\surd$	1	1	$\surd$	$4mm$	A1
N142.6.5 M3	$\surd$	1	1	$\surd$	$\bar{4}2m$	A1
N142.6.6 M4	$\surd$	1	1	$\surd$	$\bar{4}2m$	A1
N142.8.1 LD1	$\surd$	1	1	$\surd$	$4mm$	A1
N142.8.2 LD3	$\surd$	1	1	$\surd$	$4mm$	A1
N142.9.1 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM1^-}$	$\surd$	0	0	$\surd$	-	-
N142.9.2 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM2^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N142.9.3 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM2^-}$	$\surd$	0	0	$\surd$	-	-
N142.9.4 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM3^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N142.9.5 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
N142.9.6 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N142.9.7 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N142.9.8 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{GM2^+}$	$\surd$	2	2	$\surd$	422	$\mathrm{B1} \oplus \mathrm{B1}$
N142.9.9 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{GM2^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N142.9.10 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{GM3^+}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{B1} \oplus \mathrm{B2}$
N142.9.11 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{GM3^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B2_u}$
N142.9.12 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{B1} \oplus \mathrm{B2}$
N142.9.13 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{A2_u}$
N142.9.14 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{GM2^-}$	$\surd$	0	0	$\surd$	-	-
N142.9.15 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{GM3^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N142.9.16 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
N142.9.17 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N142.9.18 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N142.9.19 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{GM3^+}$	$\surd$	2	2	$\surd$	422	$\mathrm{A2} \oplus \mathrm{A2}$
N142.9.20 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{GM3^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
N142.9.21 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B2} \oplus \mathrm{A2}$
N142.9.22 $\mathrm{GM1^-} \oplus \mathrm{GM3^+} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
N142.9.23 $\mathrm{GM1^-} \oplus \mathrm{GM3^-} \oplus \mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
N142.9.24 $\mathrm{GM1^-} \oplus \mathrm{GM3^-} \oplus \mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N142.9.25 $\mathrm{GM1^-} \oplus \mathrm{GM3^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N142.9.26 $\mathrm{GM1^-} \oplus \mathrm{GM4^+} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	422	$\mathrm{B2} \oplus \mathrm{B2}$
N142.9.27 $\mathrm{GM1^-} \oplus \mathrm{GM4^+} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N142.9.28 $\mathrm{GM1^-} \oplus \mathrm{GM4^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N142.9.29 $\mathrm{GM2^+} \oplus \mathrm{GM2^+} \oplus \mathrm{GM2^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N142.9.30 $\mathrm{GM2^+} \oplus \mathrm{GM2^+} \oplus \mathrm{GM2^-}$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B1} \oplus \mathrm{B1}$
N142.9.31 $\mathrm{GM2^+} \oplus \mathrm{GM2^+} \oplus \mathrm{GM3^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{A2_g}$
N142.9.32 $\mathrm{GM2^+} \oplus \mathrm{GM2^+} \oplus \mathrm{GM3^-}$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{B1} \oplus \mathrm{B1}$
N142.9.33 $\mathrm{GM2^+} \oplus \mathrm{GM2^+} \oplus \mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B2_g}$
N142.9.34 $\mathrm{GM2^+} \oplus \mathrm{GM2^+} \oplus \mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{B1} \oplus \mathrm{B1}$
N142.9.35 $\mathrm{GM2^+} \oplus \mathrm{GM2^-} \oplus \mathrm{GM2^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{B1_g}$
N142.9.36 $\mathrm{GM2^+} \oplus \mathrm{GM2^-} \oplus \mathrm{GM3^+}$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{B1} \oplus \mathrm{A2}$
N142.9.37 $\mathrm{GM2^+} \oplus \mathrm{GM2^-} \oplus \mathrm{GM3^-}$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B2_u}$
N142.9.38 $\mathrm{GM2^+} \oplus \mathrm{GM2^-} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{B1} \oplus \mathrm{A2}$

Non-coplanar SSGs with parent space group $I4_1/acd$ (No. 142) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N142.9.39 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{A2_u}$
N142.9.40 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
N142.9.41 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B1} \oplus \mathrm{A2}$
N142.9.42 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_g} \oplus \mathrm{B2_g}$
N142.9.43 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	422	$\mathrm{B1} \oplus \mathrm{A2}$
N142.9.44 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N142.9.45 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	422	$\mathrm{B1} \oplus \mathrm{B2}$
N142.9.46 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N142.9.47 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N142.9.48 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B1} \oplus \mathrm{B2}$
N142.9.49 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N142.9.50 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
N142.9.51 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N142.9.52 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N142.9.53 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$
N142.9.54 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N142.9.55 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{A2} \oplus \mathrm{A2}$
N142.9.56 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{B2_u}$
N142.9.57 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	422	$\mathrm{A2} \oplus \mathrm{B2}$
N142.9.58 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_g} \oplus \mathrm{B2_u}$
N142.9.59 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N142.9.60 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$
N142.9.61 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N142.9.62 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$\bar{4}2m$	$\mathrm{B2} \oplus \mathrm{B2}$
N142.9.63 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$
N142.9.64 $\mathrm{GM2}^- \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N142.9.65 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
N142.9.66 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{A2} \oplus \mathrm{A2}$
N142.9.67 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{B2_g}$
N142.9.68 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{B2} \oplus \mathrm{B2}$
N142.9.69 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A2_g}$
N142.9.70 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{B2} \oplus \mathrm{A2}$
N142.9.71 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{A2_g}$
N142.9.72 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N142.9.73 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{B2} \oplus \mathrm{A2}$
N142.9.74 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{A2_g}$
N142.9.75 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N142.9.76 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B2_g}$
N142.9.77 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N142.9.78 $\mathrm{GM3}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$4mm$	$\mathrm{B2} \oplus \mathrm{B2}$
N142.9.79 $\mathrm{GM3}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B2_g}$
N142.9.80 $\mathrm{GM3}^- \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N142.9.81 $\mathrm{GM4}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N142.9.82 $\mathrm{GM4}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$\bar{4}m2$	$\mathrm{A2} \oplus \mathrm{A2}$
N142.9.83 $\mathrm{GM4}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{B2_g}$
N142.9.84 $\mathrm{GM4}^- \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-

Non-coplanar SSGs with parent space group $I4_1/acd$ (No. 142) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N142.12.1 $\mathrm{GM1}^- \oplus \mathrm{GM5}^+$	$\surd$	2	2	$\surd$	$4mm$	E
N142.12.2 $\mathrm{GM1}^- \oplus \mathrm{GM5}^-$	$\surd$	0	0	$\surd$	-	-
N142.12.3 $\mathrm{GM1}^- \oplus \mathrm{M1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N142.12.4 $\mathrm{GM1}^- \oplus \mathrm{M2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N142.12.5 $\mathrm{GM1}^- \oplus \mathrm{M3}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_u}$
N142.12.6 $\mathrm{GM1}^- \oplus \mathrm{M4}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_u}$
N142.12.7 $\mathrm{GM2}^+ \oplus \mathrm{GM5}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{E_g}$
N142.12.8 $\mathrm{GM2}^+ \oplus \mathrm{GM5}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B1_g} \oplus \mathrm{E_u}$
N142.12.9 $\mathrm{GM2}^+ \oplus \mathrm{M1}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N142.12.10 $\mathrm{GM2}^+ \oplus \mathrm{M2}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N142.12.11 $\mathrm{GM2}^+ \oplus \mathrm{M3}$	$\surd$	1	1	$\surd$	422	B1
N142.12.12 $\mathrm{GM2}^+ \oplus \mathrm{M4}$	$\surd$	1	1	$\surd$	422	B1
N142.12.13 $\mathrm{GM2}^- \oplus \mathrm{GM5}^+$	$\surd$	2	2	$\surd$	$\bar{4}m2$	E
N142.12.14 $\mathrm{GM2}^- \oplus \mathrm{GM5}^-$	$\surd$	0	0	$\surd$	-	-
N142.12.15 $\mathrm{GM2}^- \oplus \mathrm{M1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N142.12.16 $\mathrm{GM2}^- \oplus \mathrm{M2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N142.12.17 $\mathrm{GM2}^- \oplus \mathrm{M3}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_u}$
N142.12.18 $\mathrm{GM2}^- \oplus \mathrm{M4}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_u}$
N142.12.19 $\mathrm{GM3}^+ \oplus \mathrm{GM5}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{E_g}$
N142.12.20 $\mathrm{GM3}^+ \oplus \mathrm{GM5}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{A2_g} \oplus \mathrm{E_u}$
N142.12.21 $\mathrm{GM3}^+ \oplus \mathrm{M1}$	$\surd$	1	1	$\surd$	422	A2
N142.12.22 $\mathrm{GM3}^+ \oplus \mathrm{M2}$	$\surd$	1	1	$\surd$	422	A2
N142.12.23 $\mathrm{GM3}^+ \oplus \mathrm{M3}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B2
N142.12.24 $\mathrm{GM3}^+ \oplus \mathrm{M4}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B2
N142.12.25 $\mathrm{GM3}^- \oplus \mathrm{GM5}^+$	$\surd$	2	2	$\surd$	422	E
N142.12.26 $\mathrm{GM3}^- \oplus \mathrm{GM5}^-$	$\surd$	0	0	$\surd$	-	-
N142.12.27 $\mathrm{GM3}^- \oplus \mathrm{M1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N142.12.28 $\mathrm{GM3}^- \oplus \mathrm{M2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N142.12.29 $\mathrm{GM3}^- \oplus \mathrm{M3}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_u}$
N142.12.30 $\mathrm{GM3}^- \oplus \mathrm{M4}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_u}$
N142.12.31 $\mathrm{GM4}^+ \oplus \mathrm{GM5}^+$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{E_g}$
N142.12.32 $\mathrm{GM4}^+ \oplus \mathrm{GM5}^-$	$\surd$	3	3	$\surd$	$4/mmm$	$\mathrm{B2_g} \oplus \mathrm{E_u}$
N142.12.33 $\mathrm{GM4}^+ \oplus \mathrm{M1}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N142.12.34 $\mathrm{GM4}^+ \oplus \mathrm{M2}$	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N142.12.35 $\mathrm{GM4}^+ \oplus \mathrm{M3}$	$\surd$	1	1	$\surd$	$4mm$	B2
N142.12.36 $\mathrm{GM4}^+ \oplus \mathrm{M4}$	$\surd$	1	1	$\surd$	$4mm$	B2
N142.12.37 $\mathrm{GM4}^- \oplus \mathrm{GM5}^+$	$\surd$	2	2	$\surd$	$\bar{4}2m$	E
N142.12.38 $\mathrm{GM4}^- \oplus \mathrm{GM5}^-$	$\surd$	0	0	$\surd$	-	-
N142.12.39 $\mathrm{GM4}^- \oplus \mathrm{M1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N142.12.40 $\mathrm{GM4}^- \oplus \mathrm{M2}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N142.12.41 $\mathrm{GM4}^- \oplus \mathrm{M3}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_u}$
N142.12.42 $\mathrm{GM4}^- \oplus \mathrm{M4}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{B1_u}$
N142.14.1 $\mathrm{GM1}^- \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N142.14.2 $\mathrm{GM1}^- \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N142.14.3 $\mathrm{GM2}^+ \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1
N142.14.4 $\mathrm{GM2}^+ \oplus \mathrm{LD3}$	$\surd$	1	1	$\surd$	$\bar{4}m2$	B1

Non-coplanar SSGs with parent space group $I4_1/acd$ (No. 142) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N142.14.5 GM2$^-$ $\oplus$ LD1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N142.14.6 GM2$^-$ $\oplus$ LD3	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N142.14.7 GM3$^+$ $\oplus$ LD1	$\surd$	1	1	$\surd$	422	A2
N142.14.8 GM3$^+$ $\oplus$ LD3	$\surd$	1	1	$\surd$	422	A2
N142.14.9 GM3$^-$ $\oplus$ LD1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N142.14.10 GM3$^-$ $\oplus$ LD3	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N142.14.11 GM4$^+$ $\oplus$ LD1	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N142.14.12 GM4$^+$ $\oplus$ LD3	$\surd$	1	1	$\surd$	$\bar{4}2m$	B2
N142.14.13 GM4$^-$ $\oplus$ LD1	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$
N142.14.14 GM4$^-$ $\oplus$ LD3	$\surd$	1	1	$\surd$	$4/mmm$	$\mathrm{A2_u}$

TABLE S427: Collinear SSGs with parent space group $P3$ (No. 143).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L143.1.1 GM1	1	$\bar{3}$	$\mathrm{A_g}$
L143.2.1 A1	0	-	-

TABLE S428: Coplanar SSGs with parent space group $P3$ (No. 143).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P143.1.1 GM1	$\surd$	3	3	$\surd$	$\bar{3}$	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{A_u}$
P143.2.1 A1	$\surd$	1	1	$\surd$	$\bar{3}$	$\mathrm{A_g}$
P143.3.1 A1 $\oplus$ A1	$\surd$	1	1	$\surd$	$\bar{3}$	$\mathrm{A_u}$
P143.4.1 GM2GM3	$\surd$	3	3	$\surd$	$\bar{3}$	$\mathrm{A_u} \oplus {}^2\mathrm{E_g} \oplus {}^1\mathrm{E_g}$
P143.4.2 A2A3	$\surd$	1	1	$\surd$	$\bar{3}$	$\mathrm{A_u}$
P143.5.1 DT1DU1	$\surd$	1	1	$\surd$	$\bar{3}$	$\mathrm{A_u}$
P143.5.2 DT2DU2	$\surd$	1	1	$\surd$	$\bar{3}$	$\mathrm{A_u}$
P143.5.3 P1PC1	$\surd$	1	1	$\surd$	$\bar{3}$	$\mathrm{A_u}$

TABLE S429: Non-coplanar SSGs with parent space group $P3$ (No. 143).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N143.1.1 GM1	$\surd$	3	3	$\surd$	3	A1 $\oplus$ A1 $\oplus$ A1
N143.2.1 A1	$\surd$	3	3	$\surd$	$\bar{3}$	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{A_u}$
N143.3.1 A1 $\oplus$ A1	$\surd$	1	1	$\surd$	3	A1
N143.4.1 GM2GM3	$\surd$	3	3	$\surd$	3	A1 $\oplus {}^2\mathrm{E} \oplus {}^1\mathrm{E}$
N143.4.2 A2A3	$\surd$	1	1	$\surd$	3	A1
N143.5.1 DT1DU1	$\surd$	1	1	$\surd$	3	A1
N143.5.2 DT2DU2	$\surd$	1	1	$\surd$	3	A1
N143.5.3 P1PC1	$\surd$	1	1	$\surd$	3	A1
N143.9.1 A1 $\oplus$ A1 $\oplus$ A1	$\surd$	3	3	$\surd$	$\bar{3}$	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{A_u}$
N143.10.1 A1 $\oplus$ GM2GM3	$\surd$	3	3	$\surd$	$\bar{3}$	$\mathrm{A_u} \oplus {}^2\mathrm{E_g} \oplus {}^1\mathrm{E_g}$
N143.10.2 A1 $\oplus$ A2A3	$\surd$	3	3	$\surd$	$\bar{3}$	$\mathrm{A_u} \oplus {}^2\mathrm{E_u} \oplus {}^1\mathrm{E_u}$

Non-coplanar SSGs with parent space group $P3$ (No. 143) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N143.11.1 A1 $\oplus$ DT1DU1	$\surd$	1	1	$\surd$	$\bar{3}$	$\mathrm{A_u}$
N143.11.2 A1 $\oplus$ DT2DU2	$\surd$	1	1	$\surd$	$\bar{3}$	$\mathrm{A_u}$
N143.11.3 A1 $\oplus$ P1PC1	$\surd$	1	1	$\surd$	$\bar{3}$	$\mathrm{A_u}$
N143.16.1 M1	$\times$	-	-	-	-	-
N143.16.2 L1	$\times$	-	-	-	-	-

TABLE S430: Collinear SSGs with parent space group $P3_1$ (No. 144).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L144.1.1 GM1	1	$\bar{3}$	$\mathrm{A_g}$
L144.2.1 A2	0	-	-

TABLE S431: Coplanar SSGs with parent space group $P3_1$ (No. 144).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P144.1.1 GM1	$\surd$	3	3	$\surd$	$\bar{3}$	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{A_u}$
P144.2.1 A2	$\surd$	1	1	$\surd$	$\bar{3}$	$\mathrm{A_g}$
P144.3.1 A2 $\oplus$ A2	$\surd$	1	1	$\surd$	$\bar{3}$	$\mathrm{A_u}$
P144.4.1 GM2GM3	$\surd$	3	3	$\surd$	$\bar{3}$	$\mathrm{A_u} \oplus {}^2\mathrm{E_g} \oplus {}^1\mathrm{E_g}$
P144.4.2 A1A3	$\surd$	1	1	$\surd$	$\bar{3}$	$\mathrm{A_u}$
P144.5.1 DT1DU1	$\surd$	1	1	$\surd$	$\bar{3}$	$\mathrm{A_u}$
P144.5.2 P1PC1	$\surd$	1	1	$\surd$	$\bar{3}$	$\mathrm{A_u}$

TABLE S432: Non-coplanar SSGs with parent space group $P3_1$ (No. 144).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N144.1.1 GM1	$\surd$	3	3	$\surd$	3	A1 $\oplus$ A1 $\oplus$ A1
N144.2.1 A2	$\surd$	3	3	$\surd$	$\bar{3}$	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{A_u}$
N144.3.1 A2 $\oplus$ A2	$\surd$	1	1	$\surd$	3	A1
N144.4.1 GM2GM3	$\surd$	3	3	$\surd$	3	A1 $\oplus$ ^{2}E $\oplus$ ^{1}E
N144.4.2 A1A3	$\surd$	1	1	$\surd$	3	A1
N144.5.1 DT1DU1	$\surd$	1	1	$\surd$	3	A1
N144.5.2 P1PC1	$\surd$	1	1	$\surd$	3	A1
N144.9.1 A2 $\oplus$ A2 $\oplus$ A2	$\surd$	3	3	$\surd$	$\bar{3}$	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{A_u}$
N144.10.1 A2 $\oplus$ GM2GM3	$\surd$	3	3	$\surd$	$\bar{3}$	$\mathrm{A_u} \oplus {}^2\mathrm{E_g} \oplus {}^1\mathrm{E_g}$
N144.10.2 A2 $\oplus$ A1A3	$\surd$	3	3	$\surd$	$\bar{3}$	$\mathrm{A_u} \oplus {}^2\mathrm{E_u} \oplus {}^1\mathrm{E_u}$
N144.11.1 A2 $\oplus$ DT1DU1	$\surd$	1	1	$\surd$	$\bar{3}$	$\mathrm{A_u}$
N144.11.2 A2 $\oplus$ P1PC1	$\surd$	1	1	$\surd$	$\bar{3}$	$\mathrm{A_u}$
N144.16.1 M1	$\times$	-	-	-	-	-
N144.16.2 L1	$\times$	-	-	-	-	-

TABLE S433: Collinear SSGs with parent space group $P3_2$ (No. 145).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L145.1.1 GM1	1	$\bar{3}$	$\mathrm{A_g}$
L145.2.1 A1	0	-	-

Collinear SSGs with parent space group $P3_2$ (No. 145)(continued)

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation

TABLE S434: Coplanar SSGs with parent space group $P3_2$ (No. 145).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P145.1.1 GM1	$\surd$	3	3	$\surd$	$\bar{3}$	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{A_u}$
P145.2.1 A1	$\surd$	1	1	$\surd$	$\bar{3}$	$\mathrm{A_g}$
P145.3.1 A1 $\oplus$ A1	$\surd$	1	1	$\surd$	$\bar{3}$	$\mathrm{A_u}$
P145.4.1 GM2GM3	$\surd$	3	3	$\surd$	$\bar{3}$	$\mathrm{A_u}\oplus{}^2\mathrm{E_g}\oplus{}^1\mathrm{E_g}$
P145.4.2 A2A3	$\surd$	1	1	$\surd$	$\bar{3}$	$\mathrm{A_u}$
P145.5.1 DT1DU1	$\surd$	1	1	$\surd$	$\bar{3}$	$\mathrm{A_u}$
P145.5.2 P1PC1	$\surd$	1	1	$\surd$	$\bar{3}$	$\mathrm{A_u}$

TABLE S435: Non-coplanar SSGs with parent space group $P3_2$ (No. 145).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N145.1.1 GM1	$\surd$	3	3	$\surd$	3	A1 $\oplus$ A1 $\oplus$ A1
N145.2.1 A1	$\surd$	3	3	$\surd$	$\bar{3}$	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{A_u}$
N145.3.1 A1 $\oplus$ A1	$\surd$	1	1	$\surd$	3	A1
N145.4.1 GM2GM3	$\surd$	3	3	$\surd$	3	A1 $\oplus\,{}^2\mathrm{E}\oplus{}^1\mathrm{E}$
N145.4.2 A2A3	$\surd$	1	1	$\surd$	3	A1
N145.5.1 DT1DU1	$\surd$	1	1	$\surd$	3	A1
N145.5.2 P1PC1	$\surd$	1	1	$\surd$	3	A1
N145.9.1 A1 $\oplus$ A1 $\oplus$ A1	$\surd$	3	3	$\surd$	$\bar{3}$	$\mathrm{A_u}\oplus\mathrm{A_u}\oplus\mathrm{A_u}$
N145.10.1 A1 $\oplus$ GM2GM3	$\surd$	3	3	$\surd$	$\bar{3}$	$\mathrm{A_u}\oplus{}^2\mathrm{E_g}\oplus{}^1\mathrm{E_g}$
N145.10.2 A1 $\oplus$ A2A3	$\surd$	3	3	$\surd$	$\bar{3}$	$\mathrm{A_u}\oplus{}^2\mathrm{E_u}\oplus{}^1\mathrm{E_u}$
N145.11.1 A1 $\oplus$ DT1DU1	$\surd$	1	1	$\surd$	$\bar{3}$	$\mathrm{A_u}$
N145.11.2 A1 $\oplus$ P1PC1	$\surd$	1	1	$\surd$	$\bar{3}$	$\mathrm{A_u}$
N145.16.1 M1	$\times$	-	-	-	-	-
N145.16.2 L1	$\times$	-	-	-	-	-

TABLE S436: Collinear SSGs with parent space group $R3$ (No. 146).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L146.1.1 GM1	1	$\bar{3}$	$\mathrm{A_g}$
L146.2.1 T1	0	-	-

TABLE S437: Coplanar SSGs with parent space group $R3$ (No. 146).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P146.1.1 GM1	$\surd$	3	3	$\surd$	$\bar{3}$	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{A_u}$
P146.2.1 T1	$\surd$	1	1	$\surd$	$\bar{3}$	$\mathrm{A_g}$
P146.3.1 T1 $\oplus$ T1	$\surd$	1	1	$\surd$	$\bar{3}$	$\mathrm{A_u}$
P146.4.1 GM2GM3	$\surd$	3	3	$\surd$	$\bar{3}$	$\mathrm{A_u}\oplus{}^2\mathrm{E_g}\oplus{}^1\mathrm{E_g}$
P146.4.2 T2T3	$\surd$	1	1	$\surd$	$\bar{3}$	$\mathrm{A_u}$
P146.5.1 LD1LE1	$\surd$	1	1	$\surd$	$\bar{3}$	$\mathrm{A_u}$
P146.5.2 LD2LE2	$\surd$	1	1	$\surd$	$\bar{3}$	$\mathrm{A_u}$

Coplanar SSGs with parent space group $R3$ (No. 146) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation

TABLE S438: Non-coplanar SSGs with parent space group $R3$ (No. 146).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N146.1.1 GM1	$\surd$	3	3	$\surd$	3	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{A1}$
N146.2.1 T1	$\surd$	3	3	$\surd$	$\bar{3}$	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{A_u}$
N146.3.1 T1 $\oplus$ T1	$\surd$	1	1	$\surd$	3	A1
N146.4.1 GM2GM3	$\surd$	3	3	$\surd$	3	$\mathrm{A1}\oplus{}^2\mathrm{E}\oplus{}^1\mathrm{E}$
N146.4.2 T2T3	$\surd$	1	1	$\surd$	3	A1
N146.5.1 LD1LE1	$\surd$	1	1	$\surd$	3	A1
N146.5.2 LD2LE2	$\surd$	1	1	$\surd$	3	A1
N146.9.1 T1 $\oplus$ T1 $\oplus$ T1	$\surd$	3	3	$\surd$	$\bar{3}$	$\mathrm{A_u}\oplus\mathrm{A_u}\oplus\mathrm{A_u}$
N146.10.1 T1 $\oplus$ GM2GM3	$\surd$	3	3	$\surd$	$\bar{3}$	$\mathrm{A_u}\oplus{}^2\mathrm{E_g}\oplus{}^1\mathrm{E_g}$
N146.10.2 T1 $\oplus$ T2T3	$\surd$	3	3	$\surd$	$\bar{3}$	$\mathrm{A_u}\oplus{}^2\mathrm{E_u}\oplus{}^1\mathrm{E_u}$
N146.11.1 T1 $\oplus$ LD1LE1	$\surd$	1	1	$\surd$	$\bar{3}$	$\mathrm{A_u}$
N146.11.2 T1 $\oplus$ LD2LE2	$\surd$	1	1	$\surd$	$\bar{3}$	$\mathrm{A_u}$
N146.16.1 L1	$\times$	-	-	-	-	-
N146.16.2 F1	$\times$	-	-	-	-	-

TABLE S439: Collinear SSGs with parent space group $P\bar{3}$ (No. 147).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L147.1.1 $\mathrm{GM1^+}$	1	$\bar{3}$	$\mathrm{A_g}$
L147.2.1 $\mathrm{GM1^-}$	0	-	-
L147.2.2 $\mathrm{A1^+}$	0	-	-

TABLE S440: Coplanar SSGs with parent space group $P\bar{3}$ (No. 147).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P147.1.1 $\mathrm{GM1^+}$	$\surd$	2	2	$\surd$	$\bar{3}$	$\mathrm{A_g}\oplus\mathrm{A_g}$
P147.2.1 $\mathrm{GM1^-}$	$\surd$	2	2	$\surd$	$\bar{3}$	$\mathrm{A_g}\oplus\mathrm{A_u}$
P147.2.2 $\mathrm{A1^+}$	$\surd$	1	1	$\surd$	$\bar{3}$	$\mathrm{A_g}$
P147.3.1 $\mathrm{GM1^-}\oplus\mathrm{GM1^-}$	$\surd$	0	0	$\surd$	-	-
P147.3.2 $\mathrm{GM1^-}\oplus\mathrm{A1^+}$	$\surd$	1	1	$\times$	-	-
P147.3.3 $\mathrm{A1^+}\oplus\mathrm{A1^+}$	$\surd$	1	0	$\times$	-	-
P147.3.4 $\mathrm{A1^+}\oplus\mathrm{A1^-}$	$\surd$	1	1	$\surd$	$\bar{3}$	$\mathrm{A_u}$
P147.4.1 $\mathrm{GM2^+GM3^+}$	$\surd$	2	2	$\surd$	$\bar{3}$	$^2\mathrm{E_g}\oplus{}^1\mathrm{E_g}$
P147.4.2 $\mathrm{GM2^-GM3^-}$	$\surd$	0	0	$\surd$	-	-
P147.4.3 $\mathrm{A2^+A3^+}$	$\surd$	1	0	$\times$	-	-
P147.8.1 DT1	$\surd$	1	1	$\surd$	$\bar{3}$	$\mathrm{A_u}$
P147.8.2 P1	$\surd$	1	1	$\surd$	$\bar{3}$	$\mathrm{A_u}$

TABLE S441: Non-coplanar SSGs with parent space group $P\bar{3}$ (No. 147).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N147.1.1 $\mathrm{GM1^+}$	$\surd$	3	3	$\surd$	$\bar{3}$	$\mathrm{A_g \oplus A_g \oplus A_g}$
N147.2.1 $\mathrm{GM1^-}$	$\surd$	2	2	$\surd$	3	$\mathrm{A1 \oplus A1}$
N147.2.2 $\mathrm{A1^+}$	$\surd$	2	2	$\surd$	$\bar{3}$	$\mathrm{A_g \oplus A_g}$
N147.3.1 $\mathrm{GM1^- \oplus GM1^-}$	$\surd$	3	3	$\surd$	$\bar{3}$	$\mathrm{A_g \oplus A_u \oplus A_u}$
N147.3.2 $\mathrm{GM1^- \oplus A1^+}$	$\surd$	2	2	$\surd$	$\bar{3}$	$\mathrm{A_g \oplus A_u}$
N147.3.3 $\mathrm{A1^+ \oplus A1^+}$	$\surd$	1	1	$\surd$	$\bar{3}$	$\mathrm{A_g}$
N147.3.4 $\mathrm{A1^+ \oplus A1^-}$	$\surd$	1	1	$\surd$	3	A1
N147.4.1 $\mathrm{GM2^+GM3^+}$	$\surd$	3	3	$\surd$	$\bar{3}$	$\mathrm{A_g \oplus {}^2E_g \oplus {}^1E_g}$
N147.4.2 $\mathrm{GM2^-GM3^-}$	$\surd$	3	3	$\surd$	$\bar{3}$	$\mathrm{A_g \oplus {}^2E_u \oplus {}^1E_u}$
N147.4.3 $\mathrm{A2^+A3^+}$	$\surd$	1	1	$\surd$	$\bar{3}$	$\mathrm{A_g}$
N147.8.1 DT1	$\surd$	1	1	$\surd$	3	A1
N147.8.2 P1	$\surd$	1	1	$\surd$	3	A1
N147.9.1 $\mathrm{GM1^- \oplus GM1^- \oplus GM1^-}$	$\surd$	0	0	$\surd$	-	-
N147.9.2 $\mathrm{GM1^- \oplus GM1^- \oplus A1^+}$	$\surd$	0	0	$\surd$	-	-
N147.9.3 $\mathrm{GM1^- \oplus A1^+ \oplus A1^+}$	$\surd$	1	0	$\times$	-	-
N147.9.4 $\mathrm{GM1^- \oplus A1^+ \oplus A1^-}$	$\surd$	1	1	$\surd$	$\bar{3}$	$\mathrm{A_u}$
N147.9.5 $\mathrm{A1^+ \oplus A1^+ \oplus A1^+}$	$\surd$	0	0	$\surd$	-	-
N147.9.6 $\mathrm{A1^+ \oplus A1^+ \oplus A1^-}$	$\surd$	2	2	$\surd$	$\bar{3}$	$\mathrm{A_u \oplus A_u}$
N147.10.1 $\mathrm{GM1^- \oplus GM2^+GM3^+}$	$\surd$	2	2	$\surd$	3	$\mathrm{{}^2E \oplus {}^1E}$
N147.10.2 $\mathrm{GM1^- \oplus GM2^-GM3^-}$	$\surd$	0	0	$\surd$	-	-
N147.10.3 $\mathrm{GM1^- \oplus A2^+A3^+}$	$\surd$	1	0	$\times$	-	-
N147.10.4 $\mathrm{A1^+ \oplus GM2^+GM3^+}$	$\surd$	2	2	$\surd$	$\bar{3}$	$\mathrm{{}^2E_g \oplus {}^1E_g}$
N147.10.5 $\mathrm{A1^+ \oplus GM2^-GM3^-}$	$\surd$	0	0	$\surd$	-	-
N147.10.6 $\mathrm{A1^+ \oplus A2^+A3^+}$	$\surd$	0	0	$\surd$	-	-
N147.10.7 $\mathrm{A1^+ \oplus A2^-A3^-}$	$\surd$	2	2	$\surd$	$\bar{3}$	$\mathrm{{}^2E_u \oplus {}^1E_u}$
N147.14.1 $\mathrm{GM1^- \oplus DT1}$	$\surd$	1	1	$\surd$	$\bar{3}$	$\mathrm{A_u}$
N147.14.2 $\mathrm{GM1^- \oplus P1}$	$\surd$	1	1	$\surd$	$\bar{3}$	$\mathrm{A_u}$
N147.14.3 $\mathrm{A1^+ \oplus DT1}$	$\surd$	1	1	$\surd$	$\bar{3}$	$\mathrm{A_u}$
N147.14.4 $\mathrm{A1^+ \oplus P1}$	$\surd$	1	1	$\surd$	$\bar{3}$	$\mathrm{A_u}$
N147.16.1 $\mathrm{M1^+}$	$\times$	-	-	-	-	-
N147.16.2 $\mathrm{M1^-}$	$\times$	-	-	-	-	-
N147.16.3 $\mathrm{L1^+}$	$\times$	-	-	-	-	-

TABLE S442: Collinear SSGs with parent space group $R\bar{3}$ (No. 148).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L148.1.1 $\mathrm{GM1^+}$	1	$\bar{3}$	$\mathrm{A_g}$
L148.2.1 $\mathrm{GM1^-}$	0	-	-
L148.2.2 $\mathrm{T1^+}$	0	-	-

TABLE S443: Coplanar SSGs with parent space group $R\bar{3}$ (No. 148).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P148.1.1 $\mathrm{GM1^+}$	$\surd$	2	2	$\surd$	$\bar{3}$	$\mathrm{A_g \oplus A_g}$

Coplanar SSGs with parent space group $R\bar{3}$ (No. 148) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P148.2.1 $\mathrm{GM1}^-$	$\surd$	2	2	$\surd$	$\bar{3}$	$\mathrm{A_g} \oplus \mathrm{A_u}$
P148.2.2 $\mathrm{T1}^+$	$\surd$	1	1	$\surd$	$\bar{3}$	$\mathrm{A_g}$
P148.3.1 $\mathrm{GM1}^- \oplus \mathrm{GM1}^-$	$\surd$	0	0	$\surd$	-	-
P148.3.2 $\mathrm{GM1}^- \oplus \mathrm{T1}^+$	$\surd$	1	1	$\times$	-	-
P148.3.3 $\mathrm{T1}^+ \oplus \mathrm{T1}^+$	$\surd$	1	0	$\times$	-	-
P148.3.4 $\mathrm{T1}^+ \oplus \mathrm{T1}^-$	$\surd$	1	1	$\surd$	$\bar{3}$	$\mathrm{A_u}$
P148.4.1 $\mathrm{GM2}^+\mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$\bar{3}$	${}^2\mathrm{E_g} \oplus {}^1\mathrm{E_g}$
P148.4.2 $\mathrm{GM2}^-\mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
P148.4.3 $\mathrm{T2}^+\mathrm{T3}^+$	$\surd$	1	0	$\times$	-	-
P148.8.1 LD1	$\surd$	1	1	$\surd$	$\bar{3}$	$\mathrm{A_u}$

TABLE S444: Non-coplanar SSGs with parent space group $R\bar{3}$ (No. 148).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N148.1.1 $\mathrm{GM1}^+$	$\surd$	3	3	$\surd$	$\bar{3}$	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{A_g}$
N148.2.1 $\mathrm{GM1}^-$	$\surd$	2	2	$\surd$	3	$\mathrm{A1} \oplus \mathrm{A1}$
N148.2.2 $\mathrm{T1}^+$	$\surd$	2	2	$\surd$	$\bar{3}$	$\mathrm{A_g} \oplus \mathrm{A_g}$
N148.3.1 $\mathrm{GM1}^- \oplus \mathrm{GM1}^-$	$\surd$	3	3	$\surd$	$\bar{3}$	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{A_u}$
N148.3.2 $\mathrm{GM1}^- \oplus \mathrm{T1}^+$	$\surd$	2	2	$\surd$	$\bar{3}$	$\mathrm{A_g} \oplus \mathrm{A_u}$
N148.3.3 $\mathrm{T1}^+ \oplus \mathrm{T1}^+$	$\surd$	1	1	$\surd$	$\bar{3}$	$\mathrm{A_g}$
N148.3.4 $\mathrm{T1}^+ \oplus \mathrm{T1}^-$	$\surd$	1	1	$\surd$	3	A1
N148.4.1 $\mathrm{GM2}^+\mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$\bar{3}$	$\mathrm{A_g} \oplus {}^2\mathrm{E_g} \oplus {}^1\mathrm{E_g}$
N148.4.2 $\mathrm{GM2}^-\mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$\bar{3}$	$\mathrm{A_g} \oplus {}^2\mathrm{E_u} \oplus {}^1\mathrm{E_u}$
N148.4.3 $\mathrm{T2}^+\mathrm{T3}^+$	$\surd$	1	1	$\surd$	$\bar{3}$	$\mathrm{A_g}$
N148.8.1 LD1	$\surd$	1	1	$\surd$	3	A1
N148.9.1 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{GM1}^-$	$\surd$	0	0	$\surd$	-	-
N148.9.2 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{T1}^+$	$\surd$	0	0	$\surd$	-	-
N148.9.3 $\mathrm{GM1}^- \oplus \mathrm{T1}^+ \oplus \mathrm{T1}^+$	$\surd$	1	0	$\times$	-	-
N148.9.4 $\mathrm{GM1}^- \oplus \mathrm{T1}^+ \oplus \mathrm{T1}^-$	$\surd$	1	1	$\surd$	$\bar{3}$	$\mathrm{A_u}$
N148.9.5 $\mathrm{T1}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{T1}^+$	$\surd$	0	0	$\surd$	-	-
N148.9.6 $\mathrm{T1}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{T1}^-$	$\surd$	2	2	$\surd$	$\bar{3}$	$\mathrm{A_u} \oplus \mathrm{A_u}$
N148.10.1 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+\mathrm{GM3}^+$	$\surd$	2	2	$\surd$	3	${}^2\mathrm{E} \oplus {}^1\mathrm{E}$
N148.10.2 $\mathrm{GM1}^- \oplus \mathrm{GM2}^-\mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N148.10.3 $\mathrm{GM1}^- \oplus \mathrm{T2}^+\mathrm{T3}^+$	$\surd$	1	0	$\times$	-	-
N148.10.4 $\mathrm{T1}^+ \oplus \mathrm{GM2}^+\mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$\bar{3}$	${}^2\mathrm{E_g} \oplus {}^1\mathrm{E_g}$
N148.10.5 $\mathrm{T1}^+ \oplus \mathrm{GM2}^-\mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N148.10.6 $\mathrm{T1}^+ \oplus \mathrm{T2}^+\mathrm{T3}^+$	$\surd$	0	0	$\surd$	-	-
N148.10.7 $\mathrm{T1}^+ \oplus \mathrm{T2}^-\mathrm{T3}^-$	$\surd$	2	2	$\surd$	$\bar{3}$	${}^2\mathrm{E_u} \oplus {}^1\mathrm{E_u}$
N148.14.1 $\mathrm{GM1}^- \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$\bar{3}$	$\mathrm{A_u}$
N148.14.2 $\mathrm{T1}^+ \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$\bar{3}$	$\mathrm{A_u}$
N148.16.1 $\mathrm{L1}^+$	$\times$	-	-	-	-	-
N148.16.2 $\mathrm{F1}^+$	$\times$	-	-	-	-	-
N148.16.3 $\mathrm{F1}^-$	$\times$	-	-	-	-	-

TABLE S445: Collinear SSGs with parent space group $P312$ (No. 149).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L149.1.1 GM1	1	$\bar{3}m$	$\mathrm{A1_g}$
L149.2.1 GM2	1	$\bar{3}m$	$\mathrm{A2_g}$
L149.2.2 A1	0	-	-

TABLE S446: Coplanar SSGs with parent space group $P312$ (No. 149).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P149.1.1 GM1	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A1_u}$
P149.2.1 GM2	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_u}$
P149.2.2 A1	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A1_g}$
P149.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_u}\oplus\mathrm{A2_g}\oplus\mathrm{A2_g}$
P149.3.2 GM2 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
P149.3.3 A1 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
P149.3.4 A1 $\oplus$ A2	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
P149.6.1 GM3	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A2_u}\oplus\mathrm{E_g}$
P149.6.2 A3	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
P149.8.1 DT1	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
P149.8.2 DT2	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
P149.8.3 P1	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$

TABLE S447: Non-coplanar SSGs with parent space group $P312$ (No. 149).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N149.1.1 GM1	$\surd$	3	3	$\surd$	32	A1 $\oplus$ A1 $\oplus$ A1
N149.2.1 GM2	$\surd$	3	3	$\surd$	$3m$	A1 $\oplus$ A1 $\oplus$ A2
N149.2.2 A1	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A1_u}$
N149.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	32	A1 $\oplus$ A2 $\oplus$ A2
N149.3.2 GM2 $\oplus$ A1	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_u}$
N149.3.3 A1 $\oplus$ A1	$\surd$	1	1	$\surd$	32	A1
N149.3.4 A1 $\oplus$ A2	$\surd$	1	1	$\surd$	$3m$	A1
N149.6.1 GM3	$\surd$	3	3	$\surd$	$3m$	A1 $\oplus$ E
N149.6.2 A3	$\surd$	1	1	$\surd$	$3m$	A1
N149.8.1 DT1	$\surd$	1	1	$\surd$	$3m$	A1
N149.8.2 DT2	$\surd$	1	1	$\surd$	$3m$	A1
N149.8.3 P1	$\surd$	1	1	$\surd$	$3m$	A1
N149.9.1 GM2 $\oplus$ GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$3m$	A2 $\oplus$ A2 $\oplus$ A2
N149.9.2 GM2 $\oplus$ GM2 $\oplus$ A1	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_u}\oplus\mathrm{A2_g}\oplus\mathrm{A2_g}$
N149.9.3 GM2 $\oplus$ A1 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
N149.9.4 GM2 $\oplus$ A1 $\oplus$ A2	$\surd$	1	1	$\surd$	32	A2
N149.9.5 A1 $\oplus$ A1 $\oplus$ A1	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_u}\oplus\mathrm{A1_u}\oplus\mathrm{A1_u}$
N149.9.6 A1 $\oplus$ A1 $\oplus$ A2	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_u}\oplus\mathrm{A2_u}\oplus\mathrm{A2_u}$
N149.12.1 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	32	A2 $\oplus$ E
N149.12.2 GM2 $\oplus$ A3	$\surd$	1	1	$\surd$	32	A2
N149.12.3 A1 $\oplus$ GM3	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A2_u}\oplus\mathrm{E_g}$
N149.12.4 A1 $\oplus$ A3	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A2_u}\oplus\mathrm{E_u}$

Non-coplanar SSGs with parent space group $P312$ (No. 149) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N149.14.1 GM2 $\oplus$ DT1	$\surd$	1	1	$\surd$	32	A2
N149.14.2 GM2 $\oplus$ DT2	$\surd$	1	1	$\surd$	32	A2
N149.14.3 GM2 $\oplus$ P1	$\surd$	1	1	$\surd$	32	A2
N149.14.4 A1 $\oplus$ DT1	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
N149.14.5 A1 $\oplus$ DT2	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
N149.14.6 A1 $\oplus$ P1	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
N149.16.1 M1	$\times$	-	-	-	-	-
N149.16.2 M2	$\times$	-	-	-	-	-
N149.16.3 L1	$\times$	-	-	-	-	-

TABLE S448: Collinear SSGs with parent space group $P321$ (No. 150).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L150.1.1 GM1	1	$\bar{3}m$	$\mathrm{A1_g}$
L150.2.1 GM2	1	$\bar{3}m$	$\mathrm{A2_g}$
L150.2.2 A1	0	-	-

TABLE S449: Coplanar SSGs with parent space group $P321$ (No. 150).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P150.1.1 GM1	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A1_u}$
P150.2.1 GM2	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
P150.2.2 A1	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A1_g}$
P150.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
P150.3.2 GM2 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
P150.3.3 A1 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
P150.3.4 A1 $\oplus$ A2	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
P150.4.1 K1KA1	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A1_u}$
P150.4.2 K2KA2	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A1_u}$
P150.4.3 H1HA1	$\surd$	1	1	$\times$	-	-
P150.6.1 GM3	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A2_u} \oplus \mathrm{E_g}$
P150.6.2 A3	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
P150.8.1 DT1	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
P150.8.2 DT2	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$

TABLE S450: Non-coplanar SSGs with parent space group $P321$ (No. 150).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N150.1.1 GM1	$\surd$	3	3	$\surd$	32	A1 $\oplus$ A1 $\oplus$ A1
N150.2.1 GM2	$\surd$	3	3	$\surd$	$3m$	A1 $\oplus$ A1 $\oplus$ A2
N150.2.2 A1	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A1_u}$
N150.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	32	A1 $\oplus$ A2 $\oplus$ A2
N150.3.2 GM2 $\oplus$ A1	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
N150.3.3 A1 $\oplus$ A1	$\surd$	1	1	$\surd$	32	A1
N150.3.4 A1 $\oplus$ A2	$\surd$	1	1	$\surd$	$3m$	A1

Non-coplanar SSGs with parent space group $P321$ (No. 150) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N150.4.1 K1KA1	$\surd$	1	1	$\surd$	32	A1
N150.4.2 K2KA2	$\surd$	1	1	$\surd$	32	A1
N150.4.3 H1HA1	$\surd$	1	1	$\surd$	32	A1
N150.6.1 GM3	$\surd$	3	3	$\surd$	$3m$	$\mathrm{A1}\oplus\mathrm{E}$
N150.6.2 A3	$\surd$	1	1	$\surd$	$3m$	A1
N150.8.1 DT1	$\surd$	1	1	$\surd$	$3m$	A1
N150.8.2 DT2	$\surd$	1	1	$\surd$	$3m$	A1
N150.9.1 $\mathrm{GM2}\oplus\mathrm{GM2}\oplus\mathrm{GM2}$	$\surd$	3	3	$\surd$	$3m$	$\mathrm{A2}\oplus\mathrm{A2}\oplus\mathrm{A2}$
N150.9.2 $\mathrm{GM2}\oplus\mathrm{GM2}\oplus\mathrm{A1}$	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_u}\oplus\mathrm{A2_g}\oplus\mathrm{A2_g}$
N150.9.3 $\mathrm{GM2}\oplus\mathrm{A1}\oplus\mathrm{A1}$	$\surd$	1	1	$\times$	-	-
N150.9.4 $\mathrm{GM2}\oplus\mathrm{A1}\oplus\mathrm{A2}$	$\surd$	1	1	$\surd$	32	A2
N150.9.5 $\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{A1}$	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_u}\oplus\mathrm{A1_u}\oplus\mathrm{A1_u}$
N150.9.6 $\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{A2}$	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_u}\oplus\mathrm{A2_u}\oplus\mathrm{A2_u}$
N150.10.1 $\mathrm{GM2}\oplus\mathrm{K1KA1}$	$\surd$	1	1	$\surd$	$3m$	A2
N150.10.2 $\mathrm{GM2}\oplus\mathrm{K2KA2}$	$\surd$	1	1	$\surd$	$3m$	A2
N150.10.3 $\mathrm{GM2}\oplus\mathrm{H1HA1}$	$\surd$	1	1	$\times$	-	-
N150.10.4 $\mathrm{A1}\oplus\mathrm{K1KA1}$	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A1_u}$
N150.10.5 $\mathrm{A1}\oplus\mathrm{K2KA2}$	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A1_u}$
N150.10.6 $\mathrm{A1}\oplus\mathrm{H1HA1}$	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A1_u}$
N150.10.7 $\mathrm{A1}\oplus\mathrm{H2HA2}$	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A1_u}$
N150.12.1 $\mathrm{GM2}\oplus\mathrm{GM3}$	$\surd$	3	3	$\surd$	32	$\mathrm{A2}\oplus\mathrm{E}$
N150.12.2 $\mathrm{GM2}\oplus\mathrm{A3}$	$\surd$	1	1	$\surd$	32	A2
N150.12.3 $\mathrm{A1}\oplus\mathrm{GM3}$	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A2_u}\oplus\mathrm{E_g}$
N150.12.4 $\mathrm{A1}\oplus\mathrm{A3}$	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A2_u}\oplus\mathrm{E_u}$
N150.14.1 $\mathrm{GM2}\oplus\mathrm{DT1}$	$\surd$	1	1	$\surd$	32	A2
N150.14.2 $\mathrm{GM2}\oplus\mathrm{DT2}$	$\surd$	1	1	$\surd$	32	A2
N150.14.3 $\mathrm{A1}\oplus\mathrm{DT1}$	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
N150.14.4 $\mathrm{A1}\oplus\mathrm{DT2}$	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
N150.16.1 M1	$\times$	-	-	-	-	-
N150.16.2 M2	$\times$	-	-	-	-	-
N150.16.3 L1	$\times$	-	-	-	-	-

TABLE S451: Collinear SSGs with parent space group $P3_112$ (No. 151).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L151.1.1 GM1	1	$\bar{3}m$	$\mathrm{A1_g}$
L151.2.1 GM2	1	$\bar{3}m$	$\mathrm{A2_g}$
L151.2.2 A1	0	-	-

TABLE S452: Coplanar SSGs with parent space group $P3_112$ (No. 151).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P151.1.1 GM1	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A1_u}$
P151.2.1 GM2	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_u}$
P151.2.2 A1	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A1_g}$

Coplanar SSGs with parent space group $P3_112$ (No. 151) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P151.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
P151.3.2 GM2 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
P151.3.3 A1 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
P151.3.4 A1 $\oplus$ A2	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
P151.6.1 GM3	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A2_u} \oplus \mathrm{E_g}$
P151.6.2 A3	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
P151.8.1 DT1	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
P151.8.2 P1	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$

TABLE S453: Non-coplanar SSGs with parent space group $P3_112$ (No. 151).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N151.1.1 GM1	$\surd$	3	3	$\surd$	32	A1 $\oplus$ A1 $\oplus$ A1
N151.2.1 GM2	$\surd$	3	3	$\surd$	$3m$	A1 $\oplus$ A1 $\oplus$ A2
N151.2.2 A1	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A1_u}$
N151.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	32	A1 $\oplus$ A2 $\oplus$ A2
N151.3.2 GM2 $\oplus$ A1	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
N151.3.3 A1 $\oplus$ A1	$\surd$	1	1	$\surd$	32	A1
N151.3.4 A1 $\oplus$ A2	$\surd$	1	1	$\surd$	$3m$	A1
N151.6.1 GM3	$\surd$	3	3	$\surd$	$3m$	A1 $\oplus$ E
N151.6.2 A3	$\surd$	1	1	$\surd$	$3m$	A1
N151.8.1 DT1	$\surd$	1	1	$\surd$	$3m$	A1
N151.8.2 P1	$\surd$	1	1	$\surd$	$3m$	A1
N151.9.1 GM2 $\oplus$ GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$3m$	A2 $\oplus$ A2 $\oplus$ A2
N151.9.2 GM2 $\oplus$ GM2 $\oplus$ A1	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
N151.9.3 GM2 $\oplus$ A1 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
N151.9.4 GM2 $\oplus$ A1 $\oplus$ A2	$\surd$	1	1	$\surd$	32	A2
N151.9.5 A1 $\oplus$ A1 $\oplus$ A1	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A1_u}$
N151.9.6 A1 $\oplus$ A1 $\oplus$ A2	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N151.12.1 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	32	A2 $\oplus$ E
N151.12.2 GM2 $\oplus$ A3	$\surd$	1	1	$\surd$	32	A2
N151.12.3 A1 $\oplus$ GM3	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A2_u} \oplus \mathrm{E_g}$
N151.12.4 A1 $\oplus$ A3	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A2_u} \oplus \mathrm{E_u}$
N151.14.1 GM2 $\oplus$ DT1	$\surd$	1	1	$\surd$	32	A2
N151.14.2 GM2 $\oplus$ P1	$\surd$	1	1	$\surd$	32	A2
N151.14.3 A1 $\oplus$ DT1	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
N151.14.4 A1 $\oplus$ P1	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
N151.16.1 M1	$\times$	-	-	-	-	-
N151.16.2 M2	$\times$	-	-	-	-	-
N151.16.3 L1	$\times$	-	-	-	-	-

TABLE S454: Collinear SSGs with parent space group $P3_121$ (No. 152).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L152.1.1 GM1	1	$\bar{3}m$	$\mathrm{A1_g}$

Collinear SSGs with parent space group $P3_121$ (No. 152)(continued)

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L152.2.1 GM2	1	$\bar{3}m$	$\mathrm{A2_g}$
L152.2.2 A1	0	-	-

TABLE S455: Coplanar SSGs with parent space group $P3_121$ (No. 152).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P152.1.1 GM1	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A1_u}$
P152.2.1 GM2	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_u}$
P152.2.2 A1	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A1_g}$
P152.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_u}\oplus\mathrm{A2_g}\oplus\mathrm{A2_g}$
P152.3.2 GM2 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
P152.3.3 A1 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
P152.3.4 A1 $\oplus$ A2	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
P152.4.1 K1KA1	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A1_u}$
P152.4.2 K2KA2	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A1_u}$
P152.4.3 H1HA1	$\surd$	1	1	$\times$	-	-
P152.6.1 GM3	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A2_u}\oplus\mathrm{E_g}$
P152.6.2 A3	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
P152.8.1 DT1	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$

TABLE S456: Non-coplanar SSGs with parent space group $P3_121$ (No. 152).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N152.1.1 GM1	$\surd$	3	3	$\surd$	32	A1 $\oplus$ A1 $\oplus$ A1
N152.2.1 GM2	$\surd$	3	3	$\surd$	$3m$	A1 $\oplus$ A1 $\oplus$ A2
N152.2.2 A1	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A1_u}$
N152.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	32	A1 $\oplus$ A2 $\oplus$ A2
N152.3.2 GM2 $\oplus$ A1	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_u}$
N152.3.3 A1 $\oplus$ A1	$\surd$	1	1	$\surd$	32	A1
N152.3.4 A1 $\oplus$ A2	$\surd$	1	1	$\surd$	$3m$	A1
N152.4.1 K1KA1	$\surd$	1	1	$\surd$	32	A1
N152.4.2 K2KA2	$\surd$	1	1	$\surd$	32	A1
N152.4.3 H1HA1	$\surd$	1	1	$\surd$	32	A1
N152.6.1 GM3	$\surd$	3	3	$\surd$	$3m$	A1 $\oplus$ E
N152.6.2 A3	$\surd$	1	1	$\surd$	$3m$	A1
N152.8.1 DT1	$\surd$	1	1	$\surd$	$3m$	A1
N152.9.1 GM2 $\oplus$ GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$3m$	A2 $\oplus$ A2 $\oplus$ A2
N152.9.2 GM2 $\oplus$ GM2 $\oplus$ A1	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_u}\oplus\mathrm{A2_g}\oplus\mathrm{A2_g}$
N152.9.3 GM2 $\oplus$ A1 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
N152.9.4 GM2 $\oplus$ A1 $\oplus$ A2	$\surd$	1	1	$\surd$	32	A2
N152.9.5 A1 $\oplus$ A1 $\oplus$ A1	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_u}\oplus\mathrm{A1_u}\oplus\mathrm{A1_u}$
N152.9.6 A1 $\oplus$ A1 $\oplus$ A2	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_u}\oplus\mathrm{A2_u}\oplus\mathrm{A2_u}$
N152.10.1 GM2 $\oplus$ K1KA1	$\surd$	1	1	$\surd$	$3m$	A2
N152.10.2 GM2 $\oplus$ K2KA2	$\surd$	1	1	$\surd$	$3m$	A2
N152.10.3 GM2 $\oplus$ H1HA1	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $P3_121$ (No. 152) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N152.10.4 A1 $\oplus$ K1KA1	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A1_u}$
N152.10.5 A1 $\oplus$ K2KA2	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A1_u}$
N152.10.6 A1 $\oplus$ H1HA1	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A1_u}$
N152.10.7 A1 $\oplus$ H2HA2	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A1_u}$
N152.12.1 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	32	$\mathrm{A2 \oplus E}$
N152.12.2 GM2 $\oplus$ A3	$\surd$	1	1	$\surd$	32	A2
N152.12.3 A1 $\oplus$ GM3	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A2_u \oplus E_g}$
N152.12.4 A1 $\oplus$ A3	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A2_u \oplus E_u}$
N152.14.1 GM2 $\oplus$ DT1	$\surd$	1	1	$\surd$	32	A2
N152.14.2 A1 $\oplus$ DT1	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
N152.16.1 M1	$\times$	-	-	-	-	-
N152.16.2 M2	$\times$	-	-	-	-	-
N152.16.3 L1	$\times$	-	-	-	-	-

TABLE S457: Collinear SSGs with parent space group $P3_212$ (No. 153).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L153.1.1 GM1	1	$\bar{3}m$	$\mathrm{A1_g}$
L153.2.1 GM2	1	$\bar{3}m$	$\mathrm{A2_g}$
L153.2.2 A1	0	-	-

TABLE S458: Coplanar SSGs with parent space group $P3_212$ (No. 153).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P153.1.1 GM1	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_g \oplus A1_g \oplus A1_u}$
P153.2.1 GM2	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_g \oplus A2_g \oplus A2_u}$
P153.2.2 A1	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A1_g}$
P153.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_u \oplus A2_g \oplus A2_g}$
P153.3.2 GM2 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
P153.3.3 A1 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
P153.3.4 A1 $\oplus$ A2	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
P153.6.1 GM3	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A2_u \oplus E_g}$
P153.6.2 A3	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
P153.8.1 DT1	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
P153.8.2 P1	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$

TABLE S459: Non-coplanar SSGs with parent space group $P3_212$ (No. 153).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N153.1.1 GM1	$\surd$	3	3	$\surd$	32	$\mathrm{A1 \oplus A1 \oplus A1}$
N153.2.1 GM2	$\surd$	3	3	$\surd$	$3m$	$\mathrm{A1 \oplus A1 \oplus A2}$
N153.2.2 A1	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_g \oplus A1_g \oplus A1_u}$
N153.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	32	$\mathrm{A1 \oplus A2 \oplus A2}$
N153.3.2 GM2 $\oplus$ A1	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_g \oplus A2_g \oplus A2_u}$

Non-coplanar SSGs with parent space group $P3_212$ (No. 153) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N153.3.3 A1 $\oplus$ A1	$\surd$	1	1	$\surd$	32	A1
N153.3.4 A1 $\oplus$ A2	$\surd$	1	1	$\surd$	$3m$	A1
N153.6.1 GM3	$\surd$	3	3	$\surd$	$3m$	A1 $\oplus$ E
N153.6.2 A3	$\surd$	1	1	$\surd$	$3m$	A1
N153.8.1 DT1	$\surd$	1	1	$\surd$	$3m$	A1
N153.8.2 P1	$\surd$	1	1	$\surd$	$3m$	A1
N153.9.1 GM2 $\oplus$ GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$3m$	A2 $\oplus$ A2 $\oplus$ A2
N153.9.2 GM2 $\oplus$ GM2 $\oplus$ A1	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
N153.9.3 GM2 $\oplus$ A1 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
N153.9.4 GM2 $\oplus$ A1 $\oplus$ A2	$\surd$	1	1	$\surd$	32	A2
N153.9.5 A1 $\oplus$ A1 $\oplus$ A1	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A1_u}$
N153.9.6 A1 $\oplus$ A1 $\oplus$ A2	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N153.12.1 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	32	A2 $\oplus$ E
N153.12.2 GM2 $\oplus$ A3	$\surd$	1	1	$\surd$	32	A2
N153.12.3 A1 $\oplus$ GM3	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A2_u} \oplus \mathrm{E_g}$
N153.12.4 A1 $\oplus$ A3	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A2_u} \oplus \mathrm{E_u}$
N153.14.1 GM2 $\oplus$ DT1	$\surd$	1	1	$\surd$	32	A2
N153.14.2 GM2 $\oplus$ P1	$\surd$	1	1	$\surd$	32	A2
N153.14.3 A1 $\oplus$ DT1	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
N153.14.4 A1 $\oplus$ P1	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
N153.16.1 M1	$\times$	-	-	-	-	-
N153.16.2 M2	$\times$	-	-	-	-	-
N153.16.3 L1	$\times$	-	-	-	-	-

TABLE S460: Collinear SSGs with parent space group $P3_221$ (No. 154).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L154.1.1 GM1	1	$\bar{3}m$	$\mathrm{A1_g}$
L154.2.1 GM2	1	$\bar{3}m$	$\mathrm{A2_g}$
L154.2.2 A1	0	-	-

TABLE S461: Coplanar SSGs with parent space group $P3_221$ (No. 154).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P154.1.1 GM1	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A1_u}$
P154.2.1 GM2	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
P154.2.2 A1	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A1_g}$
P154.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
P154.3.2 GM2 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
P154.3.3 A1 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
P154.3.4 A1 $\oplus$ A2	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
P154.4.1 K1KA1	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A1_u}$
P154.4.2 K2KA2	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A1_u}$
P154.4.3 H1HA1	$\surd$	1	1	$\times$	-	-

Coplanar SSGs with parent space group $P3_221$ (No. 154) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P154.6.1 GM3	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A2_u} \oplus \mathrm{E_g}$
P154.6.2 A3	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
P154.8.1 DT1	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$

TABLE S462: Non-coplanar SSGs with parent space group $P3_221$ (No. 154).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N154.1.1 GM1	$\surd$	3	3	$\surd$	32	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{A1}$
N154.2.1 GM2	$\surd$	3	3	$\surd$	$3m$	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{A2}$
N154.2.2 A1	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A1_u}$
N154.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	32	$\mathrm{A1} \oplus \mathrm{A2} \oplus \mathrm{A2}$
N154.3.2 GM2 $\oplus$ A1	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
N154.3.3 A1 $\oplus$ A1	$\surd$	1	1	$\surd$	32	A1
N154.3.4 A1 $\oplus$ A2	$\surd$	1	1	$\surd$	$3m$	A1
N154.4.1 K1KA1	$\surd$	1	1	$\surd$	32	A1
N154.4.2 K2KA2	$\surd$	1	1	$\surd$	32	A1
N154.4.3 H1HA1	$\surd$	1	1	$\surd$	32	A1
N154.6.1 GM3	$\surd$	3	3	$\surd$	$3m$	$\mathrm{A1} \oplus \mathrm{E}$
N154.6.2 A3	$\surd$	1	1	$\surd$	$3m$	A1
N154.8.1 DT1	$\surd$	1	1	$\surd$	$3m$	A1
N154.9.1 GM2 $\oplus$ GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$3m$	$\mathrm{A2} \oplus \mathrm{A2} \oplus \mathrm{A2}$
N154.9.2 GM2 $\oplus$ GM2 $\oplus$ A1	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
N154.9.3 GM2 $\oplus$ A1 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
N154.9.4 GM2 $\oplus$ A1 $\oplus$ A2	$\surd$	1	1	$\surd$	32	A2
N154.9.5 A1 $\oplus$ A1 $\oplus$ A1	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A1_u}$
N154.9.6 A1 $\oplus$ A1 $\oplus$ A2	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N154.10.1 GM2 $\oplus$ K1KA1	$\surd$	1	1	$\surd$	$3m$	A2
N154.10.2 GM2 $\oplus$ K2KA2	$\surd$	1	1	$\surd$	$3m$	A2
N154.10.3 GM2 $\oplus$ H1HA1	$\surd$	1	1	$\times$	-	-
N154.10.4 A1 $\oplus$ K1KA1	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A1_u}$
N154.10.5 A1 $\oplus$ K2KA2	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A1_u}$
N154.10.6 A1 $\oplus$ H1HA1	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A1_u}$
N154.10.7 A1 $\oplus$ H2HA2	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A1_u}$
N154.12.1 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	32	$\mathrm{A2} \oplus \mathrm{E}$
N154.12.2 GM2 $\oplus$ A3	$\surd$	1	1	$\surd$	32	A2
N154.12.3 A1 $\oplus$ GM3	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A2_u} \oplus \mathrm{E_g}$
N154.12.4 A1 $\oplus$ A3	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A2_u} \oplus \mathrm{E_u}$
N154.14.1 GM2 $\oplus$ DT1	$\surd$	1	1	$\surd$	32	A2
N154.14.2 A1 $\oplus$ DT1	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
N154.16.1 M1	$\times$	-	-	-	-	-
N154.16.2 M2	$\times$	-	-	-	-	-
N154.16.3 L1	$\times$	-	-	-	-	-

TABLE S463: Collinear SSGs with parent space group $R32$ (No. 155).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L155.1.1 GM1	1	$\bar{3}m$	$\mathrm{A1_g}$
L155.2.1 GM2	1	$\bar{3}m$	$\mathrm{A2_g}$
L155.2.2 T1	0	-	-

TABLE S464: Coplanar SSGs with parent space group $R32$ (No. 155).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P155.1.1 GM1	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A1_u}$
P155.2.1 GM2	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
P155.2.2 T1	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A1_g}$
P155.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
P155.3.2 GM2 $\oplus$ T1	$\surd$	1	1	$\times$	-	-
P155.3.3 T1 $\oplus$ T1	$\surd$	1	1	$\times$	-	-
P155.3.4 T1 $\oplus$ T2	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
P155.6.1 GM3	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A2_u} \oplus \mathrm{E_g}$
P155.6.2 T3	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
P155.8.1 LD1	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
P155.8.2 LD2	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$

TABLE S465: Non-coplanar SSGs with parent space group $R32$ (No. 155).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N155.1.1 GM1	$\surd$	3	3	$\surd$	32	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{A1}$
N155.2.1 GM2	$\surd$	3	3	$\surd$	$3m$	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{A2}$
N155.2.2 T1	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A1_u}$
N155.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	32	$\mathrm{A1} \oplus \mathrm{A2} \oplus \mathrm{A2}$
N155.3.2 GM2 $\oplus$ T1	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
N155.3.3 T1 $\oplus$ T1	$\surd$	1	1	$\surd$	32	A1
N155.3.4 T1 $\oplus$ T2	$\surd$	1	1	$\surd$	$3m$	A1
N155.6.1 GM3	$\surd$	3	3	$\surd$	$3m$	$\mathrm{A1} \oplus \mathrm{E}$
N155.6.2 T3	$\surd$	1	1	$\surd$	$3m$	A1
N155.8.1 LD1	$\surd$	1	1	$\surd$	$3m$	A1
N155.8.2 LD2	$\surd$	1	1	$\surd$	$3m$	A1
N155.9.1 GM2 $\oplus$ GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$3m$	$\mathrm{A2} \oplus \mathrm{A2} \oplus \mathrm{A2}$
N155.9.2 GM2 $\oplus$ GM2 $\oplus$ T1	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
N155.9.3 GM2 $\oplus$ T1 $\oplus$ T1	$\surd$	1	1	$\times$	-	-
N155.9.4 GM2 $\oplus$ T1 $\oplus$ T2	$\surd$	1	1	$\surd$	32	A2
N155.9.5 T1 $\oplus$ T1 $\oplus$ T1	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A1_u}$
N155.9.6 T1 $\oplus$ T1 $\oplus$ T2	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N155.12.1 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	32	$\mathrm{A2} \oplus \mathrm{E}$
N155.12.2 GM2 $\oplus$ T3	$\surd$	1	1	$\surd$	32	A2
N155.12.3 T1 $\oplus$ GM3	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A2_u} \oplus \mathrm{E_g}$
N155.12.4 T1 $\oplus$ T3	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A2_u} \oplus \mathrm{E_u}$
N155.14.1 GM2 $\oplus$ LD1	$\surd$	1	1	$\surd$	32	A2
N155.14.2 GM2 $\oplus$ LD2	$\surd$	1	1	$\surd$	32	A2

Non-coplanar SSGs with parent space group $R32$ (No. 155) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N155.14.3 T1 $\oplus$ LD1	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
N155.14.4 T1 $\oplus$ LD2	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
N155.16.1 L1	$\times$	-	-	-	-	-
N155.16.2 F1	$\times$	-	-	-	-	-
N155.16.3 F2	$\times$	-	-	-	-	-

TABLE S466: Collinear SSGs with parent space group $P3m1$ (No. 156).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L156.1.1 GM1	1	$\bar{3}m$	$\mathrm{A1_g}$
L156.2.1 GM2	1	$\bar{3}m$	$\mathrm{A2_g}$
L156.2.2 A1	0	-	-
L156.2.3 A2	0	-	-

TABLE S467: Coplanar SSGs with parent space group $P3m1$ (No. 156).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P156.1.1 GM1	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A2_u}$
P156.2.1 GM2	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{A2_g}$
P156.2.2 A1	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A1_g}$
P156.2.3 A2	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A1_g}$
P156.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
P156.3.2 GM2 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
P156.3.3 GM2 $\oplus$ A2	$\surd$	1	1	$\times$	-	-
P156.3.4 A1 $\oplus$ A1	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
P156.3.5 A1 $\oplus$ A2	$\surd$	1	1	$\times$	-	-
P156.3.6 A2 $\oplus$ A2	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
P156.5.1 DT1DU1	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
P156.5.2 DT2DU2	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
P156.6.1 GM3	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{E_g}$
P156.6.2 A3	$\surd$	1	1	$\times$	-	-
P156.7.1 K1	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A1_u}$
P156.7.2 H1	$\surd$	1	1	$\times$	-	-

TABLE S468: Non-coplanar SSGs with parent space group $P3m1$ (No. 156).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N156.1.1 GM1	$\surd$	3	3	$\surd$	$3m$	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{A1}$
N156.2.1 GM2	$\surd$	3	3	$\surd$	32	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{A2}$
N156.2.2 A1	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A2_u}$
N156.2.3 A2	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A2_u}$
N156.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$3m$	$\mathrm{A1} \oplus \mathrm{A2} \oplus \mathrm{A2}$
N156.3.2 GM2 $\oplus$ A1	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{A2_g}$
N156.3.3 GM2 $\oplus$ A2	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{A2_g}$

Non-coplanar SSGs with parent space group $P3m1$ (No. 156) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N156.3.4 A1 ⊕ A1	√	1	1	√	$3m$	A1
N156.3.5 A1 ⊕ A2	√	1	1	√	32	A1
N156.3.6 A2 ⊕ A2	√	1	1	√	$3m$	A1
N156.5.1 DT1DU1	√	1	1	√	$3m$	A1
N156.5.2 DT2DU2	√	1	1	√	$3m$	A1
N156.6.1 GM3	√	3	3	√	32	A1 ⊕ E
N156.6.2 A3	√	1	1	√	32	A1
N156.7.1 K1	√	1	1	√	32	A1
N156.7.2 H1	√	1	1	√	32	A1
N156.9.1 GM2 ⊕ GM2 ⊕ GM2	√	3	3	√	32	A2 ⊕ A2 ⊕ A2
N156.9.2 GM2 ⊕ GM2 ⊕ A1	√	3	3	√	$\bar{3}m$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
N156.9.3 GM2 ⊕ GM2 ⊕ A2	√	3	3	√	$\bar{3}m$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
N156.9.4 GM2 ⊕ A1 ⊕ A1	√	1	1	√	32	A2
N156.9.5 GM2 ⊕ A1 ⊕ A2	√	1	1	×	-	-
N156.9.6 GM2 ⊕ A2 ⊕ A2	√	1	1	√	32	A2
N156.9.7 A1 ⊕ A1 ⊕ A1	√	3	3	√	$\bar{3}m$	$\mathrm{A2_u} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N156.9.8 A1 ⊕ A1 ⊕ A2	√	3	3	√	$\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A2_u}$
N156.9.9 A1 ⊕ A2 ⊕ A2	√	3	3	√	$\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A2_u}$
N156.9.10 A2 ⊕ A2 ⊕ A2	√	3	3	√	$\bar{3}m$	$\mathrm{A2_u} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N156.11.1 GM2 ⊕ DT1DU1	√	1	1	√	32	A2
N156.11.2 GM2 ⊕ DT2DU2	√	1	1	√	32	A2
N156.11.3 A1 ⊕ DT1DU1	√	1	1	√	$\bar{3}m$	$\mathrm{A2_u}$
N156.11.4 A1 ⊕ DT2DU2	√	1	1	√	$\bar{3}m$	$\mathrm{A2_u}$
N156.11.5 A2 ⊕ DT1DU1	√	1	1	√	$\bar{3}m$	$\mathrm{A2_u}$
N156.11.6 A2 ⊕ DT2DU2	√	1	1	√	$\bar{3}m$	$\mathrm{A2_u}$
N156.12.1 GM2 ⊕ GM3	√	3	3	√	$3m$	A2 ⊕ E
N156.12.2 GM2 ⊕ A3	√	1	1	×	-	-
N156.12.3 A1 ⊕ GM3	√	3	3	√	$\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{E_g}$
N156.12.4 A1 ⊕ A3	√	3	3	√	$\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{E_u}$
N156.12.5 A2 ⊕ GM3	√	3	3	√	$\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{E_g}$
N156.12.6 A2 ⊕ A3	√	3	3	√	$\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{E_u}$
N156.13.1 GM2 ⊕ K1	√	1	1	√	$3m$	A2
N156.13.2 GM2 ⊕ H1	√	1	1	×	-	-
N156.13.3 A1 ⊕ K1	√	1	1	√	$\bar{3}m$	$\mathrm{A1_u}$
N156.13.4 A1 ⊕ H1	√	1	1	√	$\bar{3}m$	$\mathrm{A1_u}$
N156.13.5 A2 ⊕ K1	√	1	1	√	$\bar{3}m$	$\mathrm{A1_u}$
N156.13.6 A2 ⊕ H1	√	1	1	√	$\bar{3}m$	$\mathrm{A1_u}$
N156.16.1 M1	×	-	-	-	-	-
N156.16.2 M2	×	-	-	-	-	-
N156.16.3 L1	×	-	-	-	-	-
N156.16.4 L2	×	-	-	-	-	-

TABLE S469: Collinear SSGs with parent space group $P31m$ (No. 157).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L157.1.1 GM1	1	$\bar{3}m$	$\mathrm{A1_g}$

Collinear SSGs with parent space group $P31m$ (No. 157)(continued)

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L157.2.1 GM2	1	$\bar{3}m$	$\mathrm{A2_g}$
L157.2.2 A1	0	-	-
L157.2.3 A2	0	-	-

TABLE S470: Coplanar SSGs with parent space group $P31m$ (No. 157).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P157.1.1 GM1	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A2_u}$
P157.2.1 GM2	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{A2_g}$
P157.2.2 A1	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A1_g}$
P157.2.3 A2	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A1_g}$
P157.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
P157.3.2 GM2 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
P157.3.3 GM2 $\oplus$ A2	$\surd$	1	1	$\times$	-	-
P157.3.4 A1 $\oplus$ A1	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
P157.3.5 A1 $\oplus$ A2	$\surd$	1	1	$\times$	-	-
P157.3.6 A2 $\oplus$ A2	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
P157.5.1 DT1DU1	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
P157.5.2 DT2DU2	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
P157.5.3 P1PC1	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
P157.5.4 P2PC2	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
P157.6.1 GM3	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{E_g}$
P157.6.2 A3	$\surd$	1	1	$\times$	-	-

TABLE S471: Non-coplanar SSGs with parent space group $P31m$ (No. 157).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N157.1.1 GM1	$\surd$	3	3	$\surd$	$3m$	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{A1}$
N157.2.1 GM2	$\surd$	3	3	$\surd$	32	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{A2}$
N157.2.2 A1	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A2_u}$
N157.2.3 A2	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A2_u}$
N157.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$3m$	$\mathrm{A1} \oplus \mathrm{A2} \oplus \mathrm{A2}$
N157.3.2 GM2 $\oplus$ A1	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{A2_g}$
N157.3.3 GM2 $\oplus$ A2	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{A2_g}$
N157.3.4 A1 $\oplus$ A1	$\surd$	1	1	$\surd$	$3m$	A1
N157.3.5 A1 $\oplus$ A2	$\surd$	1	1	$\surd$	32	A1
N157.3.6 A2 $\oplus$ A2	$\surd$	1	1	$\surd$	$3m$	A1
N157.5.1 DT1DU1	$\surd$	1	1	$\surd$	$3m$	A1
N157.5.2 DT2DU2	$\surd$	1	1	$\surd$	$3m$	A1
N157.5.3 P1PC1	$\surd$	1	1	$\surd$	$3m$	A1
N157.5.4 P2PC2	$\surd$	1	1	$\surd$	$3m$	A1
N157.6.1 GM3	$\surd$	3	3	$\surd$	32	$\mathrm{A1} \oplus \mathrm{E}$
N157.6.2 A3	$\surd$	1	1	$\surd$	32	A1
N157.9.1 GM2 $\oplus$ GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	32	$\mathrm{A2} \oplus \mathrm{A2} \oplus \mathrm{A2}$
N157.9.2 GM2 $\oplus$ GM2 $\oplus$ A1	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$

Non-coplanar SSGs with parent space group $P31m$ (No. 157) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N157.9.3 GM2 $\oplus$ GM2 $\oplus$ A2	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
N157.9.4 GM2 $\oplus$ A1 $\oplus$ A1	$\surd$	1	1	$\surd$	32	A2
N157.9.5 GM2 $\oplus$ A1 $\oplus$ A2	$\surd$	1	1	$\times$	-	-
N157.9.6 GM2 $\oplus$ A2 $\oplus$ A2	$\surd$	1	1	$\surd$	32	A2
N157.9.7 A1 $\oplus$ A1 $\oplus$ A1	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A2_u} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N157.9.8 A1 $\oplus$ A1 $\oplus$ A2	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A2_u}$
N157.9.9 A1 $\oplus$ A2 $\oplus$ A2	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A2_u}$
N157.9.10 A2 $\oplus$ A2 $\oplus$ A2	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A2_u} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N157.11.1 GM2 $\oplus$ DT1DU1	$\surd$	1	1	$\surd$	32	A2
N157.11.2 GM2 $\oplus$ DT2DU2	$\surd$	1	1	$\surd$	32	A2
N157.11.3 GM2 $\oplus$ P1PC1	$\surd$	1	1	$\surd$	32	A2
N157.11.4 GM2 $\oplus$ P2PC2	$\surd$	1	1	$\surd$	32	A2
N157.11.5 A1 $\oplus$ DT1DU1	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
N157.11.6 A1 $\oplus$ DT2DU2	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
N157.11.7 A1 $\oplus$ P1PC1	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
N157.11.8 A1 $\oplus$ P2PC2	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
N157.11.9 A2 $\oplus$ DT1DU1	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
N157.11.10 A2 $\oplus$ DT2DU2	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
N157.11.11 A2 $\oplus$ P1PC1	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
N157.11.12 A2 $\oplus$ P2PC2	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
N157.12.1 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$3m$	$\mathrm{A2} \oplus \mathrm{E}$
N157.12.2 GM2 $\oplus$ A3	$\surd$	1	1	$\times$	-	-
N157.12.3 A1 $\oplus$ GM3	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{E_g}$
N157.12.4 A1 $\oplus$ A3	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{E_u}$
N157.12.5 A2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{E_g}$
N157.12.6 A2 $\oplus$ A3	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{E_u}$
N157.16.1 M1	$\times$	-	-	-	-	-
N157.16.2 M2	$\times$	-	-	-	-	-
N157.16.3 L1	$\times$	-	-	-	-	-
N157.16.4 L2	$\times$	-	-	-	-	-

TABLE S472: Collinear SSGs with parent space group $P3c1$ (No. 158).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L158.1.1 GM1	1	$\bar{3}m$	$\mathrm{A1_g}$
L158.2.1 GM2	1	$\bar{3}m$	$\mathrm{A2_g}$

TABLE S473: Coplanar SSGs with parent space group $P3c1$ (No. 158).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P158.1.1 GM1	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A2_u}$
P158.2.1 GM2	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{A2_g}$
P158.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
P158.4.1 A1A2	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
P158.5.1 DT1DU1	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$

Coplanar SSGs with parent space group $P3c1$ (No. 158) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P158.6.1 GM3	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{E_g}$
P158.7.1 K1	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A1_u}$

TABLE S474: Non-coplanar SSGs with parent space group $P3c1$ (No. 158).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N158.1.1 GM1	$\surd$	3	3	$\surd$	$3m$	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{A1}$
N158.2.1 GM2	$\surd$	3	3	$\surd$	32	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{A2}$
N158.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$3m$	$\mathrm{A1} \oplus \mathrm{A2} \oplus \mathrm{A2}$
N158.4.1 A1A2	$\surd$	1	1	$\surd$	$3m$	A1
N158.5.1 DT1DU1	$\surd$	1	1	$\surd$	$3m$	A1
N158.6.1 GM3	$\surd$	3	3	$\surd$	32	$\mathrm{A1} \oplus \mathrm{E}$
N158.7.1 K1	$\surd$	1	1	$\surd$	32	A1
N158.9.1 GM2 $\oplus$ GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	32	$\mathrm{A2} \oplus \mathrm{A2} \oplus \mathrm{A2}$
N158.10.1 GM2 $\oplus$ A1A2	$\surd$	1	1	$\surd$	32	A2
N158.11.1 GM2 $\oplus$ DT1DU1	$\surd$	1	1	$\surd$	32	A2
N158.12.1 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$3m$	$\mathrm{A2} \oplus \mathrm{E}$
N158.13.1 GM2 $\oplus$ K1	$\surd$	1	1	$\surd$	$3m$	A2
N158.16.1 M1	$\times$	-	-	-	-	-
N158.16.2 M2	$\times$	-	-	-	-	-

TABLE S475: Collinear SSGs with parent space group $P31c$ (No. 159).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L159.1.1 GM1	1	$\bar{3}m$	$\mathrm{A1_g}$
L159.2.1 GM2	1	$\bar{3}m$	$\mathrm{A2_g}$

TABLE S476: Coplanar SSGs with parent space group $P31c$ (No. 159).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P159.1.1 GM1	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A2_u}$
P159.2.1 GM2	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{A2_g}$
P159.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
P159.4.1 A1A2	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
P159.5.1 DT1DU1	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
P159.5.2 P1PC1	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
P159.6.1 GM3	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{E_g}$

TABLE S477: Non-coplanar SSGs with parent space group $P31c$ (No. 159).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N159.1.1 GM1	$\surd$	3	3	$\surd$	$3m$	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{A1}$
N159.2.1 GM2	$\surd$	3	3	$\surd$	32	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{A2}$

Non-coplanar SSGs with parent space group $P31c$ (No. 159) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N159.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$3m$	A1 $\oplus$ A2 $\oplus$ A2
N159.4.1 A1A2	$\surd$	1	1	$\surd$	$3m$	A1
N159.5.1 DT1DU1	$\surd$	1	1	$\surd$	$3m$	A1
N159.5.2 P1PC1	$\surd$	1	1	$\surd$	$3m$	A1
N159.6.1 GM3	$\surd$	3	3	$\surd$	32	A1 $\oplus$ E
N159.9.1 GM2 $\oplus$ GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	32	A2 $\oplus$ A2 $\oplus$ A2
N159.10.1 GM2 $\oplus$ A1A2	$\surd$	1	1	$\surd$	32	A2
N159.11.1 GM2 $\oplus$ DT1DU1	$\surd$	1	1	$\surd$	32	A2
N159.11.2 GM2 $\oplus$ P1PC1	$\surd$	1	1	$\surd$	32	A2
N159.12.1 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$3m$	A2 $\oplus$ E
N159.16.1 M1	$\times$	-	-	-	-	-
N159.16.2 M2	$\times$	-	-	-	-	-

TABLE S478: Collinear SSGs with parent space group $R3m$ (No. 160).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L160.1.1 GM1	1	$\bar{3}m$	$\mathrm{A1_g}$
L160.2.1 GM2	1	$\bar{3}m$	$\mathrm{A2_g}$
L160.2.2 T1	0	-	-
L160.2.3 T2	0	-	-

TABLE S479: Coplanar SSGs with parent space group $R3m$ (No. 160).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P160.1.1 GM1	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A2_u}$
P160.2.1 GM2	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{A2_g}$
P160.2.2 T1	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A1_g}$
P160.2.3 T2	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A1_g}$
P160.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
P160.3.2 GM2 $\oplus$ T1	$\surd$	1	1	$\times$	-	-
P160.3.3 GM2 $\oplus$ T2	$\surd$	1	1	$\times$	-	-
P160.3.4 T1 $\oplus$ T1	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
P160.3.5 T1 $\oplus$ T2	$\surd$	1	1	$\times$	-	-
P160.3.6 T2 $\oplus$ T2	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
P160.5.1 LD1LE1	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
P160.5.2 LD2LE2	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
P160.6.1 GM3	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{E_g}$
P160.6.2 T3	$\surd$	1	1	$\times$	-	-

TABLE S480: Non-coplanar SSGs with parent space group $R3m$ (No. 160).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N160.1.1 GM1	$\surd$	3	3	$\surd$	$3m$	A1 $\oplus$ A1 $\oplus$ A1

Non-coplanar SSGs with parent space group $R3m$ (No. 160) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N160.2.1 GM2	$\surd$	3	3	$\surd$	32	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{A2}$
N160.2.2 T1	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A2_u}$
N160.2.3 T2	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A2_u}$
N160.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$3m$	$\mathrm{A1}\oplus\mathrm{A2}\oplus\mathrm{A2}$
N160.3.2 GM2 $\oplus$ T1	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{A2_g}$
N160.3.3 GM2 $\oplus$ T2	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{A2_g}$
N160.3.4 T1 $\oplus$ T1	$\surd$	1	1	$\surd$	$3m$	A1
N160.3.5 T1 $\oplus$ T2	$\surd$	1	1	$\surd$	32	A1
N160.3.6 T2 $\oplus$ T2	$\surd$	1	1	$\surd$	$3m$	A1
N160.5.1 LD1LE1	$\surd$	1	1	$\surd$	$3m$	A1
N160.5.2 LD2LE2	$\surd$	1	1	$\surd$	$3m$	A1
N160.6.1 GM3	$\surd$	3	3	$\surd$	32	$\mathrm{A1}\oplus\mathrm{E}$
N160.6.2 T3	$\surd$	1	1	$\surd$	32	A1
N160.9.1 GM2 $\oplus$ GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	32	$\mathrm{A2}\oplus\mathrm{A2}\oplus\mathrm{A2}$
N160.9.2 GM2 $\oplus$ GM2 $\oplus$ T1	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A2_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_u}$
N160.9.3 GM2 $\oplus$ GM2 $\oplus$ T2	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A2_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_u}$
N160.9.4 GM2 $\oplus$ T1 $\oplus$ T1	$\surd$	1	1	$\surd$	32	A2
N160.9.5 GM2 $\oplus$ T1 $\oplus$ T2	$\surd$	1	1	$\times$	-	-
N160.9.6 GM2 $\oplus$ T2 $\oplus$ T2	$\surd$	1	1	$\surd$	32	A2
N160.9.7 T1 $\oplus$ T1 $\oplus$ T1	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A2_u}\oplus\mathrm{A2_u}\oplus\mathrm{A2_u}$
N160.9.8 T1 $\oplus$ T1 $\oplus$ T2	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_u}\oplus\mathrm{A1_u}\oplus\mathrm{A2_u}$
N160.9.9 T1 $\oplus$ T2 $\oplus$ T2	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_u}\oplus\mathrm{A1_u}\oplus\mathrm{A2_u}$
N160.9.10 T2 $\oplus$ T2 $\oplus$ T2	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A2_u}\oplus\mathrm{A2_u}\oplus\mathrm{A2_u}$
N160.11.1 GM2 $\oplus$ LD1LE1	$\surd$	1	1	$\surd$	32	A2
N160.11.2 GM2 $\oplus$ LD2LE2	$\surd$	1	1	$\surd$	32	A2
N160.11.3 T1 $\oplus$ LD1LE1	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
N160.11.4 T1 $\oplus$ LD2LE2	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
N160.11.5 T2 $\oplus$ LD1LE1	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
N160.11.6 T2 $\oplus$ LD2LE2	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
N160.12.1 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$3m$	$\mathrm{A2}\oplus\mathrm{E}$
N160.12.2 GM2 $\oplus$ T3	$\surd$	1	1	$\times$	-	-
N160.12.3 T1 $\oplus$ GM3	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_u}\oplus\mathrm{E_g}$
N160.12.4 T1 $\oplus$ T3	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_u}\oplus\mathrm{E_u}$
N160.12.5 T2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_u}\oplus\mathrm{E_g}$
N160.12.6 T2 $\oplus$ T3	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_u}\oplus\mathrm{E_u}$
N160.16.1 L1	$\times$	-	-	-	-	-
N160.16.2 L2	$\times$	-	-	-	-	-
N160.16.3 F1	$\times$	-	-	-	-	-
N160.16.4 F2	$\times$	-	-	-	-	-

TABLE S481: Collinear SSGs with parent space group $R3c$ (No. 161).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L161.1.1 GM1	1	$\bar{3}m$	$\mathrm{A1_g}$
L161.2.1 GM2	1	$\bar{3}m$	$\mathrm{A2_g}$

TABLE S482: Coplanar SSGs with parent space group $R3c$ (No. 161).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P161.1.1 GM1	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A2_u}$
P161.2.1 GM2	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{A2_g}$
P161.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
P161.4.1 T1T2	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
P161.5.1 LD1LE1	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
P161.6.1 GM3	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{E_g}$

TABLE S483: Non-coplanar SSGs with parent space group $R3c$ (No. 161).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N161.1.1 GM1	$\surd$	3	3	$\surd$	$3m$	A1 $\oplus$ A1 $\oplus$ A1
N161.2.1 GM2	$\surd$	3	3	$\surd$	32	A1 $\oplus$ A1 $\oplus$ A2
N161.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$3m$	A1 $\oplus$ A2 $\oplus$ A2
N161.4.1 T1T2	$\surd$	1	1	$\surd$	$3m$	A1
N161.5.1 LD1LE1	$\surd$	1	1	$\surd$	$3m$	A1
N161.6.1 GM3	$\surd$	3	3	$\surd$	32	A1 $\oplus$ E
N161.9.1 GM2 $\oplus$ GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	32	A2 $\oplus$ A2 $\oplus$ A2
N161.10.1 GM2 $\oplus$ T1T2	$\surd$	1	1	$\surd$	32	A2
N161.11.1 GM2 $\oplus$ LD1LE1	$\surd$	1	1	$\surd$	32	A2
N161.12.1 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$3m$	A2 $\oplus$ E
N161.16.1 F1	$\times$	-	-	-	-	-
N161.16.2 F2	$\times$	-	-	-	-	-

TABLE S484: Collinear SSGs with parent space group $P\bar{3}1m$ (No. 162).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L162.1.1 $\mathrm{GM1^+}$	1	$\bar{3}m$	$\mathrm{A1_g}$
L162.2.1 $\mathrm{GM1^-}$	0	-	-
L162.2.2 $\mathrm{GM2^+}$	1	$\bar{3}m$	$\mathrm{A2_g}$
L162.2.3 $\mathrm{GM2^-}$	0	-	-
L162.2.4 $\mathrm{A1^+}$	0	-	-
L162.2.5 $\mathrm{A1^-}$	0	-	-

TABLE S485: Coplanar SSGs with parent space group $P\bar{3}1m$ (No. 162).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P162.1.1 $\mathrm{GM1^+}$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A1_g}$
P162.2.1 $\mathrm{GM1^-}$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A1_u}$
P162.2.2 $\mathrm{GM2^+}$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A2_g}$
P162.2.3 $\mathrm{GM2^-}$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A2_u}$
P162.2.4 $\mathrm{A1^+}$	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A1_g}$
P162.2.5 $\mathrm{A1^-}$	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A1_g}$

Coplanar SSGs with parent space group $P\bar{3}1m$ (No. 162) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P162.3.1 $\mathrm{GM1}^- \oplus \mathrm{GM1}^-$	$\surd$	0	0	$\surd$	-	-
P162.3.2 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{A2_g} \oplus \mathrm{A2_u}$
P162.3.3 $\mathrm{GM1}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
P162.3.4 $\mathrm{GM1}^- \oplus \mathrm{A1}^+$	$\surd$	1	1	$\times$	-	-
P162.3.5 $\mathrm{GM1}^- \oplus \mathrm{A1}^-$	$\surd$	1	1	$\times$	-	-
P162.3.6 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{A2_g} \oplus \mathrm{A2_g}$
P162.3.7 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{A2_g}$
P162.3.8 $\mathrm{GM2}^+ \oplus \mathrm{A1}^+$	$\surd$	1	0	$\times$	-	-
P162.3.9 $\mathrm{GM2}^+ \oplus \mathrm{A1}^-$	$\surd$	1	0	$\times$	-	-
P162.3.10 $\mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
P162.3.11 $\mathrm{GM2}^- \oplus \mathrm{A1}^+$	$\surd$	1	1	$\times$	-	-
P162.3.12 $\mathrm{GM2}^- \oplus \mathrm{A1}^-$	$\surd$	1	1	$\times$	-	-
P162.3.13 $\mathrm{A1}^+ \oplus \mathrm{A1}^+$	$\surd$	1	0	$\times$	-	-
P162.3.14 $\mathrm{A1}^+ \oplus \mathrm{A2}^-$	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
P162.3.15 $\mathrm{A1}^+ \oplus \mathrm{A1}^-$	$\surd$	1	1	$\times$	-	-
P162.3.16 $\mathrm{A1}^+ \oplus \mathrm{A2}^+$	$\surd$	1	0	$\times$	-	-
P162.3.17 $\mathrm{A1}^- \oplus \mathrm{A1}^-$	$\surd$	1	0	$\times$	-	-
P162.3.18 $\mathrm{A1}^- \oplus \mathrm{A2}^+$	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
P162.6.1 $\mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{E_g}$
P162.6.2 $\mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
P162.6.3 $\mathrm{A3}^+$	$\surd$	1	0	$\times$	-	-
P162.8.1 DT1	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
P162.8.2 DT2	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
P162.8.3 P1	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
P162.8.4 P2	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$

TABLE S486: Non-coplanar SSGs with parent space group $P\bar{3}1m$ (No. 162).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N162.1.1 $\mathrm{GM1}^+$	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A1_g}$
N162.2.1 $\mathrm{GM1}^-$	$\surd$	2	2	$\surd$	32	$\mathrm{A1} \oplus \mathrm{A1}$
N162.2.2 $\mathrm{GM2}^+$	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A2_g}$
N162.2.3 $\mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$3m$	$\mathrm{A1} \oplus \mathrm{A1}$
N162.2.4 $\mathrm{A1}^+$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A1_g}$
N162.2.5 $\mathrm{A1}^-$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A1_g}$
N162.3.1 $\mathrm{GM1}^- \oplus \mathrm{GM1}^-$	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{A1_u}$
N162.3.2 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$3m$	$\mathrm{A1} \oplus \mathrm{A2}$
N162.3.3 $\mathrm{GM1}^- \oplus \mathrm{GM2}^-$	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{A2_u}$
N162.3.4 $\mathrm{GM1}^- \oplus \mathrm{A1}^+$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A1_u}$
N162.3.5 $\mathrm{GM1}^- \oplus \mathrm{A1}^-$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A1_u}$
N162.3.6 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
N162.3.7 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	2	2	$\surd$	32	$\mathrm{A1} \oplus \mathrm{A2}$
N162.3.8 $\mathrm{GM2}^+ \oplus \mathrm{A1}^+$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A2_g}$
N162.3.9 $\mathrm{GM2}^+ \oplus \mathrm{A1}^-$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A2_g}$
N162.3.10 $\mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N162.3.11 $\mathrm{GM2}^- \oplus \mathrm{A1}^+$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A2_u}$

Non-coplanar SSGs with parent space group $P\bar{3}1m$ (No. 162) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N162.3.12 $\mathrm{GM2}^{-} \oplus \mathrm{A1}^{-}$	√	2	2	√	$\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A2_u}$
N162.3.13 $\mathrm{A1}^{+} \oplus \mathrm{A1}^{+}$	√	1	1	√	$\bar{3}m$	$\mathrm{A1_g}$
N162.3.14 $\mathrm{A1}^{+} \oplus \mathrm{A2}^{-}$	√	1	1	√	$3m$	A1
N162.3.15 $\mathrm{A1}^{+} \oplus \mathrm{A1}^{-}$	√	1	1	√	32	A1
N162.3.16 $\mathrm{A1}^{+} \oplus \mathrm{A2}^{+}$	√	1	1	√	$\bar{3}m$	$\mathrm{A1_g}$
N162.3.17 $\mathrm{A1}^{-} \oplus \mathrm{A1}^{-}$	√	1	1	√	$\bar{3}m$	$\mathrm{A1_g}$
N162.3.18 $\mathrm{A1}^{-} \oplus \mathrm{A2}^{+}$	√	1	1	√	$3m$	A1
N162.6.1 $\mathrm{GM3}^{+}$	√	3	3	√	$\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{E_g}$
N162.6.2 $\mathrm{GM3}^{-}$	√	3	3	√	$\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{E_u}$
N162.6.3 $\mathrm{A3}^{+}$	√	1	1	√	$\bar{3}m$	$\mathrm{A1_g}$
N162.8.1 DT1	√	1	1	√	$3m$	A1
N162.8.2 DT2	√	1	1	√	$3m$	A1
N162.8.3 P1	√	1	1	√	$3m$	A1
N162.8.4 P2	√	1	1	√	$3m$	A1
N162.9.1 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-}$	√	0	0	√	-	-
N162.9.2 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-} \oplus \mathrm{GM2}^{+}$	√	3	3	√	$\bar{3}m$	$\mathrm{A2_g} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N162.9.3 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-} \oplus \mathrm{GM2}^{-}$	√	0	0	√	-	-
N162.9.4 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-} \oplus \mathrm{A1}^{+}$	√	0	0	√	-	-
N162.9.5 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-} \oplus \mathrm{A1}^{-}$	√	0	0	√	-	-
N162.9.6 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{+} \oplus \mathrm{GM2}^{+}$	√	2	2	√	32	$\mathrm{A2} \oplus \mathrm{A2}$
N162.9.7 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{+} \oplus \mathrm{GM2}^{-}$	√	3	3	√	$\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
N162.9.8 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{+} \oplus \mathrm{A1}^{+}$	√	2	2	√	$\bar{3}m$	$\mathrm{A2_g} \oplus \mathrm{A2_u}$
N162.9.9 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{+} \oplus \mathrm{A1}^{-}$	√	2	2	√	$\bar{3}m$	$\mathrm{A2_g} \oplus \mathrm{A2_u}$
N162.9.10 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{-} \oplus \mathrm{GM2}^{-}$	√	0	0	√	-	-
N162.9.11 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{-} \oplus \mathrm{A1}^{+}$	√	0	0	√	-	-
N162.9.12 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{-} \oplus \mathrm{A1}^{-}$	√	0	0	√	-	-
N162.9.13 $\mathrm{GM1}^{-} \oplus \mathrm{A1}^{+} \oplus \mathrm{A1}^{+}$	√	1	0	×	-	-
N162.9.14 $\mathrm{GM1}^{-} \oplus \mathrm{A1}^{+} \oplus \mathrm{A2}^{-}$	√	1	1	√	$\bar{3}m$	$\mathrm{A2_u}$
N162.9.15 $\mathrm{GM1}^{-} \oplus \mathrm{A1}^{+} \oplus \mathrm{A1}^{-}$	√	1	1	×	-	-
N162.9.16 $\mathrm{GM1}^{-} \oplus \mathrm{A1}^{+} \oplus \mathrm{A2}^{+}$	√	1	0	×	-	-
N162.9.17 $\mathrm{GM1}^{-} \oplus \mathrm{A1}^{-} \oplus \mathrm{A1}^{-}$	√	1	0	×	-	-
N162.9.18 $\mathrm{GM1}^{-} \oplus \mathrm{A1}^{-} \oplus \mathrm{A2}^{+}$	√	1	1	√	$\bar{3}m$	$\mathrm{A2_u}$
N162.9.19 $\mathrm{GM2}^{+} \oplus \mathrm{GM2}^{+} \oplus \mathrm{GM2}^{+}$	√	3	3	√	$\bar{3}m$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
N162.9.20 $\mathrm{GM2}^{+} \oplus \mathrm{GM2}^{+} \oplus \mathrm{GM2}^{-}$	√	2	2	√	$3m$	$\mathrm{A2} \oplus \mathrm{A2}$
N162.9.21 $\mathrm{GM2}^{+} \oplus \mathrm{GM2}^{+} \oplus \mathrm{A1}^{+}$	√	2	2	√	$\bar{3}m$	$\mathrm{A2_g} \oplus \mathrm{A2_g}$
N162.9.22 $\mathrm{GM2}^{+} \oplus \mathrm{GM2}^{+} \oplus \mathrm{A1}^{-}$	√	2	2	√	$\bar{3}m$	$\mathrm{A2_g} \oplus \mathrm{A2_g}$
N162.9.23 $\mathrm{GM2}^{+} \oplus \mathrm{GM2}^{-} \oplus \mathrm{GM2}^{-}$	√	3	3	√	$\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A2_g}$
N162.9.24 $\mathrm{GM2}^{+} \oplus \mathrm{GM2}^{-} \oplus \mathrm{A1}^{+}$	√	2	2	√	$\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{A2_g}$
N162.9.25 $\mathrm{GM2}^{+} \oplus \mathrm{GM2}^{-} \oplus \mathrm{A1}^{-}$	√	2	2	√	$\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{A2_g}$
N162.9.26 $\mathrm{GM2}^{+} \oplus \mathrm{A1}^{+} \oplus \mathrm{A1}^{+}$	√	1	1	×	-	-
N162.9.27 $\mathrm{GM2}^{+} \oplus \mathrm{A1}^{+} \oplus \mathrm{A2}^{-}$	√	1	1	√	32	A2
N162.9.28 $\mathrm{GM2}^{+} \oplus \mathrm{A1}^{+} \oplus \mathrm{A1}^{-}$	√	1	1	×	-	-
N162.9.29 $\mathrm{GM2}^{+} \oplus \mathrm{A1}^{+} \oplus \mathrm{A2}^{+}$	√	1	1	×	-	-
N162.9.30 $\mathrm{GM2}^{+} \oplus \mathrm{A1}^{-} \oplus \mathrm{A1}^{-}$	√	1	1	×	-	-
N162.9.31 $\mathrm{GM2}^{+} \oplus \mathrm{A1}^{-} \oplus \mathrm{A2}^{+}$	√	1	1	√	32	A2
N162.9.32 $\mathrm{GM2}^{-} \oplus \mathrm{GM2}^{-} \oplus \mathrm{GM2}^{-}$	√	0	0	√	-	-

Non-coplanar SSGs with parent space group $P\bar{3}1m$ (No. 162) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N162.9.33 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{A1}^+$	$\surd$	0	0	$\surd$	-	-
N162.9.34 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{A1}^-$	$\surd$	0	0	$\surd$	-	-
N162.9.35 $\mathrm{GM2}^- \oplus \mathrm{A1}^+ \oplus \mathrm{A1}^+$	$\surd$	1	0	$\times$	-	-
N162.9.36 $\mathrm{GM2}^- \oplus \mathrm{A1}^+ \oplus \mathrm{A2}^-$	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
N162.9.37 $\mathrm{GM2}^- \oplus \mathrm{A1}^+ \oplus \mathrm{A1}^-$	$\surd$	1	1	$\times$	-	-
N162.9.38 $\mathrm{GM2}^- \oplus \mathrm{A1}^+ \oplus \mathrm{A2}^+$	$\surd$	1	0	$\times$	-	-
N162.9.39 $\mathrm{GM2}^- \oplus \mathrm{A1}^- \oplus \mathrm{A1}^-$	$\surd$	1	0	$\times$	-	-
N162.9.40 $\mathrm{GM2}^- \oplus \mathrm{A1}^- \oplus \mathrm{A2}^+$	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
N162.9.41 $\mathrm{A1}^+ \oplus \mathrm{A1}^+ \oplus \mathrm{A1}^+$	$\surd$	0	0	$\surd$	-	-
N162.9.42 $\mathrm{A1}^+ \oplus \mathrm{A1}^+ \oplus \mathrm{A2}^-$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{A2_u} \oplus \mathrm{A2_u}$
N162.9.43 $\mathrm{A1}^+ \oplus \mathrm{A1}^+ \oplus \mathrm{A1}^-$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{A1_u}$
N162.9.44 $\mathrm{A1}^+ \oplus \mathrm{A1}^+ \oplus \mathrm{A2}^+$	$\surd$	0	0	$\surd$	-	-
N162.9.45 $\mathrm{A1}^+ \oplus \mathrm{A2}^- \oplus \mathrm{A1}^-$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{A2_u}$
N162.9.46 $\mathrm{A1}^+ \oplus \mathrm{A1}^- \oplus \mathrm{A1}^-$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{A1_u}$
N162.9.47 $\mathrm{A1}^+ \oplus \mathrm{A1}^- \oplus \mathrm{A2}^+$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{A2_u}$
N162.9.48 $\mathrm{A1}^+ \oplus \mathrm{A2}^+ \oplus \mathrm{A2}^+$	$\surd$	0	0	$\surd$	-	-
N162.9.49 $\mathrm{A1}^- \oplus \mathrm{A1}^- \oplus \mathrm{A1}^-$	$\surd$	0	0	$\surd$	-	-
N162.9.50 $\mathrm{A1}^- \oplus \mathrm{A1}^- \oplus \mathrm{A2}^+$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{A2_u} \oplus \mathrm{A2_u}$
N162.12.1 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$3m$	E
N162.12.2 $\mathrm{GM1}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N162.12.3 $\mathrm{GM1}^- \oplus \mathrm{A3}^+$	$\surd$	1	0	$\times$	-	-
N162.12.4 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A2_g} \oplus \mathrm{E_g}$
N162.12.5 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A2_g} \oplus \mathrm{E_u}$
N162.12.6 $\mathrm{GM2}^+ \oplus \mathrm{A3}^+$	$\surd$	1	1	$\times$	-	-
N162.12.7 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	32	E
N162.12.8 $\mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N162.12.9 $\mathrm{GM2}^- \oplus \mathrm{A3}^+$	$\surd$	1	0	$\times$	-	-
N162.12.10 $\mathrm{A1}^+ \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{E_g}$
N162.12.11 $\mathrm{A1}^+ \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N162.12.12 $\mathrm{A1}^+ \oplus \mathrm{A3}^+$	$\surd$	0	0	$\surd$	-	-
N162.12.13 $\mathrm{A1}^+ \oplus \mathrm{A3}^-$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{E_u}$
N162.12.14 $\mathrm{A1}^- \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{E_g}$
N162.12.15 $\mathrm{A1}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N162.12.16 $\mathrm{A1}^- \oplus \mathrm{A3}^+$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{E_u}$
N162.12.17 $\mathrm{A1}^- \oplus \mathrm{A3}^-$	$\surd$	0	0	$\surd$	-	-
N162.14.1 $\mathrm{GM1}^- \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
N162.14.2 $\mathrm{GM1}^- \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
N162.14.3 $\mathrm{GM1}^- \oplus \mathrm{P1}$	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
N162.14.4 $\mathrm{GM1}^- \oplus \mathrm{P2}$	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
N162.14.5 $\mathrm{GM2}^+ \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	32	A2
N162.14.6 $\mathrm{GM2}^+ \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	32	A2
N162.14.7 $\mathrm{GM2}^+ \oplus \mathrm{P1}$	$\surd$	1	1	$\surd$	32	A2
N162.14.8 $\mathrm{GM2}^+ \oplus \mathrm{P2}$	$\surd$	1	1	$\surd$	32	A2
N162.14.9 $\mathrm{GM2}^- \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
N162.14.10 $\mathrm{GM2}^- \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
N162.14.11 $\mathrm{GM2}^- \oplus \mathrm{P1}$	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$

Non-coplanar SSGs with parent space group $P\bar{3}1m$ (No. 162) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N162.14.12 $\mathrm{GM2}^{-} \oplus \mathrm{P2}$	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
N162.14.13 $\mathrm{A1}^{+} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
N162.14.14 $\mathrm{A1}^{+} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
N162.14.15 $\mathrm{A1}^{+} \oplus \mathrm{P1}$	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
N162.14.16 $\mathrm{A1}^{+} \oplus \mathrm{P2}$	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
N162.14.17 $\mathrm{A1}^{-} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
N162.14.18 $\mathrm{A1}^{-} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
N162.14.19 $\mathrm{A1}^{-} \oplus \mathrm{P1}$	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
N162.14.20 $\mathrm{A1}^{-} \oplus \mathrm{P2}$	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
N162.16.1 $\mathrm{M1}^{+}$	$\times$	-	-	-	-	-
N162.16.2 $\mathrm{M1}^{-}$	$\times$	-	-	-	-	-
N162.16.3 $\mathrm{M2}^{+}$	$\times$	-	-	-	-	-
N162.16.4 $\mathrm{M2}^{-}$	$\times$	-	-	-	-	-
N162.16.5 $\mathrm{L1}^{+}$	$\times$	-	-	-	-	-
N162.16.6 $\mathrm{L1}^{-}$	$\times$	-	-	-	-	-

TABLE S487: Collinear SSGs with parent space group $P\bar{3}1c$ (No. 163).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L163.1.1 $\mathrm{GM1}^{+}$	1	$\bar{3}m$	$\mathrm{A1_g}$
L163.2.1 $\mathrm{GM1}^{-}$	0	-	-
L163.2.2 $\mathrm{GM2}^{+}$	1	$\bar{3}m$	$\mathrm{A2_g}$
L163.2.3 $\mathrm{GM2}^{-}$	0	-	-

TABLE S488: Coplanar SSGs with parent space group $P\bar{3}1c$ (No. 163).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P163.1.1 $\mathrm{GM1}^{+}$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A1_g}$
P163.2.1 $\mathrm{GM1}^{-}$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A1_u}$
P163.2.2 $\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A2_g}$
P163.2.3 $\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A2_u}$
P163.3.1 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-}$	$\surd$	0	0	$\surd$	-	-
P163.3.2 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{A2_g} \oplus \mathrm{A2_u}$
P163.3.3 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
P163.3.4 $\mathrm{GM2}^{+} \oplus \mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{A2_g} \oplus \mathrm{A2_g}$
P163.3.5 $\mathrm{GM2}^{+} \oplus \mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{A2_g}$
P163.3.6 $\mathrm{GM2}^{-} \oplus \mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
P163.6.1 $\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{E_g}$
P163.6.2 $\mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
P163.6.3 A3	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
P163.8.1 DT1	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
P163.8.2 P1	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$

TABLE S489: Non-coplanar SSGs with parent space group $P\bar{3}1c$ (No. 163).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N163.1.1 $\mathrm{GM1}^{+}$	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A1_g}$
N163.2.1 $\mathrm{GM1}^{-}$	$\surd$	2	2	$\surd$	32	$\mathrm{A1}\oplus\mathrm{A1}$
N163.2.2 $\mathrm{GM2}^{+}$	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A2_g}$
N163.2.3 $\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	$3m$	$\mathrm{A1}\oplus\mathrm{A1}$
N163.3.1 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}$	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{A1_u}$
N163.3.2 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	$3m$	$\mathrm{A1}\oplus\mathrm{A2}$
N163.3.3 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{A2_u}$
N163.3.4 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}$	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_g}$
N163.3.5 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	32	$\mathrm{A1}\oplus\mathrm{A2}$
N163.3.6 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A2_u}\oplus\mathrm{A2_u}$
N163.6.1 $\mathrm{GM3}^{+}$	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{E_g}$
N163.6.2 $\mathrm{GM3}^{-}$	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{E_u}$
N163.6.3 A3	$\surd$	1	1	$\surd$	$3m$	A1
N163.8.1 DT1	$\surd$	1	1	$\surd$	$3m$	A1
N163.8.2 P1	$\surd$	1	1	$\surd$	$3m$	A1
N163.9.1 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}$	$\surd$	0	0	$\surd$	-	-
N163.9.2 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}$	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A2_g}\oplus\mathrm{A2_u}\oplus\mathrm{A2_u}$
N163.9.3 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
N163.9.4 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	32	$\mathrm{A2}\oplus\mathrm{A2}$
N163.9.5 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}$	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_u}\oplus\mathrm{A2_g}\oplus\mathrm{A2_u}$
N163.9.6 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
N163.9.7 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}$	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A2_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_g}$
N163.9.8 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	$3m$	$\mathrm{A2}\oplus\mathrm{A2}$
N163.9.9 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_u}\oplus\mathrm{A1_u}\oplus\mathrm{A2_g}$
N163.9.10 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
N163.12.1 $\mathrm{GM1}^{-}\oplus\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	$3m$	E
N163.12.2 $\mathrm{GM1}^{-}\oplus\mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
N163.12.3 $\mathrm{GM1}^{-}\oplus$ A3	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
N163.12.4 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{+}$	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A2_g}\oplus\mathrm{E_g}$
N163.12.5 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{-}$	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A2_g}\oplus\mathrm{E_u}$
N163.12.6 $\mathrm{GM2}^{+}\oplus$ A3	$\surd$	1	1	$\surd$	32	A2
N163.12.7 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	32	E
N163.12.8 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
N163.12.9 $\mathrm{GM2}^{-}\oplus$ A3	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
N163.14.1 $\mathrm{GM1}^{-}\oplus$ DT1	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
N163.14.2 $\mathrm{GM1}^{-}\oplus$ P1	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
N163.14.3 $\mathrm{GM2}^{+}\oplus$ DT1	$\surd$	1	1	$\surd$	32	A2
N163.14.4 $\mathrm{GM2}^{+}\oplus$ P1	$\surd$	1	1	$\surd$	32	A2
N163.14.5 $\mathrm{GM2}^{-}\oplus$ DT1	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
N163.14.6 $\mathrm{GM2}^{-}\oplus$ P1	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
N163.16.1 $\mathrm{M1}^{+}$	$\times$	-	-	-	-	-
N163.16.2 $\mathrm{M1}^{-}$	$\times$	-	-	-	-	-
N163.16.3 $\mathrm{M2}^{+}$	$\times$	-	-	-	-	-
N163.16.4 $\mathrm{M2}^{-}$	$\times$	-	-	-	-	-

TABLE S490: Collinear SSGs with parent space group $P\bar{3}m1$ (No. 164).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L164.1.1 $\mathrm{GM1}^{+}$	1	$\bar{3}m$	$\mathrm{A1_g}$
L164.2.1 $\mathrm{GM1}^{-}$	0	-	-
L164.2.2 $\mathrm{GM2}^{+}$	1	$\bar{3}m$	$\mathrm{A2_g}$
L164.2.3 $\mathrm{GM2}^{-}$	0	-	-
L164.2.4 $\mathrm{A1}^{+}$	0	-	-
L164.2.5 $\mathrm{A1}^{-}$	0	-	-

TABLE S491: Coplanar SSGs with parent space group $P\bar{3}m1$ (No. 164).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P164.1.1 $\mathrm{GM1}^{+}$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_g}$
P164.2.1 $\mathrm{GM1}^{-}$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_u}$
P164.2.2 $\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A2_g}$
P164.2.3 $\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A2_u}$
P164.2.4 $\mathrm{A1}^{+}$	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A1_g}$
P164.2.5 $\mathrm{A1}^{-}$	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A1_g}$
P164.3.1 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}$	$\surd$	0	0	$\surd$	-	-
P164.3.2 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{A2_g}\oplus\mathrm{A2_u}$
P164.3.3 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
P164.3.4 $\mathrm{GM1}^{-}\oplus\mathrm{A1}^{+}$	$\surd$	1	1	$\times$	-	-
P164.3.5 $\mathrm{GM1}^{-}\oplus\mathrm{A1}^{-}$	$\surd$	1	1	$\times$	-	-
P164.3.6 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{A2_g}\oplus\mathrm{A2_g}$
P164.3.7 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{A1_u}\oplus\mathrm{A2_g}$
P164.3.8 $\mathrm{GM2}^{+}\oplus\mathrm{A1}^{+}$	$\surd$	1	0	$\times$	-	-
P164.3.9 $\mathrm{GM2}^{+}\oplus\mathrm{A1}^{-}$	$\surd$	1	0	$\times$	-	-
P164.3.10 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
P164.3.11 $\mathrm{GM2}^{-}\oplus\mathrm{A1}^{+}$	$\surd$	1	1	$\times$	-	-
P164.3.12 $\mathrm{GM2}^{-}\oplus\mathrm{A1}^{-}$	$\surd$	1	1	$\times$	-	-
P164.3.13 $\mathrm{A1}^{+}\oplus\mathrm{A1}^{+}$	$\surd$	1	0	$\times$	-	-
P164.3.14 $\mathrm{A1}^{+}\oplus\mathrm{A2}^{-}$	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
P164.3.15 $\mathrm{A1}^{+}\oplus\mathrm{A1}^{-}$	$\surd$	1	1	$\times$	-	-
P164.3.16 $\mathrm{A1}^{+}\oplus\mathrm{A2}^{+}$	$\surd$	1	0	$\times$	-	-
P164.3.17 $\mathrm{A1}^{-}\oplus\mathrm{A1}^{-}$	$\surd$	1	0	$\times$	-	-
P164.3.18 $\mathrm{A1}^{-}\oplus\mathrm{A2}^{+}$	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
P164.6.1 $\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{E_g}$
P164.6.2 $\mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
P164.6.3 $\mathrm{A3}^{+}$	$\surd$	1	0	$\times$	-	-
P164.7.1 K1	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A1_u}$
P164.7.2 K2	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A1_u}$
P164.7.3 H1	$\surd$	1	1	$\times$	-	-
P164.8.1 DT1	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
P164.8.2 DT2	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$

TABLE S492: Non-coplanar SSGs with parent space group $P\bar{3}m1$ (No. 164).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N164.1.1 $\mathrm{GM1}^{+}$	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A1_g}$
N164.2.1 $\mathrm{GM1}^{-}$	$\surd$	2	2	$\surd$	32	$\mathrm{A1}\oplus\mathrm{A1}$
N164.2.2 $\mathrm{GM2}^{+}$	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A2_g}$
N164.2.3 $\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	$3m$	$\mathrm{A1}\oplus\mathrm{A1}$
N164.2.4 $\mathrm{A1}^{+}$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_g}$
N164.2.5 $\mathrm{A1}^{-}$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_g}$
N164.3.1 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}$	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{A1_u}$
N164.3.2 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	$3m$	$\mathrm{A1}\oplus\mathrm{A2}$
N164.3.3 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{A2_u}$
N164.3.4 $\mathrm{GM1}^{-}\oplus\mathrm{A1}^{+}$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_u}$
N164.3.5 $\mathrm{GM1}^{-}\oplus\mathrm{A1}^{-}$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_u}$
N164.3.6 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}$	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_g}$
N164.3.7 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	32	$\mathrm{A1}\oplus\mathrm{A2}$
N164.3.8 $\mathrm{GM2}^{+}\oplus\mathrm{A1}^{+}$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A2_g}$
N164.3.9 $\mathrm{GM2}^{+}\oplus\mathrm{A1}^{-}$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A2_g}$
N164.3.10 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A2_u}\oplus\mathrm{A2_u}$
N164.3.11 $\mathrm{GM2}^{-}\oplus\mathrm{A1}^{+}$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A2_u}$
N164.3.12 $\mathrm{GM2}^{-}\oplus\mathrm{A1}^{-}$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A2_u}$
N164.3.13 $\mathrm{A1}^{+}\oplus\mathrm{A1}^{+}$	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A1_g}$
N164.3.14 $\mathrm{A1}^{+}\oplus\mathrm{A2}^{-}$	$\surd$	1	1	$\surd$	$3m$	A1
N164.3.15 $\mathrm{A1}^{+}\oplus\mathrm{A1}^{-}$	$\surd$	1	1	$\surd$	32	A1
N164.3.16 $\mathrm{A1}^{+}\oplus\mathrm{A2}^{+}$	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A1_g}$
N164.3.17 $\mathrm{A1}^{-}\oplus\mathrm{A1}^{-}$	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A1_g}$
N164.3.18 $\mathrm{A1}^{-}\oplus\mathrm{A2}^{+}$	$\surd$	1	1	$\surd$	$3m$	A1
N164.6.1 $\mathrm{GM3}^{+}$	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{E_g}$
N164.6.2 $\mathrm{GM3}^{-}$	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{E_u}$
N164.6.3 $\mathrm{A3}^{+}$	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A1_g}$
N164.7.1 K1	$\surd$	1	1	$\surd$	32	A1
N164.7.2 K2	$\surd$	1	1	$\surd$	32	A1
N164.7.3 H1	$\surd$	1	1	$\surd$	32	A1
N164.8.1 DT1	$\surd$	1	1	$\surd$	$3m$	A1
N164.8.2 DT2	$\surd$	1	1	$\surd$	$3m$	A1
N164.9.1 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}$	$\surd$	0	0	$\surd$	-	-
N164.9.2 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}$	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A2_g}\oplus\mathrm{A2_u}\oplus\mathrm{A2_u}$
N164.9.3 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
N164.9.4 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}\oplus\mathrm{A1}^{+}$	$\surd$	0	0	$\surd$	-	-
N164.9.5 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}\oplus\mathrm{A1}^{-}$	$\surd$	0	0	$\surd$	-	-
N164.9.6 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	32	$\mathrm{A2}\oplus\mathrm{A2}$
N164.9.7 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}$	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_u}\oplus\mathrm{A2_g}\oplus\mathrm{A2_u}$
N164.9.8 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}\oplus\mathrm{A1}^{+}$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{A2_g}\oplus\mathrm{A2_u}$
N164.9.9 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}\oplus\mathrm{A1}^{-}$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{A2_g}\oplus\mathrm{A2_u}$
N164.9.10 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
N164.9.11 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{A1}^{+}$	$\surd$	0	0	$\surd$	-	-
N164.9.12 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{A1}^{-}$	$\surd$	0	0	$\surd$	-	-
N164.9.13 $\mathrm{GM1}^{-}\oplus\mathrm{A1}^{+}\oplus\mathrm{A1}^{+}$	$\surd$	1	0	$\times$	-	-
N164.9.14 $\mathrm{GM1}^{-}\oplus\mathrm{A1}^{+}\oplus\mathrm{A2}^{-}$	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$

Non-coplanar SSGs with parent space group $P\bar{3}m1$ (No. 164) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N164.9.15 $\mathrm{GM1}^- \oplus \mathrm{A1}^+ \oplus \mathrm{A1}^-$	$\surd$	1	1	$\times$	-	-
N164.9.16 $\mathrm{GM1}^- \oplus \mathrm{A1}^+ \oplus \mathrm{A2}^+$	$\surd$	1	0	$\times$	-	-
N164.9.17 $\mathrm{GM1}^- \oplus \mathrm{A1}^- \oplus \mathrm{A1}^-$	$\surd$	1	0	$\times$	-	-
N164.9.18 $\mathrm{GM1}^- \oplus \mathrm{A1}^- \oplus \mathrm{A2}^+$	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
N164.9.19 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
N164.9.20 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$3m$	$\mathrm{A2} \oplus \mathrm{A2}$
N164.9.21 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{A1}^+$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{A2_g} \oplus \mathrm{A2_g}$
N164.9.22 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{A1}^-$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{A2_g} \oplus \mathrm{A2_g}$
N164.9.23 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A2_g}$
N164.9.24 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{A1}^+$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{A2_g}$
N164.9.25 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{A1}^-$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{A2_g}$
N164.9.26 $\mathrm{GM2}^+ \oplus \mathrm{A1}^+ \oplus \mathrm{A1}^+$	$\surd$	1	1	$\times$	-	-
N164.9.27 $\mathrm{GM2}^+ \oplus \mathrm{A1}^+ \oplus \mathrm{A2}^-$	$\surd$	1	1	$\surd$	32	A2
N164.9.28 $\mathrm{GM2}^+ \oplus \mathrm{A1}^+ \oplus \mathrm{A1}^-$	$\surd$	1	1	$\times$	-	-
N164.9.29 $\mathrm{GM2}^+ \oplus \mathrm{A1}^+ \oplus \mathrm{A2}^+$	$\surd$	1	1	$\times$	-	-
N164.9.30 $\mathrm{GM2}^+ \oplus \mathrm{A1}^- \oplus \mathrm{A1}^-$	$\surd$	1	1	$\times$	-	-
N164.9.31 $\mathrm{GM2}^+ \oplus \mathrm{A1}^- \oplus \mathrm{A2}^+$	$\surd$	1	1	$\surd$	32	A2
N164.9.32 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
N164.9.33 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{A1}^+$	$\surd$	0	0	$\surd$	-	-
N164.9.34 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{A1}^-$	$\surd$	0	0	$\surd$	-	-
N164.9.35 $\mathrm{GM2}^- \oplus \mathrm{A1}^+ \oplus \mathrm{A1}^+$	$\surd$	1	0	$\times$	-	-
N164.9.36 $\mathrm{GM2}^- \oplus \mathrm{A1}^+ \oplus \mathrm{A2}^-$	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
N164.9.37 $\mathrm{GM2}^- \oplus \mathrm{A1}^+ \oplus \mathrm{A1}^-$	$\surd$	1	1	$\times$	-	-
N164.9.38 $\mathrm{GM2}^- \oplus \mathrm{A1}^+ \oplus \mathrm{A2}^+$	$\surd$	1	0	$\times$	-	-
N164.9.39 $\mathrm{GM2}^- \oplus \mathrm{A1}^- \oplus \mathrm{A1}^-$	$\surd$	1	0	$\times$	-	-
N164.9.40 $\mathrm{GM2}^- \oplus \mathrm{A1}^- \oplus \mathrm{A2}^+$	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
N164.9.41 $\mathrm{A1}^+ \oplus \mathrm{A1}^+ \oplus \mathrm{A1}^+$	$\surd$	0	0	$\surd$	-	-
N164.9.42 $\mathrm{A1}^+ \oplus \mathrm{A1}^+ \oplus \mathrm{A2}^-$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{A2_u} \oplus \mathrm{A2_u}$
N164.9.43 $\mathrm{A1}^+ \oplus \mathrm{A1}^+ \oplus \mathrm{A1}^-$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{A1_u}$
N164.9.44 $\mathrm{A1}^+ \oplus \mathrm{A1}^+ \oplus \mathrm{A2}^+$	$\surd$	0	0	$\surd$	-	-
N164.9.45 $\mathrm{A1}^+ \oplus \mathrm{A2}^- \oplus \mathrm{A1}^-$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{A2_u}$
N164.9.46 $\mathrm{A1}^+ \oplus \mathrm{A1}^- \oplus \mathrm{A1}^-$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{A1_u}$
N164.9.47 $\mathrm{A1}^+ \oplus \mathrm{A1}^- \oplus \mathrm{A2}^+$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{A2_u}$
N164.9.48 $\mathrm{A1}^+ \oplus \mathrm{A2}^+ \oplus \mathrm{A2}^+$	$\surd$	0	0	$\surd$	-	-
N164.9.49 $\mathrm{A1}^- \oplus \mathrm{A1}^- \oplus \mathrm{A1}^-$	$\surd$	0	0	$\surd$	-	-
N164.9.50 $\mathrm{A1}^- \oplus \mathrm{A1}^- \oplus \mathrm{A2}^+$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{A2_u} \oplus \mathrm{A2_u}$
N164.12.1 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$3m$	E
N164.12.2 $\mathrm{GM1}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N164.12.3 $\mathrm{GM1}^- \oplus \mathrm{A3}^+$	$\surd$	1	0	$\times$	-	-
N164.12.4 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A2_g} \oplus \mathrm{E_g}$
N164.12.5 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A2_g} \oplus \mathrm{E_u}$
N164.12.6 $\mathrm{GM2}^+ \oplus \mathrm{A3}^+$	$\surd$	1	1	$\times$	-	-
N164.12.7 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	32	E
N164.12.8 $\mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N164.12.9 $\mathrm{GM2}^- \oplus \mathrm{A3}^+$	$\surd$	1	0	$\times$	-	-
N164.12.10 $\mathrm{A1}^+ \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{E_g}$

Non-coplanar SSGs with parent space group $P\bar{3}m1$ (No. 164) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N164.12.11 $A1^+ \oplus GM3^-$	$\surd$	0	0	$\surd$	-	-
N164.12.12 $A1^+ \oplus A3^+$	$\surd$	0	0	$\surd$	-	-
N164.12.13 $A1^+ \oplus A3^-$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{E_u}$
N164.12.14 $A1^- \oplus GM3^+$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{E_g}$
N164.12.15 $A1^- \oplus GM3^-$	$\surd$	0	0	$\surd$	-	-
N164.12.16 $A1^- \oplus A3^+$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{E_u}$
N164.12.17 $A1^- \oplus A3^-$	$\surd$	0	0	$\surd$	-	-
N164.13.1 $GM1^- \oplus K1$	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A1_u}$
N164.13.2 $GM1^- \oplus K2$	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A1_u}$
N164.13.3 $GM1^- \oplus H1$	$\surd$	1	1	$\times$	-	-
N164.13.4 $GM2^+ \oplus K1$	$\surd$	1	1	$\surd$	$3m$	A2
N164.13.5 $GM2^+ \oplus K2$	$\surd$	1	1	$\surd$	$3m$	A2
N164.13.6 $GM2^+ \oplus H1$	$\surd$	1	1	$\times$	-	-
N164.13.7 $GM2^- \oplus K1$	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A1_u}$
N164.13.8 $GM2^- \oplus K2$	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A1_u}$
N164.13.9 $GM2^- \oplus H1$	$\surd$	1	1	$\times$	-	-
N164.13.10 $A1^+ \oplus K1$	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A1_u}$
N164.13.11 $A1^+ \oplus K2$	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A1_u}$
N164.13.12 $A1^+ \oplus H1$	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A1_u}$
N164.13.13 $A1^+ \oplus H2$	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A1_u}$
N164.13.14 $A1^- \oplus K1$	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A1_u}$
N164.13.15 $A1^- \oplus K2$	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A1_u}$
N164.13.16 $A1^- \oplus H1$	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A1_u}$
N164.13.17 $A1^- \oplus H2$	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A1_u}$
N164.14.1 $GM1^- \oplus DT1$	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
N164.14.2 $GM1^- \oplus DT2$	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
N164.14.3 $GM2^+ \oplus DT1$	$\surd$	1	1	$\surd$	32	A2
N164.14.4 $GM2^+ \oplus DT2$	$\surd$	1	1	$\surd$	32	A2
N164.14.5 $GM2^- \oplus DT1$	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
N164.14.6 $GM2^- \oplus DT2$	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
N164.14.7 $A1^+ \oplus DT1$	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
N164.14.8 $A1^+ \oplus DT2$	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
N164.14.9 $A1^- \oplus DT1$	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
N164.14.10 $A1^- \oplus DT2$	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
N164.16.1 $M1^+$	$\times$	-	-	-	-	-
N164.16.2 $M1^-$	$\times$	-	-	-	-	-
N164.16.3 $M2^+$	$\times$	-	-	-	-	-
N164.16.4 $M2^-$	$\times$	-	-	-	-	-
N164.16.5 $L1^+$	$\times$	-	-	-	-	-
N164.16.6 $L1^-$	$\times$	-	-	-	-	-

TABLE S493: Collinear SSGs with parent space group $P\bar{3}c1$ (No. 165).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L165.1.1 $GM1^+$	1	$\bar{3}m$	$\mathrm{A1_g}$
L165.2.1 $GM1^-$	0	-	-

Collinear SSGs with parent space group $P\bar{3}c1$ (No. 165)(continued)

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L165.2.2 $\mathrm{GM2}^{+}$	1	$\bar{3}m$	$\mathrm{A2_g}$
L165.2.3 $\mathrm{GM2}^{-}$	0	-	-

TABLE S494: Coplanar SSGs with parent space group $P\bar{3}c1$ (No. 165).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P165.1.1 $\mathrm{GM1}^{+}$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_g}$
P165.2.1 $\mathrm{GM1}^{-}$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_u}$
P165.2.2 $\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A2_g}$
P165.2.3 $\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A2_u}$
P165.3.1 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}$	$\surd$	0	0	$\surd$	-	-
P165.3.2 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{A2_g}\oplus\mathrm{A2_u}$
P165.3.3 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
P165.3.4 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{A2_g}\oplus\mathrm{A2_g}$
P165.3.5 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{A1_u}\oplus\mathrm{A2_g}$
P165.3.6 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
P165.6.1 $\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{E_g}$
P165.6.2 $\mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
P165.6.3 A3	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
P165.7.1 K1	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A1_u}$
P165.7.2 K2	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A1_u}$
P165.8.1 DT1	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$

TABLE S495: Non-coplanar SSGs with parent space group $P\bar{3}c1$ (No. 165).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N165.1.1 $\mathrm{GM1}^{+}$	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A1_g}$
N165.2.1 $\mathrm{GM1}^{-}$	$\surd$	2	2	$\surd$	32	$\mathrm{A1}\oplus\mathrm{A1}$
N165.2.2 $\mathrm{GM2}^{+}$	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A2_g}$
N165.2.3 $\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	$3m$	$\mathrm{A1}\oplus\mathrm{A1}$
N165.3.1 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}$	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{A1_u}$
N165.3.2 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	$3m$	$\mathrm{A1}\oplus\mathrm{A2}$
N165.3.3 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{A2_u}$
N165.3.4 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}$	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_g}$
N165.3.5 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	32	$\mathrm{A1}\oplus\mathrm{A2}$
N165.3.6 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A2_u}\oplus\mathrm{A2_u}$
N165.6.1 $\mathrm{GM3}^{+}$	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{E_g}$
N165.6.2 $\mathrm{GM3}^{-}$	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{E_u}$
N165.6.3 A3	$\surd$	1	1	$\surd$	$3m$	A1
N165.7.1 K1	$\surd$	1	1	$\surd$	32	A1
N165.7.2 K2	$\surd$	1	1	$\surd$	32	A1
N165.8.1 DT1	$\surd$	1	1	$\surd$	$3m$	A1
N165.9.1 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}$	$\surd$	0	0	$\surd$	-	-
N165.9.2 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}$	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A2_g}\oplus\mathrm{A2_u}\oplus\mathrm{A2_u}$
N165.9.3 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-

Non-coplanar SSGs with parent space group $P\bar{3}c1$ (No. 165) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N165.9.4 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{GM2^+}$	$\surd$	2	2	$\surd$	32	$\mathrm{A2} \oplus \mathrm{A2}$
N165.9.5 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{GM2^-}$	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
N165.9.6 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{GM2^-}$	$\surd$	0	0	$\surd$	-	-
N165.9.7 $\mathrm{GM2^+} \oplus \mathrm{GM2^+} \oplus \mathrm{GM2^+}$	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
N165.9.8 $\mathrm{GM2^+} \oplus \mathrm{GM2^+} \oplus \mathrm{GM2^-}$	$\surd$	2	2	$\surd$	$3m$	$\mathrm{A2} \oplus \mathrm{A2}$
N165.9.9 $\mathrm{GM2^+} \oplus \mathrm{GM2^-} \oplus \mathrm{GM2^-}$	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A2_g}$
N165.9.10 $\mathrm{GM2^-} \oplus \mathrm{GM2^-} \oplus \mathrm{GM2^-}$	$\surd$	0	0	$\surd$	-	-
N165.12.1 $\mathrm{GM1^-} \oplus \mathrm{GM3^+}$	$\surd$	2	2	$\surd$	$3m$	E
N165.12.2 $\mathrm{GM1^-} \oplus \mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
N165.12.3 $\mathrm{GM1^-} \oplus \mathrm{A3}$	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
N165.12.4 $\mathrm{GM2^+} \oplus \mathrm{GM3^+}$	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A2_g} \oplus \mathrm{E_g}$
N165.12.5 $\mathrm{GM2^+} \oplus \mathrm{GM3^-}$	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A2_g} \oplus \mathrm{E_u}$
N165.12.6 $\mathrm{GM2^+} \oplus \mathrm{A3}$	$\surd$	1	1	$\surd$	32	$\mathrm{A2}$
N165.12.7 $\mathrm{GM2^-} \oplus \mathrm{GM3^+}$	$\surd$	2	2	$\surd$	32	E
N165.12.8 $\mathrm{GM2^-} \oplus \mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
N165.12.9 $\mathrm{GM2^-} \oplus \mathrm{A3}$	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
N165.13.1 $\mathrm{GM1^-} \oplus \mathrm{K1}$	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A1_u}$
N165.13.2 $\mathrm{GM1^-} \oplus \mathrm{K2}$	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A1_u}$
N165.13.3 $\mathrm{GM2^+} \oplus \mathrm{K1}$	$\surd$	1	1	$\surd$	$3m$	$\mathrm{A2}$
N165.13.4 $\mathrm{GM2^+} \oplus \mathrm{K2}$	$\surd$	1	1	$\surd$	$3m$	$\mathrm{A2}$
N165.13.5 $\mathrm{GM2^-} \oplus \mathrm{K1}$	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A1_u}$
N165.13.6 $\mathrm{GM2^-} \oplus \mathrm{K2}$	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A1_u}$
N165.14.1 $\mathrm{GM1^-} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
N165.14.2 $\mathrm{GM2^+} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	32	$\mathrm{A2}$
N165.14.3 $\mathrm{GM2^-} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
N165.16.1 $\mathrm{M1^+}$	$\times$	-	-	-	-	-
N165.16.2 $\mathrm{M1^-}$	$\times$	-	-	-	-	-
N165.16.3 $\mathrm{M2^+}$	$\times$	-	-	-	-	-
N165.16.4 $\mathrm{M2^-}$	$\times$	-	-	-	-	-

TABLE S496: Collinear SSGs with parent space group $R\bar{3}m$ (No. 166).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L166.1.1 $\mathrm{GM1^+}$	1	$\bar{3}m$	$\mathrm{A1_g}$
L166.2.1 $\mathrm{GM1^-}$	0	-	-
L166.2.2 $\mathrm{GM2^+}$	1	$\bar{3}m$	$\mathrm{A2_g}$
L166.2.3 $\mathrm{GM2^-}$	0	-	-
L166.2.4 $\mathrm{T1^+}$	0	-	-
L166.2.5 $\mathrm{T1^-}$	0	-	-

TABLE S497: Coplanar SSGs with parent space group $R\bar{3}m$ (No. 166).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P166.1.1 $\mathrm{GM1^+}$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A1_g}$

Coplanar SSGs with parent space group $R\bar{3}m$ (No. 166) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P166.2.1 $\mathrm{GM1}^-$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A1_u}$
P166.2.2 $\mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A2_g}$
P166.2.3 $\mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A2_u}$
P166.2.4 $\mathrm{T1}^+$	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A1_g}$
P166.2.5 $\mathrm{T1}^-$	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A1_g}$
P166.3.1 $\mathrm{GM1}^- \oplus \mathrm{GM1}^-$	$\surd$	0	0	$\surd$	-	-
P166.3.2 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{A2_g} \oplus \mathrm{A2_u}$
P166.3.3 $\mathrm{GM1}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
P166.3.4 $\mathrm{GM1}^- \oplus \mathrm{T1}^+$	$\surd$	1	1	$\times$	-	-
P166.3.5 $\mathrm{GM1}^- \oplus \mathrm{T1}^-$	$\surd$	1	1	$\times$	-	-
P166.3.6 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{A2_g} \oplus \mathrm{A2_g}$
P166.3.7 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{A2_g}$
P166.3.8 $\mathrm{GM2}^+ \oplus \mathrm{T1}^+$	$\surd$	1	0	$\times$	-	-
P166.3.9 $\mathrm{GM2}^+ \oplus \mathrm{T1}^-$	$\surd$	1	0	$\times$	-	-
P166.3.10 $\mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
P166.3.11 $\mathrm{GM2}^- \oplus \mathrm{T1}^+$	$\surd$	1	1	$\times$	-	-
P166.3.12 $\mathrm{GM2}^- \oplus \mathrm{T1}^-$	$\surd$	1	1	$\times$	-	-
P166.3.13 $\mathrm{T1}^+ \oplus \mathrm{T1}^+$	$\surd$	1	0	$\times$	-	-
P166.3.14 $\mathrm{T1}^+ \oplus \mathrm{T2}^-$	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
P166.3.15 $\mathrm{T1}^+ \oplus \mathrm{T1}^-$	$\surd$	1	1	$\times$	-	-
P166.3.16 $\mathrm{T1}^+ \oplus \mathrm{T2}^+$	$\surd$	1	0	$\times$	-	-
P166.3.17 $\mathrm{T1}^- \oplus \mathrm{T1}^-$	$\surd$	1	0	$\times$	-	-
P166.3.18 $\mathrm{T1}^- \oplus \mathrm{T2}^+$	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
P166.6.1 $\mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{E_g}$
P166.6.2 $\mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
P166.6.3 $\mathrm{T3}^+$	$\surd$	1	0	$\times$	-	-
P166.8.1 LD1	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
P166.8.2 LD2	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$

TABLE S498: Non-coplanar SSGs with parent space group $R\bar{3}m$ (No. 166).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N166.1.1 $\mathrm{GM1}^+$	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A1_g}$
N166.2.1 $\mathrm{GM1}^-$	$\surd$	2	2	$\surd$	32	$\mathrm{A1} \oplus \mathrm{A1}$
N166.2.2 $\mathrm{GM2}^+$	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A2_g}$
N166.2.3 $\mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$3m$	$\mathrm{A1} \oplus \mathrm{A1}$
N166.2.4 $\mathrm{T1}^+$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A1_g}$
N166.2.5 $\mathrm{T1}^-$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A1_g}$
N166.3.1 $\mathrm{GM1}^- \oplus \mathrm{GM1}^-$	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{A1_u}$
N166.3.2 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$3m$	$\mathrm{A1} \oplus \mathrm{A2}$
N166.3.3 $\mathrm{GM1}^- \oplus \mathrm{GM2}^-$	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{A2_u}$
N166.3.4 $\mathrm{GM1}^- \oplus \mathrm{T1}^+$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A1_u}$
N166.3.5 $\mathrm{GM1}^- \oplus \mathrm{T1}^-$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A1_u}$
N166.3.6 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
N166.3.7 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	2	2	$\surd$	32	$\mathrm{A1} \oplus \mathrm{A2}$
N166.3.8 $\mathrm{GM2}^+ \oplus \mathrm{T1}^+$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A2_g}$

Non-coplanar SSGs with parent space group $R\bar{3}m$ (No. 166) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N166.3.9 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{-}$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A2_g}$
N166.3.10 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A2_u}\oplus\mathrm{A2_u}$
N166.3.11 $\mathrm{GM2}^{-}\oplus\mathrm{T1}^{+}$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A2_u}$
N166.3.12 $\mathrm{GM2}^{-}\oplus\mathrm{T1}^{-}$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A2_u}$
N166.3.13 $\mathrm{T1}^{+}\oplus\mathrm{T1}^{+}$	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A1_g}$
N166.3.14 $\mathrm{T1}^{+}\oplus\mathrm{T2}^{-}$	$\surd$	1	1	$\surd$	$3m$	A1
N166.3.15 $\mathrm{T1}^{+}\oplus\mathrm{T1}^{-}$	$\surd$	1	1	$\surd$	32	A1
N166.3.16 $\mathrm{T1}^{+}\oplus\mathrm{T2}^{+}$	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A1_g}$
N166.3.17 $\mathrm{T1}^{-}\oplus\mathrm{T1}^{-}$	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A1_g}$
N166.3.18 $\mathrm{T1}^{-}\oplus\mathrm{T2}^{+}$	$\surd$	1	1	$\surd$	$3m$	A1
N166.6.1 $\mathrm{GM3}^{+}$	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{E_g}$
N166.6.2 $\mathrm{GM3}^{-}$	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{E_u}$
N166.6.3 $\mathrm{T3}^{+}$	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A1_g}$
N166.8.1 LD1	$\surd$	1	1	$\surd$	$3m$	A1
N166.8.2 LD2	$\surd$	1	1	$\surd$	$3m$	A1
N166.9.1 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}$	$\surd$	0	0	$\surd$	-	-
N166.9.2 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}$	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A2_g}\oplus\mathrm{A2_u}\oplus\mathrm{A2_u}$
N166.9.3 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
N166.9.4 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}\oplus\mathrm{T1}^{+}$	$\surd$	0	0	$\surd$	-	-
N166.9.5 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}\oplus\mathrm{T1}^{-}$	$\surd$	0	0	$\surd$	-	-
N166.9.6 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	32	$\mathrm{A2}\oplus\mathrm{A2}$
N166.9.7 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}$	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_u}\oplus\mathrm{A2_g}\oplus\mathrm{A2_u}$
N166.9.8 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}\oplus\mathrm{T1}^{+}$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{A2_g}\oplus\mathrm{A2_u}$
N166.9.9 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}\oplus\mathrm{T1}^{-}$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{A2_g}\oplus\mathrm{A2_u}$
N166.9.10 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
N166.9.11 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{T1}^{+}$	$\surd$	0	0	$\surd$	-	-
N166.9.12 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{T1}^{-}$	$\surd$	0	0	$\surd$	-	-
N166.9.13 $\mathrm{GM1}^{-}\oplus\mathrm{T1}^{+}\oplus\mathrm{T1}^{+}$	$\surd$	1	0	$\times$	-	-
N166.9.14 $\mathrm{GM1}^{-}\oplus\mathrm{T1}^{+}\oplus\mathrm{T2}^{-}$	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
N166.9.15 $\mathrm{GM1}^{-}\oplus\mathrm{T1}^{+}\oplus\mathrm{T1}^{-}$	$\surd$	1	1	$\times$	-	-
N166.9.16 $\mathrm{GM1}^{-}\oplus\mathrm{T1}^{+}\oplus\mathrm{T2}^{+}$	$\surd$	1	0	$\times$	-	-
N166.9.17 $\mathrm{GM1}^{-}\oplus\mathrm{T1}^{-}\oplus\mathrm{T1}^{-}$	$\surd$	1	0	$\times$	-	-
N166.9.18 $\mathrm{GM1}^{-}\oplus\mathrm{T1}^{-}\oplus\mathrm{T2}^{+}$	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
N166.9.19 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}$	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A2_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_g}$
N166.9.20 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	$3m$	$\mathrm{A2}\oplus\mathrm{A2}$
N166.9.21 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}\oplus\mathrm{T1}^{+}$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{A2_g}\oplus\mathrm{A2_g}$
N166.9.22 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}\oplus\mathrm{T1}^{-}$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{A2_g}\oplus\mathrm{A2_g}$
N166.9.23 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_u}\oplus\mathrm{A1_u}\oplus\mathrm{A2_g}$
N166.9.24 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}\oplus\mathrm{T1}^{+}$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{A1_u}\oplus\mathrm{A2_g}$
N166.9.25 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}\oplus\mathrm{T1}^{-}$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{A1_u}\oplus\mathrm{A2_g}$
N166.9.26 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{+}\oplus\mathrm{T1}^{+}$	$\surd$	1	1	$\times$	-	-
N166.9.27 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{+}\oplus\mathrm{T2}^{-}$	$\surd$	1	1	$\surd$	32	A2
N166.9.28 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{+}\oplus\mathrm{T1}^{-}$	$\surd$	1	1	$\times$	-	-
N166.9.29 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{+}\oplus\mathrm{T2}^{+}$	$\surd$	1	1	$\times$	-	-
N166.9.30 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{-}\oplus\mathrm{T1}^{-}$	$\surd$	1	1	$\times$	-	-
N166.9.31 $\mathrm{GM2}^{+}\oplus\mathrm{T1}^{-}\oplus\mathrm{T2}^{+}$	$\surd$	1	1	$\surd$	32	A2

Non-coplanar SSGs with parent space group $R\bar{3}m$ (No. 166) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N166.9.32 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
N166.9.33 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{T1}^+$	$\surd$	0	0	$\surd$	-	-
N166.9.34 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{T1}^-$	$\surd$	0	0	$\surd$	-	-
N166.9.35 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{T1}^+$	$\surd$	1	0	$\times$	-	-
N166.9.36 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{T2}^-$	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
N166.9.37 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{T1}^-$	$\surd$	1	1	$\times$	-	-
N166.9.38 $\mathrm{GM2}^- \oplus \mathrm{T1}^+ \oplus \mathrm{T2}^+$	$\surd$	1	0	$\times$	-	-
N166.9.39 $\mathrm{GM2}^- \oplus \mathrm{T1}^- \oplus \mathrm{T1}^-$	$\surd$	1	0	$\times$	-	-
N166.9.40 $\mathrm{GM2}^- \oplus \mathrm{T1}^- \oplus \mathrm{T2}^+$	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
N166.9.41 $\mathrm{T1}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{T1}^+$	$\surd$	0	0	$\surd$	-	-
N166.9.42 $\mathrm{T1}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{T2}^-$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{A2_u} \oplus \mathrm{A2_u}$
N166.9.43 $\mathrm{T1}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{T1}^-$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{A1_u}$
N166.9.44 $\mathrm{T1}^+ \oplus \mathrm{T1}^+ \oplus \mathrm{T2}^+$	$\surd$	0	0	$\surd$	-	-
N166.9.45 $\mathrm{T1}^+ \oplus \mathrm{T2}^- \oplus \mathrm{T1}^-$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{A2_u}$
N166.9.46 $\mathrm{T1}^+ \oplus \mathrm{T1}^- \oplus \mathrm{T1}^-$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{A1_u}$
N166.9.47 $\mathrm{T1}^+ \oplus \mathrm{T1}^- \oplus \mathrm{T2}^+$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{A2_u}$
N166.9.48 $\mathrm{T1}^+ \oplus \mathrm{T2}^+ \oplus \mathrm{T2}^+$	$\surd$	0	0	$\surd$	-	-
N166.9.49 $\mathrm{T1}^- \oplus \mathrm{T1}^- \oplus \mathrm{T1}^-$	$\surd$	0	0	$\surd$	-	-
N166.9.50 $\mathrm{T1}^- \oplus \mathrm{T1}^- \oplus \mathrm{T2}^+$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{A2_u} \oplus \mathrm{A2_u}$
N166.12.1 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$3m$	E
N166.12.2 $\mathrm{GM1}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N166.12.3 $\mathrm{GM1}^- \oplus \mathrm{T3}^+$	$\surd$	1	0	$\times$	-	-
N166.12.4 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A2_g} \oplus \mathrm{E_g}$
N166.12.5 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A2_g} \oplus \mathrm{E_u}$
N166.12.6 $\mathrm{GM2}^+ \oplus \mathrm{T3}^+$	$\surd$	1	1	$\times$	-	-
N166.12.7 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	32	E
N166.12.8 $\mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N166.12.9 $\mathrm{GM2}^- \oplus \mathrm{T3}^+$	$\surd$	1	0	$\times$	-	-
N166.12.10 $\mathrm{T1}^+ \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{E_g}$
N166.12.11 $\mathrm{T1}^+ \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N166.12.12 $\mathrm{T1}^+ \oplus \mathrm{T3}^+$	$\surd$	0	0	$\surd$	-	-
N166.12.13 $\mathrm{T1}^+ \oplus \mathrm{T3}^-$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{E_u}$
N166.12.14 $\mathrm{T1}^- \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{E_g}$
N166.12.15 $\mathrm{T1}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N166.12.16 $\mathrm{T1}^- \oplus \mathrm{T3}^+$	$\surd$	2	2	$\surd$	$\bar{3}m$	$\mathrm{E_u}$
N166.12.17 $\mathrm{T1}^- \oplus \mathrm{T3}^-$	$\surd$	0	0	$\surd$	-	-
N166.14.1 $\mathrm{GM1}^- \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
N166.14.2 $\mathrm{GM1}^- \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
N166.14.3 $\mathrm{GM2}^+ \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	32	A2
N166.14.4 $\mathrm{GM2}^+ \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	32	A2
N166.14.5 $\mathrm{GM2}^- \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
N166.14.6 $\mathrm{GM2}^- \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
N166.14.7 $\mathrm{T1}^+ \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
N166.14.8 $\mathrm{T1}^+ \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
N166.14.9 $\mathrm{T1}^- \oplus \mathrm{LD1}$	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
N166.14.10 $\mathrm{T1}^- \oplus \mathrm{LD2}$	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$

Non-coplanar SSGs with parent space group $R\bar{3}m$ (No. 166) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N166.16.1 $\mathrm{L1}^{+}$	×	-	-	-	-	-
N166.16.2 $\mathrm{L1}^{-}$	×	-	-	-	-	-
N166.16.3 $\mathrm{F1}^{+}$	×	-	-	-	-	-
N166.16.4 $\mathrm{F1}^{-}$	×	-	-	-	-	-
N166.16.5 $\mathrm{F2}^{+}$	×	-	-	-	-	-
N166.16.6 $\mathrm{F2}^{-}$	×	-	-	-	-	-

TABLE S499: Collinear SSGs with parent space group $R\bar{3}c$ (No. 167).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L167.1.1 $\mathrm{GM1}^{+}$	1	$\bar{3}m$	$\mathrm{A1_g}$
L167.2.1 $\mathrm{GM1}^{-}$	0	-	-
L167.2.2 $\mathrm{GM2}^{+}$	1	$\bar{3}m$	$\mathrm{A2_g}$
L167.2.3 $\mathrm{GM2}^{-}$	0	-	-

TABLE S500: Coplanar SSGs with parent space group $R\bar{3}c$ (No. 167).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P167.1.1 $\mathrm{GM1}^{+}$	√	2	2	√	$\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A1_g}$
P167.2.1 $\mathrm{GM1}^{-}$	√	2	2	√	$\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A1_u}$
P167.2.2 $\mathrm{GM2}^{+}$	√	2	2	√	$\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A2_g}$
P167.2.3 $\mathrm{GM2}^{-}$	√	2	2	√	$\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A2_u}$
P167.3.1 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-}$	√	0	0	√	-	-
P167.3.2 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{+}$	√	2	2	√	$\bar{3}m$	$\mathrm{A2_g} \oplus \mathrm{A2_u}$
P167.3.3 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{-}$	√	0	0	√	-	-
P167.3.4 $\mathrm{GM2}^{+} \oplus \mathrm{GM2}^{+}$	√	2	2	√	$\bar{3}m$	$\mathrm{A2_g} \oplus \mathrm{A2_g}$
P167.3.5 $\mathrm{GM2}^{+} \oplus \mathrm{GM2}^{-}$	√	2	2	√	$\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{A2_g}$
P167.3.6 $\mathrm{GM2}^{-} \oplus \mathrm{GM2}^{-}$	√	0	0	√	-	-
P167.6.1 $\mathrm{GM3}^{+}$	√	2	2	√	$\bar{3}m$	$\mathrm{E_g}$
P167.6.2 $\mathrm{GM3}^{-}$	√	0	0	√	-	-
P167.6.3 T3	√	1	1	√	$\bar{3}m$	$\mathrm{A2_u}$
P167.8.1 LD1	√	1	1	√	$\bar{3}m$	$\mathrm{A2_u}$

TABLE S501: Non-coplanar SSGs with parent space group $R\bar{3}c$ (No. 167).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N167.1.1 $\mathrm{GM1}^{+}$	√	3	3	√	$\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A1_g}$
N167.2.1 $\mathrm{GM1}^{-}$	√	2	2	√	32	$\mathrm{A1} \oplus \mathrm{A1}$
N167.2.2 $\mathrm{GM2}^{+}$	√	3	3	√	$\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A2_g}$
N167.2.3 $\mathrm{GM2}^{-}$	√	2	2	√	$3m$	$\mathrm{A1} \oplus \mathrm{A1}$
N167.3.1 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-}$	√	3	3	√	$\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{A1_u}$
N167.3.2 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{+}$	√	2	2	√	$3m$	$\mathrm{A1} \oplus \mathrm{A2}$
N167.3.3 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{-}$	√	3	3	√	$\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{A2_u}$
N167.3.4 $\mathrm{GM2}^{+} \oplus \mathrm{GM2}^{+}$	√	3	3	√	$\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
N167.3.5 $\mathrm{GM2}^{+} \oplus \mathrm{GM2}^{-}$	√	2	2	√	32	$\mathrm{A1} \oplus \mathrm{A2}$

Non-coplanar SSGs with parent space group $R\bar{3}c$ (No. 167) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N167.3.6 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A2_u}\oplus\mathrm{A2_u}$
N167.6.1 $\mathrm{GM3}^{+}$	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{E_g}$
N167.6.2 $\mathrm{GM3}^{-}$	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{E_u}$
N167.6.3 T3	$\surd$	1	1	$\surd$	$3m$	A1
N167.8.1 LD1	$\surd$	1	1	$\surd$	$3m$	A1
N167.9.1 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}$	$\surd$	0	0	$\surd$	-	-
N167.9.2 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}$	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A2_g}\oplus\mathrm{A2_u}\oplus\mathrm{A2_u}$
N167.9.3 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
N167.9.4 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	32	$\mathrm{A2}\oplus\mathrm{A2}$
N167.9.5 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}$	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_u}\oplus\mathrm{A2_g}\oplus\mathrm{A2_u}$
N167.9.6 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
N167.9.7 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}$	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A2_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_g}$
N167.9.8 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	$3m$	$\mathrm{A2}\oplus\mathrm{A2}$
N167.9.9 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A1_u}\oplus\mathrm{A1_u}\oplus\mathrm{A2_g}$
N167.9.10 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
N167.12.1 $\mathrm{GM1}^{-}\oplus\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	$3m$	E
N167.12.2 $\mathrm{GM1}^{-}\oplus\mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
N167.12.3 $\mathrm{GM1}^{-}\oplus\mathrm{T3}$	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
N167.12.4 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{+}$	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A2_g}\oplus\mathrm{E_g}$
N167.12.5 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{-}$	$\surd$	3	3	$\surd$	$\bar{3}m$	$\mathrm{A2_g}\oplus\mathrm{E_u}$
N167.12.6 $\mathrm{GM2}^{+}\oplus\mathrm{T3}$	$\surd$	1	1	$\surd$	32	A2
N167.12.7 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	32	E
N167.12.8 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
N167.12.9 $\mathrm{GM2}^{-}\oplus\mathrm{T3}$	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
N167.14.1 $\mathrm{GM1}^{-}\oplus\mathrm{LD1}$	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
N167.14.2 $\mathrm{GM2}^{+}\oplus\mathrm{LD1}$	$\surd$	1	1	$\surd$	32	A2
N167.14.3 $\mathrm{GM2}^{-}\oplus\mathrm{LD1}$	$\surd$	1	1	$\surd$	$\bar{3}m$	$\mathrm{A2_u}$
N167.16.1 $\mathrm{F1}^{+}$	$\times$	-	-	-	-	-
N167.16.2 $\mathrm{F1}^{-}$	$\times$	-	-	-	-	-
N167.16.3 $\mathrm{F2}^{+}$	$\times$	-	-	-	-	-
N167.16.4 $\mathrm{F2}^{-}$	$\times$	-	-	-	-	-

TABLE S502: Collinear SSGs with parent space group $P6$ (No. 168).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L168.1.1 GM1	1	$6/m$	$\mathrm{A_g}$
L168.2.1 GM2	1	$6/m$	$\mathrm{B_g}$
L168.2.2 A1	0	-	-
L168.2.3 A2	0	-	-

TABLE S503: Coplanar SSGs with parent space group $P6$ (No. 168).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P168.1.1 GM1	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{A_u}$

Coplanar SSGs with parent space group $P6$ (No. 168) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P168.2.1 GM2	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{A_g} \oplus \mathrm{B_g} \oplus \mathrm{B_u}$
P168.2.2 A1	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{A_g}$
P168.2.3 A2	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{A_g}$
P168.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{A_u} \oplus \mathrm{B_g} \oplus \mathrm{B_g}$
P168.3.2 GM2 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
P168.3.3 GM2 $\oplus$ A2	$\surd$	1	1	$\times$	-	-
P168.3.4 A1 $\oplus$ A1	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{A_u}$
P168.3.5 A1 $\oplus$ A2	$\surd$	1	1	$\times$	-	-
P168.3.6 A2 $\oplus$ A2	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{A_u}$
P168.4.1 GM3GM5	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{A_u} \oplus {}^2\mathrm{E1_g} \oplus {}^1\mathrm{E1_g}$
P168.4.2 GM4GM6	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{A_u} \oplus {}^2\mathrm{E2_g} \oplus {}^1\mathrm{E2_g}$
P168.4.3 A3A5	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{A_u}$
P168.4.4 A4A6	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{A_u}$
P168.5.1 DT1DU1	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{A_u}$
P168.5.2 DT2DU2	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{A_u}$
P168.5.3 DT3DU3	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{A_u}$
P168.5.4 DT4DU4	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{A_u}$
P168.7.1 K1	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{B_u}$
P168.7.2 H1	$\surd$	1	1	$\times$	-	-

TABLE S504: Non-coplanar SSGs with parent space group $P6$ (No. 168).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N168.1.1 GM1	$\surd$	3	3	$\surd$	6	$\mathrm{A} \oplus \mathrm{A} \oplus \mathrm{A}$
N168.2.1 GM2	$\surd$	3	3	$\surd$	$\bar{6}$	$\mathrm{A'} \oplus \mathrm{A'} \oplus \mathrm{A''}$
N168.2.2 A1	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{A_u}$
N168.2.3 A2	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{A_u}$
N168.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	6	$\mathrm{A} \oplus \mathrm{B} \oplus \mathrm{B}$
N168.3.2 GM2 $\oplus$ A1	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{A_g} \oplus \mathrm{B_g} \oplus \mathrm{B_u}$
N168.3.3 GM2 $\oplus$ A2	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{A_g} \oplus \mathrm{B_g} \oplus \mathrm{B_u}$
N168.3.4 A1 $\oplus$ A1	$\surd$	1	1	$\surd$	6	A
N168.3.5 A1 $\oplus$ A2	$\surd$	1	1	$\surd$	$\bar{6}$	$\mathrm{A'}$
N168.3.6 A2 $\oplus$ A2	$\surd$	1	1	$\surd$	6	A
N168.4.1 GM3GM5	$\surd$	3	3	$\surd$	6	$\mathrm{A} \oplus {}^2\mathrm{E1} \oplus {}^1\mathrm{E1}$
N168.4.2 GM4GM6	$\surd$	3	3	$\surd$	6	$\mathrm{A} \oplus {}^2\mathrm{E2} \oplus {}^1\mathrm{E2}$
N168.4.3 A3A5	$\surd$	1	1	$\surd$	6	A
N168.4.4 A4A6	$\surd$	1	1	$\surd$	6	A
N168.5.1 DT1DU1	$\surd$	1	1	$\surd$	6	A
N168.5.2 DT2DU2	$\surd$	1	1	$\surd$	6	A
N168.5.3 DT3DU3	$\surd$	1	1	$\surd$	6	A
N168.5.4 DT4DU4	$\surd$	1	1	$\surd$	6	A
N168.7.1 K1	$\surd$	1	1	$\surd$	$\bar{6}$	$\mathrm{A'}$
N168.7.2 H1	$\surd$	1	1	$\surd$	$\bar{6}$	$\mathrm{A'}$
N168.9.1 GM2 $\oplus$ GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$\bar{6}$	$\mathrm{A''} \oplus \mathrm{A''} \oplus \mathrm{A''}$
N168.9.2 GM2 $\oplus$ GM2 $\oplus$ A1	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{A_u} \oplus \mathrm{B_g} \oplus \mathrm{B_g}$
N168.9.3 GM2 $\oplus$ GM2 $\oplus$ A2	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{A_u} \oplus \mathrm{B_g} \oplus \mathrm{B_g}$

Non-coplanar SSGs with parent space group $P6$ (No. 168) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N168.9.4 GM2 $\oplus$ A1 $\oplus$ A1	$\surd$	1	1	$\surd$	$\bar{6}$	A''
N168.9.5 GM2 $\oplus$ A1 $\oplus$ A2	$\surd$	1	1	$\times$	-	-
N168.9.6 GM2 $\oplus$ A2 $\oplus$ A2	$\surd$	1	1	$\surd$	$\bar{6}$	A''
N168.9.7 A1 $\oplus$ A1 $\oplus$ A1	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{A_u}$
N168.9.8 A1 $\oplus$ A1 $\oplus$ A2	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{A_u} \oplus \mathrm{B_u} \oplus \mathrm{B_u}$
N168.9.9 A1 $\oplus$ A2 $\oplus$ A2	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{A_u} \oplus \mathrm{B_u} \oplus \mathrm{B_u}$
N168.9.10 A2 $\oplus$ A2 $\oplus$ A2	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{A_u}$
N168.10.1 GM2 $\oplus$ GM3GM5	$\surd$	3	3	$\surd$	$\bar{6}$	$\mathrm{A}'' \oplus {}^2\mathrm{E}' \oplus {}^1\mathrm{E}'$
N168.10.2 GM2 $\oplus$ GM4GM6	$\surd$	3	3	$\surd$	$\bar{6}$	$\mathrm{A}'' \oplus {}^2\mathrm{E}'' \oplus {}^1\mathrm{E}''$
N168.10.3 GM2 $\oplus$ A3A5	$\surd$	1	1	$\surd$	$\bar{6}$	A''
N168.10.4 GM2 $\oplus$ A4A6	$\surd$	1	1	$\surd$	$\bar{6}$	A''
N168.10.5 A1 $\oplus$ GM3GM5	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{A_u} \oplus {}^2\mathrm{E1_g} \oplus {}^1\mathrm{E1_g}$
N168.10.6 A1 $\oplus$ GM4GM6	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{A_u} \oplus {}^2\mathrm{E2_g} \oplus {}^1\mathrm{E2_g}$
N168.10.7 A1 $\oplus$ A3A5	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{A_u} \oplus {}^2\mathrm{E1_u} \oplus {}^1\mathrm{E1_u}$
N168.10.8 A1 $\oplus$ A4A6	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{A_u} \oplus {}^2\mathrm{E2_u} \oplus {}^1\mathrm{E2_u}$
N168.10.9 A2 $\oplus$ GM3GM5	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{A_u} \oplus {}^2\mathrm{E1_g} \oplus {}^1\mathrm{E1_g}$
N168.10.10 A2 $\oplus$ GM4GM6	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{A_u} \oplus {}^2\mathrm{E2_g} \oplus {}^1\mathrm{E2_g}$
N168.10.11 A2 $\oplus$ A3A5	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{A_u} \oplus {}^2\mathrm{E2_u} \oplus {}^1\mathrm{E2_u}$
N168.10.12 A2 $\oplus$ A4A6	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{A_u} \oplus {}^2\mathrm{E1_u} \oplus {}^1\mathrm{E1_u}$
N168.11.1 GM2 $\oplus$ DT1DU1	$\surd$	1	1	$\surd$	$\bar{6}$	A''
N168.11.2 GM2 $\oplus$ DT2DU2	$\surd$	1	1	$\surd$	$\bar{6}$	A''
N168.11.3 GM2 $\oplus$ DT3DU3	$\surd$	1	1	$\surd$	$\bar{6}$	A''
N168.11.4 GM2 $\oplus$ DT4DU4	$\surd$	1	1	$\surd$	$\bar{6}$	A''
N168.11.5 A1 $\oplus$ DT1DU1	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{A_u}$
N168.11.6 A1 $\oplus$ DT2DU2	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{A_u}$
N168.11.7 A1 $\oplus$ DT3DU3	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{A_u}$
N168.11.8 A1 $\oplus$ DT4DU4	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{A_u}$
N168.11.9 A2 $\oplus$ DT1DU1	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{A_u}$
N168.11.10 A2 $\oplus$ DT2DU2	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{A_u}$
N168.11.11 A2 $\oplus$ DT3DU3	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{A_u}$
N168.11.12 A2 $\oplus$ DT4DU4	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{A_u}$
N168.13.1 GM2 $\oplus$ K1	$\surd$	1	1	$\surd$	6	B
N168.13.2 GM2 $\oplus$ H1	$\surd$	1	1	$\times$	-	-
N168.13.3 A1 $\oplus$ K1	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{B_u}$
N168.13.4 A1 $\oplus$ H1	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{B_u}$
N168.13.5 A2 $\oplus$ K1	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{B_u}$
N168.13.6 A2 $\oplus$ H1	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{B_u}$
N168.16.1 M1	$\times$	-	-	-	-	-
N168.16.2 M2	$\times$	-	-	-	-	-
N168.16.3 L1	$\times$	-	-	-	-	-
N168.16.4 L2	$\times$	-	-	-	-	-

TABLE S505: Collinear SSGs with parent space group $P6_1$ (No. 169).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L169.1.1 GM1	1	$6/m$	$\mathrm{A_g}$

Collinear SSGs with parent space group $P6_1$ (No. 169)(continued)

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L169.2.1 GM2	1	$6/m$	$\mathrm{B_g}$

TABLE S506: Coplanar SSGs with parent space group $P6_1$ (No. 169).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P169.1.1 GM1	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{A_u}$
P169.2.1 GM2	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{A_g}\oplus\mathrm{B_g}\oplus\mathrm{B_u}$
P169.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{A_u}\oplus\mathrm{B_g}\oplus\mathrm{B_g}$
P169.4.1 GM3GM5	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{A_u}\oplus{}^2\mathrm{E1_g}\oplus{}^1\mathrm{E1_g}$
P169.4.2 GM4GM6	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{A_u}\oplus{}^2\mathrm{E2_g}\oplus{}^1\mathrm{E2_g}$
P169.4.3 A1A6	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{A_u}$
P169.4.4 A2A5	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{A_u}$
P169.4.5 A3A4	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{A_u}$
P169.5.1 DT1DU1	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{A_u}$
P169.7.1 K1	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{B_u}$

TABLE S507: Non-coplanar SSGs with parent space group $P6_1$ (No. 169).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N169.1.1 GM1	$\surd$	3	3	$\surd$	6	$\mathrm{A}\oplus\mathrm{A}\oplus\mathrm{A}$
N169.2.1 GM2	$\surd$	3	3	$\surd$	$\bar{6}$	$\mathrm{A'}\oplus\mathrm{A'}\oplus\mathrm{A''}$
N169.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	6	$\mathrm{A}\oplus\mathrm{B}\oplus\mathrm{B}$
N169.4.1 GM3GM5	$\surd$	3	3	$\surd$	6	$\mathrm{A}\oplus{}^2\mathrm{E1}\oplus{}^1\mathrm{E1}$
N169.4.2 GM4GM6	$\surd$	3	3	$\surd$	6	$\mathrm{A}\oplus{}^2\mathrm{E2}\oplus{}^1\mathrm{E2}$
N169.4.3 A1A6	$\surd$	1	1	$\surd$	6	A
N169.4.4 A2A5	$\surd$	1	1	$\surd$	6	A
N169.4.5 A3A4	$\surd$	1	1	$\surd$	6	A
N169.5.1 DT1DU1	$\surd$	1	1	$\surd$	6	A
N169.7.1 K1	$\surd$	1	1	$\surd$	$\bar{6}$	$\mathrm{A'}$
N169.9.1 GM2 $\oplus$ GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$\bar{6}$	$\mathrm{A''}\oplus\mathrm{A''}\oplus\mathrm{A''}$
N169.10.1 GM2 $\oplus$ GM3GM5	$\surd$	3	3	$\surd$	$\bar{6}$	$\mathrm{A''}\oplus{}^2\mathrm{E'}\oplus{}^1\mathrm{E'}$
N169.10.2 GM2 $\oplus$ GM4GM6	$\surd$	3	3	$\surd$	$\bar{6}$	$\mathrm{A''}\oplus{}^2\mathrm{E''}\oplus{}^1\mathrm{E''}$
N169.10.3 GM2 $\oplus$ A1A6	$\surd$	1	1	$\surd$	$\bar{6}$	$\mathrm{A''}$
N169.10.4 GM2 $\oplus$ A2A5	$\surd$	1	1	$\surd$	$\bar{6}$	$\mathrm{A''}$
N169.10.5 GM2 $\oplus$ A3A4	$\surd$	1	1	$\surd$	$\bar{6}$	$\mathrm{A''}$
N169.11.1 GM2 $\oplus$ DT1DU1	$\surd$	1	1	$\surd$	$\bar{6}$	$\mathrm{A''}$
N169.13.1 GM2 $\oplus$ K1	$\surd$	1	1	$\surd$	6	B
N169.16.1 M1	$\times$	-	-	-	-	-
N169.16.2 M2	$\times$	-	-	-	-	-

TABLE S508: Collinear SSGs with parent space group $P6_5$ (No. 170).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L170.1.1 GM1	1	$6/m$	$\mathrm{A_g}$
L170.2.1 GM2	1	$6/m$	$\mathrm{B_g}$

Coplanar SSGs with parent space group $P6_5$ (No. 170) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation

TABLE S509: Coplanar SSGs with parent space group $P6_5$ (No. 170).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P170.1.1 GM1	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{A_u}$
P170.2.1 GM2	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{A_g}\oplus\mathrm{B_g}\oplus\mathrm{B_u}$
P170.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{A_u}\oplus\mathrm{B_g}\oplus\mathrm{B_g}$
P170.4.1 GM3GM5	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{A_u}\oplus{}^2\mathrm{E1_g}\oplus{}^1\mathrm{E1_g}$
P170.4.2 GM4GM6	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{A_u}\oplus{}^2\mathrm{E2_g}\oplus{}^1\mathrm{E2_g}$
P170.4.3 A1A2	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{A_u}$
P170.4.4 A3A6	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{A_u}$
P170.4.5 A4A5	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{A_u}$
P170.5.1 DT1DU1	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{A_u}$
P170.7.1 K1	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{B_u}$

TABLE S510: Non-coplanar SSGs with parent space group $P6_5$ (No. 170).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N170.1.1 GM1	$\surd$	3	3	$\surd$	6	$\mathrm{A}\oplus\mathrm{A}\oplus\mathrm{A}$
N170.2.1 GM2	$\surd$	3	3	$\surd$	$\bar{6}$	$\mathrm{A'}\oplus\mathrm{A'}\oplus\mathrm{A''}$
N170.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	6	$\mathrm{A}\oplus\mathrm{B}\oplus\mathrm{B}$
N170.4.1 GM3GM5	$\surd$	3	3	$\surd$	6	$\mathrm{A}\oplus{}^2\mathrm{E1}\oplus{}^1\mathrm{E1}$
N170.4.2 GM4GM6	$\surd$	3	3	$\surd$	6	$\mathrm{A}\oplus{}^2\mathrm{E2}\oplus{}^1\mathrm{E2}$
N170.4.3 A1A2	$\surd$	1	1	$\surd$	6	A
N170.4.4 A3A6	$\surd$	1	1	$\surd$	6	A
N170.4.5 A4A5	$\surd$	1	1	$\surd$	6	A
N170.5.1 DT1DU1	$\surd$	1	1	$\surd$	6	A
N170.7.1 K1	$\surd$	1	1	$\surd$	$\bar{6}$	$\mathrm{A'}$
N170.9.1 GM2 $\oplus$ GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$\bar{6}$	$\mathrm{A''}\oplus\mathrm{A''}\oplus\mathrm{A''}$
N170.10.1 GM2 $\oplus$ GM3GM5	$\surd$	3	3	$\surd$	$\bar{6}$	$\mathrm{A''}\oplus{}^2\mathrm{E'}\oplus{}^1\mathrm{E'}$
N170.10.2 GM2 $\oplus$ GM4GM6	$\surd$	3	3	$\surd$	$\bar{6}$	$\mathrm{A''}\oplus{}^2\mathrm{E''}\oplus{}^1\mathrm{E''}$
N170.10.3 GM2 $\oplus$ A1A2	$\surd$	1	1	$\surd$	$\bar{6}$	$\mathrm{A''}$
N170.10.4 GM2 $\oplus$ A3A6	$\surd$	1	1	$\surd$	$\bar{6}$	$\mathrm{A''}$
N170.10.5 GM2 $\oplus$ A4A5	$\surd$	1	1	$\surd$	$\bar{6}$	$\mathrm{A''}$
N170.11.1 GM2 $\oplus$ DT1DU1	$\surd$	1	1	$\surd$	$\bar{6}$	$\mathrm{A''}$
N170.13.1 GM2 $\oplus$ K1	$\surd$	1	1	$\surd$	6	B
N170.16.1 M1	$\times$	-	-	-	-	-
N170.16.2 M2	$\times$	-	-	-	-	-

TABLE S511: Collinear SSGs with parent space group $P6_2$ (No. 171).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L171.1.1 GM1	1	$6/m$	$\mathrm{A_g}$

Collinear SSGs with parent space group $P6_2$ (No. 171)(continued)

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L171.2.1 GM2	1	$6/m$	$\mathrm{B_g}$
L171.2.2 A1	0	-	-
L171.2.3 A2	0	-	-

TABLE S512: Coplanar SSGs with parent space group $P6_2$ (No. 171).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P171.1.1 GM1	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{A_u}$
P171.2.1 GM2	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{A_g}\oplus\mathrm{B_g}\oplus\mathrm{B_u}$
P171.2.2 A1	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{A_g}$
P171.2.3 A2	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{A_g}$
P171.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{A_u}\oplus\mathrm{B_g}\oplus\mathrm{B_g}$
P171.3.2 GM2 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
P171.3.3 GM2 $\oplus$ A2	$\surd$	1	1	$\times$	-	-
P171.3.4 A1 $\oplus$ A1	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{A_u}$
P171.3.5 A1 $\oplus$ A2	$\surd$	1	1	$\times$	-	-
P171.3.6 A2 $\oplus$ A2	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{A_u}$
P171.4.1 GM3GM5	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{A_u}\oplus{}^2\mathrm{E1_g}\oplus{}^1\mathrm{E1_g}$
P171.4.2 GM4GM6	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{A_u}\oplus{}^2\mathrm{E2_g}\oplus{}^1\mathrm{E2_g}$
P171.4.3 A3A5	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{A_u}$
P171.4.4 A4A6	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{A_u}$
P171.5.1 DT1DU1	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{A_u}$
P171.5.2 DT2DU2	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{A_u}$
P171.7.1 K1	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{B_u}$
P171.7.2 H1	$\surd$	1	1	$\times$	-	-

TABLE S513: Non-coplanar SSGs with parent space group $P6_2$ (No. 171).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N171.1.1 GM1	$\surd$	3	3	$\surd$	6	$\mathrm{A}\oplus\mathrm{A}\oplus\mathrm{A}$
N171.2.1 GM2	$\surd$	3	3	$\surd$	$\bar{6}$	$\mathrm{A'}\oplus\mathrm{A'}\oplus\mathrm{A''}$
N171.2.2 A1	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{A_u}$
N171.2.3 A2	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{A_u}$
N171.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	6	$\mathrm{A}\oplus\mathrm{B}\oplus\mathrm{B}$
N171.3.2 GM2 $\oplus$ A1	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{A_g}\oplus\mathrm{B_g}\oplus\mathrm{B_u}$
N171.3.3 GM2 $\oplus$ A2	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{A_g}\oplus\mathrm{B_g}\oplus\mathrm{B_u}$
N171.3.4 A1 $\oplus$ A1	$\surd$	1	1	$\surd$	6	A
N171.3.5 A1 $\oplus$ A2	$\surd$	1	1	$\surd$	$\bar{6}$	A'
N171.3.6 A2 $\oplus$ A2	$\surd$	1	1	$\surd$	6	A
N171.4.1 GM3GM5	$\surd$	3	3	$\surd$	6	$\mathrm{A}\oplus{}^2\mathrm{E1}\oplus{}^1\mathrm{E1}$
N171.4.2 GM4GM6	$\surd$	3	3	$\surd$	6	$\mathrm{A}\oplus{}^2\mathrm{E2}\oplus{}^1\mathrm{E2}$
N171.4.3 A3A5	$\surd$	1	1	$\surd$	6	A
N171.4.4 A4A6	$\surd$	1	1	$\surd$	6	A
N171.5.1 DT1DU1	$\surd$	1	1	$\surd$	6	A
N171.5.2 DT2DU2	$\surd$	1	1	$\surd$	6	A

Non-coplanar SSGs with parent space group $P6_2$ (No. 171) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N171.7.1 K1	√	1	1	√	$\bar{6}$	A'
N171.7.2 H1	√	1	1	√	$\bar{6}$	A'
N171.9.1 GM2 ⊕ GM2 ⊕ GM2	√	3	3	√	$\bar{6}$	$\mathrm{A}'' \oplus \mathrm{A}'' \oplus \mathrm{A}''$
N171.9.2 GM2 ⊕ GM2 ⊕ A1	√	3	3	√	$6/m$	$\mathrm{A_u} \oplus \mathrm{B_g} \oplus \mathrm{B_g}$
N171.9.3 GM2 ⊕ GM2 ⊕ A2	√	3	3	√	$6/m$	$\mathrm{A_u} \oplus \mathrm{B_g} \oplus \mathrm{B_g}$
N171.9.4 GM2 ⊕ A1 ⊕ A1	√	1	1	√	$\bar{6}$	A''
N171.9.5 GM2 ⊕ A1 ⊕ A2	√	1	1	×	-	-
N171.9.6 GM2 ⊕ A2 ⊕ A2	√	1	1	√	$\bar{6}$	A''
N171.9.7 A1 ⊕ A1 ⊕ A1	√	3	3	√	$6/m$	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{A_u}$
N171.9.8 A1 ⊕ A1 ⊕ A2	√	3	3	√	$6/m$	$\mathrm{A_u} \oplus \mathrm{B_u} \oplus \mathrm{B_u}$
N171.9.9 A1 ⊕ A2 ⊕ A2	√	3	3	√	$6/m$	$\mathrm{A_u} \oplus \mathrm{B_u} \oplus \mathrm{B_u}$
N171.9.10 A2 ⊕ A2 ⊕ A2	√	3	3	√	$6/m$	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{A_u}$
N171.10.1 GM2 ⊕ GM3GM5	√	3	3	√	$\bar{6}$	$\mathrm{A}'' \oplus {}^2\mathrm{E}' \oplus {}^1\mathrm{E}'$
N171.10.2 GM2 ⊕ GM4GM6	√	3	3	√	$\bar{6}$	$\mathrm{A}'' \oplus {}^2\mathrm{E}'' \oplus {}^1\mathrm{E}''$
N171.10.3 GM2 ⊕ A3A5	√	1	1	√	$\bar{6}$	A''
N171.10.4 GM2 ⊕ A4A6	√	1	1	√	$\bar{6}$	A''
N171.10.5 A1 ⊕ GM3GM5	√	3	3	√	$6/m$	$\mathrm{A_u} \oplus {}^2\mathrm{E1_g} \oplus {}^1\mathrm{E1_g}$
N171.10.6 A1 ⊕ GM4GM6	√	3	3	√	$6/m$	$\mathrm{A_u} \oplus {}^2\mathrm{E2_g} \oplus {}^1\mathrm{E2_g}$
N171.10.7 A1 ⊕ A3A5	√	3	3	√	$6/m$	$\mathrm{A_u} \oplus {}^2\mathrm{E1_u} \oplus {}^1\mathrm{E1_u}$
N171.10.8 A1 ⊕ A4A6	√	3	3	√	$6/m$	$\mathrm{A_u} \oplus {}^2\mathrm{E2_u} \oplus {}^1\mathrm{E2_u}$
N171.10.9 A2 ⊕ GM3GM5	√	3	3	√	$6/m$	$\mathrm{A_u} \oplus {}^2\mathrm{E1_g} \oplus {}^1\mathrm{E1_g}$
N171.10.10 A2 ⊕ GM4GM6	√	3	3	√	$6/m$	$\mathrm{A_u} \oplus {}^2\mathrm{E2_g} \oplus {}^1\mathrm{E2_g}$
N171.10.11 A2 ⊕ A3A5	√	3	3	√	$6/m$	$\mathrm{A_u} \oplus {}^2\mathrm{E2_u} \oplus {}^1\mathrm{E2_u}$
N171.10.12 A2 ⊕ A4A6	√	3	3	√	$6/m$	$\mathrm{A_u} \oplus {}^2\mathrm{E1_u} \oplus {}^1\mathrm{E1_u}$
N171.11.1 GM2 ⊕ DT1DU1	√	1	1	√	$\bar{6}$	A''
N171.11.2 GM2 ⊕ DT2DU2	√	1	1	√	$\bar{6}$	A''
N171.11.3 A1 ⊕ DT1DU1	√	1	1	√	$6/m$	$\mathrm{A_u}$
N171.11.4 A1 ⊕ DT2DU2	√	1	1	√	$6/m$	$\mathrm{A_u}$
N171.11.5 A2 ⊕ DT1DU1	√	1	1	√	$6/m$	$\mathrm{A_u}$
N171.11.6 A2 ⊕ DT2DU2	√	1	1	√	$6/m$	$\mathrm{A_u}$
N171.13.1 GM2 ⊕ K1	√	1	1	√	6	B
N171.13.2 GM2 ⊕ H1	√	1	1	×	-	-
N171.13.3 A1 ⊕ K1	√	1	1	√	$6/m$	$\mathrm{B_u}$
N171.13.4 A1 ⊕ H1	√	1	1	√	$6/m$	$\mathrm{B_u}$
N171.13.5 A2 ⊕ K1	√	1	1	√	$6/m$	$\mathrm{B_u}$
N171.13.6 A2 ⊕ H1	√	1	1	√	$6/m$	$\mathrm{B_u}$
N171.16.1 M1	×	-	-	-	-	-
N171.16.2 M2	×	-	-	-	-	-
N171.16.3 L1	×	-	-	-	-	-
N171.16.4 L2	×	-	-	-	-	-

TABLE S514: Collinear SSGs with parent space group $P6_4$ (No. 172).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L172.1.1 GM1	1	$6/m$	$\mathrm{A_g}$
L172.2.1 GM2	1	$6/m$	$\mathrm{B_g}$

Collinear SSGs with parent space group $P6_4$ (No. 172)(continued)

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L172.2.2 A3	0	-	-
L172.2.3 A4	0	-	-

TABLE S515: Coplanar SSGs with parent space group $P6_4$ (No. 172).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P172.1.1 GM1	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{A_u}$
P172.2.1 GM2	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{A_g}\oplus\mathrm{B_g}\oplus\mathrm{B_u}$
P172.2.2 A3	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{A_g}$
P172.2.3 A4	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{A_g}$
P172.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{A_u}\oplus\mathrm{B_g}\oplus\mathrm{B_g}$
P172.3.2 GM2 $\oplus$ A3	$\surd$	1	1	$\times$	-	-
P172.3.3 GM2 $\oplus$ A4	$\surd$	1	1	$\times$	-	-
P172.3.4 A3 $\oplus$ A3	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{A_u}$
P172.3.5 A3 $\oplus$ A4	$\surd$	1	1	$\times$	-	-
P172.3.6 A4 $\oplus$ A4	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{A_u}$
P172.4.1 GM3GM5	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{A_u}\oplus{}^2\mathrm{E1_g}\oplus{}^1\mathrm{E1_g}$
P172.4.2 GM4GM6	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{A_u}\oplus{}^2\mathrm{E2_g}\oplus{}^1\mathrm{E2_g}$
P172.4.3 A1A5	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{A_u}$
P172.4.4 A2A6	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{A_u}$
P172.5.1 DT1DU1	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{A_u}$
P172.5.2 DT2DU2	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{A_u}$
P172.7.1 K1	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{B_u}$
P172.7.2 H2	$\surd$	1	1	$\times$	-	-

TABLE S516: Non-coplanar SSGs with parent space group $P6_4$ (No. 172).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N172.1.1 GM1	$\surd$	3	3	$\surd$	6	$\mathrm{A}\oplus\mathrm{A}\oplus\mathrm{A}$
N172.2.1 GM2	$\surd$	3	3	$\surd$	$\bar{6}$	$\mathrm{A'}\oplus\mathrm{A'}\oplus\mathrm{A''}$
N172.2.2 A3	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{A_u}$
N172.2.3 A4	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{A_u}$
N172.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	6	$\mathrm{A}\oplus\mathrm{B}\oplus\mathrm{B}$
N172.3.2 GM2 $\oplus$ A3	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{A_g}\oplus\mathrm{B_g}\oplus\mathrm{B_u}$
N172.3.3 GM2 $\oplus$ A4	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{A_g}\oplus\mathrm{B_g}\oplus\mathrm{B_u}$
N172.3.4 A3 $\oplus$ A3	$\surd$	1	1	$\surd$	6	A
N172.3.5 A3 $\oplus$ A4	$\surd$	1	1	$\surd$	$\bar{6}$	A'
N172.3.6 A4 $\oplus$ A4	$\surd$	1	1	$\surd$	6	A
N172.4.1 GM3GM5	$\surd$	3	3	$\surd$	6	$\mathrm{A}\oplus{}^2\mathrm{E1}\oplus{}^1\mathrm{E1}$
N172.4.2 GM4GM6	$\surd$	3	3	$\surd$	6	$\mathrm{A}\oplus{}^2\mathrm{E2}\oplus{}^1\mathrm{E2}$
N172.4.3 A1A5	$\surd$	1	1	$\surd$	6	A
N172.4.4 A2A6	$\surd$	1	1	$\surd$	6	A
N172.5.1 DT1DU1	$\surd$	1	1	$\surd$	6	A
N172.5.2 DT2DU2	$\surd$	1	1	$\surd$	6	A

Non-coplanar SSGs with parent space group $P6_4$ (No. 172) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N172.7.1 K1	$\surd$	1	1	$\surd$	$\bar{6}$	A'
N172.7.2 H2	$\surd$	1	1	$\surd$	$\bar{6}$	A'
N172.9.1 GM2 $\oplus$ GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$\bar{6}$	$\mathrm{A}'' \oplus \mathrm{A}'' \oplus \mathrm{A}''$
N172.9.2 GM2 $\oplus$ GM2 $\oplus$ A3	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{A_u} \oplus \mathrm{B_g} \oplus \mathrm{B_g}$
N172.9.3 GM2 $\oplus$ GM2 $\oplus$ A4	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{A_u} \oplus \mathrm{B_g} \oplus \mathrm{B_g}$
N172.9.4 GM2 $\oplus$ A3 $\oplus$ A3	$\surd$	1	1	$\surd$	$\bar{6}$	A''
N172.9.5 GM2 $\oplus$ A3 $\oplus$ A4	$\surd$	1	1	$\times$	-	-
N172.9.6 GM2 $\oplus$ A4 $\oplus$ A4	$\surd$	1	1	$\surd$	$\bar{6}$	A''
N172.9.7 A3 $\oplus$ A3 $\oplus$ A3	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{A_u}$
N172.9.8 A3 $\oplus$ A3 $\oplus$ A4	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{A_u} \oplus \mathrm{B_u} \oplus \mathrm{B_u}$
N172.9.9 A3 $\oplus$ A4 $\oplus$ A4	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{A_u} \oplus \mathrm{B_u} \oplus \mathrm{B_u}$
N172.9.10 A4 $\oplus$ A4 $\oplus$ A4	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{A_u}$
N172.10.1 GM2 $\oplus$ GM3GM5	$\surd$	3	3	$\surd$	$\bar{6}$	$\mathrm{A}'' \oplus {}^2\mathrm{E}' \oplus {}^1\mathrm{E}'$
N172.10.2 GM2 $\oplus$ GM4GM6	$\surd$	3	3	$\surd$	$\bar{6}$	$\mathrm{A}'' \oplus {}^2\mathrm{E}'' \oplus {}^1\mathrm{E}''$
N172.10.3 GM2 $\oplus$ A1A5	$\surd$	1	1	$\surd$	$\bar{6}$	A''
N172.10.4 GM2 $\oplus$ A2A6	$\surd$	1	1	$\surd$	$\bar{6}$	A''
N172.10.5 A3 $\oplus$ GM3GM5	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{A_u} \oplus {}^2\mathrm{E1_g} \oplus {}^1\mathrm{E1_g}$
N172.10.6 A3 $\oplus$ GM4GM6	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{A_u} \oplus {}^2\mathrm{E2_g} \oplus {}^1\mathrm{E2_g}$
N172.10.7 A3 $\oplus$ A1A5	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{A_u} \oplus {}^2\mathrm{E1_u} \oplus {}^1\mathrm{E1_u}$
N172.10.8 A3 $\oplus$ A2A6	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{A_u} \oplus {}^2\mathrm{E2_u} \oplus {}^1\mathrm{E2_u}$
N172.10.9 A4 $\oplus$ GM3GM5	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{A_u} \oplus {}^2\mathrm{E1_g} \oplus {}^1\mathrm{E1_g}$
N172.10.10 A4 $\oplus$ GM4GM6	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{A_u} \oplus {}^2\mathrm{E2_g} \oplus {}^1\mathrm{E2_g}$
N172.10.11 A4 $\oplus$ A1A5	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{A_u} \oplus {}^2\mathrm{E2_u} \oplus {}^1\mathrm{E2_u}$
N172.10.12 A4 $\oplus$ A2A6	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{A_u} \oplus {}^2\mathrm{E1_u} \oplus {}^1\mathrm{E1_u}$
N172.11.1 GM2 $\oplus$ DT1DU1	$\surd$	1	1	$\surd$	$\bar{6}$	A''
N172.11.2 GM2 $\oplus$ DT2DU2	$\surd$	1	1	$\surd$	$\bar{6}$	A''
N172.11.3 A3 $\oplus$ DT1DU1	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{A_u}$
N172.11.4 A3 $\oplus$ DT2DU2	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{A_u}$
N172.11.5 A4 $\oplus$ DT1DU1	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{A_u}$
N172.11.6 A4 $\oplus$ DT2DU2	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{A_u}$
N172.13.1 GM2 $\oplus$ K1	$\surd$	1	1	$\surd$	6	B
N172.13.2 GM2 $\oplus$ H2	$\surd$	1	1	$\times$	-	-
N172.13.3 A3 $\oplus$ K1	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{B_u}$
N172.13.4 A3 $\oplus$ H2	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{B_u}$
N172.13.5 A4 $\oplus$ K1	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{B_u}$
N172.13.6 A4 $\oplus$ H2	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{B_u}$
N172.16.1 M1	$\times$	-	-	-	-	-
N172.16.2 M2	$\times$	-	-	-	-	-
N172.16.3 L1	$\times$	-	-	-	-	-
N172.16.4 L2	$\times$	-	-	-	-	-

TABLE S517: Collinear SSGs with parent space group $P6_3$ (No. 173).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L173.1.1 GM1	1	$6/m$	$\mathrm{A_g}$
L173.2.1 GM2	1	$6/m$	$\mathrm{B_g}$

Coplanar SSGs with parent space group $P6_3$ (No. 173) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation

TABLE S518: Coplanar SSGs with parent space group $P6_3$ (No. 173).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P173.1.1 GM1	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{A_u}$
P173.2.1 GM2	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{A_g}\oplus\mathrm{B_g}\oplus\mathrm{B_u}$
P173.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{A_u}\oplus\mathrm{B_g}\oplus\mathrm{B_g}$
P173.4.1 GM3GM5	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{A_u}\oplus{}^2\mathrm{E1_g}\oplus{}^1\mathrm{E1_g}$
P173.4.2 GM4GM6	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{A_u}\oplus{}^2\mathrm{E2_g}\oplus{}^1\mathrm{E2_g}$
P173.4.3 A1A2	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{A_u}$
P173.4.4 A3A6	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{A_u}$
P173.4.5 A4A5	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{A_u}$
P173.5.1 DT1DU1	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{A_u}$
P173.5.2 DT3DU3	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{A_u}$
P173.7.1 K1	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{B_u}$

TABLE S519: Non-coplanar SSGs with parent space group $P6_3$ (No. 173).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N173.1.1 GM1	$\surd$	3	3	$\surd$	6	$\mathrm{A}\oplus\mathrm{A}\oplus\mathrm{A}$
N173.2.1 GM2	$\surd$	3	3	$\surd$	$\bar{6}$	$\mathrm{A'}\oplus\mathrm{A'}\oplus\mathrm{A''}$
N173.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	6	$\mathrm{A}\oplus\mathrm{B}\oplus\mathrm{B}$
N173.4.1 GM3GM5	$\surd$	3	3	$\surd$	6	$\mathrm{A}\oplus{}^2\mathrm{E1}\oplus{}^1\mathrm{E1}$
N173.4.2 GM4GM6	$\surd$	3	3	$\surd$	6	$\mathrm{A}\oplus{}^2\mathrm{E2}\oplus{}^1\mathrm{E2}$
N173.4.3 A1A2	$\surd$	1	1	$\surd$	6	A
N173.4.4 A3A6	$\surd$	1	1	$\surd$	6	A
N173.4.5 A4A5	$\surd$	1	1	$\surd$	6	A
N173.5.1 DT1DU1	$\surd$	1	1	$\surd$	6	A
N173.5.2 DT3DU3	$\surd$	1	1	$\surd$	6	A
N173.7.1 K1	$\surd$	1	1	$\surd$	$\bar{6}$	$\mathrm{A'}$
N173.9.1 GM2 $\oplus$ GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$\bar{6}$	$\mathrm{A''}\oplus\mathrm{A''}\oplus\mathrm{A''}$
N173.10.1 GM2 $\oplus$ GM3GM5	$\surd$	3	3	$\surd$	$\bar{6}$	$\mathrm{A''}\oplus{}^2\mathrm{E'}\oplus{}^1\mathrm{E'}$
N173.10.2 GM2 $\oplus$ GM4GM6	$\surd$	3	3	$\surd$	$\bar{6}$	$\mathrm{A''}\oplus{}^2\mathrm{E''}\oplus{}^1\mathrm{E''}$
N173.10.3 GM2 $\oplus$ A1A2	$\surd$	1	1	$\surd$	$\bar{6}$	$\mathrm{A''}$
N173.10.4 GM2 $\oplus$ A3A6	$\surd$	1	1	$\surd$	$\bar{6}$	$\mathrm{A''}$
N173.10.5 GM2 $\oplus$ A4A5	$\surd$	1	1	$\surd$	$\bar{6}$	$\mathrm{A''}$
N173.11.1 GM2 $\oplus$ DT1DU1	$\surd$	1	1	$\surd$	$\bar{6}$	$\mathrm{A''}$
N173.11.2 GM2 $\oplus$ DT3DU3	$\surd$	1	1	$\surd$	$\bar{6}$	$\mathrm{A''}$
N173.13.1 GM2 $\oplus$ K1	$\surd$	1	1	$\surd$	6	B
N173.16.1 M1	$\times$	-	-	-	-	-
N173.16.2 M2	$\times$	-	-	-	-	-

TABLE S520: Collinear SSGs with parent space group $P\bar{6}$ (No. 174).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L174.1.1 GM1	1	$6/m$	$\mathrm{A_g}$

Collinear SSGs with parent space group $P\bar{6}$ (No. 174)(continued)

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L174.2.1 GM2	1	$6/m$	$\mathrm{B_g}$
L174.2.2 A1	0	-	-

TABLE S521: Coplanar SSGs with parent space group $P\bar{6}$ (No. 174).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P174.1.1 GM1	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{B_u}$
P174.2.1 GM2	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{A_g}\oplus\mathrm{A_u}\oplus\mathrm{B_g}$
P174.2.2 A1	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{A_g}$
P174.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{B_g}\oplus\mathrm{B_g}\oplus\mathrm{B_u}$
P174.3.2 GM2 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
P174.3.3 A1 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
P174.3.4 A1 $\oplus$ A2	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{A_u}$
P174.4.1 GM3GM5	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{B_u}\oplus{}^2\mathrm{E1_g}\oplus{}^1\mathrm{E1_g}$
P174.4.2 GM4GM6	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{B_u}\oplus{}^2\mathrm{E2_g}\oplus{}^1\mathrm{E2_g}$
P174.4.3 A3A5	$\surd$	1	1	$\times$	-	-
P174.4.4 K1KA1	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{B_u}$
P174.4.5 K2KA2	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{B_u}$
P174.4.6 H1HA1	$\surd$	1	1	$\times$	-	-
P174.8.1 DT1	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{A_u}$

TABLE S522: Non-coplanar SSGs with parent space group $P\bar{6}$ (No. 174).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N174.1.1 GM1	$\surd$	3	3	$\surd$	$\bar{6}$	$\mathrm{A'}\oplus\mathrm{A'}\oplus\mathrm{A'}$
N174.2.1 GM2	$\surd$	3	3	$\surd$	6	$\mathrm{A}\oplus\mathrm{A}\oplus\mathrm{B}$
N174.2.2 A1	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{B_u}$
N174.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$\bar{6}$	$\mathrm{A'}\oplus\mathrm{A''}\oplus\mathrm{A''}$
N174.3.2 GM2 $\oplus$ A1	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{A_g}\oplus\mathrm{A_u}\oplus\mathrm{B_g}$
N174.3.3 A1 $\oplus$ A1	$\surd$	1	1	$\surd$	$\bar{6}$	$\mathrm{A'}$
N174.3.4 A1 $\oplus$ A2	$\surd$	1	1	$\surd$	6	A
N174.4.1 GM3GM5	$\surd$	3	3	$\surd$	$\bar{6}$	$\mathrm{A'}\oplus{}^2\mathrm{E'}\oplus{}^1\mathrm{E'}$
N174.4.2 GM4GM6	$\surd$	3	3	$\surd$	$\bar{6}$	$\mathrm{A'}\oplus{}^2\mathrm{E''}\oplus{}^1\mathrm{E''}$
N174.4.3 A3A5	$\surd$	1	1	$\surd$	$\bar{6}$	$\mathrm{A'}$
N174.4.4 K1KA1	$\surd$	1	1	$\surd$	$\bar{6}$	$\mathrm{A'}$
N174.4.5 K2KA2	$\surd$	1	1	$\surd$	$\bar{6}$	$\mathrm{A'}$
N174.4.6 H1HA1	$\surd$	1	1	$\surd$	$\bar{6}$	$\mathrm{A'}$
N174.8.1 DT1	$\surd$	1	1	$\surd$	6	A
N174.9.1 GM2 $\oplus$ GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	6	$\mathrm{B}\oplus\mathrm{B}\oplus\mathrm{B}$
N174.9.2 GM2 $\oplus$ GM2 $\oplus$ A1	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{B_g}\oplus\mathrm{B_g}\oplus\mathrm{B_u}$
N174.9.3 GM2 $\oplus$ A1 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
N174.9.4 GM2 $\oplus$ A1 $\oplus$ A2	$\surd$	1	1	$\surd$	$\bar{6}$	$\mathrm{A''}$
N174.9.5 A1 $\oplus$ A1 $\oplus$ A1	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{B_u}\oplus\mathrm{B_u}\oplus\mathrm{B_u}$
N174.9.6 A1 $\oplus$ A1 $\oplus$ A2	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{A_u}\oplus\mathrm{A_u}\oplus\mathrm{B_u}$

Non-coplanar SSGs with parent space group $P\bar{6}$ (No. 174) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N174.10.1 GM2 $\oplus$ GM3GM5	$\surd$	3	3	$\surd$	6	$\mathrm{B} \oplus {}^2\mathrm{E1} \oplus {}^1\mathrm{E1}$
N174.10.2 GM2 $\oplus$ GM4GM6	$\surd$	3	3	$\surd$	6	$\mathrm{B} \oplus {}^2\mathrm{E2} \oplus {}^1\mathrm{E2}$
N174.10.3 GM2 $\oplus$ A3A5	$\surd$	1	1	$\times$	-	-
N174.10.4 GM2 $\oplus$ K1KA1	$\surd$	1	1	$\surd$	6	B
N174.10.5 GM2 $\oplus$ K2KA2	$\surd$	1	1	$\surd$	6	B
N174.10.6 GM2 $\oplus$ H1HA1	$\surd$	1	1	$\times$	-	-
N174.10.7 A1 $\oplus$ GM3GM5	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{B_u} \oplus {}^2\mathrm{E1_g} \oplus {}^1\mathrm{E1_g}$
N174.10.8 A1 $\oplus$ GM4GM6	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{B_u} \oplus {}^2\mathrm{E2_g} \oplus {}^1\mathrm{E2_g}$
N174.10.9 A1 $\oplus$ A3A5	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{B_u} \oplus {}^2\mathrm{E2_u} \oplus {}^1\mathrm{E2_u}$
N174.10.10 A1 $\oplus$ A4A6	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{B_u} \oplus {}^2\mathrm{E1_u} \oplus {}^1\mathrm{E1_u}$
N174.10.11 A1 $\oplus$ K1KA1	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{B_u}$
N174.10.12 A1 $\oplus$ K2KA2	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{B_u}$
N174.10.13 A1 $\oplus$ H1HA1	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{B_u}$
N174.10.14 A1 $\oplus$ H2HA2	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{B_u}$
N174.14.1 GM2 $\oplus$ DT1	$\surd$	1	1	$\surd$	$\bar{6}$	$\mathrm{A''}$
N174.14.2 A1 $\oplus$ DT1	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{A_u}$
N174.16.1 M1	$\times$	-	-	-	-	-
N174.16.2 M2	$\times$	-	-	-	-	-
N174.16.3 L1	$\times$	-	-	-	-	-

TABLE S523: Collinear SSGs with parent space group $P6/m$ (No. 175).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L175.1.1 $\mathrm{GM1^+}$	1	$6/m$	$\mathrm{A_g}$
L175.2.1 $\mathrm{GM1^-}$	0	-	-
L175.2.2 $\mathrm{GM2^+}$	1	$6/m$	$\mathrm{B_g}$
L175.2.3 $\mathrm{GM2^-}$	0	-	-
L175.2.4 $\mathrm{A1^+}$	0	-	-
L175.2.5 $\mathrm{A2^+}$	0	-	-

TABLE S524: Coplanar SSGs with parent space group $P6/m$ (No. 175).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P175.1.1 $\mathrm{GM1^+}$	$\surd$	2	2	$\surd$	$6/m$	$\mathrm{A_g} \oplus \mathrm{A_g}$
P175.2.1 $\mathrm{GM1^-}$	$\surd$	2	2	$\surd$	$6/m$	$\mathrm{A_g} \oplus \mathrm{A_u}$
P175.2.2 $\mathrm{GM2^+}$	$\surd$	2	2	$\surd$	$6/m$	$\mathrm{A_g} \oplus \mathrm{B_g}$
P175.2.3 $\mathrm{GM2^-}$	$\surd$	2	2	$\surd$	$6/m$	$\mathrm{A_g} \oplus \mathrm{B_u}$
P175.2.4 $\mathrm{A1^+}$	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{A_g}$
P175.2.5 $\mathrm{A2^+}$	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{A_g}$
P175.3.1 $\mathrm{GM1^-} \oplus \mathrm{GM1^-}$	$\surd$	0	0	$\surd$	-	-
P175.3.2 $\mathrm{GM1^-} \oplus \mathrm{GM2^+}$	$\surd$	2	2	$\surd$	$6/m$	$\mathrm{B_g} \oplus \mathrm{B_u}$
P175.3.3 $\mathrm{GM1^-} \oplus \mathrm{GM2^-}$	$\surd$	0	0	$\surd$	-	-
P175.3.4 $\mathrm{GM1^-} \oplus \mathrm{A1^+}$	$\surd$	1	1	$\times$	-	-
P175.3.5 $\mathrm{GM1^-} \oplus \mathrm{A2^+}$	$\surd$	1	1	$\times$	-	-
P175.3.6 $\mathrm{GM2^+} \oplus \mathrm{GM2^+}$	$\surd$	2	2	$\surd$	$6/m$	$\mathrm{B_g} \oplus \mathrm{B_g}$

Coplanar SSGs with parent space group $P6/m$ (No. 175) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P175.3.7 $\mathrm{GM2^+} \oplus \mathrm{GM2^-}$	$\surd$	2	2	$\surd$	$6/m$	$\mathrm{A_u} \oplus \mathrm{B_g}$
P175.3.8 $\mathrm{GM2^+} \oplus \mathrm{A1^+}$	$\surd$	1	0	$\times$	-	-
P175.3.9 $\mathrm{GM2^+} \oplus \mathrm{A2^+}$	$\surd$	1	0	$\times$	-	-
P175.3.10 $\mathrm{GM2^-} \oplus \mathrm{GM2^-}$	$\surd$	0	0	$\surd$	-	-
P175.3.11 $\mathrm{GM2^-} \oplus \mathrm{A1^+}$	$\surd$	1	1	$\times$	-	-
P175.3.12 $\mathrm{GM2^-} \oplus \mathrm{A2^+}$	$\surd$	1	1	$\times$	-	-
P175.3.13 $\mathrm{A1^+} \oplus \mathrm{A1^+}$	$\surd$	1	0	$\times$	-	-
P175.3.14 $\mathrm{A1^+} \oplus \mathrm{A1^-}$	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{A_u}$
P175.3.15 $\mathrm{A1^+} \oplus \mathrm{A2^+}$	$\surd$	1	0	$\times$	-	-
P175.3.16 $\mathrm{A1^+} \oplus \mathrm{A2^-}$	$\surd$	1	1	$\times$	-	-
P175.3.17 $\mathrm{A2^+} \oplus \mathrm{A2^+}$	$\surd$	1	0	$\times$	-	-
P175.3.18 $\mathrm{A2^+} \oplus \mathrm{A2^-}$	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{A_u}$
P175.4.1 $\mathrm{GM3^+GM5^+}$	$\surd$	2	2	$\surd$	$6/m$	$^2\mathrm{E1_g} \oplus {}^1\mathrm{E1_g}$
P175.4.2 $\mathrm{GM3^-GM5^-}$	$\surd$	0	0	$\surd$	-	-
P175.4.3 $\mathrm{GM4^+GM6^+}$	$\surd$	2	2	$\surd$	$6/m$	$^2\mathrm{E2_g} \oplus {}^1\mathrm{E2_g}$
P175.4.4 $\mathrm{GM4^-GM6^-}$	$\surd$	0	0	$\surd$	-	-
P175.4.5 $\mathrm{A3^+A5^+}$	$\surd$	1	0	$\times$	-	-
P175.4.6 $\mathrm{A4^+A6^+}$	$\surd$	1	0	$\times$	-	-
P175.7.1 K1	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{B_u}$
P175.7.2 K2	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{B_u}$
P175.7.3 H1	$\surd$	1	1	$\times$	-	-
P175.8.1 DT1	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{A_u}$
P175.8.2 DT2	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{A_u}$

TABLE S525: Non-coplanar SSGs with parent space group $P6/m$ (No. 175).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N175.1.1 $\mathrm{GM1^+}$	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{A_g}$
N175.2.1 $\mathrm{GM1^-}$	$\surd$	2	2	$\surd$	6	$\mathrm{A} \oplus \mathrm{A}$
N175.2.2 $\mathrm{GM2^+}$	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{A_g} \oplus \mathrm{A_g} \oplus \mathrm{B_g}$
N175.2.3 $\mathrm{GM2^-}$	$\surd$	2	2	$\surd$	$\bar{6}$	$\mathrm{A'} \oplus \mathrm{A'}$
N175.2.4 $\mathrm{A1^+}$	$\surd$	2	2	$\surd$	$6/m$	$\mathrm{A_g} \oplus \mathrm{A_g}$
N175.2.5 $\mathrm{A2^+}$	$\surd$	2	2	$\surd$	$6/m$	$\mathrm{A_g} \oplus \mathrm{A_g}$
N175.3.1 $\mathrm{GM1^-} \oplus \mathrm{GM1^-}$	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{A_u}$
N175.3.2 $\mathrm{GM1^-} \oplus \mathrm{GM2^+}$	$\surd$	2	2	$\surd$	$\bar{6}$	$\mathrm{A'} \oplus \mathrm{A''}$
N175.3.3 $\mathrm{GM1^-} \oplus \mathrm{GM2^-}$	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{A_g} \oplus \mathrm{A_u} \oplus \mathrm{B_u}$
N175.3.4 $\mathrm{GM1^-} \oplus \mathrm{A1^+}$	$\surd$	2	2	$\surd$	$6/m$	$\mathrm{A_g} \oplus \mathrm{A_u}$
N175.3.5 $\mathrm{GM1^-} \oplus \mathrm{A2^+}$	$\surd$	2	2	$\surd$	$6/m$	$\mathrm{A_g} \oplus \mathrm{A_u}$
N175.3.6 $\mathrm{GM2^+} \oplus \mathrm{GM2^+}$	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{A_g} \oplus \mathrm{B_g} \oplus \mathrm{B_g}$
N175.3.7 $\mathrm{GM2^+} \oplus \mathrm{GM2^-}$	$\surd$	2	2	$\surd$	6	$\mathrm{A} \oplus \mathrm{B}$
N175.3.8 $\mathrm{GM2^+} \oplus \mathrm{A1^+}$	$\surd$	2	2	$\surd$	$6/m$	$\mathrm{A_g} \oplus \mathrm{B_g}$
N175.3.9 $\mathrm{GM2^+} \oplus \mathrm{A2^+}$	$\surd$	2	2	$\surd$	$6/m$	$\mathrm{A_g} \oplus \mathrm{B_g}$
N175.3.10 $\mathrm{GM2^-} \oplus \mathrm{GM2^-}$	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{A_g} \oplus \mathrm{B_u} \oplus \mathrm{B_u}$
N175.3.11 $\mathrm{GM2^-} \oplus \mathrm{A1^+}$	$\surd$	2	2	$\surd$	$6/m$	$\mathrm{A_g} \oplus \mathrm{B_u}$
N175.3.12 $\mathrm{GM2^-} \oplus \mathrm{A2^+}$	$\surd$	2	2	$\surd$	$6/m$	$\mathrm{A_g} \oplus \mathrm{B_u}$
N175.3.13 $\mathrm{A1^+} \oplus \mathrm{A1^+}$	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{A_g}$

Non-coplanar SSGs with parent space group $P6/m$ (No. 175) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N175.3.14 $\mathrm{A1^+} \oplus \mathrm{A1^-}$	√	1	1	√	6	A
N175.3.15 $\mathrm{A1^+} \oplus \mathrm{A2^+}$	√	1	1	√	$6/m$	$\mathrm{A_g}$
N175.3.16 $\mathrm{A1^+} \oplus \mathrm{A2^-}$	√	1	1	√	$\bar{6}$	$\mathrm{A'}$
N175.3.17 $\mathrm{A2^+} \oplus \mathrm{A2^+}$	√	1	1	√	$6/m$	$\mathrm{A_g}$
N175.3.18 $\mathrm{A2^+} \oplus \mathrm{A2^-}$	√	1	1	√	6	A
N175.4.1 $\mathrm{GM3^+GM5^+}$	√	3	3	√	$6/m$	$\mathrm{A_g} \oplus {}^2\mathrm{E1_g} \oplus {}^1\mathrm{E1_g}$
N175.4.2 $\mathrm{GM3^-GM5^-}$	√	3	3	√	$6/m$	$\mathrm{A_g} \oplus {}^2\mathrm{E1_u} \oplus {}^1\mathrm{E1_u}$
N175.4.3 $\mathrm{GM4^+GM6^+}$	√	3	3	√	$6/m$	$\mathrm{A_g} \oplus {}^2\mathrm{E2_g} \oplus {}^1\mathrm{E2_g}$
N175.4.4 $\mathrm{GM4^-GM6^-}$	√	3	3	√	$6/m$	$\mathrm{A_g} \oplus {}^2\mathrm{E2_u} \oplus {}^1\mathrm{E2_u}$
N175.4.5 $\mathrm{A3^+A5^+}$	√	1	1	√	$6/m$	$\mathrm{A_g}$
N175.4.6 $\mathrm{A4^+A6^+}$	√	1	1	√	$6/m$	$\mathrm{A_g}$
N175.7.1 K1	√	1	1	√	$\bar{6}$	$\mathrm{A'}$
N175.7.2 K2	√	1	1	√	$\bar{6}$	$\mathrm{A'}$
N175.7.3 H1	√	1	1	√	$\bar{6}$	$\mathrm{A'}$
N175.8.1 DT1	√	1	1	√	6	A
N175.8.2 DT2	√	1	1	√	6	A
N175.9.1 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM1^-}$	√	0	0	√	-	-
N175.9.2 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM2^+}$	√	3	3	√	$6/m$	$\mathrm{B_g} \oplus \mathrm{B_u} \oplus \mathrm{B_u}$
N175.9.3 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{GM2^-}$	√	0	0	√	-	-
N175.9.4 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{A1^+}$	√	0	0	√	-	-
N175.9.5 $\mathrm{GM1^-} \oplus \mathrm{GM1^-} \oplus \mathrm{A2^+}$	√	0	0	√	-	-
N175.9.6 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{GM2^+}$	√	2	2	√	6	$\mathrm{B} \oplus \mathrm{B}$
N175.9.7 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{GM2^-}$	√	3	3	√	$6/m$	$\mathrm{A_u} \oplus \mathrm{B_g} \oplus \mathrm{B_u}$
N175.9.8 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{A1^+}$	√	2	2	√	$6/m$	$\mathrm{B_g} \oplus \mathrm{B_u}$
N175.9.9 $\mathrm{GM1^-} \oplus \mathrm{GM2^+} \oplus \mathrm{A2^+}$	√	2	2	√	$6/m$	$\mathrm{B_g} \oplus \mathrm{B_u}$
N175.9.10 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{GM2^-}$	√	0	0	√	-	-
N175.9.11 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{A1^+}$	√	0	0	√	-	-
N175.9.12 $\mathrm{GM1^-} \oplus \mathrm{GM2^-} \oplus \mathrm{A2^+}$	√	0	0	√	-	-
N175.9.13 $\mathrm{GM1^-} \oplus \mathrm{A1^+} \oplus \mathrm{A1^+}$	√	1	0	×	-	-
N175.9.14 $\mathrm{GM1^-} \oplus \mathrm{A1^+} \oplus \mathrm{A1^-}$	√	1	1	√	$6/m$	$\mathrm{A_u}$
N175.9.15 $\mathrm{GM1^-} \oplus \mathrm{A1^+} \oplus \mathrm{A2^+}$	√	1	0	×	-	-
N175.9.16 $\mathrm{GM1^-} \oplus \mathrm{A1^+} \oplus \mathrm{A2^-}$	√	1	1	×	-	-
N175.9.17 $\mathrm{GM1^-} \oplus \mathrm{A2^+} \oplus \mathrm{A2^+}$	√	1	0	×	-	-
N175.9.18 $\mathrm{GM1^-} \oplus \mathrm{A2^+} \oplus \mathrm{A2^-}$	√	1	1	√	$6/m$	$\mathrm{A_u}$
N175.9.19 $\mathrm{GM2^+} \oplus \mathrm{GM2^+} \oplus \mathrm{GM2^+}$	√	3	3	√	$6/m$	$\mathrm{B_g} \oplus \mathrm{B_g} \oplus \mathrm{B_g}$
N175.9.20 $\mathrm{GM2^+} \oplus \mathrm{GM2^+} \oplus \mathrm{GM2^-}$	√	2	2	√	$\bar{6}$	$\mathrm{A''} \oplus \mathrm{A''}$
N175.9.21 $\mathrm{GM2^+} \oplus \mathrm{GM2^+} \oplus \mathrm{A1^+}$	√	2	2	√	$6/m$	$\mathrm{B_g} \oplus \mathrm{B_g}$
N175.9.22 $\mathrm{GM2^+} \oplus \mathrm{GM2^+} \oplus \mathrm{A2^+}$	√	2	2	√	$6/m$	$\mathrm{B_g} \oplus \mathrm{B_g}$
N175.9.23 $\mathrm{GM2^+} \oplus \mathrm{GM2^-} \oplus \mathrm{GM2^-}$	√	3	3	√	$6/m$	$\mathrm{A_u} \oplus \mathrm{A_u} \oplus \mathrm{B_g}$
N175.9.24 $\mathrm{GM2^+} \oplus \mathrm{GM2^-} \oplus \mathrm{A1^+}$	√	2	2	√	$6/m$	$\mathrm{A_u} \oplus \mathrm{B_g}$
N175.9.25 $\mathrm{GM2^+} \oplus \mathrm{GM2^-} \oplus \mathrm{A2^+}$	√	2	2	√	$6/m$	$\mathrm{A_u} \oplus \mathrm{B_g}$
N175.9.26 $\mathrm{GM2^+} \oplus \mathrm{A1^+} \oplus \mathrm{A1^+}$	√	1	1	×	-	-
N175.9.27 $\mathrm{GM2^+} \oplus \mathrm{A1^+} \oplus \mathrm{A1^-}$	√	1	1	√	$\bar{6}$	$\mathrm{A''}$
N175.9.28 $\mathrm{GM2^+} \oplus \mathrm{A1^+} \oplus \mathrm{A2^+}$	√	1	1	×	-	-
N175.9.29 $\mathrm{GM2^+} \oplus \mathrm{A1^+} \oplus \mathrm{A2^-}$	√	1	1	×	-	-
N175.9.30 $\mathrm{GM2^+} \oplus \mathrm{A2^+} \oplus \mathrm{A2^+}$	√	1	1	×	-	-

Non-coplanar SSGs with parent space group $P6/m$ (No. 175) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N175.9.31 $\mathrm{GM2}^+ \oplus \mathrm{A2}^+ \oplus \mathrm{A2}^-$	$\surd$	1	1	$\surd$	$\bar{6}$	A''
N175.9.32 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
N175.9.33 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{A1}^+$	$\surd$	0	0	$\surd$	-	-
N175.9.34 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{A2}^+$	$\surd$	0	0	$\surd$	-	-
N175.9.35 $\mathrm{GM2}^- \oplus \mathrm{A1}^+ \oplus \mathrm{A1}^+$	$\surd$	1	0	$\times$	-	-
N175.9.36 $\mathrm{GM2}^- \oplus \mathrm{A1}^+ \oplus \mathrm{A1}^-$	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{A_u}$
N175.9.37 $\mathrm{GM2}^- \oplus \mathrm{A1}^+ \oplus \mathrm{A2}^+$	$\surd$	1	0	$\times$	-	-
N175.9.38 $\mathrm{GM2}^- \oplus \mathrm{A1}^+ \oplus \mathrm{A2}^-$	$\surd$	1	1	$\times$	-	-
N175.9.39 $\mathrm{GM2}^- \oplus \mathrm{A2}^+ \oplus \mathrm{A2}^+$	$\surd$	1	0	$\times$	-	-
N175.9.40 $\mathrm{GM2}^- \oplus \mathrm{A2}^+ \oplus \mathrm{A2}^-$	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{A_u}$
N175.9.41 $\mathrm{A1}^+ \oplus \mathrm{A1}^+ \oplus \mathrm{A1}^+$	$\surd$	0	0	$\surd$	-	-
N175.9.42 $\mathrm{A1}^+ \oplus \mathrm{A1}^+ \oplus \mathrm{A1}^-$	$\surd$	2	2	$\surd$	$6/m$	$\mathrm{A_u} \oplus \mathrm{A_u}$
N175.9.43 $\mathrm{A1}^+ \oplus \mathrm{A1}^+ \oplus \mathrm{A2}^+$	$\surd$	0	0	$\surd$	-	-
N175.9.44 $\mathrm{A1}^+ \oplus \mathrm{A1}^+ \oplus \mathrm{A2}^-$	$\surd$	2	2	$\surd$	$6/m$	$\mathrm{B_u} \oplus \mathrm{B_u}$
N175.9.45 $\mathrm{A1}^+ \oplus \mathrm{A1}^- \oplus \mathrm{A2}^+$	$\surd$	2	2	$\surd$	$6/m$	$\mathrm{A_u} \oplus \mathrm{B_u}$
N175.9.46 $\mathrm{A1}^+ \oplus \mathrm{A2}^+ \oplus \mathrm{A2}^+$	$\surd$	0	0	$\surd$	-	-
N175.9.47 $\mathrm{A1}^+ \oplus \mathrm{A2}^+ \oplus \mathrm{A2}^-$	$\surd$	2	2	$\surd$	$6/m$	$\mathrm{A_u} \oplus \mathrm{B_u}$
N175.9.48 $\mathrm{A1}^+ \oplus \mathrm{A2}^- \oplus \mathrm{A2}^-$	$\surd$	2	2	$\surd$	$6/m$	$\mathrm{B_u} \oplus \mathrm{B_u}$
N175.9.49 $\mathrm{A2}^+ \oplus \mathrm{A2}^+ \oplus \mathrm{A2}^+$	$\surd$	0	0	$\surd$	-	-
N175.9.50 $\mathrm{A2}^+ \oplus \mathrm{A2}^+ \oplus \mathrm{A2}^-$	$\surd$	2	2	$\surd$	$6/m$	$\mathrm{A_u} \oplus \mathrm{A_u}$
N175.10.1 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+\mathrm{GM5}^+$	$\surd$	2	2	$\surd$	6	${}^2\mathrm{E1} \oplus {}^1\mathrm{E1}$
N175.10.2 $\mathrm{GM1}^- \oplus \mathrm{GM3}^-\mathrm{GM5}^-$	$\surd$	0	0	$\surd$	-	-
N175.10.3 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+\mathrm{GM6}^+$	$\surd$	2	2	$\surd$	6	${}^2\mathrm{E2} \oplus {}^1\mathrm{E2}$
N175.10.4 $\mathrm{GM1}^- \oplus \mathrm{GM4}^-\mathrm{GM6}^-$	$\surd$	0	0	$\surd$	-	-
N175.10.5 $\mathrm{GM1}^- \oplus \mathrm{A3}^+\mathrm{A5}^+$	$\surd$	1	0	$\times$	-	-
N175.10.6 $\mathrm{GM1}^- \oplus \mathrm{A4}^+\mathrm{A6}^+$	$\surd$	1	0	$\times$	-	-
N175.10.7 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+\mathrm{GM5}^+$	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{B_g} \oplus {}^2\mathrm{E1_g} \oplus {}^1\mathrm{E1_g}$
N175.10.8 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^-\mathrm{GM5}^-$	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{B_g} \oplus {}^2\mathrm{E2_u} \oplus {}^1\mathrm{E2_u}$
N175.10.9 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+\mathrm{GM6}^+$	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{B_g} \oplus {}^2\mathrm{E2_g} \oplus {}^1\mathrm{E2_g}$
N175.10.10 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^-\mathrm{GM6}^-$	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{B_g} \oplus {}^2\mathrm{E1_u} \oplus {}^1\mathrm{E1_u}$
N175.10.11 $\mathrm{GM2}^+ \oplus \mathrm{A3}^+\mathrm{A5}^+$	$\surd$	1	1	$\times$	-	-
N175.10.12 $\mathrm{GM2}^+ \oplus \mathrm{A4}^+\mathrm{A6}^+$	$\surd$	1	1	$\times$	-	-
N175.10.13 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+\mathrm{GM5}^+$	$\surd$	2	2	$\surd$	$\bar{6}$	${}^2\mathrm{E}' \oplus {}^1\mathrm{E}'$
N175.10.14 $\mathrm{GM2}^- \oplus \mathrm{GM3}^-\mathrm{GM5}^-$	$\surd$	0	0	$\surd$	-	-
N175.10.15 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+\mathrm{GM6}^+$	$\surd$	2	2	$\surd$	$\bar{6}$	${}^2\mathrm{E}'' \oplus {}^1\mathrm{E}''$
N175.10.16 $\mathrm{GM2}^- \oplus \mathrm{GM4}^-\mathrm{GM6}^-$	$\surd$	0	0	$\surd$	-	-
N175.10.17 $\mathrm{GM2}^- \oplus \mathrm{A3}^+\mathrm{A5}^+$	$\surd$	1	0	$\times$	-	-
N175.10.18 $\mathrm{GM2}^- \oplus \mathrm{A4}^+\mathrm{A6}^+$	$\surd$	1	0	$\times$	-	-
N175.10.19 $\mathrm{A1}^+ \oplus \mathrm{GM3}^+\mathrm{GM5}^+$	$\surd$	2	2	$\surd$	$6/m$	${}^2\mathrm{E1_g} \oplus {}^1\mathrm{E1_g}$
N175.10.20 $\mathrm{A1}^+ \oplus \mathrm{GM3}^-\mathrm{GM5}^-$	$\surd$	0	0	$\surd$	-	-
N175.10.21 $\mathrm{A1}^+ \oplus \mathrm{GM4}^+\mathrm{GM6}^+$	$\surd$	2	2	$\surd$	$6/m$	${}^2\mathrm{E2_g} \oplus {}^1\mathrm{E2_g}$
N175.10.22 $\mathrm{A1}^+ \oplus \mathrm{GM4}^-\mathrm{GM6}^-$	$\surd$	0	0	$\surd$	-	-
N175.10.23 $\mathrm{A1}^+ \oplus \mathrm{A3}^+\mathrm{A5}^+$	$\surd$	0	0	$\surd$	-	-
N175.10.24 $\mathrm{A1}^+ \oplus \mathrm{A3}^-\mathrm{A5}^-$	$\surd$	2	2	$\surd$	$6/m$	${}^2\mathrm{E1_u} \oplus {}^1\mathrm{E1_u}$
N175.10.25 $\mathrm{A1}^+ \oplus \mathrm{A4}^+\mathrm{A6}^+$	$\surd$	0	0	$\surd$	-	-
N175.10.26 $\mathrm{A1}^+ \oplus \mathrm{A4}^-\mathrm{A6}^-$	$\surd$	2	2	$\surd$	$6/m$	${}^2\mathrm{E2_u} \oplus {}^1\mathrm{E2_u}$

Non-coplanar SSGs with parent space group $P6/m$ (No. 175) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N175.10.27 $\mathrm{A2^+} \oplus \mathrm{GM3^+GM5^+}$	$\surd$	2	2	$\surd$	$6/m$	$^2\mathrm{E1_g} \oplus {}^1\mathrm{E1_g}$
N175.10.28 $\mathrm{A2^+} \oplus \mathrm{GM3^-GM5^-}$	$\surd$	0	0	$\surd$	-	-
N175.10.29 $\mathrm{A2^+} \oplus \mathrm{GM4^+GM6^+}$	$\surd$	2	2	$\surd$	$6/m$	$^2\mathrm{E2_g} \oplus {}^1\mathrm{E2_g}$
N175.10.30 $\mathrm{A2^+} \oplus \mathrm{GM4^-GM6^-}$	$\surd$	0	0	$\surd$	-	-
N175.10.31 $\mathrm{A2^+} \oplus \mathrm{A3^+A5^+}$	$\surd$	0	0	$\surd$	-	-
N175.10.32 $\mathrm{A2^+} \oplus \mathrm{A3^-A5^-}$	$\surd$	2	2	$\surd$	$6/m$	$^2\mathrm{E2_u} \oplus {}^1\mathrm{E2_u}$
N175.10.33 $\mathrm{A2^+} \oplus \mathrm{A4^+A6^+}$	$\surd$	0	0	$\surd$	-	-
N175.10.34 $\mathrm{A2^+} \oplus \mathrm{A4^-A6^-}$	$\surd$	2	2	$\surd$	$6/m$	$^2\mathrm{E1_u} \oplus {}^1\mathrm{E1_u}$
N175.13.1 $\mathrm{GM1^-} \oplus \mathrm{K1}$	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{B_u}$
N175.13.2 $\mathrm{GM1^-} \oplus \mathrm{K2}$	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{B_u}$
N175.13.3 $\mathrm{GM1^-} \oplus \mathrm{H1}$	$\surd$	1	1	$\times$	-	-
N175.13.4 $\mathrm{GM2^+} \oplus \mathrm{K1}$	$\surd$	1	1	$\surd$	6	B
N175.13.5 $\mathrm{GM2^+} \oplus \mathrm{K2}$	$\surd$	1	1	$\surd$	6	B
N175.13.6 $\mathrm{GM2^+} \oplus \mathrm{H1}$	$\surd$	1	1	$\times$	-	-
N175.13.7 $\mathrm{GM2^-} \oplus \mathrm{K1}$	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{B_u}$
N175.13.8 $\mathrm{GM2^-} \oplus \mathrm{K2}$	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{B_u}$
N175.13.9 $\mathrm{GM2^-} \oplus \mathrm{H1}$	$\surd$	1	1	$\times$	-	-
N175.13.10 $\mathrm{A1^+} \oplus \mathrm{K1}$	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{B_u}$
N175.13.11 $\mathrm{A1^+} \oplus \mathrm{K2}$	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{B_u}$
N175.13.12 $\mathrm{A1^+} \oplus \mathrm{H1}$	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{B_u}$
N175.13.13 $\mathrm{A1^+} \oplus \mathrm{H2}$	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{B_u}$
N175.13.14 $\mathrm{A2^+} \oplus \mathrm{K1}$	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{B_u}$
N175.13.15 $\mathrm{A2^+} \oplus \mathrm{K2}$	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{B_u}$
N175.13.16 $\mathrm{A2^+} \oplus \mathrm{H1}$	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{B_u}$
N175.13.17 $\mathrm{A2^+} \oplus \mathrm{H2}$	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{B_u}$
N175.14.1 $\mathrm{GM1^-} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{A_u}$
N175.14.2 $\mathrm{GM1^-} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{A_u}$
N175.14.3 $\mathrm{GM2^+} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	$\bar{6}$	$\mathrm{A''}$
N175.14.4 $\mathrm{GM2^+} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	$\bar{6}$	$\mathrm{A''}$
N175.14.5 $\mathrm{GM2^-} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{A_u}$
N175.14.6 $\mathrm{GM2^-} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{A_u}$
N175.14.7 $\mathrm{A1^+} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{A_u}$
N175.14.8 $\mathrm{A1^+} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{A_u}$
N175.14.9 $\mathrm{A2^+} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{A_u}$
N175.14.10 $\mathrm{A2^+} \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{A_u}$
N175.16.1 $\mathrm{M1^+}$	$\times$	-	-	-	-	-
N175.16.2 $\mathrm{M1^-}$	$\times$	-	-	-	-	-
N175.16.3 $\mathrm{M2^+}$	$\times$	-	-	-	-	-
N175.16.4 $\mathrm{M2^-}$	$\times$	-	-	-	-	-
N175.16.5 $\mathrm{L1^+}$	$\times$	-	-	-	-	-
N175.16.6 $\mathrm{L2^+}$	$\times$	-	-	-	-	-

TABLE S526: Collinear SSGs with parent space group $P6_3/m$ (No. 176).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L176.1.1 $\mathrm{GM1^+}$	1	$6/m$	$\mathrm{A_g}$

Collinear SSGs with parent space group $P6_3/m$ (No. 176)(continued)

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L176.2.1 $\mathrm{GM1}^-$	0	-	-
L176.2.2 $\mathrm{GM2}^+$	1	$6/m$	$\mathrm{B_g}$
L176.2.3 $\mathrm{GM2}^-$	0	-	-

TABLE S527: Coplanar SSGs with parent space group $P6_3/m$ (No. 176).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P176.1.1 $\mathrm{GM1}^+$	$\surd$	2	2	$\surd$	$6/m$	$\mathrm{A_g}\oplus\mathrm{A_g}$
P176.2.1 $\mathrm{GM1}^-$	$\surd$	2	2	$\surd$	$6/m$	$\mathrm{A_g}\oplus\mathrm{A_u}$
P176.2.2 $\mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$6/m$	$\mathrm{A_g}\oplus\mathrm{B_g}$
P176.2.3 $\mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$6/m$	$\mathrm{A_g}\oplus\mathrm{B_u}$
P176.3.1 $\mathrm{GM1}^-\oplus\mathrm{GM1}^-$	$\surd$	0	0	$\surd$	-	-
P176.3.2 $\mathrm{GM1}^-\oplus\mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$6/m$	$\mathrm{B_g}\oplus\mathrm{B_u}$
P176.3.3 $\mathrm{GM1}^-\oplus\mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
P176.3.4 $\mathrm{GM2}^+\oplus\mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$6/m$	$\mathrm{B_g}\oplus\mathrm{B_g}$
P176.3.5 $\mathrm{GM2}^+\oplus\mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$6/m$	$\mathrm{A_u}\oplus\mathrm{B_g}$
P176.3.6 $\mathrm{GM2}^-\oplus\mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
P176.4.1 $\mathrm{GM3}^+\mathrm{GM5}^+$	$\surd$	2	2	$\surd$	$6/m$	$^2\mathrm{E1_g}\oplus{}^1\mathrm{E1_g}$
P176.4.2 $\mathrm{GM3}^-\mathrm{GM5}^-$	$\surd$	0	0	$\surd$	-	-
P176.4.3 $\mathrm{GM4}^+\mathrm{GM6}^+$	$\surd$	2	2	$\surd$	$6/m$	$^2\mathrm{E2_g}\oplus{}^1\mathrm{E2_g}$
P176.4.4 $\mathrm{GM4}^-\mathrm{GM6}^-$	$\surd$	0	0	$\surd$	-	-
P176.6.1 A1	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{A_u}$
P176.7.1 K1	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{B_u}$
P176.7.2 K2	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{B_u}$
P176.8.1 DT1	$\surd$	1	1	$\surd$	$6/m$	$\mathrm{A_u}$

TABLE S528: Non-coplanar SSGs with parent space group $P6_3/m$ (No. 176).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N176.1.1 $\mathrm{GM1}^+$	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{A_g}$
N176.2.1 $\mathrm{GM1}^-$	$\surd$	2	2	$\surd$	6	$\mathrm{A}\oplus\mathrm{A}$
N176.2.2 $\mathrm{GM2}^+$	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{B_g}$
N176.2.3 $\mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$\bar{6}$	$\mathrm{A'}\oplus\mathrm{A'}$
N176.3.1 $\mathrm{GM1}^-\oplus\mathrm{GM1}^-$	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{A_g}\oplus\mathrm{A_u}\oplus\mathrm{A_u}$
N176.3.2 $\mathrm{GM1}^-\oplus\mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$\bar{6}$	$\mathrm{A'}\oplus\mathrm{A''}$
N176.3.3 $\mathrm{GM1}^-\oplus\mathrm{GM2}^-$	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{A_g}\oplus\mathrm{A_u}\oplus\mathrm{B_u}$
N176.3.4 $\mathrm{GM2}^+\oplus\mathrm{GM2}^+$	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{A_g}\oplus\mathrm{B_g}\oplus\mathrm{B_g}$
N176.3.5 $\mathrm{GM2}^+\oplus\mathrm{GM2}^-$	$\surd$	2	2	$\surd$	6	$\mathrm{A}\oplus\mathrm{B}$
N176.3.6 $\mathrm{GM2}^-\oplus\mathrm{GM2}^-$	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{A_g}\oplus\mathrm{B_u}\oplus\mathrm{B_u}$
N176.4.1 $\mathrm{GM3}^+\mathrm{GM5}^+$	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{A_g}\oplus{}^2\mathrm{E1_g}\oplus{}^1\mathrm{E1_g}$
N176.4.2 $\mathrm{GM3}^-\mathrm{GM5}^-$	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{A_g}\oplus{}^2\mathrm{E1_u}\oplus{}^1\mathrm{E1_u}$
N176.4.3 $\mathrm{GM4}^+\mathrm{GM6}^+$	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{A_g}\oplus{}^2\mathrm{E2_g}\oplus{}^1\mathrm{E2_g}$
N176.4.4 $\mathrm{GM4}^-\mathrm{GM6}^-$	$\surd$	3	3	$\surd$	$6/m$	$\mathrm{A_g}\oplus{}^2\mathrm{E2_u}\oplus{}^1\mathrm{E2_u}$
N176.6.1 A1	$\surd$	1	1	$\surd$	6	A

Non-coplanar SSGs with parent space group $P6_3/m$ (No. 176) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N176.7.1 K1	√	1	1	√	$\bar{6}$	A'
N176.7.2 K2	√	1	1	√	$\bar{6}$	A'
N176.8.1 DT1	√	1	1	√	6	A
N176.9.1 $\mathrm{GM1}^-\oplus\mathrm{GM1}^-\oplus\mathrm{GM1}^-$	√	0	0	√	-	-
N176.9.2 $\mathrm{GM1}^-\oplus\mathrm{GM1}^-\oplus\mathrm{GM2}^+$	√	3	3	√	$6/m$	$\mathrm{B_g}\oplus\mathrm{B_u}\oplus\mathrm{B_u}$
N176.9.3 $\mathrm{GM1}^-\oplus\mathrm{GM1}^-\oplus\mathrm{GM2}^-$	√	0	0	√	-	-
N176.9.4 $\mathrm{GM1}^-\oplus\mathrm{GM2}^+\oplus\mathrm{GM2}^+$	√	2	2	√	6	$\mathrm{B}\oplus\mathrm{B}$
N176.9.5 $\mathrm{GM1}^-\oplus\mathrm{GM2}^+\oplus\mathrm{GM2}^-$	√	3	3	√	$6/m$	$\mathrm{A_u}\oplus\mathrm{B_g}\oplus\mathrm{B_u}$
N176.9.6 $\mathrm{GM1}^-\oplus\mathrm{GM2}^-\oplus\mathrm{GM2}^-$	√	0	0	√	-	-
N176.9.7 $\mathrm{GM2}^+\oplus\mathrm{GM2}^+\oplus\mathrm{GM2}^+$	√	3	3	√	$6/m$	$\mathrm{B_g}\oplus\mathrm{B_g}\oplus\mathrm{B_g}$
N176.9.8 $\mathrm{GM2}^+\oplus\mathrm{GM2}^+\oplus\mathrm{GM2}^-$	√	2	2	√	$\bar{6}$	$\mathrm{A}''\oplus\mathrm{A}''$
N176.9.9 $\mathrm{GM2}^+\oplus\mathrm{GM2}^-\oplus\mathrm{GM2}^-$	√	3	3	√	$6/m$	$\mathrm{A_u}\oplus\mathrm{A_u}\oplus\mathrm{B_g}$
N176.9.10 $\mathrm{GM2}^-\oplus\mathrm{GM2}^-\oplus\mathrm{GM2}^-$	√	0	0	√	-	-
N176.10.1 $\mathrm{GM1}^-\oplus\mathrm{GM3}^+\mathrm{GM5}^+$	√	2	2	√	6	$^2\mathrm{E1}\oplus{}^1\mathrm{E1}$
N176.10.2 $\mathrm{GM1}^-\oplus\mathrm{GM3}^-\mathrm{GM5}^-$	√	0	0	√	-	-
N176.10.3 $\mathrm{GM1}^-\oplus\mathrm{GM4}^+\mathrm{GM6}^+$	√	2	2	√	6	$^2\mathrm{E2}\oplus{}^1\mathrm{E2}$
N176.10.4 $\mathrm{GM1}^-\oplus\mathrm{GM4}^-\mathrm{GM6}^-$	√	0	0	√	-	-
N176.10.5 $\mathrm{GM2}^+\oplus\mathrm{GM3}^+\mathrm{GM5}^+$	√	3	3	√	$6/m$	$\mathrm{B_g}\oplus{}^2\mathrm{E1_g}\oplus{}^1\mathrm{E1_g}$
N176.10.6 $\mathrm{GM2}^+\oplus\mathrm{GM3}^-\mathrm{GM5}^-$	√	3	3	√	$6/m$	$\mathrm{B_g}\oplus{}^2\mathrm{E2_u}\oplus{}^1\mathrm{E2_u}$
N176.10.7 $\mathrm{GM2}^+\oplus\mathrm{GM4}^+\mathrm{GM6}^+$	√	3	3	√	$6/m$	$\mathrm{B_g}\oplus{}^2\mathrm{E2_g}\oplus{}^1\mathrm{E2_g}$
N176.10.8 $\mathrm{GM2}^+\oplus\mathrm{GM4}^-\mathrm{GM6}^-$	√	3	3	√	$6/m$	$\mathrm{B_g}\oplus{}^2\mathrm{E1_u}\oplus{}^1\mathrm{E1_u}$
N176.10.9 $\mathrm{GM2}^-\oplus\mathrm{GM3}^+\mathrm{GM5}^+$	√	2	2	√	$\bar{6}$	$^2\mathrm{E}'\oplus{}^1\mathrm{E}'$
N176.10.10 $\mathrm{GM2}^-\oplus\mathrm{GM3}^-\mathrm{GM5}^-$	√	0	0	√	-	-
N176.10.11 $\mathrm{GM2}^-\oplus\mathrm{GM4}^+\mathrm{GM6}^+$	√	2	2	√	$\bar{6}$	$^2\mathrm{E}''\oplus{}^1\mathrm{E}''$
N176.10.12 $\mathrm{GM2}^-\oplus\mathrm{GM4}^-\mathrm{GM6}^-$	√	0	0	√	-	-
N176.12.1 $\mathrm{GM1}^-\oplus\mathrm{A1}$	√	1	1	√	$6/m$	$\mathrm{A_u}$
N176.12.2 $\mathrm{GM2}^+\oplus\mathrm{A1}$	√	1	1	√	$\bar{6}$	A''
N176.12.3 $\mathrm{GM2}^-\oplus\mathrm{A1}$	√	1	1	√	$6/m$	$\mathrm{A_u}$
N176.13.1 $\mathrm{GM1}^-\oplus\mathrm{K1}$	√	1	1	√	$6/m$	$\mathrm{B_u}$
N176.13.2 $\mathrm{GM1}^-\oplus\mathrm{K2}$	√	1	1	√	$6/m$	$\mathrm{B_u}$
N176.13.3 $\mathrm{GM2}^+\oplus\mathrm{K1}$	√	1	1	√	6	B
N176.13.4 $\mathrm{GM2}^+\oplus\mathrm{K2}$	√	1	1	√	6	B
N176.13.5 $\mathrm{GM2}^-\oplus\mathrm{K1}$	√	1	1	√	$6/m$	$\mathrm{B_u}$
N176.13.6 $\mathrm{GM2}^-\oplus\mathrm{K2}$	√	1	1	√	$6/m$	$\mathrm{B_u}$
N176.14.1 $\mathrm{GM1}^-\oplus\mathrm{DT1}$	√	1	1	√	$6/m$	$\mathrm{A_u}$
N176.14.2 $\mathrm{GM2}^+\oplus\mathrm{DT1}$	√	1	1	√	$\bar{6}$	A''
N176.14.3 $\mathrm{GM2}^-\oplus\mathrm{DT1}$	√	1	1	√	$6/m$	$\mathrm{A_u}$
N176.16.1 $\mathrm{M1}^+$	×	-	-	-	-	-
N176.16.2 $\mathrm{M1}^-$	×	-	-	-	-	-
N176.16.3 $\mathrm{M2}^+$	×	-	-	-	-	-
N176.16.4 $\mathrm{M2}^-$	×	-	-	-	-	-

TABLE S529: Collinear SSGs with parent space group $P622$ (No. 177).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L177.1.1 GM1	1	$6/mmm$	$\mathrm{A1_g}$

Collinear SSGs with parent space group $P622$ (No. 177)(continued)

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L177.2.1 GM2	1	$6/mmm$	$\mathrm{A2_g}$
L177.2.2 GM3	1	$6/mmm$	$\mathrm{B2_g}$
L177.2.3 GM4	1	$6/mmm$	$\mathrm{B1_g}$
L177.2.4 A1	0	-	-
L177.2.5 A3	0	-	-

TABLE S530: Coplanar SSGs with parent space group $P622$ (No. 177).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P177.1.1 GM1	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A1_u}$
P177.2.1 GM2	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
P177.2.2 GM3	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
P177.2.3 GM4	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
P177.2.4 A1	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A1_g}$
P177.2.5 A3	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A1_g}$
P177.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
P177.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B1_u}$
P177.3.3 GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_u} \oplus \mathrm{B1_g}$
P177.3.4 GM2 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
P177.3.5 GM2 $\oplus$ A3	$\surd$	1	1	$\times$	-	-
P177.3.6 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
P177.3.7 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g} \oplus \mathrm{B1_g}$
P177.3.8 GM3 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
P177.3.9 GM3 $\oplus$ A3	$\surd$	1	1	$\times$	-	-
P177.3.10 GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
P177.3.11 GM4 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
P177.3.12 GM4 $\oplus$ A3	$\surd$	1	1	$\times$	-	-
P177.3.13 A1 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
P177.3.14 A1 $\oplus$ A2	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
P177.3.15 A1 $\oplus$ A3	$\surd$	1	1	$\times$	-	-
P177.3.16 A1 $\oplus$ A4	$\surd$	1	1	$\times$	-	-
P177.3.17 A3 $\oplus$ A3	$\surd$	1	1	$\times$	-	-
P177.3.18 A3 $\oplus$ A4	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
P177.6.1 GM5	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{E2_g}$
P177.6.2 GM6	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{E1_g}$
P177.6.3 A5	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
P177.6.4 A6	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
P177.7.1 K1	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{B2_u}$
P177.7.2 K2	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{B2_u}$
P177.7.3 H1	$\surd$	1	1	$\times$	-	-
P177.8.1 DT1	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
P177.8.2 DT2	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
P177.8.3 DT3	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
P177.8.4 DT4	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$

TABLE S531: Non-coplanar SSGs with parent space group $P622$ (No. 177).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N177.1.1 GM1	√	3	3	√	622	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{A1}$
N177.2.1 GM2	√	3	3	√	$6mm$	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{A2}$
N177.2.2 GM3	√	3	3	√	$\bar{6}2m$	$\mathrm{A1}'\oplus\mathrm{A1}'\oplus\mathrm{A1}''$
N177.2.3 GM4	√	3	3	√	$\bar{6}m2$	$\mathrm{A1}'\oplus\mathrm{A1}'\oplus\mathrm{A2}'$
N177.2.4 A1	√	3	3	√	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A1_u}$
N177.2.5 A3	√	3	3	√	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A1_u}$
N177.3.1 GM2 ⊕ GM2	√	3	3	√	622	$\mathrm{A1}\oplus\mathrm{A2}\oplus\mathrm{A2}$
N177.3.2 GM2 ⊕ GM3	√	3	3	√	$\bar{6}m2$	$\mathrm{A1}'\oplus\mathrm{A1}''\oplus\mathrm{A2}''$
N177.3.3 GM2 ⊕ GM4	√	3	3	√	$\bar{6}2m$	$\mathrm{A1}'\oplus\mathrm{A2}''\oplus\mathrm{A2}'$
N177.3.4 GM2 ⊕ A1	√	3	3	√	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_u}$
N177.3.5 GM2 ⊕ A3	√	3	3	√	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_u}$
N177.3.6 GM3 ⊕ GM3	√	3	3	√	622	$\mathrm{A1}\oplus\mathrm{B2}\oplus\mathrm{B2}$
N177.3.7 GM3 ⊕ GM4	√	3	3	√	$6mm$	$\mathrm{A1}\oplus\mathrm{B2}\oplus\mathrm{B1}$
N177.3.8 GM3 ⊕ A1	√	3	3	√	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_g}\oplus\mathrm{B2_u}$
N177.3.9 GM3 ⊕ A3	√	3	3	√	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_g}\oplus\mathrm{B2_u}$
N177.3.10 GM4 ⊕ GM4	√	3	3	√	622	$\mathrm{A1}\oplus\mathrm{B1}\oplus\mathrm{B1}$
N177.3.11 GM4 ⊕ A1	√	3	3	√	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B1_u}$
N177.3.12 GM4 ⊕ A3	√	3	3	√	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B1_u}$
N177.3.13 A1 ⊕ A1	√	1	1	√	622	$\mathrm{A1}$
N177.3.14 A1 ⊕ A2	√	1	1	√	$6mm$	$\mathrm{A1}$
N177.3.15 A1 ⊕ A3	√	1	1	√	$\bar{6}2m$	$\mathrm{A1}'$
N177.3.16 A1 ⊕ A4	√	1	1	√	$\bar{6}m2$	$\mathrm{A1}'$
N177.3.17 A3 ⊕ A3	√	1	1	√	622	$\mathrm{A1}$
N177.3.18 A3 ⊕ A4	√	1	1	√	$6mm$	$\mathrm{A1}$
N177.6.1 GM5	√	3	3	√	$6mm$	$\mathrm{A1}\oplus\mathrm{E2}$
N177.6.2 GM6	√	3	3	√	$6mm$	$\mathrm{A1}\oplus\mathrm{E1}$
N177.6.3 A5	√	1	1	√	$6mm$	$\mathrm{A1}$
N177.6.4 A6	√	1	1	√	$6mm$	$\mathrm{A1}$
N177.7.1 K1	√	1	1	√	$\bar{6}2m$	$\mathrm{A1}'$
N177.7.2 K2	√	1	1	√	$\bar{6}2m$	$\mathrm{A1}'$
N177.7.3 H1	√	1	1	√	$\bar{6}2m$	$\mathrm{A1}'$
N177.8.1 DT1	√	1	1	√	$6mm$	$\mathrm{A1}$
N177.8.2 DT2	√	1	1	√	$6mm$	$\mathrm{A1}$
N177.8.3 DT3	√	1	1	√	$6mm$	$\mathrm{A1}$
N177.8.4 DT4	√	1	1	√	$6mm$	$\mathrm{A1}$
N177.9.1 GM2 ⊕ GM2 ⊕ GM2	√	3	3	√	$6mm$	$\mathrm{A2}\oplus\mathrm{A2}\oplus\mathrm{A2}$
N177.9.2 GM2 ⊕ GM2 ⊕ GM3	√	3	3	√	$\bar{6}2m$	$\mathrm{A1}''\oplus\mathrm{A2}'\oplus\mathrm{A2}'$
N177.9.3 GM2 ⊕ GM2 ⊕ GM4	√	3	3	√	$\bar{6}m2$	$\mathrm{A1}''\oplus\mathrm{A1}''\oplus\mathrm{A2}'$
N177.9.4 GM2 ⊕ GM2 ⊕ A1	√	3	3	√	$6/mmm$	$\mathrm{A1_u}\oplus\mathrm{A2_g}\oplus\mathrm{A2_g}$
N177.9.5 GM2 ⊕ GM2 ⊕ A3	√	3	3	√	$6/mmm$	$\mathrm{A1_u}\oplus\mathrm{A2_g}\oplus\mathrm{A2_g}$
N177.9.6 GM2 ⊕ GM3 ⊕ GM3	√	3	3	√	$6mm$	$\mathrm{A2}\oplus\mathrm{B1}\oplus\mathrm{B1}$
N177.9.7 GM2 ⊕ GM3 ⊕ GM4	√	3	3	√	622	$\mathrm{A2}\oplus\mathrm{B2}\oplus\mathrm{B1}$
N177.9.8 GM2 ⊕ GM3 ⊕ A1	√	3	3	√	$6/mmm$	$\mathrm{A2_g}\oplus\mathrm{B2_g}\oplus\mathrm{B1_u}$
N177.9.9 GM2 ⊕ GM3 ⊕ A3	√	3	3	√	$6/mmm$	$\mathrm{A2_g}\oplus\mathrm{B2_g}\oplus\mathrm{B1_u}$
N177.9.10 GM2 ⊕ GM4 ⊕ GM4	√	3	3	√	$6mm$	$\mathrm{A2}\oplus\mathrm{B2}\oplus\mathrm{B2}$
N177.9.11 GM2 ⊕ GM4 ⊕ A1	√	3	3	√	$6/mmm$	$\mathrm{A2_g}\oplus\mathrm{B2_u}\oplus\mathrm{B1_g}$

Non-coplanar SSGs with parent space group $P622$ (No. 177) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N177.9.12 GM2 ⊕ GM4 ⊕ A3	√	3	3	√	$6/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_u} \oplus \mathrm{B1_g}$
N177.9.13 GM2 ⊕ A1 ⊕ A1	√	1	1	×	-	-
N177.9.14 GM2 ⊕ A1 ⊕ A2	√	1	1	√	622	A2
N177.9.15 GM2 ⊕ A1 ⊕ A3	√	1	1	×	-	-
N177.9.16 GM2 ⊕ A1 ⊕ A4	√	1	1	×	-	-
N177.9.17 GM2 ⊕ A3 ⊕ A3	√	1	1	×	-	-
N177.9.18 GM2 ⊕ A3 ⊕ A4	√	1	1	√	622	A2
N177.9.19 GM3 ⊕ GM3 ⊕ GM3	√	3	3	√	$\bar{6}2m$	$\mathrm{A1''} \oplus \mathrm{A1''} \oplus \mathrm{A1''}$
N177.9.20 GM3 ⊕ GM3 ⊕ GM4	√	3	3	√	$\bar{6}m2$	$\mathrm{A2''} \oplus \mathrm{A2''} \oplus \mathrm{A2'}$
N177.9.21 GM3 ⊕ GM3 ⊕ A1	√	3	3	√	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N177.9.22 GM3 ⊕ GM3 ⊕ A3	√	3	3	√	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N177.9.23 GM3 ⊕ GM4 ⊕ GM4	√	3	3	√	$\bar{6}2m$	$\mathrm{A1''} \oplus \mathrm{A2''} \oplus \mathrm{A2''}$
N177.9.24 GM3 ⊕ GM4 ⊕ A1	√	3	3	√	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g} \oplus \mathrm{B1_g}$
N177.9.25 GM3 ⊕ GM4 ⊕ A3	√	3	3	√	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g} \oplus \mathrm{B1_g}$
N177.9.26 GM3 ⊕ A1 ⊕ A1	√	1	1	×	-	-
N177.9.27 GM3 ⊕ A1 ⊕ A2	√	1	1	√	$\bar{6}m2$	$\mathrm{A2''}$
N177.9.28 GM3 ⊕ A1 ⊕ A3	√	1	1	×	-	-
N177.9.29 GM3 ⊕ A1 ⊕ A4	√	1	1	×	-	-
N177.9.30 GM3 ⊕ A3 ⊕ A3	√	1	1	×	-	-
N177.9.31 GM3 ⊕ A3 ⊕ A4	√	1	1	√	$\bar{6}m2$	$\mathrm{A2''}$
N177.9.32 GM4 ⊕ GM4 ⊕ GM4	√	3	3	√	$\bar{6}m2$	$\mathrm{A2'} \oplus \mathrm{A2'} \oplus \mathrm{A2'}$
N177.9.33 GM4 ⊕ GM4 ⊕ A1	√	3	3	√	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N177.9.34 GM4 ⊕ GM4 ⊕ A3	√	3	3	√	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N177.9.35 GM4 ⊕ A1 ⊕ A1	√	1	1	×	-	-
N177.9.36 GM4 ⊕ A1 ⊕ A2	√	1	1	√	$\bar{6}2m$	$\mathrm{A2''}$
N177.9.37 GM4 ⊕ A1 ⊕ A3	√	1	1	×	-	-
N177.9.38 GM4 ⊕ A1 ⊕ A4	√	1	1	×	-	-
N177.9.39 GM4 ⊕ A3 ⊕ A3	√	1	1	×	-	-
N177.9.40 GM4 ⊕ A3 ⊕ A4	√	1	1	√	$\bar{6}2m$	$\mathrm{A2''}$
N177.9.41 A1 ⊕ A1 ⊕ A1	√	3	3	√	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A1_u}$
N177.9.42 A1 ⊕ A1 ⊕ A2	√	3	3	√	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N177.9.43 A1 ⊕ A1 ⊕ A3	√	3	3	√	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N177.9.44 A1 ⊕ A1 ⊕ A4	√	3	3	√	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N177.9.45 A1 ⊕ A2 ⊕ A3	√	3	3	√	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_u} \oplus \mathrm{B1_u}$
N177.9.46 A1 ⊕ A3 ⊕ A3	√	3	3	√	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N177.9.47 A1 ⊕ A3 ⊕ A4	√	3	3	√	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_u} \oplus \mathrm{B1_u}$
N177.9.48 A1 ⊕ A4 ⊕ A4	√	3	3	√	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N177.9.49 A3 ⊕ A3 ⊕ A3	√	3	3	√	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A1_u}$
N177.9.50 A3 ⊕ A3 ⊕ A4	√	3	3	√	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N177.12.1 GM2 ⊕ GM5	√	3	3	√	622	$\mathrm{A2} \oplus \mathrm{E2}$
N177.12.2 GM2 ⊕ GM6	√	3	3	√	622	$\mathrm{A2} \oplus \mathrm{E1}$
N177.12.3 GM2 ⊕ A5	√	1	1	√	622	A2
N177.12.4 GM2 ⊕ A6	√	1	1	√	622	A2
N177.12.5 GM3 ⊕ GM5	√	3	3	√	$\bar{6}m2$	$\mathrm{A2''} \oplus \mathrm{E'}$
N177.12.6 GM3 ⊕ GM6	√	3	3	√	$\bar{6}m2$	$\mathrm{A2''} \oplus \mathrm{E''}$
N177.12.7 GM3 ⊕ A5	√	1	1	√	$\bar{6}m2$	$\mathrm{A2''}$

Non-coplanar SSGs with parent space group $P622$ (No. 177) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N177.12.8 GM3 ⊕ A6	√	1	1	√	$\bar{6}m2$	$\mathrm{A2''}$
N177.12.9 GM4 ⊕ GM5	√	3	3	√	$\bar{6}2m$	$\mathrm{A2''} \oplus \mathrm{E'}$
N177.12.10 GM4 ⊕ GM6	√	3	3	√	$\bar{6}2m$	$\mathrm{A2''} \oplus \mathrm{E''}$
N177.12.11 GM4 ⊕ A5	√	1	1	√	$\bar{6}2m$	$\mathrm{A2''}$
N177.12.12 GM4 ⊕ A6	√	1	1	√	$\bar{6}2m$	$\mathrm{A2''}$
N177.12.13 A1 ⊕ GM5	√	3	3	√	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{E2_g}$
N177.12.14 A1 ⊕ GM6	√	3	3	√	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{E1_g}$
N177.12.15 A1 ⊕ A5	√	3	3	√	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{E2_u}$
N177.12.16 A1 ⊕ A6	√	3	3	√	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{E1_u}$
N177.12.17 A3 ⊕ GM5	√	3	3	√	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{E2_g}$
N177.12.18 A3 ⊕ GM6	√	3	3	√	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{E1_g}$
N177.12.19 A3 ⊕ A5	√	3	3	√	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{E1_u}$
N177.12.20 A3 ⊕ A6	√	3	3	√	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{E2_u}$
N177.13.1 GM2 ⊕ K1	√	1	1	√	$\bar{6}m2$	$\mathrm{A1''}$
N177.13.2 GM2 ⊕ K2	√	1	1	√	$\bar{6}m2$	$\mathrm{A1''}$
N177.13.3 GM2 ⊕ H1	√	1	1	×	-	-
N177.13.4 GM3 ⊕ K1	√	1	1	√	622	B2
N177.13.5 GM3 ⊕ K2	√	1	1	√	622	B2
N177.13.6 GM3 ⊕ H1	√	1	1	×	-	-
N177.13.7 GM4 ⊕ K1	√	1	1	√	$6mm$	B2
N177.13.8 GM4 ⊕ K2	√	1	1	√	$6mm$	B2
N177.13.9 GM4 ⊕ H1	√	1	1	×	-	-
N177.13.10 A1 ⊕ K1	√	1	1	√	$6/mmm$	$\mathrm{B2_u}$
N177.13.11 A1 ⊕ K2	√	1	1	√	$6/mmm$	$\mathrm{B2_u}$
N177.13.12 A1 ⊕ H1	√	1	1	√	$6/mmm$	$\mathrm{B2_u}$
N177.13.13 A1 ⊕ H2	√	1	1	√	$6/mmm$	$\mathrm{B2_u}$
N177.13.14 A3 ⊕ K1	√	1	1	√	$6/mmm$	$\mathrm{B2_u}$
N177.13.15 A3 ⊕ K2	√	1	1	√	$6/mmm$	$\mathrm{B2_u}$
N177.13.16 A3 ⊕ H1	√	1	1	√	$6/mmm$	$\mathrm{B2_u}$
N177.13.17 A3 ⊕ H2	√	1	1	√	$6/mmm$	$\mathrm{B2_u}$
N177.14.1 GM2 ⊕ DT1	√	1	1	√	622	A2
N177.14.2 GM2 ⊕ DT2	√	1	1	√	622	A2
N177.14.3 GM2 ⊕ DT3	√	1	1	√	622	A2
N177.14.4 GM2 ⊕ DT4	√	1	1	√	622	A2
N177.14.5 GM3 ⊕ DT1	√	1	1	√	$\bar{6}m2$	$\mathrm{A2''}$
N177.14.6 GM3 ⊕ DT2	√	1	1	√	$\bar{6}m2$	$\mathrm{A2''}$
N177.14.7 GM3 ⊕ DT3	√	1	1	√	$\bar{6}m2$	$\mathrm{A2''}$
N177.14.8 GM3 ⊕ DT4	√	1	1	√	$\bar{6}m2$	$\mathrm{A2''}$
N177.14.9 GM4 ⊕ DT1	√	1	1	√	$\bar{6}2m$	$\mathrm{A2''}$
N177.14.10 GM4 ⊕ DT2	√	1	1	√	$\bar{6}2m$	$\mathrm{A2''}$
N177.14.11 GM4 ⊕ DT3	√	1	1	√	$\bar{6}2m$	$\mathrm{A2''}$
N177.14.12 GM4 ⊕ DT4	√	1	1	√	$\bar{6}2m$	$\mathrm{A2''}$
N177.14.13 A1 ⊕ DT1	√	1	1	√	$6/mmm$	$\mathrm{A2_u}$
N177.14.14 A1 ⊕ DT2	√	1	1	√	$6/mmm$	$\mathrm{A2_u}$
N177.14.15 A1 ⊕ DT3	√	1	1	√	$6/mmm$	$\mathrm{A2_u}$
N177.14.16 A1 ⊕ DT4	√	1	1	√	$6/mmm$	$\mathrm{A2_u}$

Non-coplanar SSGs with parent space group $P622$ (No. 177) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N177.14.17 A3 $\oplus$ DT1	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N177.14.18 A3 $\oplus$ DT2	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N177.14.19 A3 $\oplus$ DT3	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N177.14.20 A3 $\oplus$ DT4	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N177.16.1 M1	$\times$	-	-	-	-	-
N177.16.2 M2	$\times$	-	-	-	-	-
N177.16.3 M3	$\times$	-	-	-	-	-
N177.16.4 M4	$\times$	-	-	-	-	-
N177.16.5 L1	$\times$	-	-	-	-	-
N177.16.6 L3	$\times$	-	-	-	-	-

TABLE S532: Collinear SSGs with parent space group $P6_122$ (No. 178).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L178.1.1 GM1	1	$6/mmm$	$\mathrm{A1_g}$
L178.2.1 GM2	1	$6/mmm$	$\mathrm{A2_g}$
L178.2.2 GM3	1	$6/mmm$	$\mathrm{B2_g}$
L178.2.3 GM4	1	$6/mmm$	$\mathrm{B1_g}$

TABLE S533: Coplanar SSGs with parent space group $P6_122$ (No. 178).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P178.1.1 GM1	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A1_u}$
P178.2.1 GM2	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
P178.2.2 GM3	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
P178.2.3 GM4	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
P178.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
P178.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B1_u}$
P178.3.3 GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_u} \oplus \mathrm{B1_g}$
P178.3.4 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
P178.3.5 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g} \oplus \mathrm{B1_g}$
P178.3.6 GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
P178.6.1 GM5	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{E2_g}$
P178.6.2 GM6	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{E1_g}$
P178.6.3 A1	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
P178.6.4 A2	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
P178.6.5 A3	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
P178.7.1 K1	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{B2_u}$
P178.7.2 K2	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{B2_u}$
P178.8.1 DT1	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$

TABLE S534: Non-coplanar SSGs with parent space group $P6_122$ (No. 178).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N178.1.1 GM1	$\surd$	3	3	$\surd$	622	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{A1}$

Non-coplanar SSGs with parent space group $P6_122$ (No. 178) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N178.2.1 GM2	√	3	3	√	$6mm$	A1 ⊕ A1 ⊕ A2
N178.2.2 GM3	√	3	3	√	$\bar{6}2m$	A1′ ⊕ A1′ ⊕ A1″
N178.2.3 GM4	√	3	3	√	$\bar{6}m2$	A1′ ⊕ A1′ ⊕ A2′
N178.3.1 GM2 ⊕ GM2	√	3	3	√	622	A1 ⊕ A2 ⊕ A2
N178.3.2 GM2 ⊕ GM3	√	3	3	√	$\bar{6}m2$	A1′ ⊕ A1″ ⊕ A2″
N178.3.3 GM2 ⊕ GM4	√	3	3	√	$\bar{6}2m$	A1′ ⊕ A2″ ⊕ A2′
N178.3.4 GM3 ⊕ GM3	√	3	3	√	622	A1 ⊕ B2 ⊕ B2
N178.3.5 GM3 ⊕ GM4	√	3	3	√	$6mm$	A1 ⊕ B2 ⊕ B1
N178.3.6 GM4 ⊕ GM4	√	3	3	√	622	A1 ⊕ B1 ⊕ B1
N178.6.1 GM5	√	3	3	√	$6mm$	A1 ⊕ E2
N178.6.2 GM6	√	3	3	√	$6mm$	A1 ⊕ E1
N178.6.3 A1	√	1	1	√	$6mm$	A1
N178.6.4 A2	√	1	1	√	$6mm$	A1
N178.6.5 A3	√	1	1	√	$6mm$	A1
N178.7.1 K1	√	1	1	√	$\bar{6}2m$	A1′
N178.7.2 K2	√	1	1	√	$\bar{6}2m$	A1′
N178.8.1 DT1	√	1	1	√	$6mm$	A1
N178.9.1 GM2 ⊕ GM2 ⊕ GM2	√	3	3	√	$6mm$	A2 ⊕ A2 ⊕ A2
N178.9.2 GM2 ⊕ GM2 ⊕ GM3	√	3	3	√	$\bar{6}2m$	A1″ ⊕ A2′ ⊕ A2′
N178.9.3 GM2 ⊕ GM2 ⊕ GM4	√	3	3	√	$\bar{6}m2$	A1″ ⊕ A1″ ⊕ A2′
N178.9.4 GM2 ⊕ GM3 ⊕ GM3	√	3	3	√	$6mm$	A2 ⊕ B1 ⊕ B1
N178.9.5 GM2 ⊕ GM3 ⊕ GM4	√	3	3	√	622	A2 ⊕ B2 ⊕ B1
N178.9.6 GM2 ⊕ GM4 ⊕ GM4	√	3	3	√	$6mm$	A2 ⊕ B2 ⊕ B2
N178.9.7 GM3 ⊕ GM3 ⊕ GM3	√	3	3	√	$\bar{6}2m$	A1″ ⊕ A1″ ⊕ A1″
N178.9.8 GM3 ⊕ GM3 ⊕ GM4	√	3	3	√	$\bar{6}m2$	A2″ ⊕ A2″ ⊕ A2′
N178.9.9 GM3 ⊕ GM4 ⊕ GM4	√	3	3	√	$\bar{6}2m$	A1″ ⊕ A2″ ⊕ A2″
N178.9.10 GM4 ⊕ GM4 ⊕ GM4	√	3	3	√	$\bar{6}m2$	A2′ ⊕ A2′ ⊕ A2′
N178.12.1 GM2 ⊕ GM5	√	3	3	√	622	A2 ⊕ E2
N178.12.2 GM2 ⊕ GM6	√	3	3	√	622	A2 ⊕ E1
N178.12.3 GM2 ⊕ A1	√	1	1	√	622	A2
N178.12.4 GM2 ⊕ A2	√	1	1	√	622	A2
N178.12.5 GM2 ⊕ A3	√	1	1	√	622	A2
N178.12.6 GM3 ⊕ GM5	√	3	3	√	$\bar{6}m2$	A2″ ⊕ E′
N178.12.7 GM3 ⊕ GM6	√	3	3	√	$\bar{6}m2$	A2″ ⊕ E″
N178.12.8 GM3 ⊕ A1	√	1	1	√	$\bar{6}m2$	A2″
N178.12.9 GM3 ⊕ A2	√	1	1	√	$\bar{6}m2$	A2″
N178.12.10 GM3 ⊕ A3	√	1	1	√	$\bar{6}m2$	A2″
N178.12.11 GM4 ⊕ GM5	√	3	3	√	$\bar{6}2m$	A2″ ⊕ E′
N178.12.12 GM4 ⊕ GM6	√	3	3	√	$\bar{6}2m$	A2″ ⊕ E″
N178.12.13 GM4 ⊕ A1	√	1	1	√	$\bar{6}2m$	A2″
N178.12.14 GM4 ⊕ A2	√	1	1	√	$\bar{6}2m$	A2″
N178.12.15 GM4 ⊕ A3	√	1	1	√	$\bar{6}2m$	A2″
N178.13.1 GM2 ⊕ K1	√	1	1	√	$\bar{6}m2$	A1″
N178.13.2 GM2 ⊕ K2	√	1	1	√	$\bar{6}m2$	A1″
N178.13.3 GM3 ⊕ K1	√	1	1	√	622	B2
N178.13.4 GM3 ⊕ K2	√	1	1	√	622	B2

Non-coplanar SSGs with parent space group $P6_122$ (No. 178) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N178.13.5 GM4 $\oplus$ K1	$\surd$	1	1	$\surd$	$6mm$	B2
N178.13.6 GM4 $\oplus$ K2	$\surd$	1	1	$\surd$	$6mm$	B2
N178.14.1 GM2 $\oplus$ DT1	$\surd$	1	1	$\surd$	622	A2
N178.14.2 GM3 $\oplus$ DT1	$\surd$	1	1	$\surd$	$\bar{6}m2$	A2$''$
N178.14.3 GM4 $\oplus$ DT1	$\surd$	1	1	$\surd$	$\bar{6}2m$	A2$''$
N178.16.1 M1	$\times$	-	-	-	-	-
N178.16.2 M2	$\times$	-	-	-	-	-
N178.16.3 M3	$\times$	-	-	-	-	-
N178.16.4 M4	$\times$	-	-	-	-	-

TABLE S535: Collinear SSGs with parent space group $P6_522$ (No. 179).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L179.1.1 GM1	1	$6/mmm$	$\mathrm{A1_g}$
L179.2.1 GM2	1	$6/mmm$	$\mathrm{A2_g}$
L179.2.2 GM3	1	$6/mmm$	$\mathrm{B2_g}$
L179.2.3 GM4	1	$6/mmm$	$\mathrm{B1_g}$

TABLE S536: Coplanar SSGs with parent space group $P6_522$ (No. 179).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P179.1.1 GM1	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A1_u}$
P179.2.1 GM2	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
P179.2.2 GM3	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
P179.2.3 GM4	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
P179.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
P179.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B1_u}$
P179.3.3 GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_u} \oplus \mathrm{B1_g}$
P179.3.4 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
P179.3.5 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g} \oplus \mathrm{B1_g}$
P179.3.6 GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
P179.6.1 GM5	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{E2_g}$
P179.6.2 GM6	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{E1_g}$
P179.6.3 A1	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
P179.6.4 A2	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
P179.6.5 A3	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
P179.7.1 K1	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{B2_u}$
P179.7.2 K2	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{B2_u}$
P179.8.1 DT1	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$

TABLE S537: Non-coplanar SSGs with parent space group $P6_522$ (No. 179).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N179.1.1 GM1	$\surd$	3	3	$\surd$	622	A1 $\oplus$ A1 $\oplus$ A1

Non-coplanar SSGs with parent space group $P6_522$ (No. 179) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N179.2.1 GM2	$\surd$	3	3	$\surd$	$6mm$	A1 $\oplus$ A1 $\oplus$ A2
N179.2.2 GM3	$\surd$	3	3	$\surd$	$\bar{6}2m$	A1$'$ $\oplus$ A1$'$ $\oplus$ A1$''$
N179.2.3 GM4	$\surd$	3	3	$\surd$	$\bar{6}m2$	A1$'$ $\oplus$ A1$'$ $\oplus$ A2$'$
N179.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	622	A1 $\oplus$ A2 $\oplus$ A2
N179.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$\bar{6}m2$	A1$'$ $\oplus$ A1$''$ $\oplus$ A2$''$
N179.3.3 GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	$\bar{6}2m$	A1$'$ $\oplus$ A2$''$ $\oplus$ A2$'$
N179.3.4 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	622	A1 $\oplus$ B2 $\oplus$ B2
N179.3.5 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	$6mm$	A1 $\oplus$ B2 $\oplus$ B1
N179.3.6 GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	622	A1 $\oplus$ B1 $\oplus$ B1
N179.6.1 GM5	$\surd$	3	3	$\surd$	$6mm$	A1 $\oplus$ E2
N179.6.2 GM6	$\surd$	3	3	$\surd$	$6mm$	A1 $\oplus$ E1
N179.6.3 A1	$\surd$	1	1	$\surd$	$6mm$	A1
N179.6.4 A2	$\surd$	1	1	$\surd$	$6mm$	A1
N179.6.5 A3	$\surd$	1	1	$\surd$	$6mm$	A1
N179.7.1 K1	$\surd$	1	1	$\surd$	$\bar{6}2m$	A1$'$
N179.7.2 K2	$\surd$	1	1	$\surd$	$\bar{6}2m$	A1$'$
N179.8.1 DT1	$\surd$	1	1	$\surd$	$6mm$	A1
N179.9.1 GM2 $\oplus$ GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$6mm$	A2 $\oplus$ A2 $\oplus$ A2
N179.9.2 GM2 $\oplus$ GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$\bar{6}2m$	A1$''$ $\oplus$ A2$'$ $\oplus$ A2$'$
N179.9.3 GM2 $\oplus$ GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	$\bar{6}m2$	A1$''$ $\oplus$ A1$''$ $\oplus$ A2$'$
N179.9.4 GM2 $\oplus$ GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	$6mm$	A2 $\oplus$ B1 $\oplus$ B1
N179.9.5 GM2 $\oplus$ GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	622	A2 $\oplus$ B2 $\oplus$ B1
N179.9.6 GM2 $\oplus$ GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	$6mm$	A2 $\oplus$ B2 $\oplus$ B2
N179.9.7 GM3 $\oplus$ GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	$\bar{6}2m$	A1$''$ $\oplus$ A1$''$ $\oplus$ A1$''$
N179.9.8 GM3 $\oplus$ GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	$\bar{6}m2$	A2$''$ $\oplus$ A2$''$ $\oplus$ A2$'$
N179.9.9 GM3 $\oplus$ GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	$\bar{6}2m$	A1$''$ $\oplus$ A2$''$ $\oplus$ A2$''$
N179.9.10 GM4 $\oplus$ GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	$\bar{6}m2$	A2$'$ $\oplus$ A2$'$ $\oplus$ A2$'$
N179.12.1 GM2 $\oplus$ GM5	$\surd$	3	3	$\surd$	622	A2 $\oplus$ E2
N179.12.2 GM2 $\oplus$ GM6	$\surd$	3	3	$\surd$	622	A2 $\oplus$ E1
N179.12.3 GM2 $\oplus$ A1	$\surd$	1	1	$\surd$	622	A2
N179.12.4 GM2 $\oplus$ A2	$\surd$	1	1	$\surd$	622	A2
N179.12.5 GM2 $\oplus$ A3	$\surd$	1	1	$\surd$	622	A2
N179.12.6 GM3 $\oplus$ GM5	$\surd$	3	3	$\surd$	$\bar{6}m2$	A2$''$ $\oplus$ E$'$
N179.12.7 GM3 $\oplus$ GM6	$\surd$	3	3	$\surd$	$\bar{6}m2$	A2$''$ $\oplus$ E$''$
N179.12.8 GM3 $\oplus$ A1	$\surd$	1	1	$\surd$	$\bar{6}m2$	A2$''$
N179.12.9 GM3 $\oplus$ A2	$\surd$	1	1	$\surd$	$\bar{6}m2$	A2$''$
N179.12.10 GM3 $\oplus$ A3	$\surd$	1	1	$\surd$	$\bar{6}m2$	A2$''$
N179.12.11 GM4 $\oplus$ GM5	$\surd$	3	3	$\surd$	$\bar{6}2m$	A2$''$ $\oplus$ E$'$
N179.12.12 GM4 $\oplus$ GM6	$\surd$	3	3	$\surd$	$\bar{6}2m$	A2$''$ $\oplus$ E$''$
N179.12.13 GM4 $\oplus$ A1	$\surd$	1	1	$\surd$	$\bar{6}2m$	A2$''$
N179.12.14 GM4 $\oplus$ A2	$\surd$	1	1	$\surd$	$\bar{6}2m$	A2$''$
N179.12.15 GM4 $\oplus$ A3	$\surd$	1	1	$\surd$	$\bar{6}2m$	A2$''$
N179.13.1 GM2 $\oplus$ K1	$\surd$	1	1	$\surd$	$\bar{6}m2$	A1$''$
N179.13.2 GM2 $\oplus$ K2	$\surd$	1	1	$\surd$	$\bar{6}m2$	A1$''$
N179.13.3 GM3 $\oplus$ K1	$\surd$	1	1	$\surd$	622	B2
N179.13.4 GM3 $\oplus$ K2	$\surd$	1	1	$\surd$	622	B2

Non-coplanar SSGs with parent space group $P6_522$ (No. 179) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N179.13.5 GM4 $\oplus$ K1	$\surd$	1	1	$\surd$	$6mm$	B2
N179.13.6 GM4 $\oplus$ K2	$\surd$	1	1	$\surd$	$6mm$	B2
N179.14.1 GM2 $\oplus$ DT1	$\surd$	1	1	$\surd$	622	A2
N179.14.2 GM3 $\oplus$ DT1	$\surd$	1	1	$\surd$	$\bar{6}m2$	A2$''$
N179.14.3 GM4 $\oplus$ DT1	$\surd$	1	1	$\surd$	$\bar{6}2m$	A2$''$
N179.16.1 M1	$\times$	-	-	-	-	-
N179.16.2 M2	$\times$	-	-	-	-	-
N179.16.3 M3	$\times$	-	-	-	-	-
N179.16.4 M4	$\times$	-	-	-	-	-

TABLE S538: Collinear SSGs with parent space group $P6_222$ (No. 180).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L180.1.1 GM1	1	$6/mmm$	$\mathrm{A1_g}$
L180.2.1 GM2	1	$6/mmm$	$\mathrm{A2_g}$
L180.2.2 GM3	1	$6/mmm$	$\mathrm{B2_g}$
L180.2.3 GM4	1	$6/mmm$	$\mathrm{B1_g}$
L180.2.4 A1	0	-	-
L180.2.5 A3	0	-	-

TABLE S539: Coplanar SSGs with parent space group $P6_222$ (No. 180).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P180.1.1 GM1	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A1_u}$
P180.2.1 GM2	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
P180.2.2 GM3	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
P180.2.3 GM4	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
P180.2.4 A1	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A1_g}$
P180.2.5 A3	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A1_g}$
P180.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
P180.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B1_u}$
P180.3.3 GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_u} \oplus \mathrm{B1_g}$
P180.3.4 GM2 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
P180.3.5 GM2 $\oplus$ A3	$\surd$	1	1	$\times$	-	-
P180.3.6 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
P180.3.7 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g} \oplus \mathrm{B1_g}$
P180.3.8 GM3 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
P180.3.9 GM3 $\oplus$ A3	$\surd$	1	1	$\times$	-	-
P180.3.10 GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
P180.3.11 GM4 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
P180.3.12 GM4 $\oplus$ A3	$\surd$	1	1	$\times$	-	-
P180.3.13 A1 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
P180.3.14 A1 $\oplus$ A2	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
P180.3.15 A1 $\oplus$ A3	$\surd$	1	1	$\times$	-	-
P180.3.16 A1 $\oplus$ A4	$\surd$	1	1	$\times$	-	-

Coplanar SSGs with parent space group $P6_222$ (No. 180) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P180.3.17 A3 $\oplus$ A3	$\surd$	1	1	$\times$	-	-
P180.3.18 A3 $\oplus$ A4	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
P180.6.1 GM5	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{E2_g}$
P180.6.2 GM6	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{E1_g}$
P180.6.3 A5	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
P180.6.4 A6	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
P180.7.1 K1	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{B2_u}$
P180.7.2 K2	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{B2_u}$
P180.7.3 H1	$\surd$	1	1	$\times$	-	-
P180.8.1 DT1	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
P180.8.2 DT2	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$

TABLE S540: Non-coplanar SSGs with parent space group $P6_222$ (No. 180).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N180.1.1 GM1	$\surd$	3	3	$\surd$	622	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{A1}$
N180.2.1 GM2	$\surd$	3	3	$\surd$	$6mm$	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{A2}$
N180.2.2 GM3	$\surd$	3	3	$\surd$	$\bar{6}2m$	$\mathrm{A1'} \oplus \mathrm{A1'} \oplus \mathrm{A1''}$
N180.2.3 GM4	$\surd$	3	3	$\surd$	$\bar{6}m2$	$\mathrm{A1'} \oplus \mathrm{A1'} \oplus \mathrm{A2'}$
N180.2.4 A1	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A1_u}$
N180.2.5 A3	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A1_u}$
N180.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	622	$\mathrm{A1} \oplus \mathrm{A2} \oplus \mathrm{A2}$
N180.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$\bar{6}m2$	$\mathrm{A1'} \oplus \mathrm{A1''} \oplus \mathrm{A2''}$
N180.3.3 GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	$\bar{6}2m$	$\mathrm{A1'} \oplus \mathrm{A2''} \oplus \mathrm{A2'}$
N180.3.4 GM2 $\oplus$ A1	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
N180.3.5 GM2 $\oplus$ A3	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
N180.3.6 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	622	$\mathrm{A1} \oplus \mathrm{B2} \oplus \mathrm{B2}$
N180.3.7 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	$6mm$	$\mathrm{A1} \oplus \mathrm{B2} \oplus \mathrm{B1}$
N180.3.8 GM3 $\oplus$ A1	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N180.3.9 GM3 $\oplus$ A3	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N180.3.10 GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	622	$\mathrm{A1} \oplus \mathrm{B1} \oplus \mathrm{B1}$
N180.3.11 GM4 $\oplus$ A1	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N180.3.12 GM4 $\oplus$ A3	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N180.3.13 A1 $\oplus$ A1	$\surd$	1	1	$\surd$	622	A1
N180.3.14 A1 $\oplus$ A2	$\surd$	1	1	$\surd$	$6mm$	A1
N180.3.15 A1 $\oplus$ A3	$\surd$	1	1	$\surd$	$\bar{6}2m$	A1'
N180.3.16 A1 $\oplus$ A4	$\surd$	1	1	$\surd$	$\bar{6}m2$	A1'
N180.3.17 A3 $\oplus$ A3	$\surd$	1	1	$\surd$	622	A1
N180.3.18 A3 $\oplus$ A4	$\surd$	1	1	$\surd$	$6mm$	A1
N180.6.1 GM5	$\surd$	3	3	$\surd$	$6mm$	$\mathrm{A1} \oplus \mathrm{E2}$
N180.6.2 GM6	$\surd$	3	3	$\surd$	$6mm$	$\mathrm{A1} \oplus \mathrm{E1}$
N180.6.3 A5	$\surd$	1	1	$\surd$	$6mm$	A1
N180.6.4 A6	$\surd$	1	1	$\surd$	$6mm$	A1
N180.7.1 K1	$\surd$	1	1	$\surd$	$\bar{6}2m$	A1'
N180.7.2 K2	$\surd$	1	1	$\surd$	$\bar{6}2m$	A1'
N180.7.3 H1	$\surd$	1	1	$\surd$	$\bar{6}2m$	A1'

Non-coplanar SSGs with parent space group $P6_222$ (No. 180) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N180.8.1 DT1	$\surd$	1	1	$\surd$	$6mm$	A1
N180.8.2 DT2	$\surd$	1	1	$\surd$	$6mm$	A1
N180.9.1 GM2 $\oplus$ GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$6mm$	A2 $\oplus$ A2 $\oplus$ A2
N180.9.2 GM2 $\oplus$ GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$\bar{6}2m$	A1$''$ $\oplus$ A2$'$ $\oplus$ A2$'$
N180.9.3 GM2 $\oplus$ GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	$\bar{6}m2$	A1$''$ $\oplus$ A1$''$ $\oplus$ A2$'$
N180.9.4 GM2 $\oplus$ GM2 $\oplus$ A1	$\surd$	3	3	$\surd$	$6/mmm$	A1$_{\mathrm{u}}$ $\oplus$ A2$_{\mathrm{g}}$ $\oplus$ A2$_{\mathrm{g}}$
N180.9.5 GM2 $\oplus$ GM2 $\oplus$ A3	$\surd$	3	3	$\surd$	$6/mmm$	A1$_{\mathrm{u}}$ $\oplus$ A2$_{\mathrm{g}}$ $\oplus$ A2$_{\mathrm{g}}$
N180.9.6 GM2 $\oplus$ GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	$6mm$	A2 $\oplus$ B1 $\oplus$ B1
N180.9.7 GM2 $\oplus$ GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	622	A2 $\oplus$ B2 $\oplus$ B1
N180.9.8 GM2 $\oplus$ GM3 $\oplus$ A1	$\surd$	3	3	$\surd$	$6/mmm$	A2$_{\mathrm{g}}$ $\oplus$ B2$_{\mathrm{g}}$ $\oplus$ B1$_{\mathrm{u}}$
N180.9.9 GM2 $\oplus$ GM3 $\oplus$ A3	$\surd$	3	3	$\surd$	$6/mmm$	A2$_{\mathrm{g}}$ $\oplus$ B2$_{\mathrm{g}}$ $\oplus$ B1$_{\mathrm{u}}$
N180.9.10 GM2 $\oplus$ GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	$6mm$	A2 $\oplus$ B2 $\oplus$ B2
N180.9.11 GM2 $\oplus$ GM4 $\oplus$ A1	$\surd$	3	3	$\surd$	$6/mmm$	A2$_{\mathrm{g}}$ $\oplus$ B2$_{\mathrm{u}}$ $\oplus$ B1$_{\mathrm{g}}$
N180.9.12 GM2 $\oplus$ GM4 $\oplus$ A3	$\surd$	3	3	$\surd$	$6/mmm$	A2$_{\mathrm{g}}$ $\oplus$ B2$_{\mathrm{u}}$ $\oplus$ B1$_{\mathrm{g}}$
N180.9.13 GM2 $\oplus$ A1 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
N180.9.14 GM2 $\oplus$ A1 $\oplus$ A2	$\surd$	1	1	$\surd$	622	A2
N180.9.15 GM2 $\oplus$ A1 $\oplus$ A3	$\surd$	1	1	$\times$	-	-
N180.9.16 GM2 $\oplus$ A1 $\oplus$ A4	$\surd$	1	1	$\times$	-	-
N180.9.17 GM2 $\oplus$ A3 $\oplus$ A3	$\surd$	1	1	$\times$	-	-
N180.9.18 GM2 $\oplus$ A3 $\oplus$ A4	$\surd$	1	1	$\surd$	622	A2
N180.9.19 GM3 $\oplus$ GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	$\bar{6}2m$	A1$''$ $\oplus$ A1$''$ $\oplus$ A1$''$
N180.9.20 GM3 $\oplus$ GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	$\bar{6}m2$	A2$''$ $\oplus$ A2$''$ $\oplus$ A2$'$
N180.9.21 GM3 $\oplus$ GM3 $\oplus$ A1	$\surd$	3	3	$\surd$	$6/mmm$	A1$_{\mathrm{u}}$ $\oplus$ B2$_{\mathrm{g}}$ $\oplus$ B2$_{\mathrm{g}}$
N180.9.22 GM3 $\oplus$ GM3 $\oplus$ A3	$\surd$	3	3	$\surd$	$6/mmm$	A1$_{\mathrm{u}}$ $\oplus$ B2$_{\mathrm{g}}$ $\oplus$ B2$_{\mathrm{g}}$
N180.9.23 GM3 $\oplus$ GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	$\bar{6}2m$	A1$''$ $\oplus$ A2$''$ $\oplus$ A2$''$
N180.9.24 GM3 $\oplus$ GM4 $\oplus$ A1	$\surd$	3	3	$\surd$	$6/mmm$	A2$_{\mathrm{u}}$ $\oplus$ B2$_{\mathrm{g}}$ $\oplus$ B1$_{\mathrm{g}}$
N180.9.25 GM3 $\oplus$ GM4 $\oplus$ A3	$\surd$	3	3	$\surd$	$6/mmm$	A2$_{\mathrm{u}}$ $\oplus$ B2$_{\mathrm{g}}$ $\oplus$ B1$_{\mathrm{g}}$
N180.9.26 GM3 $\oplus$ A1 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
N180.9.27 GM3 $\oplus$ A1 $\oplus$ A2	$\surd$	1	1	$\surd$	$\bar{6}m2$	A2$''$
N180.9.28 GM3 $\oplus$ A1 $\oplus$ A3	$\surd$	1	1	$\times$	-	-
N180.9.29 GM3 $\oplus$ A1 $\oplus$ A4	$\surd$	1	1	$\times$	-	-
N180.9.30 GM3 $\oplus$ A3 $\oplus$ A3	$\surd$	1	1	$\times$	-	-
N180.9.31 GM3 $\oplus$ A3 $\oplus$ A4	$\surd$	1	1	$\surd$	$\bar{6}m2$	A2$''$
N180.9.32 GM4 $\oplus$ GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	$\bar{6}m2$	A2$'$ $\oplus$ A2$'$ $\oplus$ A2$'$
N180.9.33 GM4 $\oplus$ GM4 $\oplus$ A1	$\surd$	3	3	$\surd$	$6/mmm$	A1$_{\mathrm{u}}$ $\oplus$ B1$_{\mathrm{g}}$ $\oplus$ B1$_{\mathrm{g}}$
N180.9.34 GM4 $\oplus$ GM4 $\oplus$ A3	$\surd$	3	3	$\surd$	$6/mmm$	A1$_{\mathrm{u}}$ $\oplus$ B1$_{\mathrm{g}}$ $\oplus$ B1$_{\mathrm{g}}$
N180.9.35 GM4 $\oplus$ A1 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
N180.9.36 GM4 $\oplus$ A1 $\oplus$ A2	$\surd$	1	1	$\surd$	$\bar{6}2m$	A2$''$
N180.9.37 GM4 $\oplus$ A1 $\oplus$ A3	$\surd$	1	1	$\times$	-	-
N180.9.38 GM4 $\oplus$ A1 $\oplus$ A4	$\surd$	1	1	$\times$	-	-
N180.9.39 GM4 $\oplus$ A3 $\oplus$ A3	$\surd$	1	1	$\times$	-	-
N180.9.40 GM4 $\oplus$ A3 $\oplus$ A4	$\surd$	1	1	$\surd$	$\bar{6}2m$	A2$''$
N180.9.41 A1 $\oplus$ A1 $\oplus$ A1	$\surd$	3	3	$\surd$	$6/mmm$	A1$_{\mathrm{u}}$ $\oplus$ A1$_{\mathrm{u}}$ $\oplus$ A1$_{\mathrm{u}}$
N180.9.42 A1 $\oplus$ A1 $\oplus$ A2	$\surd$	3	3	$\surd$	$6/mmm$	A1$_{\mathrm{u}}$ $\oplus$ A2$_{\mathrm{u}}$ $\oplus$ A2$_{\mathrm{u}}$
N180.9.43 A1 $\oplus$ A1 $\oplus$ A3	$\surd$	3	3	$\surd$	$6/mmm$	A1$_{\mathrm{u}}$ $\oplus$ B2$_{\mathrm{u}}$ $\oplus$ B2$_{\mathrm{u}}$
N180.9.44 A1 $\oplus$ A1 $\oplus$ A4	$\surd$	3	3	$\surd$	$6/mmm$	A1$_{\mathrm{u}}$ $\oplus$ B1$_{\mathrm{u}}$ $\oplus$ B1$_{\mathrm{u}}$

Non-coplanar SSGs with parent space group $P6_222$ (No. 180) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N180.9.45 A1 ⊕ A2 ⊕ A3	√	3	3	√	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_u} \oplus \mathrm{B1_u}$
N180.9.46 A1 ⊕ A3 ⊕ A3	√	3	3	√	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N180.9.47 A1 ⊕ A3 ⊕ A4	√	3	3	√	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_u} \oplus \mathrm{B1_u}$
N180.9.48 A1 ⊕ A4 ⊕ A4	√	3	3	√	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N180.9.49 A3 ⊕ A3 ⊕ A3	√	3	3	√	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A1_u}$
N180.9.50 A3 ⊕ A3 ⊕ A4	√	3	3	√	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N180.12.1 GM2 ⊕ GM5	√	3	3	√	622	A2 ⊕ E2
N180.12.2 GM2 ⊕ GM6	√	3	3	√	622	A2 ⊕ E1
N180.12.3 GM2 ⊕ A5	√	1	1	√	622	A2
N180.12.4 GM2 ⊕ A6	√	1	1	√	622	A2
N180.12.5 GM3 ⊕ GM5	√	3	3	√	$\bar{6}m2$	$\mathrm{A2''} \oplus \mathrm{E'}$
N180.12.6 GM3 ⊕ GM6	√	3	3	√	$\bar{6}m2$	$\mathrm{A2''} \oplus \mathrm{E''}$
N180.12.7 GM3 ⊕ A5	√	1	1	√	$\bar{6}m2$	$\mathrm{A2''}$
N180.12.8 GM3 ⊕ A6	√	1	1	√	$\bar{6}m2$	$\mathrm{A2''}$
N180.12.9 GM4 ⊕ GM5	√	3	3	√	$\bar{6}2m$	$\mathrm{A2''} \oplus \mathrm{E'}$
N180.12.10 GM4 ⊕ GM6	√	3	3	√	$\bar{6}2m$	$\mathrm{A2''} \oplus \mathrm{E''}$
N180.12.11 GM4 ⊕ A5	√	1	1	√	$\bar{6}2m$	$\mathrm{A2''}$
N180.12.12 GM4 ⊕ A6	√	1	1	√	$\bar{6}2m$	$\mathrm{A2''}$
N180.12.13 A1 ⊕ GM5	√	3	3	√	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{E2_g}$
N180.12.14 A1 ⊕ GM6	√	3	3	√	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{E1_g}$
N180.12.15 A1 ⊕ A5	√	3	3	√	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{E2_u}$
N180.12.16 A1 ⊕ A6	√	3	3	√	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{E1_u}$
N180.12.17 A3 ⊕ GM5	√	3	3	√	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{E2_g}$
N180.12.18 A3 ⊕ GM6	√	3	3	√	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{E1_g}$
N180.12.19 A3 ⊕ A5	√	3	3	√	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{E1_u}$
N180.12.20 A3 ⊕ A6	√	3	3	√	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{E2_u}$
N180.13.1 GM2 ⊕ K1	√	1	1	√	$\bar{6}m2$	$\mathrm{A1''}$
N180.13.2 GM2 ⊕ K2	√	1	1	√	$\bar{6}m2$	$\mathrm{A1''}$
N180.13.3 GM2 ⊕ H1	√	1	1	×	-	-
N180.13.4 GM3 ⊕ K1	√	1	1	√	622	B2
N180.13.5 GM3 ⊕ K2	√	1	1	√	622	B2
N180.13.6 GM3 ⊕ H1	√	1	1	×	-	-
N180.13.7 GM4 ⊕ K1	√	1	1	√	$6mm$	B2
N180.13.8 GM4 ⊕ K2	√	1	1	√	$6mm$	B2
N180.13.9 GM4 ⊕ H1	√	1	1	×	-	-
N180.13.10 A1 ⊕ K1	√	1	1	√	$6/mmm$	$\mathrm{B2_u}$
N180.13.11 A1 ⊕ K2	√	1	1	√	$6/mmm$	$\mathrm{B2_u}$
N180.13.12 A1 ⊕ H1	√	1	1	√	$6/mmm$	$\mathrm{B2_u}$
N180.13.13 A1 ⊕ H2	√	1	1	√	$6/mmm$	$\mathrm{B2_u}$
N180.13.14 A3 ⊕ K1	√	1	1	√	$6/mmm$	$\mathrm{B2_u}$
N180.13.15 A3 ⊕ K2	√	1	1	√	$6/mmm$	$\mathrm{B2_u}$
N180.13.16 A3 ⊕ H1	√	1	1	√	$6/mmm$	$\mathrm{B2_u}$
N180.13.17 A3 ⊕ H2	√	1	1	√	$6/mmm$	$\mathrm{B2_u}$
N180.14.1 GM2 ⊕ DT1	√	1	1	√	622	A2
N180.14.2 GM2 ⊕ DT2	√	1	1	√	622	A2
N180.14.3 GM3 ⊕ DT1	√	1	1	√	$\bar{6}m2$	$\mathrm{A2''}$

Non-coplanar SSGs with parent space group $P6_222$ (No. 180) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N180.14.4 GM3 $\oplus$ DT2	$\surd$	1	1	$\surd$	$\bar{6}m2$	$\mathrm{A2''}$
N180.14.5 GM4 $\oplus$ DT1	$\surd$	1	1	$\surd$	$\bar{6}2m$	$\mathrm{A2''}$
N180.14.6 GM4 $\oplus$ DT2	$\surd$	1	1	$\surd$	$\bar{6}2m$	$\mathrm{A2''}$
N180.14.7 A1 $\oplus$ DT1	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N180.14.8 A1 $\oplus$ DT2	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N180.14.9 A3 $\oplus$ DT1	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N180.14.10 A3 $\oplus$ DT2	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N180.16.1 M1	$\times$	-	-	-	-	-
N180.16.2 M2	$\times$	-	-	-	-	-
N180.16.3 M3	$\times$	-	-	-	-	-
N180.16.4 M4	$\times$	-	-	-	-	-
N180.16.5 L1	$\times$	-	-	-	-	-
N180.16.6 L3	$\times$	-	-	-	-	-

TABLE S541: Collinear SSGs with parent space group $P6_422$ (No. 181).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L181.1.1 GM1	1	$6/mmm$	$\mathrm{A1_g}$
L181.2.1 GM2	1	$6/mmm$	$\mathrm{A2_g}$
L181.2.2 GM3	1	$6/mmm$	$\mathrm{B2_g}$
L181.2.3 GM4	1	$6/mmm$	$\mathrm{B1_g}$
L181.2.4 A1	0	-	-
L181.2.5 A3	0	-	-

TABLE S542: Coplanar SSGs with parent space group $P6_422$ (No. 181).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P181.1.1 GM1	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A1_u}$
P181.2.1 GM2	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
P181.2.2 GM3	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
P181.2.3 GM4	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
P181.2.4 A1	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A1_g}$
P181.2.5 A3	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A1_g}$
P181.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
P181.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B1_u}$
P181.3.3 GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_u} \oplus \mathrm{B1_g}$
P181.3.4 GM2 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
P181.3.5 GM2 $\oplus$ A3	$\surd$	1	1	$\times$	-	-
P181.3.6 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
P181.3.7 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g} \oplus \mathrm{B1_g}$
P181.3.8 GM3 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
P181.3.9 GM3 $\oplus$ A3	$\surd$	1	1	$\times$	-	-
P181.3.10 GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
P181.3.11 GM4 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
P181.3.12 GM4 $\oplus$ A3	$\surd$	1	1	$\times$	-	-

Coplanar SSGs with parent space group $P6_422$ (No. 181) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P181.3.13 A1 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
P181.3.14 A1 $\oplus$ A2	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
P181.3.15 A1 $\oplus$ A3	$\surd$	1	1	$\times$	-	-
P181.3.16 A1 $\oplus$ A4	$\surd$	1	1	$\times$	-	-
P181.3.17 A3 $\oplus$ A3	$\surd$	1	1	$\times$	-	-
P181.3.18 A3 $\oplus$ A4	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
P181.6.1 GM5	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{E2_g}$
P181.6.2 GM6	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{E1_g}$
P181.6.3 A5	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
P181.6.4 A6	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
P181.7.1 K1	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{B2_u}$
P181.7.2 K2	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{B2_u}$
P181.7.3 H1	$\surd$	1	1	$\times$	-	-
P181.8.1 DT1	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
P181.8.2 DT2	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$

TABLE S543: Non-coplanar SSGs with parent space group $P6_422$ (No. 181).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N181.1.1 GM1	$\surd$	3	3	$\surd$	622	A1 $\oplus$ A1 $\oplus$ A1
N181.2.1 GM2	$\surd$	3	3	$\surd$	$6mm$	A1 $\oplus$ A1 $\oplus$ A2
N181.2.2 GM3	$\surd$	3	3	$\surd$	$\bar{6}2m$	A1$'$ $\oplus$ A1$'$ $\oplus$ A1$''$
N181.2.3 GM4	$\surd$	3	3	$\surd$	$\bar{6}m2$	A1$'$ $\oplus$ A1$'$ $\oplus$ A2$'$
N181.2.4 A1	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A1_u}$
N181.2.5 A3	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A1_u}$
N181.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	622	A1 $\oplus$ A2 $\oplus$ A2
N181.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$\bar{6}m2$	A1$'$ $\oplus$ A1$''$ $\oplus$ A2$''$
N181.3.3 GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	$\bar{6}2m$	A1$'$ $\oplus$ A2$''$ $\oplus$ A2$'$
N181.3.4 GM2 $\oplus$ A1	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
N181.3.5 GM2 $\oplus$ A3	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
N181.3.6 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	622	A1 $\oplus$ B2 $\oplus$ B2
N181.3.7 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	$6mm$	A1 $\oplus$ B2 $\oplus$ B1
N181.3.8 GM3 $\oplus$ A1	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N181.3.9 GM3 $\oplus$ A3	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N181.3.10 GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	622	A1 $\oplus$ B1 $\oplus$ B1
N181.3.11 GM4 $\oplus$ A1	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N181.3.12 GM4 $\oplus$ A3	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N181.3.13 A1 $\oplus$ A1	$\surd$	1	1	$\surd$	622	A1
N181.3.14 A1 $\oplus$ A2	$\surd$	1	1	$\surd$	$6mm$	A1
N181.3.15 A1 $\oplus$ A3	$\surd$	1	1	$\surd$	$\bar{6}2m$	A1$'$
N181.3.16 A1 $\oplus$ A4	$\surd$	1	1	$\surd$	$\bar{6}m2$	A1$'$
N181.3.17 A3 $\oplus$ A3	$\surd$	1	1	$\surd$	622	A1
N181.3.18 A3 $\oplus$ A4	$\surd$	1	1	$\surd$	$6mm$	A1
N181.6.1 GM5	$\surd$	3	3	$\surd$	$6mm$	A1 $\oplus$ E2
N181.6.2 GM6	$\surd$	3	3	$\surd$	$6mm$	A1 $\oplus$ E1
N181.6.3 A5	$\surd$	1	1	$\surd$	$6mm$	A1

Non-coplanar SSGs with parent space group $P6_422$ (No. 181) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N181.6.4 A6	$\surd$	1	1	$\surd$	$6mm$	A1
N181.7.1 K1	$\surd$	1	1	$\surd$	$\bar{6}2m$	A1′
N181.7.2 K2	$\surd$	1	1	$\surd$	$\bar{6}2m$	A1′
N181.7.3 H1	$\surd$	1	1	$\surd$	$\bar{6}2m$	A1′
N181.8.1 DT1	$\surd$	1	1	$\surd$	$6mm$	A1
N181.8.2 DT2	$\surd$	1	1	$\surd$	$6mm$	A1
N181.9.1 GM2 ⊕ GM2 ⊕ GM2	$\surd$	3	3	$\surd$	$6mm$	A2 ⊕ A2 ⊕ A2
N181.9.2 GM2 ⊕ GM2 ⊕ GM3	$\surd$	3	3	$\surd$	$\bar{6}2m$	A1″ ⊕ A2′ ⊕ A2′
N181.9.3 GM2 ⊕ GM2 ⊕ GM4	$\surd$	3	3	$\surd$	$\bar{6}m2$	A1″ ⊕ A1″ ⊕ A2′
N181.9.4 GM2 ⊕ GM2 ⊕ A1	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
N181.9.5 GM2 ⊕ GM2 ⊕ A3	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
N181.9.6 GM2 ⊕ GM3 ⊕ GM3	$\surd$	3	3	$\surd$	$6mm$	A2 ⊕ B1 ⊕ B1
N181.9.7 GM2 ⊕ GM3 ⊕ GM4	$\surd$	3	3	$\surd$	622	A2 ⊕ B2 ⊕ B1
N181.9.8 GM2 ⊕ GM3 ⊕ A1	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B1_u}$
N181.9.9 GM2 ⊕ GM3 ⊕ A3	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B1_u}$
N181.9.10 GM2 ⊕ GM4 ⊕ GM4	$\surd$	3	3	$\surd$	$6mm$	A2 ⊕ B2 ⊕ B2
N181.9.11 GM2 ⊕ GM4 ⊕ A1	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_u} \oplus \mathrm{B1_g}$
N181.9.12 GM2 ⊕ GM4 ⊕ A3	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_u} \oplus \mathrm{B1_g}$
N181.9.13 GM2 ⊕ A1 ⊕ A1	$\surd$	1	1	×	-	-
N181.9.14 GM2 ⊕ A1 ⊕ A2	$\surd$	1	1	$\surd$	622	A2
N181.9.15 GM2 ⊕ A1 ⊕ A3	$\surd$	1	1	×	-	-
N181.9.16 GM2 ⊕ A1 ⊕ A4	$\surd$	1	1	×	-	-
N181.9.17 GM2 ⊕ A3 ⊕ A3	$\surd$	1	1	×	-	-
N181.9.18 GM2 ⊕ A3 ⊕ A4	$\surd$	1	1	$\surd$	622	A2
N181.9.19 GM3 ⊕ GM3 ⊕ GM3	$\surd$	3	3	$\surd$	$\bar{6}2m$	A1″ ⊕ A1″ ⊕ A1″
N181.9.20 GM3 ⊕ GM3 ⊕ GM4	$\surd$	3	3	$\surd$	$\bar{6}m2$	A2″ ⊕ A2″ ⊕ A2′
N181.9.21 GM3 ⊕ GM3 ⊕ A1	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N181.9.22 GM3 ⊕ GM3 ⊕ A3	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N181.9.23 GM3 ⊕ GM4 ⊕ GM4	$\surd$	3	3	$\surd$	$\bar{6}2m$	A1″ ⊕ A2″ ⊕ A2″
N181.9.24 GM3 ⊕ GM4 ⊕ A1	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g} \oplus \mathrm{B1_g}$
N181.9.25 GM3 ⊕ GM4 ⊕ A3	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g} \oplus \mathrm{B1_g}$
N181.9.26 GM3 ⊕ A1 ⊕ A1	$\surd$	1	1	×	-	-
N181.9.27 GM3 ⊕ A1 ⊕ A2	$\surd$	1	1	$\surd$	$\bar{6}m2$	A2″
N181.9.28 GM3 ⊕ A1 ⊕ A3	$\surd$	1	1	×	-	-
N181.9.29 GM3 ⊕ A1 ⊕ A4	$\surd$	1	1	×	-	-
N181.9.30 GM3 ⊕ A3 ⊕ A3	$\surd$	1	1	×	-	-
N181.9.31 GM3 ⊕ A3 ⊕ A4	$\surd$	1	1	$\surd$	$\bar{6}m2$	A2″
N181.9.32 GM4 ⊕ GM4 ⊕ GM4	$\surd$	3	3	$\surd$	$\bar{6}m2$	A2′ ⊕ A2′ ⊕ A2′
N181.9.33 GM4 ⊕ GM4 ⊕ A1	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N181.9.34 GM4 ⊕ GM4 ⊕ A3	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N181.9.35 GM4 ⊕ A1 ⊕ A1	$\surd$	1	1	×	-	-
N181.9.36 GM4 ⊕ A1 ⊕ A2	$\surd$	1	1	$\surd$	$\bar{6}2m$	A2″
N181.9.37 GM4 ⊕ A1 ⊕ A3	$\surd$	1	1	×	-	-
N181.9.38 GM4 ⊕ A1 ⊕ A4	$\surd$	1	1	×	-	-
N181.9.39 GM4 ⊕ A3 ⊕ A3	$\surd$	1	1	×	-	-
N181.9.40 GM4 ⊕ A3 ⊕ A4	$\surd$	1	1	$\surd$	$\bar{6}2m$	A2″

Non-coplanar SSGs with parent space group $P6_422$ (No. 181) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N181.9.41 A1 ⊕ A1 ⊕ A1	√	3	3	√	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A1_u}$
N181.9.42 A1 ⊕ A1 ⊕ A2	√	3	3	√	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N181.9.43 A1 ⊕ A1 ⊕ A3	√	3	3	√	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N181.9.44 A1 ⊕ A1 ⊕ A4	√	3	3	√	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N181.9.45 A1 ⊕ A2 ⊕ A3	√	3	3	√	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_u} \oplus \mathrm{B1_u}$
N181.9.46 A1 ⊕ A3 ⊕ A3	√	3	3	√	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N181.9.47 A1 ⊕ A3 ⊕ A4	√	3	3	√	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_u} \oplus \mathrm{B1_u}$
N181.9.48 A1 ⊕ A4 ⊕ A4	√	3	3	√	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N181.9.49 A3 ⊕ A3 ⊕ A3	√	3	3	√	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A1_u}$
N181.9.50 A3 ⊕ A3 ⊕ A4	√	3	3	√	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N181.12.1 GM2 ⊕ GM5	√	3	3	√	622	A2 ⊕ E2
N181.12.2 GM2 ⊕ GM6	√	3	3	√	622	A2 ⊕ E1
N181.12.3 GM2 ⊕ A5	√	1	1	√	622	A2
N181.12.4 GM2 ⊕ A6	√	1	1	√	622	A2
N181.12.5 GM3 ⊕ GM5	√	3	3	√	$\bar{6}m2$	$\mathrm{A2''} \oplus \mathrm{E'}$
N181.12.6 GM3 ⊕ GM6	√	3	3	√	$\bar{6}m2$	$\mathrm{A2''} \oplus \mathrm{E''}$
N181.12.7 GM3 ⊕ A5	√	1	1	√	$\bar{6}m2$	$\mathrm{A2''}$
N181.12.8 GM3 ⊕ A6	√	1	1	√	$\bar{6}m2$	$\mathrm{A2''}$
N181.12.9 GM4 ⊕ GM5	√	3	3	√	$\bar{6}2m$	$\mathrm{A2''} \oplus \mathrm{E'}$
N181.12.10 GM4 ⊕ GM6	√	3	3	√	$\bar{6}2m$	$\mathrm{A2''} \oplus \mathrm{E''}$
N181.12.11 GM4 ⊕ A5	√	1	1	√	$\bar{6}2m$	$\mathrm{A2''}$
N181.12.12 GM4 ⊕ A6	√	1	1	√	$\bar{6}2m$	$\mathrm{A2''}$
N181.12.13 A1 ⊕ GM5	√	3	3	√	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{E2_g}$
N181.12.14 A1 ⊕ GM6	√	3	3	√	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{E1_g}$
N181.12.15 A1 ⊕ A5	√	3	3	√	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{E2_u}$
N181.12.16 A1 ⊕ A6	√	3	3	√	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{E1_u}$
N181.12.17 A3 ⊕ GM5	√	3	3	√	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{E2_g}$
N181.12.18 A3 ⊕ GM6	√	3	3	√	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{E1_g}$
N181.12.19 A3 ⊕ A5	√	3	3	√	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{E1_u}$
N181.12.20 A3 ⊕ A6	√	3	3	√	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{E2_u}$
N181.13.1 GM2 ⊕ K1	√	1	1	√	$\bar{6}m2$	$\mathrm{A1''}$
N181.13.2 GM2 ⊕ K2	√	1	1	√	$\bar{6}m2$	$\mathrm{A1''}$
N181.13.3 GM2 ⊕ H1	√	1	1	×	-	-
N181.13.4 GM3 ⊕ K1	√	1	1	√	622	B2
N181.13.5 GM3 ⊕ K2	√	1	1	√	622	B2
N181.13.6 GM3 ⊕ H1	√	1	1	×	-	-
N181.13.7 GM4 ⊕ K1	√	1	1	√	$6mm$	B2
N181.13.8 GM4 ⊕ K2	√	1	1	√	$6mm$	B2
N181.13.9 GM4 ⊕ H1	√	1	1	×	-	-
N181.13.10 A1 ⊕ K1	√	1	1	√	$6/mmm$	$\mathrm{B2_u}$
N181.13.11 A1 ⊕ K2	√	1	1	√	$6/mmm$	$\mathrm{B2_u}$
N181.13.12 A1 ⊕ H1	√	1	1	√	$6/mmm$	$\mathrm{B2_u}$
N181.13.13 A1 ⊕ H2	√	1	1	√	$6/mmm$	$\mathrm{B2_u}$
N181.13.14 A3 ⊕ K1	√	1	1	√	$6/mmm$	$\mathrm{B2_u}$
N181.13.15 A3 ⊕ K2	√	1	1	√	$6/mmm$	$\mathrm{B2_u}$
N181.13.16 A3 ⊕ H1	√	1	1	√	$6/mmm$	$\mathrm{B2_u}$

Non-coplanar SSGs with parent space group $P6_422$ (No. 181) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N181.13.17 A3 $\oplus$ H2	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{B2_u}$
N181.14.1 GM2 $\oplus$ DT1	$\surd$	1	1	$\surd$	622	A2
N181.14.2 GM2 $\oplus$ DT2	$\surd$	1	1	$\surd$	622	A2
N181.14.3 GM3 $\oplus$ DT1	$\surd$	1	1	$\surd$	$\bar{6}m2$	$\mathrm{A2''}$
N181.14.4 GM3 $\oplus$ DT2	$\surd$	1	1	$\surd$	$\bar{6}m2$	$\mathrm{A2''}$
N181.14.5 GM4 $\oplus$ DT1	$\surd$	1	1	$\surd$	$\bar{6}2m$	$\mathrm{A2''}$
N181.14.6 GM4 $\oplus$ DT2	$\surd$	1	1	$\surd$	$\bar{6}2m$	$\mathrm{A2''}$
N181.14.7 A1 $\oplus$ DT1	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N181.14.8 A1 $\oplus$ DT2	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N181.14.9 A3 $\oplus$ DT1	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N181.14.10 A3 $\oplus$ DT2	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N181.16.1 M1	$\times$	-	-	-	-	-
N181.16.2 M2	$\times$	-	-	-	-	-
N181.16.3 M3	$\times$	-	-	-	-	-
N181.16.4 M4	$\times$	-	-	-	-	-
N181.16.5 L1	$\times$	-	-	-	-	-
N181.16.6 L3	$\times$	-	-	-	-	-

TABLE S544: Collinear SSGs with parent space group $P6_322$ (No. 182).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L182.1.1 GM1	1	$6/mmm$	$\mathrm{A1_g}$
L182.2.1 GM2	1	$6/mmm$	$\mathrm{A2_g}$
L182.2.2 GM3	1	$6/mmm$	$\mathrm{B2_g}$
L182.2.3 GM4	1	$6/mmm$	$\mathrm{B1_g}$

TABLE S545: Coplanar SSGs with parent space group $P6_322$ (No. 182).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P182.1.1 GM1	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A1_u}$
P182.2.1 GM2	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
P182.2.2 GM3	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
P182.2.3 GM4	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
P182.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
P182.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B1_u}$
P182.3.3 GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_u} \oplus \mathrm{B1_g}$
P182.3.4 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
P182.3.5 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g} \oplus \mathrm{B1_g}$
P182.3.6 GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
P182.6.1 GM5	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{E2_g}$
P182.6.2 GM6	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{E1_g}$
P182.6.3 A1	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
P182.6.4 A2	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
P182.6.5 A3	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
P182.7.1 K1	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{B2_u}$
P182.7.2 K2	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{B2_u}$

Coplanar SSGs with parent space group $P6_322$ (No. 182) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P182.8.1 DT1	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
P182.8.2 DT3	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$

TABLE S546: Non-coplanar SSGs with parent space group $P6_322$ (No. 182).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N182.1.1 GM1	$\surd$	3	3	$\surd$	622	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{A1}$
N182.2.1 GM2	$\surd$	3	3	$\surd$	$6mm$	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{A2}$
N182.2.2 GM3	$\surd$	3	3	$\surd$	$\bar{6}2m$	$\mathrm{A1'}\oplus\mathrm{A1'}\oplus\mathrm{A1''}$
N182.2.3 GM4	$\surd$	3	3	$\surd$	$\bar{6}m2$	$\mathrm{A1'}\oplus\mathrm{A1'}\oplus\mathrm{A2'}$
N182.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	622	$\mathrm{A1}\oplus\mathrm{A2}\oplus\mathrm{A2}$
N182.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$\bar{6}m2$	$\mathrm{A1'}\oplus\mathrm{A1''}\oplus\mathrm{A2''}$
N182.3.3 GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	$\bar{6}2m$	$\mathrm{A1'}\oplus\mathrm{A2''}\oplus\mathrm{A2'}$
N182.3.4 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	622	$\mathrm{A1}\oplus\mathrm{B2}\oplus\mathrm{B2}$
N182.3.5 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	$6mm$	$\mathrm{A1}\oplus\mathrm{B2}\oplus\mathrm{B1}$
N182.3.6 GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	622	$\mathrm{A1}\oplus\mathrm{B1}\oplus\mathrm{B1}$
N182.6.1 GM5	$\surd$	3	3	$\surd$	$6mm$	$\mathrm{A1}\oplus\mathrm{E2}$
N182.6.2 GM6	$\surd$	3	3	$\surd$	$6mm$	$\mathrm{A1}\oplus\mathrm{E1}$
N182.6.3 A1	$\surd$	1	1	$\surd$	$6mm$	A1
N182.6.4 A2	$\surd$	1	1	$\surd$	$6mm$	A1
N182.6.5 A3	$\surd$	1	1	$\surd$	$6mm$	A1
N182.7.1 K1	$\surd$	1	1	$\surd$	$\bar{6}2m$	A1'
N182.7.2 K2	$\surd$	1	1	$\surd$	$\bar{6}2m$	A1'
N182.8.1 DT1	$\surd$	1	1	$\surd$	$6mm$	A1
N182.8.2 DT3	$\surd$	1	1	$\surd$	$6mm$	A1
N182.9.1 GM2 $\oplus$ GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$6mm$	$\mathrm{A2}\oplus\mathrm{A2}\oplus\mathrm{A2}$
N182.9.2 GM2 $\oplus$ GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$\bar{6}2m$	$\mathrm{A1''}\oplus\mathrm{A2'}\oplus\mathrm{A2'}$
N182.9.3 GM2 $\oplus$ GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	$\bar{6}m2$	$\mathrm{A1''}\oplus\mathrm{A1''}\oplus\mathrm{A2'}$
N182.9.4 GM2 $\oplus$ GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	$6mm$	$\mathrm{A2}\oplus\mathrm{B1}\oplus\mathrm{B1}$
N182.9.5 GM2 $\oplus$ GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	622	$\mathrm{A2}\oplus\mathrm{B2}\oplus\mathrm{B1}$
N182.9.6 GM2 $\oplus$ GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	$6mm$	$\mathrm{A2}\oplus\mathrm{B2}\oplus\mathrm{B2}$
N182.9.7 GM3 $\oplus$ GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	$\bar{6}2m$	$\mathrm{A1''}\oplus\mathrm{A1''}\oplus\mathrm{A1''}$
N182.9.8 GM3 $\oplus$ GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	$\bar{6}m2$	$\mathrm{A2''}\oplus\mathrm{A2''}\oplus\mathrm{A2'}$
N182.9.9 GM3 $\oplus$ GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	$\bar{6}2m$	$\mathrm{A1''}\oplus\mathrm{A2''}\oplus\mathrm{A2''}$
N182.9.10 GM4 $\oplus$ GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	$\bar{6}m2$	$\mathrm{A2'}\oplus\mathrm{A2'}\oplus\mathrm{A2'}$
N182.12.1 GM2 $\oplus$ GM5	$\surd$	3	3	$\surd$	622	$\mathrm{A2}\oplus\mathrm{E2}$
N182.12.2 GM2 $\oplus$ GM6	$\surd$	3	3	$\surd$	622	$\mathrm{A2}\oplus\mathrm{E1}$
N182.12.3 GM2 $\oplus$ A1	$\surd$	1	1	$\surd$	622	A2
N182.12.4 GM2 $\oplus$ A2	$\surd$	1	1	$\surd$	622	A2
N182.12.5 GM2 $\oplus$ A3	$\surd$	1	1	$\surd$	622	A2
N182.12.6 GM3 $\oplus$ GM5	$\surd$	3	3	$\surd$	$\bar{6}m2$	$\mathrm{A2''}\oplus\mathrm{E'}$
N182.12.7 GM3 $\oplus$ GM6	$\surd$	3	3	$\surd$	$\bar{6}m2$	$\mathrm{A2''}\oplus\mathrm{E''}$
N182.12.8 GM3 $\oplus$ A1	$\surd$	1	1	$\surd$	$\bar{6}m2$	A2''
N182.12.9 GM3 $\oplus$ A2	$\surd$	1	1	$\surd$	$\bar{6}m2$	A2''
N182.12.10 GM3 $\oplus$ A3	$\surd$	1	1	$\surd$	$\bar{6}m2$	A2''
N182.12.11 GM4 $\oplus$ GM5	$\surd$	3	3	$\surd$	$\bar{6}2m$	$\mathrm{A2''}\oplus\mathrm{E'}$

Non-coplanar SSGs with parent space group $P6_322$ (No. 182) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N182.12.12 GM4 $\oplus$ GM6	$\surd$	3	3	$\surd$	$\bar{6}2m$	A2$''$ $\oplus$ E$''$
N182.12.13 GM4 $\oplus$ A1	$\surd$	1	1	$\surd$	$\bar{6}2m$	A2$''$
N182.12.14 GM4 $\oplus$ A2	$\surd$	1	1	$\surd$	$\bar{6}2m$	A2$''$
N182.12.15 GM4 $\oplus$ A3	$\surd$	1	1	$\surd$	$\bar{6}2m$	A2$''$
N182.13.1 GM2 $\oplus$ K1	$\surd$	1	1	$\surd$	$\bar{6}m2$	A1$''$
N182.13.2 GM2 $\oplus$ K2	$\surd$	1	1	$\surd$	$\bar{6}m2$	A1$''$
N182.13.3 GM3 $\oplus$ K1	$\surd$	1	1	$\surd$	622	B2
N182.13.4 GM3 $\oplus$ K2	$\surd$	1	1	$\surd$	622	B2
N182.13.5 GM4 $\oplus$ K1	$\surd$	1	1	$\surd$	$6mm$	B2
N182.13.6 GM4 $\oplus$ K2	$\surd$	1	1	$\surd$	$6mm$	B2
N182.14.1 GM2 $\oplus$ DT1	$\surd$	1	1	$\surd$	622	A2
N182.14.2 GM2 $\oplus$ DT3	$\surd$	1	1	$\surd$	622	A2
N182.14.3 GM3 $\oplus$ DT1	$\surd$	1	1	$\surd$	$\bar{6}m2$	A2$''$
N182.14.4 GM3 $\oplus$ DT3	$\surd$	1	1	$\surd$	$\bar{6}m2$	A2$''$
N182.14.5 GM4 $\oplus$ DT1	$\surd$	1	1	$\surd$	$\bar{6}2m$	A2$''$
N182.14.6 GM4 $\oplus$ DT3	$\surd$	1	1	$\surd$	$\bar{6}2m$	A2$''$
N182.16.1 M1	$\times$	-	-	-	-	-
N182.16.2 M2	$\times$	-	-	-	-	-
N182.16.3 M3	$\times$	-	-	-	-	-
N182.16.4 M4	$\times$	-	-	-	-	-

TABLE S547: Collinear SSGs with parent space group $P6mm$ (No. 183).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L183.1.1 GM1	1	$6/mmm$	A1$_{\mathrm{g}}$
L183.2.1 GM2	1	$6/mmm$	A2$_{\mathrm{g}}$
L183.2.2 GM3	1	$6/mmm$	B1$_{\mathrm{g}}$
L183.2.3 GM4	1	$6/mmm$	B2$_{\mathrm{g}}$
L183.2.4 A1	0	-	-
L183.2.5 A2	0	-	-
L183.2.6 A3	0	-	-
L183.2.7 A4	0	-	-

TABLE S548: Coplanar SSGs with parent space group $P6mm$ (No. 183).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P183.1.1 GM1	$\surd$	3	3	$\surd$	$6/mmm$	A1$_{\mathrm{g}}$ $\oplus$ A1$_{\mathrm{g}}$ $\oplus$ A2$_{\mathrm{u}}$
P183.2.1 GM2	$\surd$	3	3	$\surd$	$6/mmm$	A1$_{\mathrm{g}}$ $\oplus$ A1$_{\mathrm{u}}$ $\oplus$ A2$_{\mathrm{g}}$
P183.2.2 GM3	$\surd$	3	3	$\surd$	$6/mmm$	A1$_{\mathrm{g}}$ $\oplus$ B2$_{\mathrm{u}}$ $\oplus$ B1$_{\mathrm{g}}$
P183.2.3 GM4	$\surd$	3	3	$\surd$	$6/mmm$	A1$_{\mathrm{g}}$ $\oplus$ B2$_{\mathrm{g}}$ $\oplus$ B1$_{\mathrm{u}}$
P183.2.4 A1	$\surd$	1	1	$\surd$	$6/mmm$	A1$_{\mathrm{g}}$
P183.2.5 A2	$\surd$	1	1	$\surd$	$6/mmm$	A1$_{\mathrm{g}}$
P183.2.6 A3	$\surd$	1	1	$\surd$	$6/mmm$	A1$_{\mathrm{g}}$
P183.2.7 A4	$\surd$	1	1	$\surd$	$6/mmm$	A1$_{\mathrm{g}}$

Coplanar SSGs with parent space group $P6mm$ (No. 183) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P183.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
P183.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
P183.3.3 GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
P183.3.4 GM2 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
P183.3.5 GM2 $\oplus$ A2	$\surd$	1	1	$\times$	-	-
P183.3.6 GM2 $\oplus$ A3	$\surd$	1	1	$\times$	-	-
P183.3.7 GM2 $\oplus$ A4	$\surd$	1	1	$\times$	-	-
P183.3.8 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
P183.3.9 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B1_g}$
P183.3.10 GM3 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
P183.3.11 GM3 $\oplus$ A2	$\surd$	1	1	$\times$	-	-
P183.3.12 GM3 $\oplus$ A3	$\surd$	1	1	$\times$	-	-
P183.3.13 GM3 $\oplus$ A4	$\surd$	1	1	$\times$	-	-
P183.3.14 GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
P183.3.15 GM4 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
P183.3.16 GM4 $\oplus$ A2	$\surd$	1	1	$\times$	-	-
P183.3.17 GM4 $\oplus$ A3	$\surd$	1	1	$\times$	-	-
P183.3.18 GM4 $\oplus$ A4	$\surd$	1	1	$\times$	-	-
P183.3.19 A1 $\oplus$ A1	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
P183.3.20 A1 $\oplus$ A2	$\surd$	1	1	$\times$	-	-
P183.3.21 A1 $\oplus$ A3	$\surd$	1	1	$\times$	-	-
P183.3.22 A1 $\oplus$ A4	$\surd$	1	1	$\times$	-	-
P183.3.23 A2 $\oplus$ A2	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
P183.3.24 A2 $\oplus$ A3	$\surd$	1	1	$\times$	-	-
P183.3.25 A2 $\oplus$ A4	$\surd$	1	1	$\times$	-	-
P183.3.26 A3 $\oplus$ A3	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
P183.3.27 A3 $\oplus$ A4	$\surd$	1	1	$\times$	-	-
P183.3.28 A4 $\oplus$ A4	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
P183.5.1 DT1DU1	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
P183.5.2 DT2DU2	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
P183.5.3 DT3DU3	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
P183.5.4 DT4DU4	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
P183.6.1 GM5	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{E2_g}$
P183.6.2 GM6	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{E1_g}$
P183.6.3 A5	$\surd$	1	1	$\times$	-	-
P183.6.4 A6	$\surd$	1	1	$\times$	-	-
P183.7.1 K1	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{B2_u}$
P183.7.2 K2	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{B2_u}$
P183.7.3 H1	$\surd$	1	1	$\times$	-	-
P183.7.4 H2	$\surd$	1	1	$\times$	-	-

TABLE S549: Non-coplanar SSGs with parent space group $P6mm$ (No. 183).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N183.1.1 GM1	$\surd$	3	3	$\surd$	$6mm$	A1 $\oplus$ A1 $\oplus$ A1

Non-coplanar SSGs with parent space group $P6mm$ (No. 183) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N183.2.1 GM2	$\surd$	3	3	$\surd$	622	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{A2}$
N183.2.2 GM3	$\surd$	3	3	$\surd$	$\bar{6}2m$	$\mathrm{A1}'\oplus\mathrm{A1}'\oplus\mathrm{A2}''$
N183.2.3 GM4	$\surd$	3	3	$\surd$	$\bar{6}m2$	$\mathrm{A1}'\oplus\mathrm{A1}'\oplus\mathrm{A2}''$
N183.2.4 A1	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A2_u}$
N183.2.5 A2	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A2_u}$
N183.2.6 A3	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A2_u}$
N183.2.7 A4	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A2_u}$
N183.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$6mm$	$\mathrm{A1}\oplus\mathrm{A2}\oplus\mathrm{A2}$
N183.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$\bar{6}m2$	$\mathrm{A1}'\oplus\mathrm{A1}''\oplus\mathrm{A2}'$
N183.3.3 GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	$\bar{6}2m$	$\mathrm{A1}'\oplus\mathrm{A1}''\oplus\mathrm{A2}'$
N183.3.4 GM2 $\oplus$ A1	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{A2_g}$
N183.3.5 GM2 $\oplus$ A2	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{A2_g}$
N183.3.6 GM2 $\oplus$ A3	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{A2_g}$
N183.3.7 GM2 $\oplus$ A4	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{A2_g}$
N183.3.8 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	$6mm$	$\mathrm{A1}\oplus\mathrm{B2}\oplus\mathrm{B2}$
N183.3.9 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	622	$\mathrm{A1}\oplus\mathrm{B2}\oplus\mathrm{B1}$
N183.3.10 GM3 $\oplus$ A1	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_u}\oplus\mathrm{B1_g}$
N183.3.11 GM3 $\oplus$ A2	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_u}\oplus\mathrm{B1_g}$
N183.3.12 GM3 $\oplus$ A3	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_u}\oplus\mathrm{B1_g}$
N183.3.13 GM3 $\oplus$ A4	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_u}\oplus\mathrm{B1_g}$
N183.3.14 GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	$6mm$	$\mathrm{A1}\oplus\mathrm{B1}\oplus\mathrm{B1}$
N183.3.15 GM4 $\oplus$ A1	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_g}\oplus\mathrm{B1_u}$
N183.3.16 GM4 $\oplus$ A2	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_g}\oplus\mathrm{B1_u}$
N183.3.17 GM4 $\oplus$ A3	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_g}\oplus\mathrm{B1_u}$
N183.3.18 GM4 $\oplus$ A4	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_g}\oplus\mathrm{B1_u}$
N183.3.19 A1 $\oplus$ A1	$\surd$	1	1	$\surd$	$6mm$	A1
N183.3.20 A1 $\oplus$ A2	$\surd$	1	1	$\surd$	622	A1
N183.3.21 A1 $\oplus$ A3	$\surd$	1	1	$\surd$	$\bar{6}2m$	$\mathrm{A1}'$
N183.3.22 A1 $\oplus$ A4	$\surd$	1	1	$\surd$	$\bar{6}m2$	$\mathrm{A1}'$
N183.3.23 A2 $\oplus$ A2	$\surd$	1	1	$\surd$	$6mm$	A1
N183.3.24 A2 $\oplus$ A3	$\surd$	1	1	$\surd$	$\bar{6}m2$	$\mathrm{A1}'$
N183.3.25 A2 $\oplus$ A4	$\surd$	1	1	$\surd$	$\bar{6}2m$	$\mathrm{A1}'$
N183.3.26 A3 $\oplus$ A3	$\surd$	1	1	$\surd$	$6mm$	A1
N183.3.27 A3 $\oplus$ A4	$\surd$	1	1	$\surd$	622	A1
N183.3.28 A4 $\oplus$ A4	$\surd$	1	1	$\surd$	$6mm$	A1
N183.5.1 DT1DU1	$\surd$	1	1	$\surd$	$6mm$	A1
N183.5.2 DT2DU2	$\surd$	1	1	$\surd$	$6mm$	A1
N183.5.3 DT3DU3	$\surd$	1	1	$\surd$	$6mm$	A1
N183.5.4 DT4DU4	$\surd$	1	1	$\surd$	$6mm$	A1
N183.6.1 GM5	$\surd$	3	3	$\surd$	622	$\mathrm{A1}\oplus\mathrm{E2}$
N183.6.2 GM6	$\surd$	3	3	$\surd$	622	$\mathrm{A1}\oplus\mathrm{E1}$
N183.6.3 A5	$\surd$	1	1	$\surd$	622	A1
N183.6.4 A6	$\surd$	1	1	$\surd$	622	A1
N183.7.1 K1	$\surd$	1	1	$\surd$	$\bar{6}2m$	$\mathrm{A1}'$
N183.7.2 K2	$\surd$	1	1	$\surd$	$\bar{6}2m$	$\mathrm{A1}'$
N183.7.3 H1	$\surd$	1	1	$\surd$	$\bar{6}2m$	$\mathrm{A1}'$

Non-coplanar SSGs with parent space group $P6mm$ (No. 183) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N183.7.4 H2	$\surd$	1	1	$\surd$	$\bar{6}2m$	$\mathrm{A1}'$
N183.9.1 GM2 $\oplus$ GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	622	$\mathrm{A2}\oplus\mathrm{A2}\oplus\mathrm{A2}$
N183.9.2 GM2 $\oplus$ GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$\bar{6}2m$	$\mathrm{A2}''\oplus\mathrm{A2}'\oplus\mathrm{A2}'$
N183.9.3 GM2 $\oplus$ GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	$\bar{6}m2$	$\mathrm{A1}''\oplus\mathrm{A1}''\oplus\mathrm{A2}''$
N183.9.4 GM2 $\oplus$ GM2 $\oplus$ A1	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_u}$
N183.9.5 GM2 $\oplus$ GM2 $\oplus$ A2	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_u}$
N183.9.6 GM2 $\oplus$ GM2 $\oplus$ A3	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_u}$
N183.9.7 GM2 $\oplus$ GM2 $\oplus$ A4	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_u}$
N183.9.8 GM2 $\oplus$ GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	622	$\mathrm{A2}\oplus\mathrm{B1}\oplus\mathrm{B1}$
N183.9.9 GM2 $\oplus$ GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	$6mm$	$\mathrm{A2}\oplus\mathrm{B2}\oplus\mathrm{B1}$
N183.9.10 GM2 $\oplus$ GM3 $\oplus$ A1	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g}\oplus\mathrm{B1_g}\oplus\mathrm{B1_u}$
N183.9.11 GM2 $\oplus$ GM3 $\oplus$ A2	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g}\oplus\mathrm{B1_g}\oplus\mathrm{B1_u}$
N183.9.12 GM2 $\oplus$ GM3 $\oplus$ A3	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g}\oplus\mathrm{B1_g}\oplus\mathrm{B1_u}$
N183.9.13 GM2 $\oplus$ GM3 $\oplus$ A4	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g}\oplus\mathrm{B1_g}\oplus\mathrm{B1_u}$
N183.9.14 GM2 $\oplus$ GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	622	$\mathrm{A2}\oplus\mathrm{B2}\oplus\mathrm{B2}$
N183.9.15 GM2 $\oplus$ GM4 $\oplus$ A1	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g}\oplus\mathrm{B2_g}\oplus\mathrm{B2_u}$
N183.9.16 GM2 $\oplus$ GM4 $\oplus$ A2	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g}\oplus\mathrm{B2_g}\oplus\mathrm{B2_u}$
N183.9.17 GM2 $\oplus$ GM4 $\oplus$ A3	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g}\oplus\mathrm{B2_g}\oplus\mathrm{B2_u}$
N183.9.18 GM2 $\oplus$ GM4 $\oplus$ A4	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g}\oplus\mathrm{B2_g}\oplus\mathrm{B2_u}$
N183.9.19 GM2 $\oplus$ A1 $\oplus$ A1	$\surd$	1	1	$\surd$	622	A2
N183.9.20 GM2 $\oplus$ A1 $\oplus$ A2	$\surd$	1	1	$\times$	-	-
N183.9.21 GM2 $\oplus$ A1 $\oplus$ A3	$\surd$	1	1	$\times$	-	-
N183.9.22 GM2 $\oplus$ A1 $\oplus$ A4	$\surd$	1	1	$\times$	-	-
N183.9.23 GM2 $\oplus$ A2 $\oplus$ A2	$\surd$	1	1	$\surd$	622	A2
N183.9.24 GM2 $\oplus$ A2 $\oplus$ A3	$\surd$	1	1	$\times$	-	-
N183.9.25 GM2 $\oplus$ A2 $\oplus$ A4	$\surd$	1	1	$\times$	-	-
N183.9.26 GM2 $\oplus$ A3 $\oplus$ A3	$\surd$	1	1	$\surd$	622	A2
N183.9.27 GM2 $\oplus$ A3 $\oplus$ A4	$\surd$	1	1	$\times$	-	-
N183.9.28 GM2 $\oplus$ A4 $\oplus$ A4	$\surd$	1	1	$\surd$	622	A2
N183.9.29 GM3 $\oplus$ GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	$\bar{6}2m$	$\mathrm{A2}''\oplus\mathrm{A2}''\oplus\mathrm{A2}''$
N183.9.30 GM3 $\oplus$ GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	$\bar{6}m2$	$\mathrm{A2}''\oplus\mathrm{A2}'\oplus\mathrm{A2}'$
N183.9.31 GM3 $\oplus$ GM3 $\oplus$ A1	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_u}\oplus\mathrm{B1_g}\oplus\mathrm{B1_g}$
N183.9.32 GM3 $\oplus$ GM3 $\oplus$ A2	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_u}\oplus\mathrm{B1_g}\oplus\mathrm{B1_g}$
N183.9.33 GM3 $\oplus$ GM3 $\oplus$ A3	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_u}\oplus\mathrm{B1_g}\oplus\mathrm{B1_g}$
N183.9.34 GM3 $\oplus$ GM3 $\oplus$ A4	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_u}\oplus\mathrm{B1_g}\oplus\mathrm{B1_g}$
N183.9.35 GM3 $\oplus$ GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	$\bar{6}2m$	$\mathrm{A1}''\oplus\mathrm{A1}''\oplus\mathrm{A2}''$
N183.9.36 GM3 $\oplus$ GM4 $\oplus$ A1	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u}\oplus\mathrm{B2_g}\oplus\mathrm{B1_g}$
N183.9.37 GM3 $\oplus$ GM4 $\oplus$ A2	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u}\oplus\mathrm{B2_g}\oplus\mathrm{B1_g}$
N183.9.38 GM3 $\oplus$ GM4 $\oplus$ A3	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u}\oplus\mathrm{B2_g}\oplus\mathrm{B1_g}$
N183.9.39 GM3 $\oplus$ GM4 $\oplus$ A4	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u}\oplus\mathrm{B2_g}\oplus\mathrm{B1_g}$
N183.9.40 GM3 $\oplus$ A1 $\oplus$ A1	$\surd$	1	1	$\surd$	$\bar{6}2m$	$\mathrm{A2}''$
N183.9.41 GM3 $\oplus$ A1 $\oplus$ A2	$\surd$	1	1	$\times$	-	-
N183.9.42 GM3 $\oplus$ A1 $\oplus$ A3	$\surd$	1	1	$\times$	-	-
N183.9.43 GM3 $\oplus$ A1 $\oplus$ A4	$\surd$	1	1	$\times$	-	-
N183.9.44 GM3 $\oplus$ A2 $\oplus$ A2	$\surd$	1	1	$\surd$	$\bar{6}2m$	$\mathrm{A2}''$
N183.9.45 GM3 $\oplus$ A2 $\oplus$ A3	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $P6mm$ (No. 183) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N183.9.46 GM3 $\oplus$ A2 $\oplus$ A4	$\surd$	1	1	$\times$	-	-
N183.9.47 GM3 $\oplus$ A3 $\oplus$ A3	$\surd$	1	1	$\surd$	$\bar{6}2m$	$\mathrm{A2}''$
N183.9.48 GM3 $\oplus$ A3 $\oplus$ A4	$\surd$	1	1	$\times$	-	-
N183.9.49 GM3 $\oplus$ A4 $\oplus$ A4	$\surd$	1	1	$\surd$	$\bar{6}2m$	$\mathrm{A2}''$
N183.9.50 GM4 $\oplus$ GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	$\bar{6}m2$	$\mathrm{A2}'' \oplus \mathrm{A2}'' \oplus \mathrm{A2}''$
N183.9.51 GM4 $\oplus$ GM4 $\oplus$ A1	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N183.9.52 GM4 $\oplus$ GM4 $\oplus$ A2	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N183.9.53 GM4 $\oplus$ GM4 $\oplus$ A3	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N183.9.54 GM4 $\oplus$ GM4 $\oplus$ A4	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N183.9.55 GM4 $\oplus$ A1 $\oplus$ A1	$\surd$	1	1	$\surd$	$\bar{6}m2$	$\mathrm{A2}''$
N183.9.56 GM4 $\oplus$ A1 $\oplus$ A2	$\surd$	1	1	$\times$	-	-
N183.9.57 GM4 $\oplus$ A1 $\oplus$ A3	$\surd$	1	1	$\times$	-	-
N183.9.58 GM4 $\oplus$ A1 $\oplus$ A4	$\surd$	1	1	$\times$	-	-
N183.9.59 GM4 $\oplus$ A2 $\oplus$ A2	$\surd$	1	1	$\surd$	$\bar{6}m2$	$\mathrm{A2}''$
N183.9.60 GM4 $\oplus$ A2 $\oplus$ A3	$\surd$	1	1	$\times$	-	-
N183.9.61 GM4 $\oplus$ A2 $\oplus$ A4	$\surd$	1	1	$\times$	-	-
N183.9.62 GM4 $\oplus$ A3 $\oplus$ A3	$\surd$	1	1	$\surd$	$\bar{6}m2$	$\mathrm{A2}''$
N183.9.63 GM4 $\oplus$ A3 $\oplus$ A4	$\surd$	1	1	$\times$	-	-
N183.9.64 GM4 $\oplus$ A4 $\oplus$ A4	$\surd$	1	1	$\surd$	$\bar{6}m2$	$\mathrm{A2}''$
N183.9.65 A1 $\oplus$ A1 $\oplus$ A1	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N183.9.66 A1 $\oplus$ A1 $\oplus$ A2	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A2_u}$
N183.9.67 A1 $\oplus$ A1 $\oplus$ A3	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N183.9.68 A1 $\oplus$ A1 $\oplus$ A4	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N183.9.69 A1 $\oplus$ A2 $\oplus$ A2	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A2_u}$
N183.9.70 A1 $\oplus$ A2 $\oplus$ A3	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B1_u}$
N183.9.71 A1 $\oplus$ A2 $\oplus$ A4	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B1_u}$
N183.9.72 A1 $\oplus$ A3 $\oplus$ A3	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N183.9.73 A1 $\oplus$ A3 $\oplus$ A4	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B1_u}$
N183.9.74 A1 $\oplus$ A4 $\oplus$ A4	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N183.9.75 A2 $\oplus$ A2 $\oplus$ A2	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N183.9.76 A2 $\oplus$ A2 $\oplus$ A3	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N183.9.77 A2 $\oplus$ A2 $\oplus$ A4	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N183.9.78 A2 $\oplus$ A3 $\oplus$ A3	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N183.9.79 A2 $\oplus$ A3 $\oplus$ A4	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B1_u}$
N183.9.80 A2 $\oplus$ A4 $\oplus$ A4	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N183.9.81 A3 $\oplus$ A3 $\oplus$ A3	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N183.9.82 A3 $\oplus$ A3 $\oplus$ A4	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A2_u}$
N183.9.83 A3 $\oplus$ A4 $\oplus$ A4	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A2_u}$
N183.9.84 A4 $\oplus$ A4 $\oplus$ A4	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N183.11.1 GM2 $\oplus$ DT1DU1	$\surd$	1	1	$\surd$	622	A2
N183.11.2 GM2 $\oplus$ DT2DU2	$\surd$	1	1	$\surd$	622	A2
N183.11.3 GM2 $\oplus$ DT3DU3	$\surd$	1	1	$\surd$	622	A2
N183.11.4 GM2 $\oplus$ DT4DU4	$\surd$	1	1	$\surd$	622	A2
N183.11.5 GM3 $\oplus$ DT1DU1	$\surd$	1	1	$\surd$	$\bar{6}2m$	$\mathrm{A2}''$
N183.11.6 GM3 $\oplus$ DT2DU2	$\surd$	1	1	$\surd$	$\bar{6}2m$	$\mathrm{A2}''$
N183.11.7 GM3 $\oplus$ DT3DU3	$\surd$	1	1	$\surd$	$\bar{6}2m$	$\mathrm{A2}''$

Non-coplanar SSGs with parent space group $P6mm$ (No. 183) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N183.11.8 GM3 $\oplus$ DT4DU4	$\surd$	1	1	$\surd$	$\bar{6}2m$	$\mathrm{A2''}$
N183.11.9 GM4 $\oplus$ DT1DU1	$\surd$	1	1	$\surd$	$\bar{6}m2$	$\mathrm{A2''}$
N183.11.10 GM4 $\oplus$ DT2DU2	$\surd$	1	1	$\surd$	$\bar{6}m2$	$\mathrm{A2''}$
N183.11.11 GM4 $\oplus$ DT3DU3	$\surd$	1	1	$\surd$	$\bar{6}m2$	$\mathrm{A2''}$
N183.11.12 GM4 $\oplus$ DT4DU4	$\surd$	1	1	$\surd$	$\bar{6}m2$	$\mathrm{A2''}$
N183.11.13 A1 $\oplus$ DT1DU1	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N183.11.14 A1 $\oplus$ DT2DU2	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N183.11.15 A1 $\oplus$ DT3DU3	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N183.11.16 A1 $\oplus$ DT4DU4	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N183.11.17 A2 $\oplus$ DT1DU1	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N183.11.18 A2 $\oplus$ DT2DU2	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N183.11.19 A2 $\oplus$ DT3DU3	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N183.11.20 A2 $\oplus$ DT4DU4	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N183.11.21 A3 $\oplus$ DT1DU1	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N183.11.22 A3 $\oplus$ DT2DU2	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N183.11.23 A3 $\oplus$ DT3DU3	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N183.11.24 A3 $\oplus$ DT4DU4	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N183.11.25 A4 $\oplus$ DT1DU1	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N183.11.26 A4 $\oplus$ DT2DU2	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N183.11.27 A4 $\oplus$ DT3DU3	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N183.11.28 A4 $\oplus$ DT4DU4	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N183.12.1 GM2 $\oplus$ GM5	$\surd$	3	3	$\surd$	$6mm$	$\mathrm{A2 \oplus E2}$
N183.12.2 GM2 $\oplus$ GM6	$\surd$	3	3	$\surd$	$6mm$	$\mathrm{A2 \oplus E1}$
N183.12.3 GM2 $\oplus$ A5	$\surd$	1	1	$\times$	-	-
N183.12.4 GM2 $\oplus$ A6	$\surd$	1	1	$\times$	-	-
N183.12.5 GM3 $\oplus$ GM5	$\surd$	3	3	$\surd$	$\bar{6}m2$	$\mathrm{A2' \oplus E'}$
N183.12.6 GM3 $\oplus$ GM6	$\surd$	3	3	$\surd$	$\bar{6}m2$	$\mathrm{A2' \oplus E''}$
N183.12.7 GM3 $\oplus$ A5	$\surd$	1	1	$\times$	-	-
N183.12.8 GM3 $\oplus$ A6	$\surd$	1	1	$\times$	-	-
N183.12.9 GM4 $\oplus$ GM5	$\surd$	3	3	$\surd$	$\bar{6}2m$	$\mathrm{A1'' \oplus E'}$
N183.12.10 GM4 $\oplus$ GM6	$\surd$	3	3	$\surd$	$\bar{6}2m$	$\mathrm{A1'' \oplus E''}$
N183.12.11 GM4 $\oplus$ A5	$\surd$	1	1	$\times$	-	-
N183.12.12 GM4 $\oplus$ A6	$\surd$	1	1	$\times$	-	-
N183.12.13 A1 $\oplus$ GM5	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u \oplus E2_g}$
N183.12.14 A1 $\oplus$ GM6	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u \oplus E1_g}$
N183.12.15 A1 $\oplus$ A5	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u \oplus E2_u}$
N183.12.16 A1 $\oplus$ A6	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u \oplus E1_u}$
N183.12.17 A2 $\oplus$ GM5	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u \oplus E2_g}$
N183.12.18 A2 $\oplus$ GM6	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u \oplus E1_g}$
N183.12.19 A2 $\oplus$ A5	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u \oplus E2_u}$
N183.12.20 A2 $\oplus$ A6	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u \oplus E1_u}$
N183.12.21 A3 $\oplus$ GM5	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u \oplus E2_g}$
N183.12.22 A3 $\oplus$ GM6	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u \oplus E1_g}$
N183.12.23 A3 $\oplus$ A5	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u \oplus E1_u}$
N183.12.24 A3 $\oplus$ A6	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u \oplus E2_u}$
N183.12.25 A4 $\oplus$ GM5	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u \oplus E2_g}$

Non-coplanar SSGs with parent space group $P6mm$ (No. 183) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N183.12.26 A4 ⊕ GM6	√	3	3	√	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{E1_g}$
N183.12.27 A4 ⊕ A5	√	3	3	√	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{E1_u}$
N183.12.28 A4 ⊕ A6	√	3	3	√	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{E2_u}$
N183.13.1 GM2 ⊕ K1	√	1	1	√	$\bar{6}m2$	$\mathrm{A1''}$
N183.13.2 GM2 ⊕ K2	√	1	1	√	$\bar{6}m2$	$\mathrm{A1''}$
N183.13.3 GM2 ⊕ H1	√	1	1	×	-	-
N183.13.4 GM2 ⊕ H2	√	1	1	×	-	-
N183.13.5 GM3 ⊕ K1	√	1	1	√	$6mm$	B2
N183.13.6 GM3 ⊕ K2	√	1	1	√	$6mm$	B2
N183.13.7 GM3 ⊕ H1	√	1	1	×	-	-
N183.13.8 GM3 ⊕ H2	√	1	1	×	-	-
N183.13.9 GM4 ⊕ K1	√	1	1	√	622	B2
N183.13.10 GM4 ⊕ K2	√	1	1	√	622	B2
N183.13.11 GM4 ⊕ H1	√	1	1	×	-	-
N183.13.12 GM4 ⊕ H2	√	1	1	×	-	-
N183.13.13 A1 ⊕ K1	√	1	1	√	$6/mmm$	$\mathrm{B2_u}$
N183.13.14 A1 ⊕ K2	√	1	1	√	$6/mmm$	$\mathrm{B2_u}$
N183.13.15 A1 ⊕ H1	√	1	1	√	$6/mmm$	$\mathrm{B2_u}$
N183.13.16 A1 ⊕ H2	√	1	1	√	$6/mmm$	$\mathrm{B2_u}$
N183.13.17 A2 ⊕ K1	√	1	1	√	$6/mmm$	$\mathrm{B2_u}$
N183.13.18 A2 ⊕ K2	√	1	1	√	$6/mmm$	$\mathrm{B2_u}$
N183.13.19 A2 ⊕ H1	√	1	1	√	$6/mmm$	$\mathrm{B2_u}$
N183.13.20 A2 ⊕ H2	√	1	1	√	$6/mmm$	$\mathrm{B2_u}$
N183.13.21 A3 ⊕ K1	√	1	1	√	$6/mmm$	$\mathrm{B2_u}$
N183.13.22 A3 ⊕ K2	√	1	1	√	$6/mmm$	$\mathrm{B2_u}$
N183.13.23 A3 ⊕ H1	√	1	1	√	$6/mmm$	$\mathrm{B2_u}$
N183.13.24 A3 ⊕ H2	√	1	1	√	$6/mmm$	$\mathrm{B2_u}$
N183.13.25 A4 ⊕ K1	√	1	1	√	$6/mmm$	$\mathrm{B2_u}$
N183.13.26 A4 ⊕ K2	√	1	1	√	$6/mmm$	$\mathrm{B2_u}$
N183.13.27 A4 ⊕ H1	√	1	1	√	$6/mmm$	$\mathrm{B2_u}$
N183.13.28 A4 ⊕ H2	√	1	1	√	$6/mmm$	$\mathrm{B2_u}$
N183.16.1 M1	×	-	-	-	-	-
N183.16.2 M2	×	-	-	-	-	-
N183.16.3 M3	×	-	-	-	-	-
N183.16.4 M4	×	-	-	-	-	-
N183.16.5 L1	×	-	-	-	-	-
N183.16.6 L2	×	-	-	-	-	-
N183.16.7 L3	×	-	-	-	-	-
N183.16.8 L4	×	-	-	-	-	-

TABLE S550: Collinear SSGs with parent space group $P6cc$ (No. 184).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L184.1.1 GM1	1	$6/mmm$	$\mathrm{A1_g}$
L184.2.1 GM2	1	$6/mmm$	$\mathrm{A2_g}$
L184.2.2 GM3	1	$6/mmm$	$\mathrm{B1_g}$

Collinear SSGs with parent space group $P6cc$ (No. 184)(continued)

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L184.2.3 GM4	1	$6/mmm$	$\mathrm{B2_g}$

TABLE S551: Coplanar SSGs with parent space group $P6cc$ (No. 184).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P184.1.1 GM1	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A2_u}$
P184.2.1 GM2	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{A2_g}$
P184.2.2 GM3	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_u}\oplus\mathrm{B1_g}$
P184.2.3 GM4	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_g}\oplus\mathrm{B1_u}$
P184.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_u}$
P184.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g}\oplus\mathrm{B1_g}\oplus\mathrm{B1_u}$
P184.3.3 GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g}\oplus\mathrm{B2_g}\oplus\mathrm{B2_u}$
P184.3.4 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_u}\oplus\mathrm{B1_g}\oplus\mathrm{B1_g}$
P184.3.5 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u}\oplus\mathrm{B2_g}\oplus\mathrm{B1_g}$
P184.3.6 GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_u}\oplus\mathrm{B2_g}\oplus\mathrm{B2_g}$
P184.4.1 A1A2	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
P184.4.2 A3A4	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
P184.5.1 DT1DU1	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
P184.5.2 DT3DU3	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
P184.6.1 GM5	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u}\oplus\mathrm{E2_g}$
P184.6.2 GM6	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u}\oplus\mathrm{E1_g}$
P184.7.1 K1	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{B2_u}$
P184.7.2 K2	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{B2_u}$

TABLE S552: Non-coplanar SSGs with parent space group $P6cc$ (No. 184).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N184.1.1 GM1	$\surd$	3	3	$\surd$	$6mm$	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{A1}$
N184.2.1 GM2	$\surd$	3	3	$\surd$	622	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{A2}$
N184.2.2 GM3	$\surd$	3	3	$\surd$	$\bar{6}2m$	$\mathrm{A1'}\oplus\mathrm{A1'}\oplus\mathrm{A2''}$
N184.2.3 GM4	$\surd$	3	3	$\surd$	$\bar{6}m2$	$\mathrm{A1'}\oplus\mathrm{A1'}\oplus\mathrm{A2''}$
N184.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$6mm$	$\mathrm{A1}\oplus\mathrm{A2}\oplus\mathrm{A2}$
N184.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$\bar{6}m2$	$\mathrm{A1'}\oplus\mathrm{A1''}\oplus\mathrm{A2'}$
N184.3.3 GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	$\bar{6}2m$	$\mathrm{A1'}\oplus\mathrm{A1''}\oplus\mathrm{A2'}$
N184.3.4 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	$6mm$	$\mathrm{A1}\oplus\mathrm{B2}\oplus\mathrm{B2}$
N184.3.5 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	622	$\mathrm{A1}\oplus\mathrm{B2}\oplus\mathrm{B1}$
N184.3.6 GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	$6mm$	$\mathrm{A1}\oplus\mathrm{B1}\oplus\mathrm{B1}$
N184.4.1 A1A2	$\surd$	1	1	$\surd$	$6mm$	A1
N184.4.2 A3A4	$\surd$	1	1	$\surd$	$6mm$	A1
N184.5.1 DT1DU1	$\surd$	1	1	$\surd$	$6mm$	A1
N184.5.2 DT3DU3	$\surd$	1	1	$\surd$	$6mm$	A1
N184.6.1 GM5	$\surd$	3	3	$\surd$	622	$\mathrm{A1}\oplus\mathrm{E2}$
N184.6.2 GM6	$\surd$	3	3	$\surd$	622	$\mathrm{A1}\oplus\mathrm{E1}$
N184.7.1 K1	$\surd$	1	1	$\surd$	$\bar{6}2m$	$\mathrm{A1'}$
N184.7.2 K2	$\surd$	1	1	$\surd$	$\bar{6}2m$	$\mathrm{A1'}$

Non-coplanar SSGs with parent space group $P6cc$ (No. 184) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N184.9.1 GM2 ⊕ GM2 ⊕ GM2	√	3	3	√	622	A2 ⊕ A2 ⊕ A2
N184.9.2 GM2 ⊕ GM2 ⊕ GM3	√	3	3	√	$\bar{6}2m$	A2″ ⊕ A2′ ⊕ A2′
N184.9.3 GM2 ⊕ GM2 ⊕ GM4	√	3	3	√	$\bar{6}m2$	A1″ ⊕ A1″ ⊕ A2″
N184.9.4 GM2 ⊕ GM3 ⊕ GM3	√	3	3	√	622	A2 ⊕ B1 ⊕ B1
N184.9.5 GM2 ⊕ GM3 ⊕ GM4	√	3	3	√	$6mm$	A2 ⊕ B2 ⊕ B1
N184.9.6 GM2 ⊕ GM4 ⊕ GM4	√	3	3	√	622	A2 ⊕ B2 ⊕ B2
N184.9.7 GM3 ⊕ GM3 ⊕ GM3	√	3	3	√	$\bar{6}2m$	A2″ ⊕ A2″ ⊕ A2″
N184.9.8 GM3 ⊕ GM3 ⊕ GM4	√	3	3	√	$\bar{6}m2$	A2″ ⊕ A2′ ⊕ A2′
N184.9.9 GM3 ⊕ GM4 ⊕ GM4	√	3	3	√	$\bar{6}2m$	A1″ ⊕ A1″ ⊕ A2″
N184.9.10 GM4 ⊕ GM4 ⊕ GM4	√	3	3	√	$\bar{6}m2$	A2″ ⊕ A2″ ⊕ A2″
N184.10.1 GM2 ⊕ A1A2	√	1	1	√	622	A2
N184.10.2 GM2 ⊕ A3A4	√	1	1	√	622	A2
N184.10.3 GM3 ⊕ A1A2	√	1	1	√	$\bar{6}2m$	A2″
N184.10.4 GM3 ⊕ A3A4	√	1	1	√	$\bar{6}2m$	A2″
N184.10.5 GM4 ⊕ A1A2	√	1	1	√	$\bar{6}m2$	A2″
N184.10.6 GM4 ⊕ A3A4	√	1	1	√	$\bar{6}m2$	A2″
N184.11.1 GM2 ⊕ DT1DU1	√	1	1	√	622	A2
N184.11.2 GM2 ⊕ DT3DU3	√	1	1	√	622	A2
N184.11.3 GM3 ⊕ DT1DU1	√	1	1	√	$\bar{6}2m$	A2″
N184.11.4 GM3 ⊕ DT3DU3	√	1	1	√	$\bar{6}2m$	A2″
N184.11.5 GM4 ⊕ DT1DU1	√	1	1	√	$\bar{6}m2$	A2″
N184.11.6 GM4 ⊕ DT3DU3	√	1	1	√	$\bar{6}m2$	A2″
N184.12.1 GM2 ⊕ GM5	√	3	3	√	$6mm$	A2 ⊕ E2
N184.12.2 GM2 ⊕ GM6	√	3	3	√	$6mm$	A2 ⊕ E1
N184.12.3 GM3 ⊕ GM5	√	3	3	√	$\bar{6}m2$	A2′ ⊕ E′
N184.12.4 GM3 ⊕ GM6	√	3	3	√	$\bar{6}m2$	A2′ ⊕ E″
N184.12.5 GM4 ⊕ GM5	√	3	3	√	$\bar{6}2m$	A1″ ⊕ E′
N184.12.6 GM4 ⊕ GM6	√	3	3	√	$\bar{6}2m$	A1″ ⊕ E″
N184.13.1 GM2 ⊕ K1	√	1	1	√	$\bar{6}m2$	A1″
N184.13.2 GM2 ⊕ K2	√	1	1	√	$\bar{6}m2$	A1″
N184.13.3 GM3 ⊕ K1	√	1	1	√	$6mm$	B2
N184.13.4 GM3 ⊕ K2	√	1	1	√	$6mm$	B2
N184.13.5 GM4 ⊕ K1	√	1	1	√	622	B2
N184.13.6 GM4 ⊕ K2	√	1	1	√	622	B2
N184.16.1 M1	×	-	-	-	-	-
N184.16.2 M2	×	-	-	-	-	-
N184.16.3 M3	×	-	-	-	-	-
N184.16.4 M4	×	-	-	-	-	-

TABLE S553: Collinear SSGs with parent space group $P6_3cm$ (No. 185).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L185.1.1 GM1	1	$6/mmm$	$\mathrm{A1_g}$
L185.2.1 GM2	1	$6/mmm$	$\mathrm{A2_g}$
L185.2.2 GM3	1	$6/mmm$	$\mathrm{B1_g}$
L185.2.3 GM4	1	$6/mmm$	$\mathrm{B2_g}$

Coplanar SSGs with parent space group $P6_3cm$ (No. 185) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation

TABLE S554: Coplanar SSGs with parent space group $P6_3cm$ (No. 185).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P185.1.1 GM1	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A2_u}$
P185.2.1 GM2	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{A2_g}$
P185.2.2 GM3	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_u}\oplus\mathrm{B1_g}$
P185.2.3 GM4	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_g}\oplus\mathrm{B1_u}$
P185.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_u}$
P185.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g}\oplus\mathrm{B1_g}\oplus\mathrm{B1_u}$
P185.3.3 GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g}\oplus\mathrm{B2_g}\oplus\mathrm{B2_u}$
P185.3.4 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_u}\oplus\mathrm{B1_g}\oplus\mathrm{B1_g}$
P185.3.5 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u}\oplus\mathrm{B2_g}\oplus\mathrm{B1_g}$
P185.3.6 GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_u}\oplus\mathrm{B2_g}\oplus\mathrm{B2_g}$
P185.4.1 A1A3	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
P185.4.2 A2A4	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
P185.5.1 DT1DU1	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
P185.5.2 DT2DU2	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
P185.6.1 GM5	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u}\oplus\mathrm{E2_g}$
P185.6.2 GM6	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u}\oplus\mathrm{E1_g}$
P185.7.1 K1	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{B2_u}$
P185.7.2 K2	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{B2_u}$

TABLE S555: Non-coplanar SSGs with parent space group $P6_3cm$ (No. 185).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N185.1.1 GM1	$\surd$	3	3	$\surd$	$6mm$	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{A1}$
N185.2.1 GM2	$\surd$	3	3	$\surd$	622	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{A2}$
N185.2.2 GM3	$\surd$	3	3	$\surd$	$\bar{6}2m$	$\mathrm{A1'}\oplus\mathrm{A1'}\oplus\mathrm{A2''}$
N185.2.3 GM4	$\surd$	3	3	$\surd$	$\bar{6}m2$	$\mathrm{A1'}\oplus\mathrm{A1'}\oplus\mathrm{A2''}$
N185.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$6mm$	$\mathrm{A1}\oplus\mathrm{A2}\oplus\mathrm{A2}$
N185.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$\bar{6}m2$	$\mathrm{A1'}\oplus\mathrm{A1''}\oplus\mathrm{A2'}$
N185.3.3 GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	$\bar{6}2m$	$\mathrm{A1'}\oplus\mathrm{A1''}\oplus\mathrm{A2'}$
N185.3.4 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	$6mm$	$\mathrm{A1}\oplus\mathrm{B2}\oplus\mathrm{B2}$
N185.3.5 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	622	$\mathrm{A1}\oplus\mathrm{B2}\oplus\mathrm{B1}$
N185.3.6 GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	$6mm$	$\mathrm{A1}\oplus\mathrm{B1}\oplus\mathrm{B1}$
N185.4.1 A1A3	$\surd$	1	1	$\surd$	$6mm$	A1
N185.4.2 A2A4	$\surd$	1	1	$\surd$	$6mm$	A1
N185.5.1 DT1DU1	$\surd$	1	1	$\surd$	$6mm$	A1
N185.5.2 DT2DU2	$\surd$	1	1	$\surd$	$6mm$	A1
N185.6.1 GM5	$\surd$	3	3	$\surd$	622	$\mathrm{A1}\oplus\mathrm{E2}$
N185.6.2 GM6	$\surd$	3	3	$\surd$	622	$\mathrm{A1}\oplus\mathrm{E1}$
N185.7.1 K1	$\surd$	1	1	$\surd$	$\bar{6}2m$	$\mathrm{A1'}$
N185.7.2 K2	$\surd$	1	1	$\surd$	$\bar{6}2m$	$\mathrm{A1'}$

Non-coplanar SSGs with parent space group $P6_3cm$ (No. 185) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N185.9.1 GM2 $\oplus$ GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	622	A2 $\oplus$ A2 $\oplus$ A2
N185.9.2 GM2 $\oplus$ GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$\bar{6}2m$	A2$''$ $\oplus$ A2$'$ $\oplus$ A2$'$
N185.9.3 GM2 $\oplus$ GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	$\bar{6}m2$	A1$''$ $\oplus$ A1$''$ $\oplus$ A2$''$
N185.9.4 GM2 $\oplus$ GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	622	A2 $\oplus$ B1 $\oplus$ B1
N185.9.5 GM2 $\oplus$ GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	$6mm$	A2 $\oplus$ B2 $\oplus$ B1
N185.9.6 GM2 $\oplus$ GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	622	A2 $\oplus$ B2 $\oplus$ B2
N185.9.7 GM3 $\oplus$ GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	$\bar{6}2m$	A2$''$ $\oplus$ A2$''$ $\oplus$ A2$''$
N185.9.8 GM3 $\oplus$ GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	$\bar{6}m2$	A2$''$ $\oplus$ A2$'$ $\oplus$ A2$'$
N185.9.9 GM3 $\oplus$ GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	$\bar{6}2m$	A1$''$ $\oplus$ A1$''$ $\oplus$ A2$''$
N185.9.10 GM4 $\oplus$ GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	$\bar{6}m2$	A2$''$ $\oplus$ A2$''$ $\oplus$ A2$''$
N185.10.1 GM2 $\oplus$ A1A3	$\surd$	1	1	$\surd$	622	A2
N185.10.2 GM2 $\oplus$ A2A4	$\surd$	1	1	$\surd$	622	A2
N185.10.3 GM3 $\oplus$ A1A3	$\surd$	1	1	$\surd$	$\bar{6}2m$	A2$''$
N185.10.4 GM3 $\oplus$ A2A4	$\surd$	1	1	$\surd$	$\bar{6}2m$	A2$''$
N185.10.5 GM4 $\oplus$ A1A3	$\surd$	1	1	$\surd$	$\bar{6}m2$	A2$''$
N185.10.6 GM4 $\oplus$ A2A4	$\surd$	1	1	$\surd$	$\bar{6}m2$	A2$''$
N185.11.1 GM2 $\oplus$ DT1DU1	$\surd$	1	1	$\surd$	622	A2
N185.11.2 GM2 $\oplus$ DT2DU2	$\surd$	1	1	$\surd$	622	A2
N185.11.3 GM3 $\oplus$ DT1DU1	$\surd$	1	1	$\surd$	$\bar{6}2m$	A2$''$
N185.11.4 GM3 $\oplus$ DT2DU2	$\surd$	1	1	$\surd$	$\bar{6}2m$	A2$''$
N185.11.5 GM4 $\oplus$ DT1DU1	$\surd$	1	1	$\surd$	$\bar{6}m2$	A2$''$
N185.11.6 GM4 $\oplus$ DT2DU2	$\surd$	1	1	$\surd$	$\bar{6}m2$	A2$''$
N185.12.1 GM2 $\oplus$ GM5	$\surd$	3	3	$\surd$	$6mm$	A2 $\oplus$ E2
N185.12.2 GM2 $\oplus$ GM6	$\surd$	3	3	$\surd$	$6mm$	A2 $\oplus$ E1
N185.12.3 GM3 $\oplus$ GM5	$\surd$	3	3	$\surd$	$\bar{6}m2$	A2$'$ $\oplus$ E$'$
N185.12.4 GM3 $\oplus$ GM6	$\surd$	3	3	$\surd$	$\bar{6}m2$	A2$'$ $\oplus$ E$''$
N185.12.5 GM4 $\oplus$ GM5	$\surd$	3	3	$\surd$	$\bar{6}2m$	A1$''$ $\oplus$ E$'$
N185.12.6 GM4 $\oplus$ GM6	$\surd$	3	3	$\surd$	$\bar{6}2m$	A1$''$ $\oplus$ E$''$
N185.13.1 GM2 $\oplus$ K1	$\surd$	1	1	$\surd$	$\bar{6}m2$	A1$''$
N185.13.2 GM2 $\oplus$ K2	$\surd$	1	1	$\surd$	$\bar{6}m2$	A1$''$
N185.13.3 GM3 $\oplus$ K1	$\surd$	1	1	$\surd$	$6mm$	B2
N185.13.4 GM3 $\oplus$ K2	$\surd$	1	1	$\surd$	$6mm$	B2
N185.13.5 GM4 $\oplus$ K1	$\surd$	1	1	$\surd$	622	B2
N185.13.6 GM4 $\oplus$ K2	$\surd$	1	1	$\surd$	622	B2
N185.16.1 M1	$\times$	-	-	-	-	-
N185.16.2 M2	$\times$	-	-	-	-	-
N185.16.3 M3	$\times$	-	-	-	-	-
N185.16.4 M4	$\times$	-	-	-	-	-

TABLE S556: Collinear SSGs with parent space group $P6_3mc$ (No. 186).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L186.1.1 GM1	1	$6/mmm$	$\mathrm{A1_g}$
L186.2.1 GM2	1	$6/mmm$	$\mathrm{A2_g}$
L186.2.2 GM3	1	$6/mmm$	$\mathrm{B1_g}$
L186.2.3 GM4	1	$6/mmm$	$\mathrm{B2_g}$

Coplanar SSGs with parent space group $P6_3mc$ (No. 186) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation

TABLE S557: Coplanar SSGs with parent space group $P6_3mc$ (No. 186).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P186.1.1 GM1	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A2_u}$
P186.2.1 GM2	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{A2_g}$
P186.2.2 GM3	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_u} \oplus \mathrm{B1_g}$
P186.2.3 GM4	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B1_u}$
P186.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
P186.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
P186.3.3 GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
P186.3.4 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
P186.3.5 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B1_g}$
P186.3.6 GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
P186.4.1 A1A4	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
P186.4.2 A2A3	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
P186.5.1 DT1DU1	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
P186.5.2 DT2DU2	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
P186.6.1 GM5	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{E2_g}$
P186.6.2 GM6	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{E1_g}$
P186.7.1 K1	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{B2_u}$
P186.7.2 K2	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{B2_u}$

TABLE S558: Non-coplanar SSGs with parent space group $P6_3mc$ (No. 186).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N186.1.1 GM1	$\surd$	3	3	$\surd$	$6mm$	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{A1}$
N186.2.1 GM2	$\surd$	3	3	$\surd$	622	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{A2}$
N186.2.2 GM3	$\surd$	3	3	$\surd$	$\bar{6}2m$	$\mathrm{A1'} \oplus \mathrm{A1'} \oplus \mathrm{A2''}$
N186.2.3 GM4	$\surd$	3	3	$\surd$	$\bar{6}m2$	$\mathrm{A1'} \oplus \mathrm{A1'} \oplus \mathrm{A2''}$
N186.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$6mm$	$\mathrm{A1} \oplus \mathrm{A2} \oplus \mathrm{A2}$
N186.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$\bar{6}m2$	$\mathrm{A1'} \oplus \mathrm{A1''} \oplus \mathrm{A2'}$
N186.3.3 GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	$\bar{6}2m$	$\mathrm{A1'} \oplus \mathrm{A1''} \oplus \mathrm{A2'}$
N186.3.4 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	$6mm$	$\mathrm{A1} \oplus \mathrm{B2} \oplus \mathrm{B2}$
N186.3.5 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	622	$\mathrm{A1} \oplus \mathrm{B2} \oplus \mathrm{B1}$
N186.3.6 GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	$6mm$	$\mathrm{A1} \oplus \mathrm{B1} \oplus \mathrm{B1}$
N186.4.1 A1A4	$\surd$	1	1	$\surd$	$6mm$	A1
N186.4.2 A2A3	$\surd$	1	1	$\surd$	$6mm$	A1
N186.5.1 DT1DU1	$\surd$	1	1	$\surd$	$6mm$	A1
N186.5.2 DT2DU2	$\surd$	1	1	$\surd$	$6mm$	A1
N186.6.1 GM5	$\surd$	3	3	$\surd$	622	$\mathrm{A1} \oplus \mathrm{E2}$
N186.6.2 GM6	$\surd$	3	3	$\surd$	622	$\mathrm{A1} \oplus \mathrm{E1}$
N186.7.1 K1	$\surd$	1	1	$\surd$	$\bar{6}2m$	$\mathrm{A1'}$
N186.7.2 K2	$\surd$	1	1	$\surd$	$\bar{6}2m$	$\mathrm{A1'}$

Non-coplanar SSGs with parent space group $P6_3mc$ (No. 186) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N186.9.1 GM2 ⊕ GM2 ⊕ GM2	√	3	3	√	622	A2 ⊕ A2 ⊕ A2
N186.9.2 GM2 ⊕ GM2 ⊕ GM3	√	3	3	√	$\bar{6}2m$	A2″ ⊕ A2′ ⊕ A2′
N186.9.3 GM2 ⊕ GM2 ⊕ GM4	√	3	3	√	$\bar{6}m2$	A1″ ⊕ A1″ ⊕ A2″
N186.9.4 GM2 ⊕ GM3 ⊕ GM3	√	3	3	√	622	A2 ⊕ B1 ⊕ B1
N186.9.5 GM2 ⊕ GM3 ⊕ GM4	√	3	3	√	$6mm$	A2 ⊕ B2 ⊕ B1
N186.9.6 GM2 ⊕ GM4 ⊕ GM4	√	3	3	√	622	A2 ⊕ B2 ⊕ B2
N186.9.7 GM3 ⊕ GM3 ⊕ GM3	√	3	3	√	$\bar{6}2m$	A2″ ⊕ A2″ ⊕ A2″
N186.9.8 GM3 ⊕ GM3 ⊕ GM4	√	3	3	√	$\bar{6}m2$	A2″ ⊕ A2′ ⊕ A2′
N186.9.9 GM3 ⊕ GM4 ⊕ GM4	√	3	3	√	$\bar{6}2m$	A1″ ⊕ A1″ ⊕ A2″
N186.9.10 GM4 ⊕ GM4 ⊕ GM4	√	3	3	√	$\bar{6}m2$	A2″ ⊕ A2″ ⊕ A2″
N186.10.1 GM2 ⊕ A1A4	√	1	1	√	622	A2
N186.10.2 GM2 ⊕ A2A3	√	1	1	√	622	A2
N186.10.3 GM3 ⊕ A1A4	√	1	1	√	$\bar{6}2m$	A2″
N186.10.4 GM3 ⊕ A2A3	√	1	1	√	$\bar{6}2m$	A2″
N186.10.5 GM4 ⊕ A1A4	√	1	1	√	$\bar{6}m2$	A2″
N186.10.6 GM4 ⊕ A2A3	√	1	1	√	$\bar{6}m2$	A2″
N186.11.1 GM2 ⊕ DT1DU1	√	1	1	√	622	A2
N186.11.2 GM2 ⊕ DT2DU2	√	1	1	√	622	A2
N186.11.3 GM3 ⊕ DT1DU1	√	1	1	√	$\bar{6}2m$	A2″
N186.11.4 GM3 ⊕ DT2DU2	√	1	1	√	$\bar{6}2m$	A2″
N186.11.5 GM4 ⊕ DT1DU1	√	1	1	√	$\bar{6}m2$	A2″
N186.11.6 GM4 ⊕ DT2DU2	√	1	1	√	$\bar{6}m2$	A2″
N186.12.1 GM2 ⊕ GM5	√	3	3	√	$6mm$	A2 ⊕ E2
N186.12.2 GM2 ⊕ GM6	√	3	3	√	$6mm$	A2 ⊕ E1
N186.12.3 GM3 ⊕ GM5	√	3	3	√	$\bar{6}m2$	A2′ ⊕ E′
N186.12.4 GM3 ⊕ GM6	√	3	3	√	$\bar{6}m2$	A2′ ⊕ E″
N186.12.5 GM4 ⊕ GM5	√	3	3	√	$\bar{6}2m$	A1″ ⊕ E′
N186.12.6 GM4 ⊕ GM6	√	3	3	√	$\bar{6}2m$	A1″ ⊕ E″
N186.13.1 GM2 ⊕ K1	√	1	1	√	$\bar{6}m2$	A1″
N186.13.2 GM2 ⊕ K2	√	1	1	√	$\bar{6}m2$	A1″
N186.13.3 GM3 ⊕ K1	√	1	1	√	$6mm$	B2
N186.13.4 GM3 ⊕ K2	√	1	1	√	$6mm$	B2
N186.13.5 GM4 ⊕ K1	√	1	1	√	622	B2
N186.13.6 GM4 ⊕ K2	√	1	1	√	622	B2
N186.16.1 M1	×	-	-	-	-	-
N186.16.2 M2	×	-	-	-	-	-
N186.16.3 M3	×	-	-	-	-	-
N186.16.4 M4	×	-	-	-	-	-

TABLE S559: Collinear SSGs with parent space group $P\bar{6}m2$ (No. 187).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L187.1.1 GM1	1	$6/mmm$	$\mathrm{A1_g}$
L187.2.1 GM2	1	$6/mmm$	$\mathrm{A2_g}$
L187.2.2 GM3	1	$6/mmm$	$\mathrm{B2_g}$
L187.2.3 GM4	1	$6/mmm$	$\mathrm{B1_g}$

Collinear SSGs with parent space group $P\bar{6}m2$ (No. 187)(continued)

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L187.2.4 A1	0	-	-
L187.2.5 A2	0	-	-

TABLE S560: Coplanar SSGs with parent space group $P\bar{6}m2$ (No. 187).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P187.1.1 GM1	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{B1_u}$
P187.2.1 GM2	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_g}\oplus\mathrm{B2_u}$
P187.2.2 GM3	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_u}\oplus\mathrm{B2_g}$
P187.2.3 GM4	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{B1_g}$
P187.2.4 A1	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A1_g}$
P187.2.5 A2	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A1_g}$
P187.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g}\oplus\mathrm{A2_g}\oplus\mathrm{B1_u}$
P187.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u}\oplus\mathrm{A2_g}\oplus\mathrm{B2_g}$
P187.3.3 GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g}\oplus\mathrm{A2_u}\oplus\mathrm{B1_g}$
P187.3.4 GM2 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
P187.3.5 GM2 $\oplus$ A2	$\surd$	1	1	$\times$	-	-
P187.3.6 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{B2_g}\oplus\mathrm{B2_g}\oplus\mathrm{B1_u}$
P187.3.7 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{B2_g}\oplus\mathrm{B2_u}\oplus\mathrm{B1_g}$
P187.3.8 GM3 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
P187.3.9 GM3 $\oplus$ A2	$\surd$	1	1	$\times$	-	-
P187.3.10 GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B1_u}$
P187.3.11 GM4 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
P187.3.12 GM4 $\oplus$ A2	$\surd$	1	1	$\times$	-	-
P187.3.13 A1 $\oplus$ A1	$\surd$	1	1	$\times$	-	-
P187.3.14 A1 $\oplus$ A3	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
P187.3.15 A1 $\oplus$ A2	$\surd$	1	1	$\times$	-	-
P187.3.16 A1 $\oplus$ A4	$\surd$	1	1	$\times$	-	-
P187.3.17 A2 $\oplus$ A2	$\surd$	1	1	$\times$	-	-
P187.3.18 A2 $\oplus$ A4	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
P187.6.1 GM5	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{B2_u}\oplus\mathrm{E2_g}$
P187.6.2 GM6	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{B2_u}\oplus\mathrm{E1_g}$
P187.6.3 A5	$\surd$	1	1	$\times$	-	-
P187.7.1 K1	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{B2_u}$
P187.7.2 K2	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{B2_u}$
P187.7.3 H1	$\surd$	1	1	$\times$	-	-
P187.8.1 DT1	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
P187.8.2 DT2	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$

TABLE S561: Non-coplanar SSGs with parent space group $P\bar{6}m2$ (No. 187).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N187.1.1 GM1	$\surd$	3	3	$\surd$	$\bar{6}m2$	$\mathrm{A1'}\oplus\mathrm{A1'}\oplus\mathrm{A1'}$
N187.2.1 GM2	$\surd$	3	3	$\surd$	$\bar{6}2m$	$\mathrm{A1'}\oplus\mathrm{A1'}\oplus\mathrm{A2'}$
N187.2.2 GM3	$\surd$	3	3	$\surd$	$6mm$	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{B1}$

Non-coplanar SSGs with parent space group $P\bar{6}m2$ (No. 187) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N187.2.3 GM4	√	3	3	√	622	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{B1}$
N187.2.4 A1	√	3	3	√	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{B1_u}$
N187.2.5 A2	√	3	3	√	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{B1_u}$
N187.3.1 GM2 ⊕ GM2	√	3	3	√	$\bar{6}m2$	$\mathrm{A1'}\oplus\mathrm{A1''}\oplus\mathrm{A1''}$
N187.3.2 GM2 ⊕ GM3	√	3	3	√	622	$\mathrm{A1}\oplus\mathrm{A2}\oplus\mathrm{B2}$
N187.3.3 GM2 ⊕ GM4	√	3	3	√	$6mm$	$\mathrm{A1}\oplus\mathrm{A2}\oplus\mathrm{B2}$
N187.3.4 GM2 ⊕ A1	√	3	3	√	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_g}\oplus\mathrm{B2_u}$
N187.3.5 GM2 ⊕ A2	√	3	3	√	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_g}\oplus\mathrm{B2_u}$
N187.3.6 GM3 ⊕ GM3	√	3	3	√	$\bar{6}m2$	$\mathrm{A1'}\oplus\mathrm{A2''}\oplus\mathrm{A2''}$
N187.3.7 GM3 ⊕ GM4	√	3	3	√	$\bar{6}2m$	$\mathrm{A1'}\oplus\mathrm{A1''}\oplus\mathrm{A2''}$
N187.3.8 GM3 ⊕ A1	√	3	3	√	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_u}\oplus\mathrm{B2_g}$
N187.3.9 GM3 ⊕ A2	√	3	3	√	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_u}\oplus\mathrm{B2_g}$
N187.3.10 GM4 ⊕ GM4	√	3	3	√	$\bar{6}m2$	$\mathrm{A1'}\oplus\mathrm{A2'}\oplus\mathrm{A2'}$
N187.3.11 GM4 ⊕ A1	√	3	3	√	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{B1_g}$
N187.3.12 GM4 ⊕ A2	√	3	3	√	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{B1_g}$
N187.3.13 A1 ⊕ A1	√	1	1	√	$\bar{6}m2$	$\mathrm{A1'}$
N187.3.14 A1 ⊕ A3	√	1	1	√	$6mm$	A1
N187.3.15 A1 ⊕ A2	√	1	1	√	$\bar{6}2m$	$\mathrm{A1'}$
N187.3.16 A1 ⊕ A4	√	1	1	√	622	A1
N187.3.17 A2 ⊕ A2	√	1	1	√	$\bar{6}m2$	$\mathrm{A1'}$
N187.3.18 A2 ⊕ A4	√	1	1	√	$6mm$	A1
N187.6.1 GM5	√	3	3	√	$\bar{6}2m$	$\mathrm{A1'}\oplus\mathrm{E'}$
N187.6.2 GM6	√	3	3	√	$\bar{6}2m$	$\mathrm{A1'}\oplus\mathrm{E''}$
N187.6.3 A5	√	1	1	√	$\bar{6}2m$	$\mathrm{A1'}$
N187.7.1 K1	√	1	1	√	$\bar{6}2m$	$\mathrm{A1'}$
N187.7.2 K2	√	1	1	√	$\bar{6}2m$	$\mathrm{A1'}$
N187.7.3 H1	√	1	1	√	$\bar{6}2m$	$\mathrm{A1'}$
N187.8.1 DT1	√	1	1	√	$6mm$	A1
N187.8.2 DT2	√	1	1	√	$6mm$	A1
N187.9.1 GM2 ⊕ GM2 ⊕ GM2	√	3	3	√	$\bar{6}2m$	$\mathrm{A2'}\oplus\mathrm{A2'}\oplus\mathrm{A2'}$
N187.9.2 GM2 ⊕ GM2 ⊕ GM3	√	3	3	√	$6mm$	$\mathrm{A2}\oplus\mathrm{A2}\oplus\mathrm{B1}$
N187.9.3 GM2 ⊕ GM2 ⊕ GM4	√	3	3	√	622	$\mathrm{A2}\oplus\mathrm{A2}\oplus\mathrm{B1}$
N187.9.4 GM2 ⊕ GM2 ⊕ A1	√	3	3	√	$6/mmm$	$\mathrm{A2_g}\oplus\mathrm{A2_g}\oplus\mathrm{B1_u}$
N187.9.5 GM2 ⊕ GM2 ⊕ A2	√	3	3	√	$6/mmm$	$\mathrm{A2_g}\oplus\mathrm{A2_g}\oplus\mathrm{B1_u}$
N187.9.6 GM2 ⊕ GM3 ⊕ GM3	√	3	3	√	$\bar{6}2m$	$\mathrm{A1''}\oplus\mathrm{A1''}\oplus\mathrm{A2'}$
N187.9.7 GM2 ⊕ GM3 ⊕ GM4	√	3	3	√	$\bar{6}m2$	$\mathrm{A1''}\oplus\mathrm{A2''}\oplus\mathrm{A2'}$
N187.9.8 GM2 ⊕ GM3 ⊕ A1	√	3	3	√	$6/mmm$	$\mathrm{A1_u}\oplus\mathrm{A2_g}\oplus\mathrm{B2_g}$
N187.9.9 GM2 ⊕ GM3 ⊕ A2	√	3	3	√	$6/mmm$	$\mathrm{A1_u}\oplus\mathrm{A2_g}\oplus\mathrm{B2_g}$
N187.9.10 GM2 ⊕ GM4 ⊕ GM4	√	3	3	√	$\bar{6}2m$	$\mathrm{A2''}\oplus\mathrm{A2''}\oplus\mathrm{A2'}$
N187.9.11 GM2 ⊕ GM4 ⊕ A1	√	3	3	√	$6/mmm$	$\mathrm{A2_g}\oplus\mathrm{A2_u}\oplus\mathrm{B1_g}$
N187.9.12 GM2 ⊕ GM4 ⊕ A2	√	3	3	√	$6/mmm$	$\mathrm{A2_g}\oplus\mathrm{A2_u}\oplus\mathrm{B1_g}$
N187.9.13 GM2 ⊕ A1 ⊕ A1	√	1	1	×	-	-
N187.9.14 GM2 ⊕ A1 ⊕ A3	√	1	1	√	622	A2
N187.9.15 GM2 ⊕ A1 ⊕ A2	√	1	1	×	-	-
N187.9.16 GM2 ⊕ A1 ⊕ A4	√	1	1	×	-	-
N187.9.17 GM2 ⊕ A2 ⊕ A2	√	1	1	×	-	-

Non-coplanar SSGs with parent space group $P\bar{6}m2$ (No. 187) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N187.9.18 GM2 ⊕ A2 ⊕ A4	√	1	1	√	622	A2
N187.9.19 GM3 ⊕ GM3 ⊕ GM3	√	3	3	√	$6mm$	B1 ⊕ B1 ⊕ B1
N187.9.20 GM3 ⊕ GM3 ⊕ GM4	√	3	3	√	622	B2 ⊕ B2 ⊕ B1
N187.9.21 GM3 ⊕ GM3 ⊕ A1	√	3	3	√	$6/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B1_u}$
N187.9.22 GM3 ⊕ GM3 ⊕ A2	√	3	3	√	$6/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B1_u}$
N187.9.23 GM3 ⊕ GM4 ⊕ GM4	√	3	3	√	$6mm$	B2 ⊕ B2 ⊕ B1
N187.9.24 GM3 ⊕ GM4 ⊕ A1	√	3	3	√	$6/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_u} \oplus \mathrm{B1_g}$
N187.9.25 GM3 ⊕ GM4 ⊕ A2	√	3	3	√	$6/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_u} \oplus \mathrm{B1_g}$
N187.9.26 GM3 ⊕ A1 ⊕ A1	√	1	1	×	-	-
N187.9.27 GM3 ⊕ A1 ⊕ A3	√	1	1	√	$\bar{6}m2$	$\mathrm{A2''}$
N187.9.28 GM3 ⊕ A1 ⊕ A2	√	1	1	×	-	-
N187.9.29 GM3 ⊕ A1 ⊕ A4	√	1	1	×	-	-
N187.9.30 GM3 ⊕ A2 ⊕ A2	√	1	1	×	-	-
N187.9.31 GM3 ⊕ A2 ⊕ A4	√	1	1	√	$\bar{6}m2$	$\mathrm{A2''}$
N187.9.32 GM4 ⊕ GM4 ⊕ GM4	√	3	3	√	622	B1 ⊕ B1 ⊕ B1
N187.9.33 GM4 ⊕ GM4 ⊕ A1	√	3	3	√	$6/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N187.9.34 GM4 ⊕ GM4 ⊕ A2	√	3	3	√	$6/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N187.9.35 GM4 ⊕ A1 ⊕ A1	√	1	1	×	-	-
N187.9.36 GM4 ⊕ A1 ⊕ A3	√	1	1	√	$\bar{6}2m$	$\mathrm{A2''}$
N187.9.37 GM4 ⊕ A1 ⊕ A2	√	1	1	×	-	-
N187.9.38 GM4 ⊕ A1 ⊕ A4	√	1	1	×	-	-
N187.9.39 GM4 ⊕ A2 ⊕ A2	√	1	1	×	-	-
N187.9.40 GM4 ⊕ A2 ⊕ A4	√	1	1	√	$\bar{6}2m$	$\mathrm{A2''}$
N187.9.41 A1 ⊕ A1 ⊕ A1	√	3	3	√	$6/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N187.9.42 A1 ⊕ A1 ⊕ A3	√	3	3	√	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u} \oplus \mathrm{B1_u}$
N187.9.43 A1 ⊕ A1 ⊕ A2	√	3	3	√	$6/mmm$	$\mathrm{B2_u} \oplus \mathrm{B2_u} \oplus \mathrm{B1_u}$
N187.9.44 A1 ⊕ A1 ⊕ A4	√	3	3	√	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{B1_u}$
N187.9.45 A1 ⊕ A3 ⊕ A2	√	3	3	√	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N187.9.46 A1 ⊕ A2 ⊕ A2	√	3	3	√	$6/mmm$	$\mathrm{B2_u} \oplus \mathrm{B2_u} \oplus \mathrm{B1_u}$
N187.9.47 A1 ⊕ A2 ⊕ A4	√	3	3	√	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N187.9.48 A1 ⊕ A4 ⊕ A4	√	3	3	√	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{B1_u}$
N187.9.49 A2 ⊕ A2 ⊕ A2	√	3	3	√	$6/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N187.9.50 A2 ⊕ A2 ⊕ A4	√	3	3	√	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u} \oplus \mathrm{B1_u}$
N187.12.1 GM2 ⊕ GM5	√	3	3	√	$\bar{6}m2$	$\mathrm{A1''} \oplus \mathrm{E'}$
N187.12.2 GM2 ⊕ GM6	√	3	3	√	$\bar{6}m2$	$\mathrm{A1''} \oplus \mathrm{E''}$
N187.12.3 GM2 ⊕ A5	√	1	1	×	-	-
N187.12.4 GM3 ⊕ GM5	√	3	3	√	622	B2 ⊕ E2
N187.12.5 GM3 ⊕ GM6	√	3	3	√	622	B2 ⊕ E1
N187.12.6 GM3 ⊕ A5	√	1	1	×	-	-
N187.12.7 GM4 ⊕ GM5	√	3	3	√	$6mm$	B2 ⊕ E2
N187.12.8 GM4 ⊕ GM6	√	3	3	√	$6mm$	B2 ⊕ E1
N187.12.9 GM4 ⊕ A5	√	1	1	×	-	-
N187.12.10 A1 ⊕ GM5	√	3	3	√	$6/mmm$	$\mathrm{B2_u} \oplus \mathrm{E2_g}$
N187.12.11 A1 ⊕ GM6	√	3	3	√	$6/mmm$	$\mathrm{B2_u} \oplus \mathrm{E1_g}$
N187.12.12 A1 ⊕ A5	√	3	3	√	$6/mmm$	$\mathrm{B2_u} \oplus \mathrm{E1_u}$
N187.12.13 A1 ⊕ A6	√	3	3	√	$6/mmm$	$\mathrm{B2_u} \oplus \mathrm{E2_u}$

Non-coplanar SSGs with parent space group $P\bar{6}m2$ (No. 187) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N187.12.14 A2 ⊕ GM5	√	3	3	√	$6/mmm$	$\mathrm{B2_u} \oplus \mathrm{E2_g}$
N187.12.15 A2 ⊕ GM6	√	3	3	√	$6/mmm$	$\mathrm{B2_u} \oplus \mathrm{E1_g}$
N187.12.16 A2 ⊕ A5	√	3	3	√	$6/mmm$	$\mathrm{B2_u} \oplus \mathrm{E1_u}$
N187.12.17 A2 ⊕ A6	√	3	3	√	$6/mmm$	$\mathrm{B2_u} \oplus \mathrm{E2_u}$
N187.13.1 GM2 ⊕ K1	√	1	1	√	$\bar{6}m2$	$\mathrm{A1''}$
N187.13.2 GM2 ⊕ K2	√	1	1	√	$\bar{6}m2$	$\mathrm{A1''}$
N187.13.3 GM2 ⊕ H1	√	1	1	×	-	-
N187.13.4 GM3 ⊕ K1	√	1	1	√	622	B2
N187.13.5 GM3 ⊕ K2	√	1	1	√	622	B2
N187.13.6 GM3 ⊕ H1	√	1	1	×	-	-
N187.13.7 GM4 ⊕ K1	√	1	1	√	$6mm$	B2
N187.13.8 GM4 ⊕ K2	√	1	1	√	$6mm$	B2
N187.13.9 GM4 ⊕ H1	√	1	1	×	-	-
N187.13.10 A1 ⊕ K1	√	1	1	√	$6/mmm$	$\mathrm{B2_u}$
N187.13.11 A1 ⊕ K2	√	1	1	√	$6/mmm$	$\mathrm{B2_u}$
N187.13.12 A1 ⊕ H1	√	1	1	√	$6/mmm$	$\mathrm{B2_u}$
N187.13.13 A1 ⊕ H2	√	1	1	√	$6/mmm$	$\mathrm{B2_u}$
N187.13.14 A2 ⊕ K1	√	1	1	√	$6/mmm$	$\mathrm{B2_u}$
N187.13.15 A2 ⊕ K2	√	1	1	√	$6/mmm$	$\mathrm{B2_u}$
N187.13.16 A2 ⊕ H1	√	1	1	√	$6/mmm$	$\mathrm{B2_u}$
N187.13.17 A2 ⊕ H2	√	1	1	√	$6/mmm$	$\mathrm{B2_u}$
N187.14.1 GM2 ⊕ DT1	√	1	1	√	622	A2
N187.14.2 GM2 ⊕ DT2	√	1	1	√	622	A2
N187.14.3 GM3 ⊕ DT1	√	1	1	√	$\bar{6}m2$	$\mathrm{A2''}$
N187.14.4 GM3 ⊕ DT2	√	1	1	√	$\bar{6}m2$	$\mathrm{A2''}$
N187.14.5 GM4 ⊕ DT1	√	1	1	√	$\bar{6}2m$	$\mathrm{A2''}$
N187.14.6 GM4 ⊕ DT2	√	1	1	√	$\bar{6}2m$	$\mathrm{A2''}$
N187.14.7 A1 ⊕ DT1	√	1	1	√	$6/mmm$	$\mathrm{A2_u}$
N187.14.8 A1 ⊕ DT2	√	1	1	√	$6/mmm$	$\mathrm{A2_u}$
N187.14.9 A2 ⊕ DT1	√	1	1	√	$6/mmm$	$\mathrm{A2_u}$
N187.14.10 A2 ⊕ DT2	√	1	1	√	$6/mmm$	$\mathrm{A2_u}$
N187.16.1 M1	×	-	-	-	-	-
N187.16.2 M2	×	-	-	-	-	-
N187.16.3 M3	×	-	-	-	-	-
N187.16.4 M4	×	-	-	-	-	-
N187.16.5 L1	×	-	-	-	-	-
N187.16.6 L2	×	-	-	-	-	-

TABLE S562: Collinear SSGs with parent space group $P\bar{6}c2$ (No. 188).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L188.1.1 GM1	1	$6/mmm$	$\mathrm{A1_g}$
L188.2.1 GM2	1	$6/mmm$	$\mathrm{A2_g}$
L188.2.2 GM3	1	$6/mmm$	$\mathrm{B2_g}$
L188.2.3 GM4	1	$6/mmm$	$\mathrm{B1_g}$

TABLE S563: Coplanar SSGs with parent space group $P\bar{6}c2$ (No. 188).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P188.1.1 GM1	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{B1_u}$
P188.2.1 GM2	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_g}\oplus\mathrm{B2_u}$
P188.2.2 GM3	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_u}\oplus\mathrm{B2_g}$
P188.2.3 GM4	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{B1_g}$
P188.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g}\oplus\mathrm{A2_g}\oplus\mathrm{B1_u}$
P188.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u}\oplus\mathrm{A2_g}\oplus\mathrm{B2_g}$
P188.3.3 GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g}\oplus\mathrm{A2_u}\oplus\mathrm{B1_g}$
P188.3.4 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{B2_g}\oplus\mathrm{B2_g}\oplus\mathrm{B1_u}$
P188.3.5 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{B2_g}\oplus\mathrm{B2_u}\oplus\mathrm{B1_g}$
P188.3.6 GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B1_u}$
P188.6.1 GM5	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{B2_u}\oplus\mathrm{E2_g}$
P188.6.2 GM6	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{B2_u}\oplus\mathrm{E1_g}$
P188.6.3 A1	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
P188.7.1 K1	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{B2_u}$
P188.7.2 K2	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{B2_u}$
P188.8.1 DT1	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$

TABLE S564: Non-coplanar SSGs with parent space group $P\bar{6}c2$ (No. 188).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N188.1.1 GM1	$\surd$	3	3	$\surd$	$\bar{6}m2$	$\mathrm{A1'}\oplus\mathrm{A1'}\oplus\mathrm{A1'}$
N188.2.1 GM2	$\surd$	3	3	$\surd$	$\bar{6}2m$	$\mathrm{A1'}\oplus\mathrm{A1'}\oplus\mathrm{A2'}$
N188.2.2 GM3	$\surd$	3	3	$\surd$	$6mm$	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{B1}$
N188.2.3 GM4	$\surd$	3	3	$\surd$	622	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{B1}$
N188.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$\bar{6}m2$	$\mathrm{A1'}\oplus\mathrm{A1''}\oplus\mathrm{A1''}$
N188.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	622	$\mathrm{A1}\oplus\mathrm{A2}\oplus\mathrm{B2}$
N188.3.3 GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	$6mm$	$\mathrm{A1}\oplus\mathrm{A2}\oplus\mathrm{B2}$
N188.3.4 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	$\bar{6}m2$	$\mathrm{A1'}\oplus\mathrm{A2''}\oplus\mathrm{A2''}$
N188.3.5 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	$\bar{6}2m$	$\mathrm{A1'}\oplus\mathrm{A1''}\oplus\mathrm{A2''}$
N188.3.6 GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	$\bar{6}m2$	$\mathrm{A1'}\oplus\mathrm{A2'}\oplus\mathrm{A2'}$
N188.6.1 GM5	$\surd$	3	3	$\surd$	$\bar{6}2m$	$\mathrm{A1'}\oplus\mathrm{E'}$
N188.6.2 GM6	$\surd$	3	3	$\surd$	$\bar{6}2m$	$\mathrm{A1'}\oplus\mathrm{E''}$
N188.6.3 A1	$\surd$	1	1	$\surd$	$6mm$	$\mathrm{A1}$
N188.7.1 K1	$\surd$	1	1	$\surd$	$\bar{6}2m$	$\mathrm{A1'}$
N188.7.2 K2	$\surd$	1	1	$\surd$	$\bar{6}2m$	$\mathrm{A1'}$
N188.8.1 DT1	$\surd$	1	1	$\surd$	$6mm$	$\mathrm{A1}$
N188.9.1 GM2 $\oplus$ GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$\bar{6}2m$	$\mathrm{A2'}\oplus\mathrm{A2'}\oplus\mathrm{A2'}$
N188.9.2 GM2 $\oplus$ GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$6mm$	$\mathrm{A2}\oplus\mathrm{A2}\oplus\mathrm{B1}$
N188.9.3 GM2 $\oplus$ GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	622	$\mathrm{A2}\oplus\mathrm{A2}\oplus\mathrm{B1}$
N188.9.4 GM2 $\oplus$ GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	$\bar{6}2m$	$\mathrm{A1''}\oplus\mathrm{A1''}\oplus\mathrm{A2'}$
N188.9.5 GM2 $\oplus$ GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	$\bar{6}m2$	$\mathrm{A1''}\oplus\mathrm{A2''}\oplus\mathrm{A2'}$
N188.9.6 GM2 $\oplus$ GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	$\bar{6}2m$	$\mathrm{A2''}\oplus\mathrm{A2''}\oplus\mathrm{A2'}$
N188.9.7 GM3 $\oplus$ GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	$6mm$	$\mathrm{B1}\oplus\mathrm{B1}\oplus\mathrm{B1}$
N188.9.8 GM3 $\oplus$ GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	622	$\mathrm{B2}\oplus\mathrm{B2}\oplus\mathrm{B1}$
N188.9.9 GM3 $\oplus$ GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	$6mm$	$\mathrm{B2}\oplus\mathrm{B2}\oplus\mathrm{B1}$
N188.9.10 GM4 $\oplus$ GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	622	$\mathrm{B1}\oplus\mathrm{B1}\oplus\mathrm{B1}$

Non-coplanar SSGs with parent space group $P\bar{6}c2$ (No. 188) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N188.12.1 GM2 $\oplus$ GM5	$\surd$	3	3	$\surd$	$\bar{6}m2$	A1$''$ $\oplus$ E$'$
N188.12.2 GM2 $\oplus$ GM6	$\surd$	3	3	$\surd$	$\bar{6}m2$	A1$''$ $\oplus$ E$''$
N188.12.3 GM2 $\oplus$ A1	$\surd$	1	1	$\surd$	622	A2
N188.12.4 GM3 $\oplus$ GM5	$\surd$	3	3	$\surd$	622	B2 $\oplus$ E2
N188.12.5 GM3 $\oplus$ GM6	$\surd$	3	3	$\surd$	622	B2 $\oplus$ E1
N188.12.6 GM3 $\oplus$ A1	$\surd$	1	1	$\surd$	$\bar{6}m2$	A2$''$
N188.12.7 GM4 $\oplus$ GM5	$\surd$	3	3	$\surd$	$6mm$	B2 $\oplus$ E2
N188.12.8 GM4 $\oplus$ GM6	$\surd$	3	3	$\surd$	$6mm$	B2 $\oplus$ E1
N188.12.9 GM4 $\oplus$ A1	$\surd$	1	1	$\surd$	$\bar{6}2m$	A2$''$
N188.13.1 GM2 $\oplus$ K1	$\surd$	1	1	$\surd$	$\bar{6}m2$	A1$''$
N188.13.2 GM2 $\oplus$ K2	$\surd$	1	1	$\surd$	$\bar{6}m2$	A1$''$
N188.13.3 GM3 $\oplus$ K1	$\surd$	1	1	$\surd$	622	B2
N188.13.4 GM3 $\oplus$ K2	$\surd$	1	1	$\surd$	622	B2
N188.13.5 GM4 $\oplus$ K1	$\surd$	1	1	$\surd$	$6mm$	B2
N188.13.6 GM4 $\oplus$ K2	$\surd$	1	1	$\surd$	$6mm$	B2
N188.14.1 GM2 $\oplus$ DT1	$\surd$	1	1	$\surd$	622	A2
N188.14.2 GM3 $\oplus$ DT1	$\surd$	1	1	$\surd$	$\bar{6}m2$	A2$''$
N188.14.3 GM4 $\oplus$ DT1	$\surd$	1	1	$\surd$	$\bar{6}2m$	A2$''$
N188.16.1 M1	$\times$	-	-	-	-	-
N188.16.2 M2	$\times$	-	-	-	-	-
N188.16.3 M3	$\times$	-	-	-	-	-
N188.16.4 M4	$\times$	-	-	-	-	-

TABLE S565: Collinear SSGs with parent space group $P\bar{6}2m$ (No. 189).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L189.1.1 GM1	1	$6/mmm$	A1$_{\mathrm{g}}$
L189.2.1 GM2	1	$6/mmm$	B2$_{\mathrm{g}}$
L189.2.2 GM3	1	$6/mmm$	B1$_{\mathrm{g}}$
L189.2.3 GM4	1	$6/mmm$	A2$_{\mathrm{g}}$
L189.2.4 A1	0	-	-
L189.2.5 A2	0	-	-

TABLE S566: Coplanar SSGs with parent space group $P\bar{6}2m$ (No. 189).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P189.1.1 GM1	$\surd$	3	3	$\surd$	$6/mmm$	A1$_{\mathrm{g}}$ $\oplus$ A1$_{\mathrm{g}}$ $\oplus$ B2$_{\mathrm{u}}$
P189.2.1 GM2	$\surd$	3	3	$\surd$	$6/mmm$	A1$_{\mathrm{g}}$ $\oplus$ A1$_{\mathrm{u}}$ $\oplus$ B2$_{\mathrm{g}}$
P189.2.2 GM3	$\surd$	3	3	$\surd$	$6/mmm$	A1$_{\mathrm{g}}$ $\oplus$ A2$_{\mathrm{u}}$ $\oplus$ B1$_{\mathrm{g}}$
P189.2.3 GM4	$\surd$	3	3	$\surd$	$6/mmm$	A1$_{\mathrm{g}}$ $\oplus$ A2$_{\mathrm{g}}$ $\oplus$ B1$_{\mathrm{u}}$
P189.2.4 A1	$\surd$	1	1	$\surd$	$6/mmm$	A1$_{\mathrm{g}}$
P189.2.5 A2	$\surd$	1	1	$\surd$	$6/mmm$	A1$_{\mathrm{g}}$
P189.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$6/mmm$	B2$_{\mathrm{g}}$ $\oplus$ B2$_{\mathrm{g}}$ $\oplus$ B2$_{\mathrm{u}}$
P189.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$6/mmm$	B2$_{\mathrm{g}}$ $\oplus$ B1$_{\mathrm{g}}$ $\oplus$ B1$_{\mathrm{u}}$
P189.3.3 GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	$6/mmm$	A2$_{\mathrm{g}}$ $\oplus$ A2$_{\mathrm{u}}$ $\oplus$ B2$_{\mathrm{g}}$

Coplanar SSGs with parent space group $P\bar{6}2m$ (No. 189) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P189.3.4 GM2 ⊕ A1	√	1	1	×	-	-
P189.3.5 GM2 ⊕ A2	√	1	1	×	-	-
P189.3.6 GM3 ⊕ GM3	√	3	3	√	$6/mmm$	$\mathrm{B2_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
P189.3.7 GM3 ⊕ GM4	√	3	3	√	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{B1_g}$
P189.3.8 GM3 ⊕ A1	√	1	1	×	-	-
P189.3.9 GM3 ⊕ A2	√	1	1	×	-	-
P189.3.10 GM4 ⊕ GM4	√	3	3	√	$6/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{B2_u}$
P189.3.11 GM4 ⊕ A1	√	1	1	×	-	-
P189.3.12 GM4 ⊕ A2	√	1	1	×	-	-
P189.3.13 A1 ⊕ A1	√	1	1	×	-	-
P189.3.14 A1 ⊕ A3	√	1	1	√	$6/mmm$	$\mathrm{A2_u}$
P189.3.15 A1 ⊕ A2	√	1	1	×	-	-
P189.3.16 A1 ⊕ A4	√	1	1	×	-	-
P189.3.17 A2 ⊕ A2	√	1	1	×	-	-
P189.3.18 A2 ⊕ A4	√	1	1	√	$6/mmm$	$\mathrm{A2_u}$
P189.4.1 K1KA1	√	1	1	√	$6/mmm$	$\mathrm{B2_u}$
P189.4.2 K2KA2	√	1	1	√	$6/mmm$	$\mathrm{B2_u}$
P189.4.3 K3KA3	√	1	1	√	$6/mmm$	$\mathrm{B2_u}$
P189.4.4 K4KA4	√	1	1	√	$6/mmm$	$\mathrm{B2_u}$
P189.4.5 H1HA1	√	1	1	×	-	-
P189.4.6 H2HA2	√	1	1	×	-	-
P189.6.1 GM5	√	3	3	√	$6/mmm$	$\mathrm{B1_u} \oplus \mathrm{E2_g}$
P189.6.2 GM6	√	3	3	√	$6/mmm$	$\mathrm{B1_u} \oplus \mathrm{E1_g}$
P189.6.3 A5	√	1	1	×	-	-
P189.8.1 DT1	√	1	1	√	$6/mmm$	$\mathrm{A2_u}$
P189.8.2 DT2	√	1	1	√	$6/mmm$	$\mathrm{A2_u}$

TABLE S567: Non-coplanar SSGs with parent space group $P\bar{6}2m$ (No. 189).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N189.1.1 GM1	√	3	3	√	$\bar{6}2m$	$\mathrm{A1'} \oplus \mathrm{A1'} \oplus \mathrm{A1'}$
N189.2.1 GM2	√	3	3	√	622	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{B2}$
N189.2.2 GM3	√	3	3	√	$6mm$	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{B2}$
N189.2.3 GM4	√	3	3	√	$\bar{6}m2$	$\mathrm{A1'} \oplus \mathrm{A1'} \oplus \mathrm{A1''}$
N189.2.4 A1	√	3	3	√	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{B2_u}$
N189.2.5 A2	√	3	3	√	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{B2_u}$
N189.3.1 GM2 ⊕ GM2	√	3	3	√	$\bar{6}2m$	$\mathrm{A1'} \oplus \mathrm{A1''} \oplus \mathrm{A1''}$
N189.3.2 GM2 ⊕ GM3	√	3	3	√	$\bar{6}m2$	$\mathrm{A1'} \oplus \mathrm{A2''} \oplus \mathrm{A2'}$
N189.3.3 GM2 ⊕ GM4	√	3	3	√	$6mm$	$\mathrm{A1} \oplus \mathrm{A2} \oplus \mathrm{B1}$
N189.3.4 GM2 ⊕ A1	√	3	3	√	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{B2_g}$
N189.3.5 GM2 ⊕ A2	√	3	3	√	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{B2_g}$
N189.3.6 GM3 ⊕ GM3	√	3	3	√	$\bar{6}2m$	$\mathrm{A1'} \oplus \mathrm{A2''} \oplus \mathrm{A2''}$
N189.3.7 GM3 ⊕ GM4	√	3	3	√	622	$\mathrm{A1} \oplus \mathrm{A2} \oplus \mathrm{B1}$
N189.3.8 GM3 ⊕ A1	√	3	3	√	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_u} \oplus \mathrm{B1_g}$
N189.3.9 GM3 ⊕ A2	√	3	3	√	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_u} \oplus \mathrm{B1_g}$
N189.3.10 GM4 ⊕ GM4	√	3	3	√	$\bar{6}2m$	$\mathrm{A1'} \oplus \mathrm{A2'} \oplus \mathrm{A2'}$

Non-coplanar SSGs with parent space group $P\bar{6}2m$ (No. 189) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N189.3.11 GM4 ⊕ A1	√	3	3	√	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g} \oplus \mathrm{B1_u}$
N189.3.12 GM4 ⊕ A2	√	3	3	√	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g} \oplus \mathrm{B1_u}$
N189.3.13 A1 ⊕ A1	√	1	1	√	$\bar{6}2m$	$\mathrm{A1'}$
N189.3.14 A1 ⊕ A3	√	1	1	√	$6mm$	A1
N189.3.15 A1 ⊕ A2	√	1	1	√	622	A1
N189.3.16 A1 ⊕ A4	√	1	1	√	$\bar{6}m2$	$\mathrm{A1'}$
N189.3.17 A2 ⊕ A2	√	1	1	√	$\bar{6}2m$	$\mathrm{A1'}$
N189.3.18 A2 ⊕ A4	√	1	1	√	$6mm$	A1
N189.4.1 K1KA1	√	1	1	√	$\bar{6}2m$	$\mathrm{A1'}$
N189.4.2 K2KA2	√	1	1	√	$\bar{6}2m$	$\mathrm{A1'}$
N189.4.3 K3KA3	√	1	1	√	$\bar{6}2m$	$\mathrm{A1'}$
N189.4.4 K4KA4	√	1	1	√	$\bar{6}2m$	$\mathrm{A1'}$
N189.4.5 H1HA1	√	1	1	√	$\bar{6}2m$	$\mathrm{A1'}$
N189.4.6 H2HA2	√	1	1	√	$\bar{6}2m$	$\mathrm{A1'}$
N189.6.1 GM5	√	3	3	√	$\bar{6}m2$	$\mathrm{A1'} \oplus \mathrm{E'}$
N189.6.2 GM6	√	3	3	√	$\bar{6}m2$	$\mathrm{A1'} \oplus \mathrm{E''}$
N189.6.3 A5	√	1	1	√	$\bar{6}m2$	$\mathrm{A1'}$
N189.8.1 DT1	√	1	1	√	$6mm$	A1
N189.8.2 DT2	√	1	1	√	$6mm$	A1
N189.9.1 GM2 ⊕ GM2 ⊕ GM2	√	3	3	√	622	B2 ⊕ B2 ⊕ B2
N189.9.2 GM2 ⊕ GM2 ⊕ GM3	√	3	3	√	$6mm$	B2 ⊕ B1 ⊕ B1
N189.9.3 GM2 ⊕ GM2 ⊕ GM4	√	3	3	√	$\bar{6}m2$	$\mathrm{A1''} \oplus \mathrm{A2''} \oplus \mathrm{A2''}$
N189.9.4 GM2 ⊕ GM2 ⊕ A1	√	3	3	√	$6/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N189.9.5 GM2 ⊕ GM2 ⊕ A2	√	3	3	√	$6/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N189.9.6 GM2 ⊕ GM3 ⊕ GM3	√	3	3	√	622	B2 ⊕ B1 ⊕ B1
N189.9.7 GM2 ⊕ GM3 ⊕ GM4	√	3	3	√	$\bar{6}2m$	$\mathrm{A1''} \oplus \mathrm{A2''} \oplus \mathrm{A2'}$
N189.9.8 GM2 ⊕ GM3 ⊕ A1	√	3	3	√	$6/mmm$	$\mathrm{B2_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N189.9.9 GM2 ⊕ GM3 ⊕ A2	√	3	3	√	$6/mmm$	$\mathrm{B2_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N189.9.10 GM2 ⊕ GM4 ⊕ GM4	√	3	3	√	622	A2 ⊕ A2 ⊕ B2
N189.9.11 GM2 ⊕ GM4 ⊕ A1	√	3	3	√	$6/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$
N189.9.12 GM2 ⊕ GM4 ⊕ A2	√	3	3	√	$6/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$
N189.9.13 GM2 ⊕ A1 ⊕ A1	√	1	1	×	-	-
N189.9.14 GM2 ⊕ A1 ⊕ A3	√	1	1	√	$\bar{6}m2$	$\mathrm{A2''}$
N189.9.15 GM2 ⊕ A1 ⊕ A2	√	1	1	×	-	-
N189.9.16 GM2 ⊕ A1 ⊕ A4	√	1	1	×	-	-
N189.9.17 GM2 ⊕ A2 ⊕ A2	√	1	1	×	-	-
N189.9.18 GM2 ⊕ A2 ⊕ A4	√	1	1	√	$\bar{6}m2$	$\mathrm{A2''}$
N189.9.19 GM3 ⊕ GM3 ⊕ GM3	√	3	3	√	$6mm$	B2 ⊕ B2 ⊕ B2
N189.9.20 GM3 ⊕ GM3 ⊕ GM4	√	3	3	√	$\bar{6}m2$	$\mathrm{A1''} \oplus \mathrm{A2'} \oplus \mathrm{A2'}$
N189.9.21 GM3 ⊕ GM3 ⊕ A1	√	3	3	√	$6/mmm$	$\mathrm{B2_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N189.9.22 GM3 ⊕ GM3 ⊕ A2	√	3	3	√	$6/mmm$	$\mathrm{B2_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N189.9.23 GM3 ⊕ GM4 ⊕ GM4	√	3	3	√	$6mm$	A2 ⊕ A2 ⊕ B2
N189.9.24 GM3 ⊕ GM4 ⊕ A1	√	3	3	√	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{B1_g}$
N189.9.25 GM3 ⊕ GM4 ⊕ A2	√	3	3	√	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{B1_g}$
N189.9.26 GM3 ⊕ A1 ⊕ A1	√	1	1	×	-	-
N189.9.27 GM3 ⊕ A1 ⊕ A3	√	1	1	√	$\bar{6}2m$	$\mathrm{A2''}$

Non-coplanar SSGs with parent space group $P\bar{6}2m$ (No. 189) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N189.9.28 GM3 ⊕ A1 ⊕ A2	√	1	1	×	-	-
N189.9.29 GM3 ⊕ A1 ⊕ A4	√	1	1	×	-	-
N189.9.30 GM3 ⊕ A2 ⊕ A2	√	1	1	×	-	-
N189.9.31 GM3 ⊕ A2 ⊕ A4	√	1	1	√	$\bar{6}2m$	$\mathrm{A2}''$
N189.9.32 GM4 ⊕ GM4 ⊕ GM4	√	3	3	√	$\bar{6}m2$	$\mathrm{A1}'' \oplus \mathrm{A1}'' \oplus \mathrm{A1}''$
N189.9.33 GM4 ⊕ GM4 ⊕ A1	√	3	3	√	$6/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{B2_u}$
N189.9.34 GM4 ⊕ GM4 ⊕ A2	√	3	3	√	$6/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{B2_u}$
N189.9.35 GM4 ⊕ A1 ⊕ A1	√	1	1	×	-	-
N189.9.36 GM4 ⊕ A1 ⊕ A3	√	1	1	√	622	A2
N189.9.37 GM4 ⊕ A1 ⊕ A2	√	1	1	×	-	-
N189.9.38 GM4 ⊕ A1 ⊕ A4	√	1	1	×	-	-
N189.9.39 GM4 ⊕ A2 ⊕ A2	√	1	1	×	-	-
N189.9.40 GM4 ⊕ A2 ⊕ A4	√	1	1	√	622	A2
N189.9.41 A1 ⊕ A1 ⊕ A1	√	3	3	√	$6/mmm$	$\mathrm{B2_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N189.9.42 A1 ⊕ A1 ⊕ A3	√	3	3	√	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N189.9.43 A1 ⊕ A1 ⊕ A2	√	3	3	√	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{B2_u}$
N189.9.44 A1 ⊕ A1 ⊕ A4	√	3	3	√	$6/mmm$	$\mathrm{B2_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N189.9.45 A1 ⊕ A3 ⊕ A2	√	3	3	√	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u} \oplus \mathrm{B1_u}$
N189.9.46 A1 ⊕ A2 ⊕ A2	√	3	3	√	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{B2_u}$
N189.9.47 A1 ⊕ A2 ⊕ A4	√	3	3	√	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u} \oplus \mathrm{B1_u}$
N189.9.48 A1 ⊕ A4 ⊕ A4	√	3	3	√	$6/mmm$	$\mathrm{B2_u} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N189.9.49 A2 ⊕ A2 ⊕ A2	√	3	3	√	$6/mmm$	$\mathrm{B2_u} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N189.9.50 A2 ⊕ A2 ⊕ A4	√	3	3	√	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N189.10.1 GM2 ⊕ K1KA1	√	1	1	√	622	B2
N189.10.2 GM2 ⊕ K2KA2	√	1	1	√	622	B2
N189.10.3 GM2 ⊕ K3KA3	√	1	1	√	622	B2
N189.10.4 GM2 ⊕ K4KA4	√	1	1	√	622	B2
N189.10.5 GM2 ⊕ H1HA1	√	1	1	×	-	-
N189.10.6 GM2 ⊕ H2HA2	√	1	1	×	-	-
N189.10.7 GM3 ⊕ K1KA1	√	1	1	√	$6mm$	B2
N189.10.8 GM3 ⊕ K2KA2	√	1	1	√	$6mm$	B2
N189.10.9 GM3 ⊕ K3KA3	√	1	1	√	$6mm$	B2
N189.10.10 GM3 ⊕ K4KA4	√	1	1	√	$6mm$	B2
N189.10.11 GM3 ⊕ H1HA1	√	1	1	×	-	-
N189.10.12 GM3 ⊕ H2HA2	√	1	1	×	-	-
N189.10.13 GM4 ⊕ K1KA1	√	1	1	√	$\bar{6}m2$	$\mathrm{A1}''$
N189.10.14 GM4 ⊕ K2KA2	√	1	1	√	$\bar{6}m2$	$\mathrm{A1}''$
N189.10.15 GM4 ⊕ K3KA3	√	1	1	√	$\bar{6}m2$	$\mathrm{A1}''$
N189.10.16 GM4 ⊕ K4KA4	√	1	1	√	$\bar{6}m2$	$\mathrm{A1}''$
N189.10.17 GM4 ⊕ H1HA1	√	1	1	×	-	-
N189.10.18 GM4 ⊕ H2HA2	√	1	1	×	-	-
N189.10.19 A1 ⊕ K1KA1	√	1	1	√	$6/mmm$	$\mathrm{B2_u}$
N189.10.20 A1 ⊕ K2KA2	√	1	1	√	$6/mmm$	$\mathrm{B2_u}$
N189.10.21 A1 ⊕ K3KA3	√	1	1	√	$6/mmm$	$\mathrm{B2_u}$
N189.10.22 A1 ⊕ K4KA4	√	1	1	√	$6/mmm$	$\mathrm{B2_u}$
N189.10.23 A1 ⊕ H1HA1	√	1	1	√	$6/mmm$	$\mathrm{B2_u}$

Non-coplanar SSGs with parent space group $P\bar{6}2m$ (No. 189) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N189.10.24 A1 ⊕ H3HA3	√	1	1	√	$6/mmm$	$\mathrm{B2_u}$
N189.10.25 A1 ⊕ H2HA2	√	1	1	√	$6/mmm$	$\mathrm{B2_u}$
N189.10.26 A1 ⊕ H4HA4	√	1	1	√	$6/mmm$	$\mathrm{B2_u}$
N189.10.27 A2 ⊕ K1KA1	√	1	1	√	$6/mmm$	$\mathrm{B2_u}$
N189.10.28 A2 ⊕ K2KA2	√	1	1	√	$6/mmm$	$\mathrm{B2_u}$
N189.10.29 A2 ⊕ K3KA3	√	1	1	√	$6/mmm$	$\mathrm{B2_u}$
N189.10.30 A2 ⊕ K4KA4	√	1	1	√	$6/mmm$	$\mathrm{B2_u}$
N189.10.31 A2 ⊕ H1HA1	√	1	1	√	$6/mmm$	$\mathrm{B2_u}$
N189.10.32 A2 ⊕ H3HA3	√	1	1	√	$6/mmm$	$\mathrm{B2_u}$
N189.10.33 A2 ⊕ H2HA2	√	1	1	√	$6/mmm$	$\mathrm{B2_u}$
N189.10.34 A2 ⊕ H4HA4	√	1	1	√	$6/mmm$	$\mathrm{B2_u}$
N189.12.1 GM2 ⊕ GM5	√	3	3	√	$6mm$	B1 ⊕ E2
N189.12.2 GM2 ⊕ GM6	√	3	3	√	$6mm$	B1 ⊕ E1
N189.12.3 GM2 ⊕ A5	√	1	1	×	-	-
N189.12.4 GM3 ⊕ GM5	√	3	3	√	622	B1 ⊕ E2
N189.12.5 GM3 ⊕ GM6	√	3	3	√	622	B1 ⊕ E1
N189.12.6 GM3 ⊕ A5	√	1	1	×	-	-
N189.12.7 GM4 ⊕ GM5	√	3	3	√	$\bar{6}2m$	$\mathrm{A2'} \oplus \mathrm{E'}$
N189.12.8 GM4 ⊕ GM6	√	3	3	√	$\bar{6}2m$	$\mathrm{A2'} \oplus \mathrm{E''}$
N189.12.9 GM4 ⊕ A5	√	1	1	×	-	-
N189.12.10 A1 ⊕ GM5	√	3	3	√	$6/mmm$	$\mathrm{B1_u} \oplus \mathrm{E2_g}$
N189.12.11 A1 ⊕ GM6	√	3	3	√	$6/mmm$	$\mathrm{B1_u} \oplus \mathrm{E1_g}$
N189.12.12 A1 ⊕ A5	√	3	3	√	$6/mmm$	$\mathrm{B1_u} \oplus \mathrm{E1_u}$
N189.12.13 A1 ⊕ A6	√	3	3	√	$6/mmm$	$\mathrm{B1_u} \oplus \mathrm{E2_u}$
N189.12.14 A2 ⊕ GM5	√	3	3	√	$6/mmm$	$\mathrm{B1_u} \oplus \mathrm{E2_g}$
N189.12.15 A2 ⊕ GM6	√	3	3	√	$6/mmm$	$\mathrm{B1_u} \oplus \mathrm{E1_g}$
N189.12.16 A2 ⊕ A5	√	3	3	√	$6/mmm$	$\mathrm{B1_u} \oplus \mathrm{E2_u}$
N189.12.17 A2 ⊕ A6	√	3	3	√	$6/mmm$	$\mathrm{B1_u} \oplus \mathrm{E1_u}$
N189.14.1 GM2 ⊕ DT1	√	1	1	√	$\bar{6}m2$	$\mathrm{A2''}$
N189.14.2 GM2 ⊕ DT2	√	1	1	√	$\bar{6}m2$	$\mathrm{A2''}$
N189.14.3 GM3 ⊕ DT1	√	1	1	√	$\bar{6}2m$	$\mathrm{A2''}$
N189.14.4 GM3 ⊕ DT2	√	1	1	√	$\bar{6}2m$	$\mathrm{A2''}$
N189.14.5 GM4 ⊕ DT1	√	1	1	√	622	A2
N189.14.6 GM4 ⊕ DT2	√	1	1	√	622	A2
N189.14.7 A1 ⊕ DT1	√	1	1	√	$6/mmm$	$\mathrm{A2_u}$
N189.14.8 A1 ⊕ DT2	√	1	1	√	$6/mmm$	$\mathrm{A2_u}$
N189.14.9 A2 ⊕ DT1	√	1	1	√	$6/mmm$	$\mathrm{A2_u}$
N189.14.10 A2 ⊕ DT2	√	1	1	√	$6/mmm$	$\mathrm{A2_u}$
N189.16.1 M1	×	-	-	-	-	-
N189.16.2 M2	×	-	-	-	-	-
N189.16.3 M3	×	-	-	-	-	-
N189.16.4 M4	×	-	-	-	-	-
N189.16.5 L1	×	-	-	-	-	-
N189.16.6 L2	×	-	-	-	-	-

TABLE S568: Collinear SSGs with parent space group $P\bar{6}2c$ (No. 190).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L190.1.1 GM1	1	$6/mmm$	$\mathrm{A1_g}$
L190.2.1 GM2	1	$6/mmm$	$\mathrm{B2_g}$
L190.2.2 GM3	1	$6/mmm$	$\mathrm{B1_g}$
L190.2.3 GM4	1	$6/mmm$	$\mathrm{A2_g}$

TABLE S569: Coplanar SSGs with parent space group $P\bar{6}2c$ (No. 190).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P190.1.1 GM1	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{B2_u}$
P190.2.1 GM2	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{B2_g}$
P190.2.2 GM3	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_u}\oplus\mathrm{B1_g}$
P190.2.3 GM4	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_g}\oplus\mathrm{B1_u}$
P190.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{B2_g}\oplus\mathrm{B2_g}\oplus\mathrm{B2_u}$
P190.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{B2_g}\oplus\mathrm{B1_g}\oplus\mathrm{B1_u}$
P190.3.3 GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g}\oplus\mathrm{A2_u}\oplus\mathrm{B2_g}$
P190.3.4 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{B2_u}\oplus\mathrm{B1_g}\oplus\mathrm{B1_g}$
P190.3.5 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u}\oplus\mathrm{A2_g}\oplus\mathrm{B1_g}$
P190.3.6 GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g}\oplus\mathrm{A2_g}\oplus\mathrm{B2_u}$
P190.4.1 K1KA1	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{B2_u}$
P190.4.2 K2KA2	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{B2_u}$
P190.4.3 K3KA3	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{B2_u}$
P190.4.4 K4KA4	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{B2_u}$
P190.6.1 GM5	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{B1_u}\oplus\mathrm{E2_g}$
P190.6.2 GM6	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{B1_u}\oplus\mathrm{E1_g}$
P190.6.3 A3	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
P190.8.1 DT1	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$

TABLE S570: Non-coplanar SSGs with parent space group $P\bar{6}2c$ (No. 190).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N190.1.1 GM1	$\surd$	3	3	$\surd$	$\bar{6}2m$	$\mathrm{A1'}\oplus\mathrm{A1'}\oplus\mathrm{A1'}$
N190.2.1 GM2	$\surd$	3	3	$\surd$	622	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{B2}$
N190.2.2 GM3	$\surd$	3	3	$\surd$	$6mm$	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{B2}$
N190.2.3 GM4	$\surd$	3	3	$\surd$	$\bar{6}m2$	$\mathrm{A1'}\oplus\mathrm{A1'}\oplus\mathrm{A1''}$
N190.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$\bar{6}2m$	$\mathrm{A1'}\oplus\mathrm{A1''}\oplus\mathrm{A1''}$
N190.3.2 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$\bar{6}m2$	$\mathrm{A1'}\oplus\mathrm{A2''}\oplus\mathrm{A2'}$
N190.3.3 GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	$6mm$	$\mathrm{A1}\oplus\mathrm{A2}\oplus\mathrm{B1}$
N190.3.4 GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	$\bar{6}2m$	$\mathrm{A1'}\oplus\mathrm{A2''}\oplus\mathrm{A2''}$
N190.3.5 GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	622	$\mathrm{A1}\oplus\mathrm{A2}\oplus\mathrm{B1}$
N190.3.6 GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	$\bar{6}2m$	$\mathrm{A1'}\oplus\mathrm{A2'}\oplus\mathrm{A2'}$
N190.4.1 K1KA1	$\surd$	1	1	$\surd$	$\bar{6}2m$	$\mathrm{A1'}$
N190.4.2 K2KA2	$\surd$	1	1	$\surd$	$\bar{6}2m$	$\mathrm{A1'}$
N190.4.3 K3KA3	$\surd$	1	1	$\surd$	$\bar{6}2m$	$\mathrm{A1'}$
N190.4.4 K4KA4	$\surd$	1	1	$\surd$	$\bar{6}2m$	$\mathrm{A1'}$

Non-coplanar SSGs with parent space group $P\bar{6}2c$ (No. 190) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N190.6.1 GM5	$\surd$	3	3	$\surd$	$\bar{6}m2$	$\mathrm{A1}' \oplus \mathrm{E}'$
N190.6.2 GM6	$\surd$	3	3	$\surd$	$\bar{6}m2$	$\mathrm{A1}' \oplus \mathrm{E}''$
N190.6.3 A3	$\surd$	1	1	$\surd$	$6mm$	A1
N190.8.1 DT1	$\surd$	1	1	$\surd$	$6mm$	A1
N190.9.1 GM2 $\oplus$ GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	622	B2 $\oplus$ B2 $\oplus$ B2
N190.9.2 GM2 $\oplus$ GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$6mm$	B2 $\oplus$ B1 $\oplus$ B1
N190.9.3 GM2 $\oplus$ GM2 $\oplus$ GM4	$\surd$	3	3	$\surd$	$\bar{6}m2$	$\mathrm{A1}'' \oplus \mathrm{A2}'' \oplus \mathrm{A2}''$
N190.9.4 GM2 $\oplus$ GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	622	B2 $\oplus$ B1 $\oplus$ B1
N190.9.5 GM2 $\oplus$ GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	$\bar{6}2m$	$\mathrm{A1}'' \oplus \mathrm{A2}'' \oplus \mathrm{A2}'$
N190.9.6 GM2 $\oplus$ GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	622	A2 $\oplus$ A2 $\oplus$ B2
N190.9.7 GM3 $\oplus$ GM3 $\oplus$ GM3	$\surd$	3	3	$\surd$	$6mm$	B2 $\oplus$ B2 $\oplus$ B2
N190.9.8 GM3 $\oplus$ GM3 $\oplus$ GM4	$\surd$	3	3	$\surd$	$\bar{6}m2$	$\mathrm{A1}'' \oplus \mathrm{A2}' \oplus \mathrm{A2}'$
N190.9.9 GM3 $\oplus$ GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	$6mm$	A2 $\oplus$ A2 $\oplus$ B2
N190.9.10 GM4 $\oplus$ GM4 $\oplus$ GM4	$\surd$	3	3	$\surd$	$\bar{6}m2$	$\mathrm{A1}'' \oplus \mathrm{A1}'' \oplus \mathrm{A1}''$
N190.10.1 GM2 $\oplus$ K1KA1	$\surd$	1	1	$\surd$	622	B2
N190.10.2 GM2 $\oplus$ K2KA2	$\surd$	1	1	$\surd$	622	B2
N190.10.3 GM2 $\oplus$ K3KA3	$\surd$	1	1	$\surd$	622	B2
N190.10.4 GM2 $\oplus$ K4KA4	$\surd$	1	1	$\surd$	622	B2
N190.10.5 GM3 $\oplus$ K1KA1	$\surd$	1	1	$\surd$	$6mm$	B2
N190.10.6 GM3 $\oplus$ K2KA2	$\surd$	1	1	$\surd$	$6mm$	B2
N190.10.7 GM3 $\oplus$ K3KA3	$\surd$	1	1	$\surd$	$6mm$	B2
N190.10.8 GM3 $\oplus$ K4KA4	$\surd$	1	1	$\surd$	$6mm$	B2
N190.10.9 GM4 $\oplus$ K1KA1	$\surd$	1	1	$\surd$	$\bar{6}m2$	$\mathrm{A1}''$
N190.10.10 GM4 $\oplus$ K2KA2	$\surd$	1	1	$\surd$	$\bar{6}m2$	$\mathrm{A1}''$
N190.10.11 GM4 $\oplus$ K3KA3	$\surd$	1	1	$\surd$	$\bar{6}m2$	$\mathrm{A1}''$
N190.10.12 GM4 $\oplus$ K4KA4	$\surd$	1	1	$\surd$	$\bar{6}m2$	$\mathrm{A1}''$
N190.12.1 GM2 $\oplus$ GM5	$\surd$	3	3	$\surd$	$6mm$	B1 $\oplus$ E2
N190.12.2 GM2 $\oplus$ GM6	$\surd$	3	3	$\surd$	$6mm$	B1 $\oplus$ E1
N190.12.3 GM2 $\oplus$ A3	$\surd$	1	1	$\surd$	$\bar{6}m2$	$\mathrm{A2}''$
N190.12.4 GM3 $\oplus$ GM5	$\surd$	3	3	$\surd$	622	B1 $\oplus$ E2
N190.12.5 GM3 $\oplus$ GM6	$\surd$	3	3	$\surd$	622	B1 $\oplus$ E1
N190.12.6 GM3 $\oplus$ A3	$\surd$	1	1	$\surd$	$\bar{6}2m$	$\mathrm{A2}''$
N190.12.7 GM4 $\oplus$ GM5	$\surd$	3	3	$\surd$	$\bar{6}2m$	$\mathrm{A2}' \oplus \mathrm{E}'$
N190.12.8 GM4 $\oplus$ GM6	$\surd$	3	3	$\surd$	$\bar{6}2m$	$\mathrm{A2}' \oplus \mathrm{E}''$
N190.12.9 GM4 $\oplus$ A3	$\surd$	1	1	$\surd$	622	A2
N190.14.1 GM2 $\oplus$ DT1	$\surd$	1	1	$\surd$	$\bar{6}m2$	$\mathrm{A2}''$
N190.14.2 GM3 $\oplus$ DT1	$\surd$	1	1	$\surd$	$\bar{6}2m$	$\mathrm{A2}''$
N190.14.3 GM4 $\oplus$ DT1	$\surd$	1	1	$\surd$	622	A2
N190.16.1 M1	$\times$	-	-	-	-	-
N190.16.2 M2	$\times$	-	-	-	-	-
N190.16.3 M3	$\times$	-	-	-	-	-
N190.16.4 M4	$\times$	-	-	-	-	-

TABLE S571: Collinear SSGs with parent space group $P6/mmm$ (No. 191).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L191.1.1 $\mathrm{GM1}^{+}$	1	$6/mmm$	$\mathrm{A1_g}$
L191.2.1 $\mathrm{GM1}^{-}$	0	-	-
L191.2.2 $\mathrm{GM2}^{+}$	1	$6/mmm$	$\mathrm{A2_g}$
L191.2.3 $\mathrm{GM2}^{-}$	0	-	-
L191.2.4 $\mathrm{GM3}^{+}$	1	$6/mmm$	$\mathrm{B2_g}$
L191.2.5 $\mathrm{GM3}^{-}$	0	-	-
L191.2.6 $\mathrm{GM4}^{+}$	1	$6/mmm$	$\mathrm{B1_g}$
L191.2.7 $\mathrm{GM4}^{-}$	0	-	-
L191.2.8 $\mathrm{A1}^{+}$	0	-	-
L191.2.9 $\mathrm{A1}^{-}$	0	-	-
L191.2.10 $\mathrm{A3}^{+}$	0	-	-
L191.2.11 $\mathrm{A3}^{-}$	0	-	-

TABLE S572: Coplanar SSGs with parent space group $P6/mmm$ (No. 191).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P191.1.1 $\mathrm{GM1}^{+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}$
P191.2.1 $\mathrm{GM1}^{-}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}$
P191.2.2 $\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_g}$
P191.2.3 $\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_u}$
P191.2.4 $\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_g}$
P191.2.5 $\mathrm{GM3}^{-}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_u}$
P191.2.6 $\mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}$
P191.2.7 $\mathrm{GM4}^{-}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}$
P191.2.8 $\mathrm{A1}^{+}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A1_g}$
P191.2.9 $\mathrm{A1}^{-}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A1_g}$
P191.2.10 $\mathrm{A3}^{+}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A1_g}$
P191.2.11 $\mathrm{A3}^{-}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A1_g}$
P191.3.1 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}$	$\surd$	0	0	$\surd$	-	-
P191.3.2 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A2_g}\oplus\mathrm{A2_u}$
P191.3.3 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
P191.3.4 $\mathrm{GM1}^{-}\oplus\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{B2_g}\oplus\mathrm{B2_u}$
P191.3.5 $\mathrm{GM1}^{-}\oplus\mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
P191.3.6 $\mathrm{GM1}^{-}\oplus\mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_u}$
P191.3.7 $\mathrm{GM1}^{-}\oplus\mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
P191.3.8 $\mathrm{GM1}^{-}\oplus\mathrm{A1}^{+}$	$\surd$	1	1	$\times$	-	-
P191.3.9 $\mathrm{GM1}^{-}\oplus\mathrm{A1}^{-}$	$\surd$	1	1	$\times$	-	-
P191.3.10 $\mathrm{GM1}^{-}\oplus\mathrm{A3}^{+}$	$\surd$	1	1	$\times$	-	-
P191.3.11 $\mathrm{GM1}^{-}\oplus\mathrm{A3}^{-}$	$\surd$	1	1	$\times$	-	-
P191.3.12 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A2_g}\oplus\mathrm{A2_g}$
P191.3.13 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A1_u}\oplus\mathrm{A2_g}$
P191.3.14 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A2_g}\oplus\mathrm{B2_g}$
P191.3.15 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{-}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A2_g}\oplus\mathrm{B1_u}$
P191.3.16 $\mathrm{GM2}^{+}\oplus\mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A2_g}\oplus\mathrm{B1_g}$
P191.3.17 $\mathrm{GM2}^{+}\oplus\mathrm{GM4}^{-}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A2_g}\oplus\mathrm{B2_u}$
P191.3.18 $\mathrm{GM2}^{+}\oplus\mathrm{A1}^{+}$	$\surd$	1	0	$\times$	-	-

Coplanar SSGs with parent space group $P6/mmm$ (No. 191) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P191.3.19 $\mathrm{GM2}^{+} \oplus \mathrm{A1}^{-}$	$\surd$	1	0	$\times$	-	-
P191.3.20 $\mathrm{GM2}^{+} \oplus \mathrm{A3}^{+}$	$\surd$	1	0	$\times$	-	-
P191.3.21 $\mathrm{GM2}^{+} \oplus \mathrm{A3}^{-}$	$\surd$	1	0	$\times$	-	-
P191.3.22 $\mathrm{GM2}^{-} \oplus \mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
P191.3.23 $\mathrm{GM2}^{-} \oplus \mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{B2_g} \oplus \mathrm{B1_u}$
P191.3.24 $\mathrm{GM2}^{-} \oplus \mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
P191.3.25 $\mathrm{GM2}^{-} \oplus \mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{B2_u} \oplus \mathrm{B1_g}$
P191.3.26 $\mathrm{GM2}^{-} \oplus \mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
P191.3.27 $\mathrm{GM2}^{-} \oplus \mathrm{A1}^{+}$	$\surd$	1	1	$\times$	-	-
P191.3.28 $\mathrm{GM2}^{-} \oplus \mathrm{A1}^{-}$	$\surd$	1	1	$\times$	-	-
P191.3.29 $\mathrm{GM2}^{-} \oplus \mathrm{A3}^{+}$	$\surd$	1	1	$\times$	-	-
P191.3.30 $\mathrm{GM2}^{-} \oplus \mathrm{A3}^{-}$	$\surd$	1	1	$\times$	-	-
P191.3.31 $\mathrm{GM3}^{+} \oplus \mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_g}$
P191.3.32 $\mathrm{GM3}^{+} \oplus \mathrm{GM3}^{-}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g}$
P191.3.33 $\mathrm{GM3}^{+} \oplus \mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{B2_g} \oplus \mathrm{B1_g}$
P191.3.34 $\mathrm{GM3}^{+} \oplus \mathrm{GM4}^{-}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g}$
P191.3.35 $\mathrm{GM3}^{+} \oplus \mathrm{A1}^{+}$	$\surd$	1	0	$\times$	-	-
P191.3.36 $\mathrm{GM3}^{+} \oplus \mathrm{A1}^{-}$	$\surd$	1	0	$\times$	-	-
P191.3.37 $\mathrm{GM3}^{+} \oplus \mathrm{A3}^{+}$	$\surd$	1	0	$\times$	-	-
P191.3.38 $\mathrm{GM3}^{+} \oplus \mathrm{A3}^{-}$	$\surd$	1	0	$\times$	-	-
P191.3.39 $\mathrm{GM3}^{-} \oplus \mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
P191.3.40 $\mathrm{GM3}^{-} \oplus \mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{B1_g}$
P191.3.41 $\mathrm{GM3}^{-} \oplus \mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
P191.3.42 $\mathrm{GM3}^{-} \oplus \mathrm{A1}^{+}$	$\surd$	1	1	$\times$	-	-
P191.3.43 $\mathrm{GM3}^{-} \oplus \mathrm{A1}^{-}$	$\surd$	1	1	$\times$	-	-
P191.3.44 $\mathrm{GM3}^{-} \oplus \mathrm{A3}^{+}$	$\surd$	1	1	$\times$	-	-
P191.3.45 $\mathrm{GM3}^{-} \oplus \mathrm{A3}^{-}$	$\surd$	1	1	$\times$	-	-
P191.3.46 $\mathrm{GM4}^{+} \oplus \mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
P191.3.47 $\mathrm{GM4}^{+} \oplus \mathrm{GM4}^{-}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g}$
P191.3.48 $\mathrm{GM4}^{+} \oplus \mathrm{A1}^{+}$	$\surd$	1	0	$\times$	-	-
P191.3.49 $\mathrm{GM4}^{+} \oplus \mathrm{A1}^{-}$	$\surd$	1	0	$\times$	-	-
P191.3.50 $\mathrm{GM4}^{+} \oplus \mathrm{A3}^{+}$	$\surd$	1	0	$\times$	-	-
P191.3.51 $\mathrm{GM4}^{+} \oplus \mathrm{A3}^{-}$	$\surd$	1	0	$\times$	-	-
P191.3.52 $\mathrm{GM4}^{-} \oplus \mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
P191.3.53 $\mathrm{GM4}^{-} \oplus \mathrm{A1}^{+}$	$\surd$	1	1	$\times$	-	-
P191.3.54 $\mathrm{GM4}^{-} \oplus \mathrm{A1}^{-}$	$\surd$	1	1	$\times$	-	-
P191.3.55 $\mathrm{GM4}^{-} \oplus \mathrm{A3}^{+}$	$\surd$	1	1	$\times$	-	-
P191.3.56 $\mathrm{GM4}^{-} \oplus \mathrm{A3}^{-}$	$\surd$	1	1	$\times$	-	-
P191.3.57 $\mathrm{A1}^{+} \oplus \mathrm{A1}^{+}$	$\surd$	1	0	$\times$	-	-
P191.3.58 $\mathrm{A1}^{+} \oplus \mathrm{A2}^{-}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
P191.3.59 $\mathrm{A1}^{+} \oplus \mathrm{A1}^{-}$	$\surd$	1	1	$\times$	-	-
P191.3.60 $\mathrm{A1}^{+} \oplus \mathrm{A2}^{+}$	$\surd$	1	0	$\times$	-	-
P191.3.61 $\mathrm{A1}^{+} \oplus \mathrm{A3}^{+}$	$\surd$	1	0	$\times$	-	-
P191.3.62 $\mathrm{A1}^{+} \oplus \mathrm{A4}^{-}$	$\surd$	1	1	$\times$	-	-
P191.3.63 $\mathrm{A1}^{+} \oplus \mathrm{A3}^{-}$	$\surd$	1	1	$\times$	-	-
P191.3.64 $\mathrm{A1}^{+} \oplus \mathrm{A4}^{+}$	$\surd$	1	0	$\times$	-	-

Coplanar SSGs with parent space group $P6/mmm$ (No. 191) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P191.3.65 $\mathrm{A1}^- \oplus \mathrm{A1}^-$	$\surd$	1	0	$\times$	-	-
P191.3.66 $\mathrm{A1}^- \oplus \mathrm{A2}^+$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
P191.3.67 $\mathrm{A1}^- \oplus \mathrm{A3}^+$	$\surd$	1	1	$\times$	-	-
P191.3.68 $\mathrm{A1}^- \oplus \mathrm{A4}^-$	$\surd$	1	0	$\times$	-	-
P191.3.69 $\mathrm{A1}^- \oplus \mathrm{A3}^-$	$\surd$	1	0	$\times$	-	-
P191.3.70 $\mathrm{A1}^- \oplus \mathrm{A4}^+$	$\surd$	1	1	$\times$	-	-
P191.3.71 $\mathrm{A3}^+ \oplus \mathrm{A3}^+$	$\surd$	1	0	$\times$	-	-
P191.3.72 $\mathrm{A3}^+ \oplus \mathrm{A4}^-$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
P191.3.73 $\mathrm{A3}^+ \oplus \mathrm{A3}^-$	$\surd$	1	1	$\times$	-	-
P191.3.74 $\mathrm{A3}^+ \oplus \mathrm{A4}^+$	$\surd$	1	0	$\times$	-	-
P191.3.75 $\mathrm{A3}^- \oplus \mathrm{A3}^-$	$\surd$	1	0	$\times$	-	-
P191.3.76 $\mathrm{A3}^- \oplus \mathrm{A4}^+$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
P191.6.1 $\mathrm{GM5}^+$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{E2_g}$
P191.6.2 $\mathrm{GM5}^-$	$\surd$	0	0	$\surd$	-	-
P191.6.3 $\mathrm{GM6}^+$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{E1_g}$
P191.6.4 $\mathrm{GM6}^-$	$\surd$	0	0	$\surd$	-	-
P191.6.5 $\mathrm{A5}^+$	$\surd$	1	0	$\times$	-	-
P191.6.6 $\mathrm{A6}^+$	$\surd$	1	0	$\times$	-	-
P191.7.1 K1	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{B2_u}$
P191.7.2 K2	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{B2_u}$
P191.7.3 K3	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{B2_u}$
P191.7.4 K4	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{B2_u}$
P191.7.5 H1	$\surd$	1	1	$\times$	-	-
P191.7.6 H2	$\surd$	1	1	$\times$	-	-
P191.8.1 DT1	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
P191.8.2 DT2	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
P191.8.3 DT3	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
P191.8.4 DT4	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$

TABLE S573: Non-coplanar SSGs with parent space group $P6/mmm$ (No. 191).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N191.1.1 $\mathrm{GM1}^+$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A1_g}$
N191.2.1 $\mathrm{GM1}^-$	$\surd$	2	2	$\surd$	622	$\mathrm{A1} \oplus \mathrm{A1}$
N191.2.2 $\mathrm{GM2}^+$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A2_g}$
N191.2.3 $\mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$6mm$	$\mathrm{A1} \oplus \mathrm{A1}$
N191.2.4 $\mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{B2_g}$
N191.2.5 $\mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$\bar{6}2m$	$\mathrm{A1'} \oplus \mathrm{A1'}$
N191.2.6 $\mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{B1_g}$
N191.2.7 $\mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$\bar{6}m2$	$\mathrm{A1'} \oplus \mathrm{A1'}$
N191.2.8 $\mathrm{A1}^+$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g}$
N191.2.9 $\mathrm{A1}^-$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g}$
N191.2.10 $\mathrm{A3}^+$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g}$
N191.2.11 $\mathrm{A3}^-$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g}$
N191.3.1 $\mathrm{GM1}^- \oplus \mathrm{GM1}^-$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{A1_u}$
N191.3.2 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$6mm$	$\mathrm{A1} \oplus \mathrm{A2}$

Non-coplanar SSGs with parent space group $P6/mmm$ (No. 191) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N191.3.3 $\mathrm{GM1}^- \oplus \mathrm{GM2}^-$	√	3	3	√	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{A2_u}$
N191.3.4 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+$	√	2	2	√	$\bar{6}2m$	$\mathrm{A1}' \oplus \mathrm{A1}''$
N191.3.5 $\mathrm{GM1}^- \oplus \mathrm{GM3}^-$	√	3	3	√	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{B2_u}$
N191.3.6 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+$	√	2	2	√	$\bar{6}m2$	$\mathrm{A1}' \oplus \mathrm{A2}'$
N191.3.7 $\mathrm{GM1}^- \oplus \mathrm{GM4}^-$	√	3	3	√	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{B1_u}$
N191.3.8 $\mathrm{GM1}^- \oplus \mathrm{A1}^+$	√	2	2	√	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u}$
N191.3.9 $\mathrm{GM1}^- \oplus \mathrm{A1}^-$	√	2	2	√	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u}$
N191.3.10 $\mathrm{GM1}^- \oplus \mathrm{A3}^+$	√	2	2	√	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u}$
N191.3.11 $\mathrm{GM1}^- \oplus \mathrm{A3}^-$	√	2	2	√	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u}$
N191.3.12 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	√	3	3	√	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
N191.3.13 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	√	2	2	√	622	$\mathrm{A1} \oplus \mathrm{A2}$
N191.3.14 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+$	√	3	3	√	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g} \oplus \mathrm{B2_g}$
N191.3.15 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^-$	√	2	2	√	$\bar{6}m2$	$\mathrm{A1}' \oplus \mathrm{A1}''$
N191.3.16 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+$	√	3	3	√	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g} \oplus \mathrm{B1_g}$
N191.3.17 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^-$	√	2	2	√	$\bar{6}2m$	$\mathrm{A1}' \oplus \mathrm{A2}'$
N191.3.18 $\mathrm{GM2}^+ \oplus \mathrm{A1}^+$	√	2	2	√	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g}$
N191.3.19 $\mathrm{GM2}^+ \oplus \mathrm{A1}^-$	√	2	2	√	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g}$
N191.3.20 $\mathrm{GM2}^+ \oplus \mathrm{A3}^+$	√	2	2	√	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g}$
N191.3.21 $\mathrm{GM2}^+ \oplus \mathrm{A3}^-$	√	2	2	√	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g}$
N191.3.22 $\mathrm{GM2}^- \oplus \mathrm{GM2}^-$	√	3	3	√	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N191.3.23 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+$	√	2	2	√	$\bar{6}m2$	$\mathrm{A1}' \oplus \mathrm{A2}''$
N191.3.24 $\mathrm{GM2}^- \oplus \mathrm{GM3}^-$	√	3	3	√	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N191.3.25 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+$	√	2	2	√	$\bar{6}2m$	$\mathrm{A1}' \oplus \mathrm{A2}''$
N191.3.26 $\mathrm{GM2}^- \oplus \mathrm{GM4}^-$	√	3	3	√	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_u} \oplus \mathrm{B1_u}$
N191.3.27 $\mathrm{GM2}^- \oplus \mathrm{A1}^+$	√	2	2	√	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_u}$
N191.3.28 $\mathrm{GM2}^- \oplus \mathrm{A1}^-$	√	2	2	√	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_u}$
N191.3.29 $\mathrm{GM2}^- \oplus \mathrm{A3}^+$	√	2	2	√	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_u}$
N191.3.30 $\mathrm{GM2}^- \oplus \mathrm{A3}^-$	√	2	2	√	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_u}$
N191.3.31 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	√	3	3	√	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N191.3.32 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	√	2	2	√	622	$\mathrm{A1} \oplus \mathrm{B2}$
N191.3.33 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	√	3	3	√	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B1_g}$
N191.3.34 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	√	2	2	√	$6mm$	$\mathrm{A1} \oplus \mathrm{B1}$
N191.3.35 $\mathrm{GM3}^+ \oplus \mathrm{A1}^+$	√	2	2	√	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_g}$
N191.3.36 $\mathrm{GM3}^+ \oplus \mathrm{A1}^-$	√	2	2	√	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_g}$
N191.3.37 $\mathrm{GM3}^+ \oplus \mathrm{A3}^+$	√	2	2	√	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_g}$
N191.3.38 $\mathrm{GM3}^+ \oplus \mathrm{A3}^-$	√	2	2	√	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_g}$
N191.3.39 $\mathrm{GM3}^- \oplus \mathrm{GM3}^-$	√	3	3	√	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N191.3.40 $\mathrm{GM3}^- \oplus \mathrm{GM4}^+$	√	2	2	√	$6mm$	$\mathrm{A1} \oplus \mathrm{B2}$
N191.3.41 $\mathrm{GM3}^- \oplus \mathrm{GM4}^-$	√	3	3	√	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_u} \oplus \mathrm{B1_u}$
N191.3.42 $\mathrm{GM3}^- \oplus \mathrm{A1}^+$	√	2	2	√	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_u}$
N191.3.43 $\mathrm{GM3}^- \oplus \mathrm{A1}^-$	√	2	2	√	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_u}$
N191.3.44 $\mathrm{GM3}^- \oplus \mathrm{A3}^+$	√	2	2	√	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_u}$
N191.3.45 $\mathrm{GM3}^- \oplus \mathrm{A3}^-$	√	2	2	√	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_u}$
N191.3.46 $\mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	√	3	3	√	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N191.3.47 $\mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	√	2	2	√	622	$\mathrm{A1} \oplus \mathrm{B1}$
N191.3.48 $\mathrm{GM4}^+ \oplus \mathrm{A1}^+$	√	2	2	√	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g}$

Non-coplanar SSGs with parent space group $P6/mmm$ (No. 191) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N191.3.49 $\mathrm{GM4}^{+}\oplus\mathrm{A1}^{-}$	√	2	2	√	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}$
N191.3.50 $\mathrm{GM4}^{+}\oplus\mathrm{A3}^{+}$	√	2	2	√	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}$
N191.3.51 $\mathrm{GM4}^{+}\oplus\mathrm{A3}^{-}$	√	2	2	√	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}$
N191.3.52 $\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}$	√	3	3	√	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}\oplus\mathrm{B1_u}$
N191.3.53 $\mathrm{GM4}^{-}\oplus\mathrm{A1}^{+}$	√	2	2	√	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}$
N191.3.54 $\mathrm{GM4}^{-}\oplus\mathrm{A1}^{-}$	√	2	2	√	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}$
N191.3.55 $\mathrm{GM4}^{-}\oplus\mathrm{A3}^{+}$	√	2	2	√	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}$
N191.3.56 $\mathrm{GM4}^{-}\oplus\mathrm{A3}^{-}$	√	2	2	√	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}$
N191.3.57 $\mathrm{A1}^{+}\oplus\mathrm{A1}^{+}$	√	1	1	√	$6/mmm$	$\mathrm{A1_g}$
N191.3.58 $\mathrm{A1}^{+}\oplus\mathrm{A2}^{-}$	√	1	1	√	$6mm$	A1
N191.3.59 $\mathrm{A1}^{+}\oplus\mathrm{A1}^{-}$	√	1	1	√	622	A1
N191.3.60 $\mathrm{A1}^{+}\oplus\mathrm{A2}^{+}$	√	1	1	√	$6/mmm$	$\mathrm{A1_g}$
N191.3.61 $\mathrm{A1}^{+}\oplus\mathrm{A3}^{+}$	√	1	1	√	$6/mmm$	$\mathrm{A1_g}$
N191.3.62 $\mathrm{A1}^{+}\oplus\mathrm{A4}^{-}$	√	1	1	√	$\bar{6}m2$	$\mathrm{A1}'$
N191.3.63 $\mathrm{A1}^{+}\oplus\mathrm{A3}^{-}$	√	1	1	√	$\bar{6}2m$	$\mathrm{A1}'$
N191.3.64 $\mathrm{A1}^{+}\oplus\mathrm{A4}^{+}$	√	1	1	√	$6/mmm$	$\mathrm{A1_g}$
N191.3.65 $\mathrm{A1}^{-}\oplus\mathrm{A1}^{-}$	√	1	1	√	$6/mmm$	$\mathrm{A1_g}$
N191.3.66 $\mathrm{A1}^{-}\oplus\mathrm{A2}^{+}$	√	1	1	√	$6mm$	A1
N191.3.67 $\mathrm{A1}^{-}\oplus\mathrm{A3}^{+}$	√	1	1	√	$\bar{6}2m$	$\mathrm{A1}'$
N191.3.68 $\mathrm{A1}^{-}\oplus\mathrm{A4}^{-}$	√	1	1	√	$6/mmm$	$\mathrm{A1_g}$
N191.3.69 $\mathrm{A1}^{-}\oplus\mathrm{A3}^{-}$	√	1	1	√	$6/mmm$	$\mathrm{A1_g}$
N191.3.70 $\mathrm{A1}^{-}\oplus\mathrm{A4}^{+}$	√	1	1	√	$\bar{6}m2$	$\mathrm{A1}'$
N191.3.71 $\mathrm{A3}^{+}\oplus\mathrm{A3}^{+}$	√	1	1	√	$6/mmm$	$\mathrm{A1_g}$
N191.3.72 $\mathrm{A3}^{+}\oplus\mathrm{A4}^{-}$	√	1	1	√	$6mm$	A1
N191.3.73 $\mathrm{A3}^{+}\oplus\mathrm{A3}^{-}$	√	1	1	√	622	A1
N191.3.74 $\mathrm{A3}^{+}\oplus\mathrm{A4}^{+}$	√	1	1	√	$6/mmm$	$\mathrm{A1_g}$
N191.3.75 $\mathrm{A3}^{-}\oplus\mathrm{A3}^{-}$	√	1	1	√	$6/mmm$	$\mathrm{A1_g}$
N191.3.76 $\mathrm{A3}^{-}\oplus\mathrm{A4}^{+}$	√	1	1	√	$6mm$	A1
N191.6.1 $\mathrm{GM5}^{+}$	√	3	3	√	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{E2_g}$
N191.6.2 $\mathrm{GM5}^{-}$	√	3	3	√	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{E2_u}$
N191.6.3 $\mathrm{GM6}^{+}$	√	3	3	√	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{E1_g}$
N191.6.4 $\mathrm{GM6}^{-}$	√	3	3	√	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{E1_u}$
N191.6.5 $\mathrm{A5}^{+}$	√	1	1	√	$6/mmm$	$\mathrm{A1_g}$
N191.6.6 $\mathrm{A6}^{+}$	√	1	1	√	$6/mmm$	$\mathrm{A1_g}$
N191.7.1 K1	√	1	1	√	$\bar{6}2m$	$\mathrm{A1}'$
N191.7.2 K2	√	1	1	√	$\bar{6}2m$	$\mathrm{A1}'$
N191.7.3 K3	√	1	1	√	$\bar{6}2m$	$\mathrm{A1}'$
N191.7.4 K4	√	1	1	√	$\bar{6}2m$	$\mathrm{A1}'$
N191.7.5 H1	√	1	1	√	$\bar{6}2m$	$\mathrm{A1}'$
N191.7.6 H2	√	1	1	√	$\bar{6}2m$	$\mathrm{A1}'$
N191.8.1 DT1	√	1	1	√	$6mm$	A1
N191.8.2 DT2	√	1	1	√	$6mm$	A1
N191.8.3 DT3	√	1	1	√	$6mm$	A1
N191.8.4 DT4	√	1	1	√	$6mm$	A1
N191.9.1 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}$	√	0	0	√	-	-
N191.9.2 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}$	√	3	3	√	$6/mmm$	$\mathrm{A2_g}\oplus\mathrm{A2_u}\oplus\mathrm{A2_u}$

Non-coplanar SSGs with parent space group $P6/mmm$ (No. 191) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N191.9.3 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
N191.9.4 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N191.9.5 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N191.9.6 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N191.9.7 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N191.9.8 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{A1}^+$	$\surd$	0	0	$\surd$	-	-
N191.9.9 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{A1}^-$	$\surd$	0	0	$\surd$	-	-
N191.9.10 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{A3}^+$	$\surd$	0	0	$\surd$	-	-
N191.9.11 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{A3}^-$	$\surd$	0	0	$\surd$	-	-
N191.9.12 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	2	2	$\surd$	622	$\mathrm{A2} \oplus \mathrm{A2}$
N191.9.13 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
N191.9.14 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$\bar{6}m2$	$\mathrm{A1}'' \oplus \mathrm{A2}''$
N191.9.15 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u} \oplus \mathrm{B1_u}$
N191.9.16 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$\bar{6}2m$	$\mathrm{A2}'' \oplus \mathrm{A2}'$
N191.9.17 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N191.9.18 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{A1}^+$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u}$
N191.9.19 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{A1}^-$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u}$
N191.9.20 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{A3}^+$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u}$
N191.9.21 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{A3}^-$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u}$
N191.9.22 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
N191.9.23 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_u} \oplus \mathrm{B1_u}$
N191.9.24 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N191.9.25 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{B2_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N191.9.26 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N191.9.27 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{A1}^+$	$\surd$	0	0	$\surd$	-	-
N191.9.28 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{A1}^-$	$\surd$	0	0	$\surd$	-	-
N191.9.29 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{A3}^+$	$\surd$	0	0	$\surd$	-	-
N191.9.30 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{A3}^-$	$\surd$	0	0	$\surd$	-	-
N191.9.31 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	622	$\mathrm{B2} \oplus \mathrm{B2}$
N191.9.32 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N191.9.33 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$6mm$	$\mathrm{B2} \oplus \mathrm{B1}$
N191.9.34 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N191.9.35 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{A1}^+$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_u}$
N191.9.36 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{A1}^-$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_u}$
N191.9.37 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{A3}^+$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_u}$
N191.9.38 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{A3}^-$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_u}$
N191.9.39 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N191.9.40 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N191.9.41 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N191.9.42 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{A1}^+$	$\surd$	0	0	$\surd$	-	-
N191.9.43 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{A1}^-$	$\surd$	0	0	$\surd$	-	-
N191.9.44 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{A3}^+$	$\surd$	0	0	$\surd$	-	-
N191.9.45 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{A3}^-$	$\surd$	0	0	$\surd$	-	-
N191.9.46 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	622	$\mathrm{B1} \oplus \mathrm{B1}$
N191.9.47 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N191.9.48 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{A1}^+$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u}$

Non-coplanar SSGs with parent space group $P6/mmm$ (No. 191) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N191.9.49 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{A1}^-$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N191.9.50 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{A3}^+$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N191.9.51 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{A3}^-$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
N191.9.52 $\mathrm{GM1}^- \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N191.9.53 $\mathrm{GM1}^- \oplus \mathrm{GM4}^- \oplus \mathrm{A1}^+$	$\surd$	0	0	$\surd$	-	-
N191.9.54 $\mathrm{GM1}^- \oplus \mathrm{GM4}^- \oplus \mathrm{A1}^-$	$\surd$	0	0	$\surd$	-	-
N191.9.55 $\mathrm{GM1}^- \oplus \mathrm{GM4}^- \oplus \mathrm{A3}^+$	$\surd$	0	0	$\surd$	-	-
N191.9.56 $\mathrm{GM1}^- \oplus \mathrm{GM4}^- \oplus \mathrm{A3}^-$	$\surd$	0	0	$\surd$	-	-
N191.9.57 $\mathrm{GM1}^- \oplus \mathrm{A1}^+ \oplus \mathrm{A1}^+$	$\surd$	1	0	$\times$	-	-
N191.9.58 $\mathrm{GM1}^- \oplus \mathrm{A1}^+ \oplus \mathrm{A2}^-$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N191.9.59 $\mathrm{GM1}^- \oplus \mathrm{A1}^+ \oplus \mathrm{A1}^-$	$\surd$	1	1	$\times$	-	-
N191.9.60 $\mathrm{GM1}^- \oplus \mathrm{A1}^+ \oplus \mathrm{A2}^+$	$\surd$	1	0	$\times$	-	-
N191.9.61 $\mathrm{GM1}^- \oplus \mathrm{A1}^+ \oplus \mathrm{A3}^+$	$\surd$	1	0	$\times$	-	-
N191.9.62 $\mathrm{GM1}^- \oplus \mathrm{A1}^+ \oplus \mathrm{A4}^-$	$\surd$	1	1	$\times$	-	-
N191.9.63 $\mathrm{GM1}^- \oplus \mathrm{A1}^+ \oplus \mathrm{A3}^-$	$\surd$	1	1	$\times$	-	-
N191.9.64 $\mathrm{GM1}^- \oplus \mathrm{A1}^+ \oplus \mathrm{A4}^+$	$\surd$	1	0	$\times$	-	-
N191.9.65 $\mathrm{GM1}^- \oplus \mathrm{A1}^- \oplus \mathrm{A1}^-$	$\surd$	1	0	$\times$	-	-
N191.9.66 $\mathrm{GM1}^- \oplus \mathrm{A1}^- \oplus \mathrm{A2}^+$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N191.9.67 $\mathrm{GM1}^- \oplus \mathrm{A1}^- \oplus \mathrm{A3}^+$	$\surd$	1	1	$\times$	-	-
N191.9.68 $\mathrm{GM1}^- \oplus \mathrm{A1}^- \oplus \mathrm{A4}^-$	$\surd$	1	0	$\times$	-	-
N191.9.69 $\mathrm{GM1}^- \oplus \mathrm{A1}^- \oplus \mathrm{A3}^-$	$\surd$	1	0	$\times$	-	-
N191.9.70 $\mathrm{GM1}^- \oplus \mathrm{A1}^- \oplus \mathrm{A4}^+$	$\surd$	1	1	$\times$	-	-
N191.9.71 $\mathrm{GM1}^- \oplus \mathrm{A3}^+ \oplus \mathrm{A3}^+$	$\surd$	1	0	$\times$	-	-
N191.9.72 $\mathrm{GM1}^- \oplus \mathrm{A3}^+ \oplus \mathrm{A4}^-$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N191.9.73 $\mathrm{GM1}^- \oplus \mathrm{A3}^+ \oplus \mathrm{A3}^-$	$\surd$	1	1	$\times$	-	-
N191.9.74 $\mathrm{GM1}^- \oplus \mathrm{A3}^+ \oplus \mathrm{A4}^+$	$\surd$	1	0	$\times$	-	-
N191.9.75 $\mathrm{GM1}^- \oplus \mathrm{A3}^- \oplus \mathrm{A3}^-$	$\surd$	1	0	$\times$	-	-
N191.9.76 $\mathrm{GM1}^- \oplus \mathrm{A3}^- \oplus \mathrm{A4}^+$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N191.9.77 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
N191.9.78 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$6mm$	$\mathrm{A2} \oplus \mathrm{A2}$
N191.9.79 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{B2_g}$
N191.9.80 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$\bar{6}2m$	$\mathrm{A2'} \oplus \mathrm{A2'}$
N191.9.81 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{B1_g}$
N191.9.82 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$\bar{6}m2$	$\mathrm{A1''} \oplus \mathrm{A1''}$
N191.9.83 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{A1}^+$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g}$
N191.9.84 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{A1}^-$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g}$
N191.9.85 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{A3}^+$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g}$
N191.9.86 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{A3}^-$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g}$
N191.9.87 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A2_g}$
N191.9.88 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$\bar{6}2m$	$\mathrm{A1''} \oplus \mathrm{A2'}$
N191.9.89 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{B1_u}$
N191.9.90 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$\bar{6}m2$	$\mathrm{A1''} \oplus \mathrm{A2'}$
N191.9.91 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{B2_u}$
N191.9.92 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{A1}^+$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g}$
N191.9.93 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{A1}^-$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g}$
N191.9.94 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{A3}^+$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g}$

Non-coplanar SSGs with parent space group $P6/mmm$ (No. 191) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N191.9.95 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}\oplus\mathrm{A3}^{-}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A1_u}\oplus\mathrm{A2_g}$
N191.9.96 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{+}$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g}\oplus\mathrm{B2_g}\oplus\mathrm{B2_g}$
N191.9.97 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{-}$	$\surd$	2	2	$\surd$	$6mm$	$\mathrm{A2}\oplus\mathrm{B1}$
N191.9.98 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{+}\oplus\mathrm{GM4}^{+}$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g}\oplus\mathrm{B2_g}\oplus\mathrm{B1_g}$
N191.9.99 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{+}\oplus\mathrm{GM4}^{-}$	$\surd$	2	2	$\surd$	622	$\mathrm{A2}\oplus\mathrm{B2}$
N191.9.100 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{+}\oplus\mathrm{A1}^{+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A2_g}\oplus\mathrm{B2_g}$
N191.9.101 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{+}\oplus\mathrm{A1}^{-}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A2_g}\oplus\mathrm{B2_g}$
N191.9.102 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{+}\oplus\mathrm{A3}^{+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A2_g}\oplus\mathrm{B2_g}$
N191.9.103 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{+}\oplus\mathrm{A3}^{-}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A2_g}\oplus\mathrm{B2_g}$
N191.9.104 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g}\oplus\mathrm{B1_u}\oplus\mathrm{B1_u}$
N191.9.105 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	622	$\mathrm{A2}\oplus\mathrm{B1}$
N191.9.106 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{-}$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g}\oplus\mathrm{B2_u}\oplus\mathrm{B1_u}$
N191.9.107 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{-}\oplus\mathrm{A1}^{+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A2_g}\oplus\mathrm{B1_u}$
N191.9.108 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{-}\oplus\mathrm{A1}^{-}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A2_g}\oplus\mathrm{B1_u}$
N191.9.109 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{-}\oplus\mathrm{A3}^{+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A2_g}\oplus\mathrm{B1_u}$
N191.9.110 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{-}\oplus\mathrm{A3}^{-}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A2_g}\oplus\mathrm{B1_u}$
N191.9.111 $\mathrm{GM2}^{+}\oplus\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{+}$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g}\oplus\mathrm{B1_g}\oplus\mathrm{B1_g}$
N191.9.112 $\mathrm{GM2}^{+}\oplus\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{-}$	$\surd$	2	2	$\surd$	$6mm$	$\mathrm{A2}\oplus\mathrm{B2}$
N191.9.113 $\mathrm{GM2}^{+}\oplus\mathrm{GM4}^{+}\oplus\mathrm{A1}^{+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A2_g}\oplus\mathrm{B1_g}$
N191.9.114 $\mathrm{GM2}^{+}\oplus\mathrm{GM4}^{+}\oplus\mathrm{A1}^{-}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A2_g}\oplus\mathrm{B1_g}$
N191.9.115 $\mathrm{GM2}^{+}\oplus\mathrm{GM4}^{+}\oplus\mathrm{A3}^{+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A2_g}\oplus\mathrm{B1_g}$
N191.9.116 $\mathrm{GM2}^{+}\oplus\mathrm{GM4}^{+}\oplus\mathrm{A3}^{-}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A2_g}\oplus\mathrm{B1_g}$
N191.9.117 $\mathrm{GM2}^{+}\oplus\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g}\oplus\mathrm{B2_u}\oplus\mathrm{B2_u}$
N191.9.118 $\mathrm{GM2}^{+}\oplus\mathrm{GM4}^{-}\oplus\mathrm{A1}^{+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A2_g}\oplus\mathrm{B2_u}$
N191.9.119 $\mathrm{GM2}^{+}\oplus\mathrm{GM4}^{-}\oplus\mathrm{A1}^{-}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A2_g}\oplus\mathrm{B2_u}$
N191.9.120 $\mathrm{GM2}^{+}\oplus\mathrm{GM4}^{-}\oplus\mathrm{A3}^{+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A2_g}\oplus\mathrm{B2_u}$
N191.9.121 $\mathrm{GM2}^{+}\oplus\mathrm{GM4}^{-}\oplus\mathrm{A3}^{-}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A2_g}\oplus\mathrm{B2_u}$
N191.9.122 $\mathrm{GM2}^{+}\oplus\mathrm{A1}^{+}\oplus\mathrm{A1}^{+}$	$\surd$	1	1	$\times$	-	-
N191.9.123 $\mathrm{GM2}^{+}\oplus\mathrm{A1}^{+}\oplus\mathrm{A2}^{-}$	$\surd$	1	1	$\surd$	622	A2
N191.9.124 $\mathrm{GM2}^{+}\oplus\mathrm{A1}^{+}\oplus\mathrm{A1}^{-}$	$\surd$	1	1	$\times$	-	-
N191.9.125 $\mathrm{GM2}^{+}\oplus\mathrm{A1}^{+}\oplus\mathrm{A2}^{+}$	$\surd$	1	1	$\times$	-	-
N191.9.126 $\mathrm{GM2}^{+}\oplus\mathrm{A1}^{+}\oplus\mathrm{A3}^{+}$	$\surd$	1	1	$\times$	-	-
N191.9.127 $\mathrm{GM2}^{+}\oplus\mathrm{A1}^{+}\oplus\mathrm{A4}^{-}$	$\surd$	1	1	$\times$	-	-
N191.9.128 $\mathrm{GM2}^{+}\oplus\mathrm{A1}^{+}\oplus\mathrm{A3}^{-}$	$\surd$	1	1	$\times$	-	-
N191.9.129 $\mathrm{GM2}^{+}\oplus\mathrm{A1}^{+}\oplus\mathrm{A4}^{+}$	$\surd$	1	1	$\times$	-	-
N191.9.130 $\mathrm{GM2}^{+}\oplus\mathrm{A1}^{-}\oplus\mathrm{A1}^{-}$	$\surd$	1	1	$\times$	-	-
N191.9.131 $\mathrm{GM2}^{+}\oplus\mathrm{A1}^{-}\oplus\mathrm{A2}^{+}$	$\surd$	1	1	$\surd$	622	A2
N191.9.132 $\mathrm{GM2}^{+}\oplus\mathrm{A1}^{-}\oplus\mathrm{A3}^{+}$	$\surd$	1	1	$\times$	-	-
N191.9.133 $\mathrm{GM2}^{+}\oplus\mathrm{A1}^{-}\oplus\mathrm{A4}^{-}$	$\surd$	1	1	$\times$	-	-
N191.9.134 $\mathrm{GM2}^{+}\oplus\mathrm{A1}^{-}\oplus\mathrm{A3}^{-}$	$\surd$	1	1	$\times$	-	-
N191.9.135 $\mathrm{GM2}^{+}\oplus\mathrm{A1}^{-}\oplus\mathrm{A4}^{+}$	$\surd$	1	1	$\times$	-	-
N191.9.136 $\mathrm{GM2}^{+}\oplus\mathrm{A3}^{+}\oplus\mathrm{A3}^{+}$	$\surd$	1	1	$\times$	-	-
N191.9.137 $\mathrm{GM2}^{+}\oplus\mathrm{A3}^{+}\oplus\mathrm{A4}^{-}$	$\surd$	1	1	$\surd$	622	A2
N191.9.138 $\mathrm{GM2}^{+}\oplus\mathrm{A3}^{+}\oplus\mathrm{A3}^{-}$	$\surd$	1	1	$\times$	-	-
N191.9.139 $\mathrm{GM2}^{+}\oplus\mathrm{A3}^{+}\oplus\mathrm{A4}^{+}$	$\surd$	1	1	$\times$	-	-
N191.9.140 $\mathrm{GM2}^{+}\oplus\mathrm{A3}^{-}\oplus\mathrm{A3}^{-}$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $P6/mmm$ (No. 191) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N191.9.141 $\mathrm{GM2}^{+}\oplus\mathrm{A3}^{-}\oplus\mathrm{A4}^{+}$	$\surd$	1	1	$\surd$	622	A2
N191.9.142 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
N191.9.143 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{+}$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{B2_g}\oplus\mathrm{B1_u}\oplus\mathrm{B1_u}$
N191.9.144 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
N191.9.145 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{GM4}^{+}$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{B2_u}\oplus\mathrm{B2_u}\oplus\mathrm{B1_g}$
N191.9.146 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
N191.9.147 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{A1}^{+}$	$\surd$	0	0	$\surd$	-	-
N191.9.148 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{A1}^{-}$	$\surd$	0	0	$\surd$	-	-
N191.9.149 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{A3}^{+}$	$\surd$	0	0	$\surd$	-	-
N191.9.150 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{A3}^{-}$	$\surd$	0	0	$\surd$	-	-
N191.9.151 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	$6mm$	$\mathrm{B1}\oplus\mathrm{B1}$
N191.9.152 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{-}$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u}\oplus\mathrm{B2_g}\oplus\mathrm{B1_u}$
N191.9.153 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{+}\oplus\mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	622	$\mathrm{B2}\oplus\mathrm{B1}$
N191.9.154 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{+}\oplus\mathrm{GM4}^{-}$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_u}\oplus\mathrm{B2_g}\oplus\mathrm{B1_u}$
N191.9.155 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{+}\oplus\mathrm{A1}^{+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{B2_g}\oplus\mathrm{B1_u}$
N191.9.156 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{+}\oplus\mathrm{A1}^{-}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{B2_g}\oplus\mathrm{B1_u}$
N191.9.157 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{+}\oplus\mathrm{A3}^{+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{B2_g}\oplus\mathrm{B1_u}$
N191.9.158 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{+}\oplus\mathrm{A3}^{-}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{B2_g}\oplus\mathrm{B1_u}$
N191.9.159 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
N191.9.160 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{+}$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_u}\oplus\mathrm{B2_u}\oplus\mathrm{B1_g}$
N191.9.161 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
N191.9.162 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{A1}^{+}$	$\surd$	0	0	$\surd$	-	-
N191.9.163 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{A1}^{-}$	$\surd$	0	0	$\surd$	-	-
N191.9.164 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{A3}^{+}$	$\surd$	0	0	$\surd$	-	-
N191.9.165 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}\oplus\mathrm{A3}^{-}$	$\surd$	0	0	$\surd$	-	-
N191.9.166 $\mathrm{GM2}^{-}\oplus\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	$6mm$	$\mathrm{B2}\oplus\mathrm{B2}$
N191.9.167 $\mathrm{GM2}^{-}\oplus\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{-}$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u}\oplus\mathrm{B2_u}\oplus\mathrm{B1_g}$
N191.9.168 $\mathrm{GM2}^{-}\oplus\mathrm{GM4}^{+}\oplus\mathrm{A1}^{+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{B2_u}\oplus\mathrm{B1_g}$
N191.9.169 $\mathrm{GM2}^{-}\oplus\mathrm{GM4}^{+}\oplus\mathrm{A1}^{-}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{B2_u}\oplus\mathrm{B1_g}$
N191.9.170 $\mathrm{GM2}^{-}\oplus\mathrm{GM4}^{+}\oplus\mathrm{A3}^{+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{B2_u}\oplus\mathrm{B1_g}$
N191.9.171 $\mathrm{GM2}^{-}\oplus\mathrm{GM4}^{+}\oplus\mathrm{A3}^{-}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{B2_u}\oplus\mathrm{B1_g}$
N191.9.172 $\mathrm{GM2}^{-}\oplus\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
N191.9.173 $\mathrm{GM2}^{-}\oplus\mathrm{GM4}^{-}\oplus\mathrm{A1}^{+}$	$\surd$	0	0	$\surd$	-	-
N191.9.174 $\mathrm{GM2}^{-}\oplus\mathrm{GM4}^{-}\oplus\mathrm{A1}^{-}$	$\surd$	0	0	$\surd$	-	-
N191.9.175 $\mathrm{GM2}^{-}\oplus\mathrm{GM4}^{-}\oplus\mathrm{A3}^{+}$	$\surd$	0	0	$\surd$	-	-
N191.9.176 $\mathrm{GM2}^{-}\oplus\mathrm{GM4}^{-}\oplus\mathrm{A3}^{-}$	$\surd$	0	0	$\surd$	-	-
N191.9.177 $\mathrm{GM2}^{-}\oplus\mathrm{A1}^{+}\oplus\mathrm{A1}^{+}$	$\surd$	1	0	$\times$	-	-
N191.9.178 $\mathrm{GM2}^{-}\oplus\mathrm{A1}^{+}\oplus\mathrm{A2}^{-}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N191.9.179 $\mathrm{GM2}^{-}\oplus\mathrm{A1}^{+}\oplus\mathrm{A1}^{-}$	$\surd$	1	1	$\times$	-	-
N191.9.180 $\mathrm{GM2}^{-}\oplus\mathrm{A1}^{+}\oplus\mathrm{A2}^{+}$	$\surd$	1	0	$\times$	-	-
N191.9.181 $\mathrm{GM2}^{-}\oplus\mathrm{A1}^{+}\oplus\mathrm{A3}^{+}$	$\surd$	1	0	$\times$	-	-
N191.9.182 $\mathrm{GM2}^{-}\oplus\mathrm{A1}^{+}\oplus\mathrm{A4}^{-}$	$\surd$	1	1	$\times$	-	-
N191.9.183 $\mathrm{GM2}^{-}\oplus\mathrm{A1}^{+}\oplus\mathrm{A3}^{-}$	$\surd$	1	1	$\times$	-	-
N191.9.184 $\mathrm{GM2}^{-}\oplus\mathrm{A1}^{+}\oplus\mathrm{A4}^{+}$	$\surd$	1	0	$\times$	-	-
N191.9.185 $\mathrm{GM2}^{-}\oplus\mathrm{A1}^{-}\oplus\mathrm{A1}^{-}$	$\surd$	1	0	$\times$	-	-
N191.9.186 $\mathrm{GM2}^{-}\oplus\mathrm{A1}^{-}\oplus\mathrm{A2}^{+}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$

Non-coplanar SSGs with parent space group $P6/mmm$ (No. 191) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N191.9.187 $\mathrm{GM2}^- \oplus \mathrm{A1}^- \oplus \mathrm{A3}^+$	$\surd$	1	1	$\times$	-	-
N191.9.188 $\mathrm{GM2}^- \oplus \mathrm{A1}^- \oplus \mathrm{A4}^-$	$\surd$	1	0	$\times$	-	-
N191.9.189 $\mathrm{GM2}^- \oplus \mathrm{A1}^- \oplus \mathrm{A3}^-$	$\surd$	1	0	$\times$	-	-
N191.9.190 $\mathrm{GM2}^- \oplus \mathrm{A1}^- \oplus \mathrm{A4}^+$	$\surd$	1	1	$\times$	-	-
N191.9.191 $\mathrm{GM2}^- \oplus \mathrm{A3}^+ \oplus \mathrm{A3}^+$	$\surd$	1	0	$\times$	-	-
N191.9.192 $\mathrm{GM2}^- \oplus \mathrm{A3}^+ \oplus \mathrm{A4}^-$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N191.9.193 $\mathrm{GM2}^- \oplus \mathrm{A3}^+ \oplus \mathrm{A3}^-$	$\surd$	1	1	$\times$	-	-
N191.9.194 $\mathrm{GM2}^- \oplus \mathrm{A3}^+ \oplus \mathrm{A4}^+$	$\surd$	1	0	$\times$	-	-
N191.9.195 $\mathrm{GM2}^- \oplus \mathrm{A3}^- \oplus \mathrm{A3}^-$	$\surd$	1	0	$\times$	-	-
N191.9.196 $\mathrm{GM2}^- \oplus \mathrm{A3}^- \oplus \mathrm{A4}^+$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N191.9.197 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N191.9.198 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$\bar{6}2m$	$\mathrm{A1}'' \oplus \mathrm{A1}''$
N191.9.199 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B1_g}$
N191.9.200 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$\bar{6}m2$	$\mathrm{A2}'' \oplus \mathrm{A2}''$
N191.9.201 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{A1}^+$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_g}$
N191.9.202 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{A1}^-$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_g}$
N191.9.203 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{A3}^+$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_g}$
N191.9.204 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{A3}^-$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_g}$
N191.9.205 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{B2_g}$
N191.9.206 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$\bar{6}m2$	$\mathrm{A2}'' \oplus \mathrm{A2}'$
N191.9.207 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$
N191.9.208 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{A1}^+$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g}$
N191.9.209 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{A1}^-$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g}$
N191.9.210 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{A3}^+$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g}$
N191.9.211 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{A3}^-$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g}$
N191.9.212 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{B2_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N191.9.213 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$\bar{6}2m$	$\mathrm{A1}'' \oplus \mathrm{A2}''$
N191.9.214 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{A1}^+$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{B2_g} \oplus \mathrm{B1_g}$
N191.9.215 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{A1}^-$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{B2_g} \oplus \mathrm{B1_g}$
N191.9.216 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{A3}^+$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{B2_g} \oplus \mathrm{B1_g}$
N191.9.217 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{A3}^-$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{B2_g} \oplus \mathrm{B1_g}$
N191.9.218 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$
N191.9.219 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{A1}^+$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g}$
N191.9.220 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{A1}^-$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g}$
N191.9.221 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{A3}^+$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g}$
N191.9.222 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{A3}^-$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g}$
N191.9.223 $\mathrm{GM3}^+ \oplus \mathrm{A1}^+ \oplus \mathrm{A1}^+$	$\surd$	1	1	$\times$	-	-
N191.9.224 $\mathrm{GM3}^+ \oplus \mathrm{A1}^+ \oplus \mathrm{A2}^-$	$\surd$	1	1	$\surd$	$\bar{6}m2$	$\mathrm{A2}''$
N191.9.225 $\mathrm{GM3}^+ \oplus \mathrm{A1}^+ \oplus \mathrm{A1}^-$	$\surd$	1	1	$\times$	-	-
N191.9.226 $\mathrm{GM3}^+ \oplus \mathrm{A1}^+ \oplus \mathrm{A2}^+$	$\surd$	1	1	$\times$	-	-
N191.9.227 $\mathrm{GM3}^+ \oplus \mathrm{A1}^+ \oplus \mathrm{A3}^+$	$\surd$	1	1	$\times$	-	-
N191.9.228 $\mathrm{GM3}^+ \oplus \mathrm{A1}^+ \oplus \mathrm{A4}^-$	$\surd$	1	1	$\times$	-	-
N191.9.229 $\mathrm{GM3}^+ \oplus \mathrm{A1}^+ \oplus \mathrm{A3}^-$	$\surd$	1	1	$\times$	-	-
N191.9.230 $\mathrm{GM3}^+ \oplus \mathrm{A1}^+ \oplus \mathrm{A4}^+$	$\surd$	1	1	$\times$	-	-
N191.9.231 $\mathrm{GM3}^+ \oplus \mathrm{A1}^- \oplus \mathrm{A1}^-$	$\surd$	1	1	$\times$	-	-
N191.9.232 $\mathrm{GM3}^+ \oplus \mathrm{A1}^- \oplus \mathrm{A2}^+$	$\surd$	1	1	$\surd$	$\bar{6}m2$	$\mathrm{A2}''$

Non-coplanar SSGs with parent space group $P6/mmm$ (No. 191) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N191.9.233 $\mathrm{GM3^+} \oplus \mathrm{A1^-} \oplus \mathrm{A3^+}$	$\surd$	1	1	$\times$	-	-
N191.9.234 $\mathrm{GM3^+} \oplus \mathrm{A1^-} \oplus \mathrm{A4^-}$	$\surd$	1	1	$\times$	-	-
N191.9.235 $\mathrm{GM3^+} \oplus \mathrm{A1^-} \oplus \mathrm{A3^-}$	$\surd$	1	1	$\times$	-	-
N191.9.236 $\mathrm{GM3^+} \oplus \mathrm{A1^-} \oplus \mathrm{A4^+}$	$\surd$	1	1	$\times$	-	-
N191.9.237 $\mathrm{GM3^+} \oplus \mathrm{A3^+} \oplus \mathrm{A3^+}$	$\surd$	1	1	$\times$	-	-
N191.9.238 $\mathrm{GM3^+} \oplus \mathrm{A3^+} \oplus \mathrm{A4^-}$	$\surd$	1	1	$\surd$	$\bar{6}m2$	$\mathrm{A2''}$
N191.9.239 $\mathrm{GM3^+} \oplus \mathrm{A3^+} \oplus \mathrm{A3^-}$	$\surd$	1	1	$\times$	-	-
N191.9.240 $\mathrm{GM3^+} \oplus \mathrm{A3^+} \oplus \mathrm{A4^+}$	$\surd$	1	1	$\times$	-	-
N191.9.241 $\mathrm{GM3^+} \oplus \mathrm{A3^-} \oplus \mathrm{A3^-}$	$\surd$	1	1	$\times$	-	-
N191.9.242 $\mathrm{GM3^+} \oplus \mathrm{A3^-} \oplus \mathrm{A4^+}$	$\surd$	1	1	$\surd$	$\bar{6}m2$	$\mathrm{A2''}$
N191.9.243 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
N191.9.244 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u} \oplus \mathrm{B1_g}$
N191.9.245 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N191.9.246 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{A1^+}$	$\surd$	0	0	$\surd$	-	-
N191.9.247 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{A1^-}$	$\surd$	0	0	$\surd$	-	-
N191.9.248 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{A3^+}$	$\surd$	0	0	$\surd$	-	-
N191.9.249 $\mathrm{GM3^-} \oplus \mathrm{GM3^-} \oplus \mathrm{A3^-}$	$\surd$	0	0	$\surd$	-	-
N191.9.250 $\mathrm{GM3^-} \oplus \mathrm{GM4^+} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$\bar{6}2m$	$\mathrm{A2''} \oplus \mathrm{A2''}$
N191.9.251 $\mathrm{GM3^-} \oplus \mathrm{GM4^+} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u} \oplus \mathrm{B1_g}$
N191.9.252 $\mathrm{GM3^-} \oplus \mathrm{GM4^+} \oplus \mathrm{A1^+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{B1_g}$
N191.9.253 $\mathrm{GM3^-} \oplus \mathrm{GM4^+} \oplus \mathrm{A1^-}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{B1_g}$
N191.9.254 $\mathrm{GM3^-} \oplus \mathrm{GM4^+} \oplus \mathrm{A3^+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{B1_g}$
N191.9.255 $\mathrm{GM3^-} \oplus \mathrm{GM4^+} \oplus \mathrm{A3^-}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{B1_g}$
N191.9.256 $\mathrm{GM3^-} \oplus \mathrm{GM4^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N191.9.257 $\mathrm{GM3^-} \oplus \mathrm{GM4^-} \oplus \mathrm{A1^+}$	$\surd$	0	0	$\surd$	-	-
N191.9.258 $\mathrm{GM3^-} \oplus \mathrm{GM4^-} \oplus \mathrm{A1^-}$	$\surd$	0	0	$\surd$	-	-
N191.9.259 $\mathrm{GM3^-} \oplus \mathrm{GM4^-} \oplus \mathrm{A3^+}$	$\surd$	0	0	$\surd$	-	-
N191.9.260 $\mathrm{GM3^-} \oplus \mathrm{GM4^-} \oplus \mathrm{A3^-}$	$\surd$	0	0	$\surd$	-	-
N191.9.261 $\mathrm{GM3^-} \oplus \mathrm{A1^+} \oplus \mathrm{A1^+}$	$\surd$	1	0	$\times$	-	-
N191.9.262 $\mathrm{GM3^-} \oplus \mathrm{A1^+} \oplus \mathrm{A2^-}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N191.9.263 $\mathrm{GM3^-} \oplus \mathrm{A1^+} \oplus \mathrm{A1^-}$	$\surd$	1	1	$\times$	-	-
N191.9.264 $\mathrm{GM3^-} \oplus \mathrm{A1^+} \oplus \mathrm{A2^+}$	$\surd$	1	0	$\times$	-	-
N191.9.265 $\mathrm{GM3^-} \oplus \mathrm{A1^+} \oplus \mathrm{A3^+}$	$\surd$	1	0	$\times$	-	-
N191.9.266 $\mathrm{GM3^-} \oplus \mathrm{A1^+} \oplus \mathrm{A4^-}$	$\surd$	1	1	$\times$	-	-
N191.9.267 $\mathrm{GM3^-} \oplus \mathrm{A1^+} \oplus \mathrm{A3^-}$	$\surd$	1	1	$\times$	-	-
N191.9.268 $\mathrm{GM3^-} \oplus \mathrm{A1^+} \oplus \mathrm{A4^+}$	$\surd$	1	0	$\times$	-	-
N191.9.269 $\mathrm{GM3^-} \oplus \mathrm{A1^-} \oplus \mathrm{A1^-}$	$\surd$	1	0	$\times$	-	-
N191.9.270 $\mathrm{GM3^-} \oplus \mathrm{A1^-} \oplus \mathrm{A2^+}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N191.9.271 $\mathrm{GM3^-} \oplus \mathrm{A1^-} \oplus \mathrm{A3^+}$	$\surd$	1	1	$\times$	-	-
N191.9.272 $\mathrm{GM3^-} \oplus \mathrm{A1^-} \oplus \mathrm{A4^-}$	$\surd$	1	0	$\times$	-	-
N191.9.273 $\mathrm{GM3^-} \oplus \mathrm{A1^-} \oplus \mathrm{A3^-}$	$\surd$	1	0	$\times$	-	-
N191.9.274 $\mathrm{GM3^-} \oplus \mathrm{A1^-} \oplus \mathrm{A4^+}$	$\surd$	1	1	$\times$	-	-
N191.9.275 $\mathrm{GM3^-} \oplus \mathrm{A3^+} \oplus \mathrm{A3^+}$	$\surd$	1	0	$\times$	-	-
N191.9.276 $\mathrm{GM3^-} \oplus \mathrm{A3^+} \oplus \mathrm{A4^-}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N191.9.277 $\mathrm{GM3^-} \oplus \mathrm{A3^+} \oplus \mathrm{A3^-}$	$\surd$	1	1	$\times$	-	-
N191.9.278 $\mathrm{GM3^-} \oplus \mathrm{A3^+} \oplus \mathrm{A4^+}$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $P6/mmm$ (No. 191) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N191.9.279 $\mathrm{GM3^-} \oplus \mathrm{A3^-} \oplus \mathrm{A3^-}$	$\surd$	1	0	$\times$	-	-
N191.9.280 $\mathrm{GM3^-} \oplus \mathrm{A3^-} \oplus \mathrm{A4^+}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N191.9.281 $\mathrm{GM4^+} \oplus \mathrm{GM4^+} \oplus \mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N191.9.282 $\mathrm{GM4^+} \oplus \mathrm{GM4^+} \oplus \mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$\bar{6}m2$	$\mathrm{A2'} \oplus \mathrm{A2'}$
N191.9.283 $\mathrm{GM4^+} \oplus \mathrm{GM4^+} \oplus \mathrm{A1^+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N191.9.284 $\mathrm{GM4^+} \oplus \mathrm{GM4^+} \oplus \mathrm{A1^-}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N191.9.285 $\mathrm{GM4^+} \oplus \mathrm{GM4^+} \oplus \mathrm{A3^+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N191.9.286 $\mathrm{GM4^+} \oplus \mathrm{GM4^+} \oplus \mathrm{A3^-}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
N191.9.287 $\mathrm{GM4^+} \oplus \mathrm{GM4^-} \oplus \mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{B1_g}$
N191.9.288 $\mathrm{GM4^+} \oplus \mathrm{GM4^-} \oplus \mathrm{A1^+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g}$
N191.9.289 $\mathrm{GM4^+} \oplus \mathrm{GM4^-} \oplus \mathrm{A1^-}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g}$
N191.9.290 $\mathrm{GM4^+} \oplus \mathrm{GM4^-} \oplus \mathrm{A3^+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g}$
N191.9.291 $\mathrm{GM4^+} \oplus \mathrm{GM4^-} \oplus \mathrm{A3^-}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g}$
N191.9.292 $\mathrm{GM4^+} \oplus \mathrm{A1^+} \oplus \mathrm{A1^+}$	$\surd$	1	1	$\times$	-	-
N191.9.293 $\mathrm{GM4^+} \oplus \mathrm{A1^+} \oplus \mathrm{A2^-}$	$\surd$	1	1	$\surd$	$\bar{6}2m$	$\mathrm{A2''}$
N191.9.294 $\mathrm{GM4^+} \oplus \mathrm{A1^+} \oplus \mathrm{A1^-}$	$\surd$	1	1	$\times$	-	-
N191.9.295 $\mathrm{GM4^+} \oplus \mathrm{A1^+} \oplus \mathrm{A2^+}$	$\surd$	1	1	$\times$	-	-
N191.9.296 $\mathrm{GM4^+} \oplus \mathrm{A1^+} \oplus \mathrm{A3^+}$	$\surd$	1	1	$\times$	-	-
N191.9.297 $\mathrm{GM4^+} \oplus \mathrm{A1^+} \oplus \mathrm{A4^-}$	$\surd$	1	1	$\times$	-	-
N191.9.298 $\mathrm{GM4^+} \oplus \mathrm{A1^+} \oplus \mathrm{A3^-}$	$\surd$	1	1	$\times$	-	-
N191.9.299 $\mathrm{GM4^+} \oplus \mathrm{A1^+} \oplus \mathrm{A4^+}$	$\surd$	1	1	$\times$	-	-
N191.9.300 $\mathrm{GM4^+} \oplus \mathrm{A1^-} \oplus \mathrm{A1^-}$	$\surd$	1	1	$\times$	-	-
N191.9.301 $\mathrm{GM4^+} \oplus \mathrm{A1^-} \oplus \mathrm{A2^+}$	$\surd$	1	1	$\surd$	$\bar{6}2m$	$\mathrm{A2''}$
N191.9.302 $\mathrm{GM4^+} \oplus \mathrm{A1^-} \oplus \mathrm{A3^+}$	$\surd$	1	1	$\times$	-	-
N191.9.303 $\mathrm{GM4^+} \oplus \mathrm{A1^-} \oplus \mathrm{A4^-}$	$\surd$	1	1	$\times$	-	-
N191.9.304 $\mathrm{GM4^+} \oplus \mathrm{A1^-} \oplus \mathrm{A3^-}$	$\surd$	1	1	$\times$	-	-
N191.9.305 $\mathrm{GM4^+} \oplus \mathrm{A1^-} \oplus \mathrm{A4^+}$	$\surd$	1	1	$\times$	-	-
N191.9.306 $\mathrm{GM4^+} \oplus \mathrm{A3^+} \oplus \mathrm{A3^+}$	$\surd$	1	1	$\times$	-	-
N191.9.307 $\mathrm{GM4^+} \oplus \mathrm{A3^+} \oplus \mathrm{A4^-}$	$\surd$	1	1	$\surd$	$\bar{6}2m$	$\mathrm{A2''}$
N191.9.308 $\mathrm{GM4^+} \oplus \mathrm{A3^+} \oplus \mathrm{A3^-}$	$\surd$	1	1	$\times$	-	-
N191.9.309 $\mathrm{GM4^+} \oplus \mathrm{A3^+} \oplus \mathrm{A4^+}$	$\surd$	1	1	$\times$	-	-
N191.9.310 $\mathrm{GM4^+} \oplus \mathrm{A3^-} \oplus \mathrm{A3^-}$	$\surd$	1	1	$\times$	-	-
N191.9.311 $\mathrm{GM4^+} \oplus \mathrm{A3^-} \oplus \mathrm{A4^+}$	$\surd$	1	1	$\surd$	$\bar{6}2m$	$\mathrm{A2''}$
N191.9.312 $\mathrm{GM4^-} \oplus \mathrm{GM4^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N191.9.313 $\mathrm{GM4^-} \oplus \mathrm{GM4^-} \oplus \mathrm{A1^+}$	$\surd$	0	0	$\surd$	-	-
N191.9.314 $\mathrm{GM4^-} \oplus \mathrm{GM4^-} \oplus \mathrm{A1^-}$	$\surd$	0	0	$\surd$	-	-
N191.9.315 $\mathrm{GM4^-} \oplus \mathrm{GM4^-} \oplus \mathrm{A3^+}$	$\surd$	0	0	$\surd$	-	-
N191.9.316 $\mathrm{GM4^-} \oplus \mathrm{GM4^-} \oplus \mathrm{A3^-}$	$\surd$	0	0	$\surd$	-	-
N191.9.317 $\mathrm{GM4^-} \oplus \mathrm{A1^+} \oplus \mathrm{A1^+}$	$\surd$	1	0	$\times$	-	-
N191.9.318 $\mathrm{GM4^-} \oplus \mathrm{A1^+} \oplus \mathrm{A2^-}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N191.9.319 $\mathrm{GM4^-} \oplus \mathrm{A1^+} \oplus \mathrm{A1^-}$	$\surd$	1	1	$\times$	-	-
N191.9.320 $\mathrm{GM4^-} \oplus \mathrm{A1^+} \oplus \mathrm{A2^+}$	$\surd$	1	0	$\times$	-	-
N191.9.321 $\mathrm{GM4^-} \oplus \mathrm{A1^+} \oplus \mathrm{A3^+}$	$\surd$	1	0	$\times$	-	-
N191.9.322 $\mathrm{GM4^-} \oplus \mathrm{A1^+} \oplus \mathrm{A4^-}$	$\surd$	1	1	$\times$	-	-
N191.9.323 $\mathrm{GM4^-} \oplus \mathrm{A1^+} \oplus \mathrm{A3^-}$	$\surd$	1	1	$\times$	-	-
N191.9.324 $\mathrm{GM4^-} \oplus \mathrm{A1^+} \oplus \mathrm{A4^+}$	$\surd$	1	0	$\times$	-	-

Non-coplanar SSGs with parent space group $P6/mmm$ (No. 191) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N191.9.325 $\mathrm{GM4^-}\oplus\mathrm{A1^-}\oplus\mathrm{A1^-}$	$\surd$	1	0	$\times$	-	-
N191.9.326 $\mathrm{GM4^-}\oplus\mathrm{A1^-}\oplus\mathrm{A2^+}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N191.9.327 $\mathrm{GM4^-}\oplus\mathrm{A1^-}\oplus\mathrm{A3^+}$	$\surd$	1	1	$\times$	-	-
N191.9.328 $\mathrm{GM4^-}\oplus\mathrm{A1^-}\oplus\mathrm{A4^-}$	$\surd$	1	0	$\times$	-	-
N191.9.329 $\mathrm{GM4^-}\oplus\mathrm{A1^-}\oplus\mathrm{A3^-}$	$\surd$	1	0	$\times$	-	-
N191.9.330 $\mathrm{GM4^-}\oplus\mathrm{A1^-}\oplus\mathrm{A4^+}$	$\surd$	1	1	$\times$	-	-
N191.9.331 $\mathrm{GM4^-}\oplus\mathrm{A3^+}\oplus\mathrm{A3^+}$	$\surd$	1	0	$\times$	-	-
N191.9.332 $\mathrm{GM4^-}\oplus\mathrm{A3^+}\oplus\mathrm{A4^-}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N191.9.333 $\mathrm{GM4^-}\oplus\mathrm{A3^+}\oplus\mathrm{A3^-}$	$\surd$	1	1	$\times$	-	-
N191.9.334 $\mathrm{GM4^-}\oplus\mathrm{A3^+}\oplus\mathrm{A4^+}$	$\surd$	1	0	$\times$	-	-
N191.9.335 $\mathrm{GM4^-}\oplus\mathrm{A3^-}\oplus\mathrm{A3^-}$	$\surd$	1	0	$\times$	-	-
N191.9.336 $\mathrm{GM4^-}\oplus\mathrm{A3^-}\oplus\mathrm{A4^+}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N191.9.337 $\mathrm{A1^+}\oplus\mathrm{A1^+}\oplus\mathrm{A1^+}$	$\surd$	0	0	$\surd$	-	-
N191.9.338 $\mathrm{A1^+}\oplus\mathrm{A1^+}\oplus\mathrm{A2^-}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A2_u}\oplus\mathrm{A2_u}$
N191.9.339 $\mathrm{A1^+}\oplus\mathrm{A1^+}\oplus\mathrm{A1^-}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A1_u}\oplus\mathrm{A1_u}$
N191.9.340 $\mathrm{A1^+}\oplus\mathrm{A1^+}\oplus\mathrm{A2^+}$	$\surd$	0	0	$\surd$	-	-
N191.9.341 $\mathrm{A1^+}\oplus\mathrm{A2^-}\oplus\mathrm{A1^-}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A1_u}\oplus\mathrm{A2_u}$
N191.9.342 $\mathrm{A1^+}\oplus\mathrm{A1^+}\oplus\mathrm{A3^+}$	$\surd$	0	0	$\surd$	-	-
N191.9.343 $\mathrm{A1^+}\oplus\mathrm{A1^+}\oplus\mathrm{A4^-}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{B1_u}\oplus\mathrm{B1_u}$
N191.9.344 $\mathrm{A1^+}\oplus\mathrm{A2^-}\oplus\mathrm{A3^+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A2_u}\oplus\mathrm{B1_u}$
N191.9.345 $\mathrm{A1^+}\oplus\mathrm{A1^+}\oplus\mathrm{A3^-}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{B2_u}\oplus\mathrm{B2_u}$
N191.9.346 $\mathrm{A1^+}\oplus\mathrm{A1^+}\oplus\mathrm{A4^+}$	$\surd$	0	0	$\surd$	-	-
N191.9.347 $\mathrm{A1^+}\oplus\mathrm{A2^-}\oplus\mathrm{A3^-}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A2_u}\oplus\mathrm{B2_u}$
N191.9.348 $\mathrm{A1^+}\oplus\mathrm{A1^-}\oplus\mathrm{A1^-}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A1_u}\oplus\mathrm{A1_u}$
N191.9.349 $\mathrm{A1^+}\oplus\mathrm{A1^-}\oplus\mathrm{A2^+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A1_u}\oplus\mathrm{A2_u}$
N191.9.350 $\mathrm{A1^+}\oplus\mathrm{A2^+}\oplus\mathrm{A2^+}$	$\surd$	0	0	$\surd$	-	-
N191.9.351 $\mathrm{A1^+}\oplus\mathrm{A1^-}\oplus\mathrm{A3^+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A1_u}\oplus\mathrm{B2_u}$
N191.9.352 $\mathrm{A1^+}\oplus\mathrm{A1^-}\oplus\mathrm{A4^-}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A1_u}\oplus\mathrm{B1_u}$
N191.9.353 $\mathrm{A1^+}\oplus\mathrm{A2^+}\oplus\mathrm{A3^+}$	$\surd$	0	0	$\surd$	-	-
N191.9.354 $\mathrm{A1^+}\oplus\mathrm{A2^+}\oplus\mathrm{A4^-}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{B2_u}\oplus\mathrm{B1_u}$
N191.9.355 $\mathrm{A1^+}\oplus\mathrm{A1^-}\oplus\mathrm{A3^-}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A1_u}\oplus\mathrm{B2_u}$
N191.9.356 $\mathrm{A1^+}\oplus\mathrm{A1^-}\oplus\mathrm{A4^+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A1_u}\oplus\mathrm{B1_u}$
N191.9.357 $\mathrm{A1^+}\oplus\mathrm{A2^+}\oplus\mathrm{A3^-}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{B2_u}\oplus\mathrm{B1_u}$
N191.9.358 $\mathrm{A1^+}\oplus\mathrm{A2^+}\oplus\mathrm{A4^+}$	$\surd$	0	0	$\surd$	-	-
N191.9.359 $\mathrm{A1^+}\oplus\mathrm{A3^+}\oplus\mathrm{A3^+}$	$\surd$	0	0	$\surd$	-	-
N191.9.360 $\mathrm{A1^+}\oplus\mathrm{A3^+}\oplus\mathrm{A4^-}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A2_u}\oplus\mathrm{B1_u}$
N191.9.361 $\mathrm{A1^+}\oplus\mathrm{A4^-}\oplus\mathrm{A4^-}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{B1_u}\oplus\mathrm{B1_u}$
N191.9.362 $\mathrm{A1^+}\oplus\mathrm{A3^+}\oplus\mathrm{A3^-}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A1_u}\oplus\mathrm{B2_u}$
N191.9.363 $\mathrm{A1^+}\oplus\mathrm{A3^+}\oplus\mathrm{A4^+}$	$\surd$	0	0	$\surd$	-	-
N191.9.364 $\mathrm{A1^+}\oplus\mathrm{A4^-}\oplus\mathrm{A3^-}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{B2_u}\oplus\mathrm{B1_u}$
N191.9.365 $\mathrm{A1^+}\oplus\mathrm{A4^-}\oplus\mathrm{A4^+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A1_u}\oplus\mathrm{B1_u}$
N191.9.366 $\mathrm{A1^+}\oplus\mathrm{A3^-}\oplus\mathrm{A3^-}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{B2_u}\oplus\mathrm{B2_u}$
N191.9.367 $\mathrm{A1^+}\oplus\mathrm{A3^-}\oplus\mathrm{A4^+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A2_u}\oplus\mathrm{B2_u}$
N191.9.368 $\mathrm{A1^+}\oplus\mathrm{A4^+}\oplus\mathrm{A4^+}$	$\surd$	0	0	$\surd$	-	-
N191.9.369 $\mathrm{A1^-}\oplus\mathrm{A1^-}\oplus\mathrm{A1^-}$	$\surd$	0	0	$\surd$	-	-
N191.9.370 $\mathrm{A1^-}\oplus\mathrm{A1^-}\oplus\mathrm{A2^+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A2_u}\oplus\mathrm{A2_u}$

Non-coplanar SSGs with parent space group $P6/mmm$ (No. 191) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N191.9.371 $\mathrm{A1}^- \oplus \mathrm{A1}^- \oplus \mathrm{A3}^+$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{B2_u} \oplus \mathrm{B2_u}$
N191.9.372 $\mathrm{A1}^- \oplus \mathrm{A1}^- \oplus \mathrm{A4}^-$	$\surd$	0	0	$\surd$	-	-
N191.9.373 $\mathrm{A1}^- \oplus \mathrm{A2}^+ \oplus \mathrm{A3}^+$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_u}$
N191.9.374 $\mathrm{A1}^- \oplus \mathrm{A1}^- \oplus \mathrm{A3}^-$	$\surd$	0	0	$\surd$	-	-
N191.9.375 $\mathrm{A1}^- \oplus \mathrm{A1}^- \oplus \mathrm{A4}^+$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N191.9.376 $\mathrm{A1}^- \oplus \mathrm{A2}^+ \oplus \mathrm{A3}^-$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{B1_u}$
N191.9.377 $\mathrm{A1}^- \oplus \mathrm{A3}^+ \oplus \mathrm{A3}^+$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{B2_u} \oplus \mathrm{B2_u}$
N191.9.378 $\mathrm{A1}^- \oplus \mathrm{A3}^+ \oplus \mathrm{A4}^-$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_u}$
N191.9.379 $\mathrm{A1}^- \oplus \mathrm{A4}^- \oplus \mathrm{A4}^-$	$\surd$	0	0	$\surd$	-	-
N191.9.380 $\mathrm{A1}^- \oplus \mathrm{A3}^+ \oplus \mathrm{A3}^-$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_u}$
N191.9.381 $\mathrm{A1}^- \oplus \mathrm{A3}^+ \oplus \mathrm{A4}^+$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{B2_u} \oplus \mathrm{B1_u}$
N191.9.382 $\mathrm{A1}^- \oplus \mathrm{A4}^- \oplus \mathrm{A3}^-$	$\surd$	0	0	$\surd$	-	-
N191.9.383 $\mathrm{A1}^- \oplus \mathrm{A4}^- \oplus \mathrm{A4}^+$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_u}$
N191.9.384 $\mathrm{A1}^- \oplus \mathrm{A3}^- \oplus \mathrm{A3}^-$	$\surd$	0	0	$\surd$	-	-
N191.9.385 $\mathrm{A1}^- \oplus \mathrm{A3}^- \oplus \mathrm{A4}^+$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{B1_u}$
N191.9.386 $\mathrm{A1}^- \oplus \mathrm{A4}^+ \oplus \mathrm{A4}^+$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{B1_u} \oplus \mathrm{B1_u}$
N191.9.387 $\mathrm{A3}^+ \oplus \mathrm{A3}^+ \oplus \mathrm{A3}^+$	$\surd$	0	0	$\surd$	-	-
N191.9.388 $\mathrm{A3}^+ \oplus \mathrm{A3}^+ \oplus \mathrm{A4}^-$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u}$
N191.9.389 $\mathrm{A3}^+ \oplus \mathrm{A3}^+ \oplus \mathrm{A3}^-$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u}$
N191.9.390 $\mathrm{A3}^+ \oplus \mathrm{A3}^+ \oplus \mathrm{A4}^+$	$\surd$	0	0	$\surd$	-	-
N191.9.391 $\mathrm{A3}^+ \oplus \mathrm{A4}^- \oplus \mathrm{A3}^-$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u}$
N191.9.392 $\mathrm{A3}^+ \oplus \mathrm{A3}^- \oplus \mathrm{A3}^-$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u}$
N191.9.393 $\mathrm{A3}^+ \oplus \mathrm{A3}^- \oplus \mathrm{A4}^+$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u}$
N191.9.394 $\mathrm{A3}^+ \oplus \mathrm{A4}^+ \oplus \mathrm{A4}^+$	$\surd$	0	0	$\surd$	-	-
N191.9.395 $\mathrm{A3}^- \oplus \mathrm{A3}^- \oplus \mathrm{A3}^-$	$\surd$	0	0	$\surd$	-	-
N191.9.396 $\mathrm{A3}^- \oplus \mathrm{A3}^- \oplus \mathrm{A4}^+$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u}$
N191.12.1 $\mathrm{GM1}^- \oplus \mathrm{GM5}^+$	$\surd$	2	2	$\surd$	$6mm$	E2
N191.12.2 $\mathrm{GM1}^- \oplus \mathrm{GM5}^-$	$\surd$	0	0	$\surd$	-	-
N191.12.3 $\mathrm{GM1}^- \oplus \mathrm{GM6}^+$	$\surd$	2	2	$\surd$	$6mm$	E1
N191.12.4 $\mathrm{GM1}^- \oplus \mathrm{GM6}^-$	$\surd$	0	0	$\surd$	-	-
N191.12.5 $\mathrm{GM1}^- \oplus \mathrm{A5}^+$	$\surd$	1	0	$\times$	-	-
N191.12.6 $\mathrm{GM1}^- \oplus \mathrm{A6}^+$	$\surd$	1	0	$\times$	-	-
N191.12.7 $\mathrm{GM2}^+ \oplus \mathrm{GM5}^+$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g} \oplus \mathrm{E2_g}$
N191.12.8 $\mathrm{GM2}^+ \oplus \mathrm{GM5}^-$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g} \oplus \mathrm{E2_u}$
N191.12.9 $\mathrm{GM2}^+ \oplus \mathrm{GM6}^+$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g} \oplus \mathrm{E1_g}$
N191.12.10 $\mathrm{GM2}^+ \oplus \mathrm{GM6}^-$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g} \oplus \mathrm{E1_u}$
N191.12.11 $\mathrm{GM2}^+ \oplus \mathrm{A5}^+$	$\surd$	1	1	$\times$	-	-
N191.12.12 $\mathrm{GM2}^+ \oplus \mathrm{A6}^+$	$\surd$	1	1	$\times$	-	-
N191.12.13 $\mathrm{GM2}^- \oplus \mathrm{GM5}^+$	$\surd$	2	2	$\surd$	622	E2
N191.12.14 $\mathrm{GM2}^- \oplus \mathrm{GM5}^-$	$\surd$	0	0	$\surd$	-	-
N191.12.15 $\mathrm{GM2}^- \oplus \mathrm{GM6}^+$	$\surd$	2	2	$\surd$	622	E1
N191.12.16 $\mathrm{GM2}^- \oplus \mathrm{GM6}^-$	$\surd$	0	0	$\surd$	-	-
N191.12.17 $\mathrm{GM2}^- \oplus \mathrm{A5}^+$	$\surd$	1	0	$\times$	-	-
N191.12.18 $\mathrm{GM2}^- \oplus \mathrm{A6}^+$	$\surd$	1	0	$\times$	-	-
N191.12.19 $\mathrm{GM3}^+ \oplus \mathrm{GM5}^+$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{B2_g} \oplus \mathrm{E2_g}$
N191.12.20 $\mathrm{GM3}^+ \oplus \mathrm{GM5}^-$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{B2_g} \oplus \mathrm{E1_u}$

Non-coplanar SSGs with parent space group $P6/mmm$ (No. 191) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N191.12.21 $\mathrm{GM3^+} \oplus \mathrm{GM6^+}$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{B2_g} \oplus \mathrm{E1_g}$
N191.12.22 $\mathrm{GM3^+} \oplus \mathrm{GM6^-}$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{B2_g} \oplus \mathrm{E2_u}$
N191.12.23 $\mathrm{GM3^+} \oplus \mathrm{A5^+}$	$\surd$	1	1	$\times$	-	-
N191.12.24 $\mathrm{GM3^+} \oplus \mathrm{A6^+}$	$\surd$	1	1	$\times$	-	-
N191.12.25 $\mathrm{GM3^-} \oplus \mathrm{GM5^+}$	$\surd$	2	2	$\surd$	$\bar{6}m2$	$\mathrm{E'}$
N191.12.26 $\mathrm{GM3^-} \oplus \mathrm{GM5^-}$	$\surd$	0	0	$\surd$	-	-
N191.12.27 $\mathrm{GM3^-} \oplus \mathrm{GM6^+}$	$\surd$	2	2	$\surd$	$\bar{6}m2$	$\mathrm{E''}$
N191.12.28 $\mathrm{GM3^-} \oplus \mathrm{GM6^-}$	$\surd$	0	0	$\surd$	-	-
N191.12.29 $\mathrm{GM3^-} \oplus \mathrm{A5^+}$	$\surd$	1	0	$\times$	-	-
N191.12.30 $\mathrm{GM3^-} \oplus \mathrm{A6^+}$	$\surd$	1	0	$\times$	-	-
N191.12.31 $\mathrm{GM4^+} \oplus \mathrm{GM5^+}$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{B1_g} \oplus \mathrm{E2_g}$
N191.12.32 $\mathrm{GM4^+} \oplus \mathrm{GM5^-}$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{B1_g} \oplus \mathrm{E1_u}$
N191.12.33 $\mathrm{GM4^+} \oplus \mathrm{GM6^+}$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{B1_g} \oplus \mathrm{E1_g}$
N191.12.34 $\mathrm{GM4^+} \oplus \mathrm{GM6^-}$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{B1_g} \oplus \mathrm{E2_u}$
N191.12.35 $\mathrm{GM4^+} \oplus \mathrm{A5^+}$	$\surd$	1	1	$\times$	-	-
N191.12.36 $\mathrm{GM4^+} \oplus \mathrm{A6^+}$	$\surd$	1	1	$\times$	-	-
N191.12.37 $\mathrm{GM4^-} \oplus \mathrm{GM5^+}$	$\surd$	2	2	$\surd$	$\bar{6}2m$	$\mathrm{E'}$
N191.12.38 $\mathrm{GM4^-} \oplus \mathrm{GM5^-}$	$\surd$	0	0	$\surd$	-	-
N191.12.39 $\mathrm{GM4^-} \oplus \mathrm{GM6^+}$	$\surd$	2	2	$\surd$	$\bar{6}2m$	$\mathrm{E''}$
N191.12.40 $\mathrm{GM4^-} \oplus \mathrm{GM6^-}$	$\surd$	0	0	$\surd$	-	-
N191.12.41 $\mathrm{GM4^-} \oplus \mathrm{A5^+}$	$\surd$	1	0	$\times$	-	-
N191.12.42 $\mathrm{GM4^-} \oplus \mathrm{A6^+}$	$\surd$	1	0	$\times$	-	-
N191.12.43 $\mathrm{A1^+} \oplus \mathrm{GM5^+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{E2_g}$
N191.12.44 $\mathrm{A1^+} \oplus \mathrm{GM5^-}$	$\surd$	0	0	$\surd$	-	-
N191.12.45 $\mathrm{A1^+} \oplus \mathrm{GM6^+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{E1_g}$
N191.12.46 $\mathrm{A1^+} \oplus \mathrm{GM6^-}$	$\surd$	0	0	$\surd$	-	-
N191.12.47 $\mathrm{A1^+} \oplus \mathrm{A5^+}$	$\surd$	0	0	$\surd$	-	-
N191.12.48 $\mathrm{A1^+} \oplus \mathrm{A5^-}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{E2_u}$
N191.12.49 $\mathrm{A1^+} \oplus \mathrm{A6^+}$	$\surd$	0	0	$\surd$	-	-
N191.12.50 $\mathrm{A1^+} \oplus \mathrm{A6^-}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{E1_u}$
N191.12.51 $\mathrm{A1^-} \oplus \mathrm{GM5^+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{E2_g}$
N191.12.52 $\mathrm{A1^-} \oplus \mathrm{GM5^-}$	$\surd$	0	0	$\surd$	-	-
N191.12.53 $\mathrm{A1^-} \oplus \mathrm{GM6^+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{E1_g}$
N191.12.54 $\mathrm{A1^-} \oplus \mathrm{GM6^-}$	$\surd$	0	0	$\surd$	-	-
N191.12.55 $\mathrm{A1^-} \oplus \mathrm{A5^+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{E2_u}$
N191.12.56 $\mathrm{A1^-} \oplus \mathrm{A5^-}$	$\surd$	0	0	$\surd$	-	-
N191.12.57 $\mathrm{A1^-} \oplus \mathrm{A6^+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{E1_u}$
N191.12.58 $\mathrm{A1^-} \oplus \mathrm{A6^-}$	$\surd$	0	0	$\surd$	-	-
N191.12.59 $\mathrm{A3^+} \oplus \mathrm{GM5^+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{E2_g}$
N191.12.60 $\mathrm{A3^+} \oplus \mathrm{GM5^-}$	$\surd$	0	0	$\surd$	-	-
N191.12.61 $\mathrm{A3^+} \oplus \mathrm{GM6^+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{E1_g}$
N191.12.62 $\mathrm{A3^+} \oplus \mathrm{GM6^-}$	$\surd$	0	0	$\surd$	-	-
N191.12.63 $\mathrm{A3^+} \oplus \mathrm{A5^+}$	$\surd$	0	0	$\surd$	-	-
N191.12.64 $\mathrm{A3^+} \oplus \mathrm{A5^-}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{E1_u}$
N191.12.65 $\mathrm{A3^+} \oplus \mathrm{A6^+}$	$\surd$	0	0	$\surd$	-	-
N191.12.66 $\mathrm{A3^+} \oplus \mathrm{A6^-}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{E2_u}$

Non-coplanar SSGs with parent space group $P6/mmm$ (No. 191) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N191.12.67 A3$^-$ ⊕ GM5$^+$	√	2	2	√	$6/mmm$	$\mathrm{E2_g}$
N191.12.68 A3$^-$ ⊕ GM5$^-$	√	0	0	√	-	-
N191.12.69 A3$^-$ ⊕ GM6$^+$	√	2	2	√	$6/mmm$	$\mathrm{E1_g}$
N191.12.70 A3$^-$ ⊕ GM6$^-$	√	0	0	√	-	-
N191.12.71 A3$^-$ ⊕ A5$^+$	√	2	2	√	$6/mmm$	$\mathrm{E1_u}$
N191.12.72 A3$^-$ ⊕ A5$^-$	√	0	0	√	-	-
N191.12.73 A3$^-$ ⊕ A6$^+$	√	2	2	√	$6/mmm$	$\mathrm{E2_u}$
N191.12.74 A3$^-$ ⊕ A6$^-$	√	0	0	√	-	-
N191.13.1 GM1$^-$ ⊕ K1	√	1	1	√	$6/mmm$	$\mathrm{B2_u}$
N191.13.2 GM1$^-$ ⊕ K2	√	1	1	√	$6/mmm$	$\mathrm{B2_u}$
N191.13.3 GM1$^-$ ⊕ K3	√	1	1	√	$6/mmm$	$\mathrm{B2_u}$
N191.13.4 GM1$^-$ ⊕ K4	√	1	1	√	$6/mmm$	$\mathrm{B2_u}$
N191.13.5 GM1$^-$ ⊕ H1	√	1	1	×	-	-
N191.13.6 GM1$^-$ ⊕ H2	√	1	1	×	-	-
N191.13.7 GM2$^+$ ⊕ K1	√	1	1	√	$\bar{6}m2$	$\mathrm{A1''}$
N191.13.8 GM2$^+$ ⊕ K2	√	1	1	√	$\bar{6}m2$	$\mathrm{A1''}$
N191.13.9 GM2$^+$ ⊕ K3	√	1	1	√	$\bar{6}m2$	$\mathrm{A1''}$
N191.13.10 GM2$^+$ ⊕ K4	√	1	1	√	$\bar{6}m2$	$\mathrm{A1''}$
N191.13.11 GM2$^+$ ⊕ H1	√	1	1	×	-	-
N191.13.12 GM2$^+$ ⊕ H2	√	1	1	×	-	-
N191.13.13 GM2$^-$ ⊕ K1	√	1	1	√	$6/mmm$	$\mathrm{B2_u}$
N191.13.14 GM2$^-$ ⊕ K2	√	1	1	√	$6/mmm$	$\mathrm{B2_u}$
N191.13.15 GM2$^-$ ⊕ K3	√	1	1	√	$6/mmm$	$\mathrm{B2_u}$
N191.13.16 GM2$^-$ ⊕ K4	√	1	1	√	$6/mmm$	$\mathrm{B2_u}$
N191.13.17 GM2$^-$ ⊕ H1	√	1	1	×	-	-
N191.13.18 GM2$^-$ ⊕ H2	√	1	1	×	-	-
N191.13.19 GM3$^+$ ⊕ K1	√	1	1	√	622	B2
N191.13.20 GM3$^+$ ⊕ K2	√	1	1	√	622	B2
N191.13.21 GM3$^+$ ⊕ K3	√	1	1	√	622	B2
N191.13.22 GM3$^+$ ⊕ K4	√	1	1	√	622	B2
N191.13.23 GM3$^+$ ⊕ H1	√	1	1	×	-	-
N191.13.24 GM3$^+$ ⊕ H2	√	1	1	×	-	-
N191.13.25 GM3$^-$ ⊕ K1	√	1	1	√	$6/mmm$	$\mathrm{B2_u}$
N191.13.26 GM3$^-$ ⊕ K2	√	1	1	√	$6/mmm$	$\mathrm{B2_u}$
N191.13.27 GM3$^-$ ⊕ K3	√	1	1	√	$6/mmm$	$\mathrm{B2_u}$
N191.13.28 GM3$^-$ ⊕ K4	√	1	1	√	$6/mmm$	$\mathrm{B2_u}$
N191.13.29 GM3$^-$ ⊕ H1	√	1	1	×	-	-
N191.13.30 GM3$^-$ ⊕ H2	√	1	1	×	-	-
N191.13.31 GM4$^+$ ⊕ K1	√	1	1	√	$6mm$	B2
N191.13.32 GM4$^+$ ⊕ K2	√	1	1	√	$6mm$	B2
N191.13.33 GM4$^+$ ⊕ K3	√	1	1	√	$6mm$	B2
N191.13.34 GM4$^+$ ⊕ K4	√	1	1	√	$6mm$	B2
N191.13.35 GM4$^+$ ⊕ H1	√	1	1	×	-	-
N191.13.36 GM4$^+$ ⊕ H2	√	1	1	×	-	-
N191.13.37 GM4$^-$ ⊕ K1	√	1	1	√	$6/mmm$	$\mathrm{B2_u}$
N191.13.38 GM4$^-$ ⊕ K2	√	1	1	√	$6/mmm$	$\mathrm{B2_u}$

Non-coplanar SSGs with parent space group $P6/mmm$ (No. 191) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N191.13.39 GM4$^-$ ⊕ K3	√	1	1	√	$6/mmm$	B2$_\mathrm{u}$
N191.13.40 GM4$^-$ ⊕ K4	√	1	1	√	$6/mmm$	B2$_\mathrm{u}$
N191.13.41 GM4$^-$ ⊕ H1	√	1	1	×	-	-
N191.13.42 GM4$^-$ ⊕ H2	√	1	1	×	-	-
N191.13.43 A1$^+$ ⊕ K1	√	1	1	√	$6/mmm$	B2$_\mathrm{u}$
N191.13.44 A1$^+$ ⊕ K2	√	1	1	√	$6/mmm$	B2$_\mathrm{u}$
N191.13.45 A1$^+$ ⊕ K3	√	1	1	√	$6/mmm$	B2$_\mathrm{u}$
N191.13.46 A1$^+$ ⊕ K4	√	1	1	√	$6/mmm$	B2$_\mathrm{u}$
N191.13.47 A1$^+$ ⊕ H1	√	1	1	√	$6/mmm$	B2$_\mathrm{u}$
N191.13.48 A1$^+$ ⊕ H3	√	1	1	√	$6/mmm$	B2$_\mathrm{u}$
N191.13.49 A1$^+$ ⊕ H2	√	1	1	√	$6/mmm$	B2$_\mathrm{u}$
N191.13.50 A1$^+$ ⊕ H4	√	1	1	√	$6/mmm$	B2$_\mathrm{u}$
N191.13.51 A1$^-$ ⊕ K1	√	1	1	√	$6/mmm$	B2$_\mathrm{u}$
N191.13.52 A1$^-$ ⊕ K2	√	1	1	√	$6/mmm$	B2$_\mathrm{u}$
N191.13.53 A1$^-$ ⊕ K3	√	1	1	√	$6/mmm$	B2$_\mathrm{u}$
N191.13.54 A1$^-$ ⊕ K4	√	1	1	√	$6/mmm$	B2$_\mathrm{u}$
N191.13.55 A1$^-$ ⊕ H1	√	1	1	√	$6/mmm$	B2$_\mathrm{u}$
N191.13.56 A1$^-$ ⊕ H3	√	1	1	√	$6/mmm$	B2$_\mathrm{u}$
N191.13.57 A1$^-$ ⊕ H2	√	1	1	√	$6/mmm$	B2$_\mathrm{u}$
N191.13.58 A1$^-$ ⊕ H4	√	1	1	√	$6/mmm$	B2$_\mathrm{u}$
N191.13.59 A3$^+$ ⊕ K1	√	1	1	√	$6/mmm$	B2$_\mathrm{u}$
N191.13.60 A3$^+$ ⊕ K2	√	1	1	√	$6/mmm$	B2$_\mathrm{u}$
N191.13.61 A3$^+$ ⊕ K3	√	1	1	√	$6/mmm$	B2$_\mathrm{u}$
N191.13.62 A3$^+$ ⊕ K4	√	1	1	√	$6/mmm$	B2$_\mathrm{u}$
N191.13.63 A3$^+$ ⊕ H1	√	1	1	√	$6/mmm$	B2$_\mathrm{u}$
N191.13.64 A3$^+$ ⊕ H3	√	1	1	√	$6/mmm$	B2$_\mathrm{u}$
N191.13.65 A3$^+$ ⊕ H2	√	1	1	√	$6/mmm$	B2$_\mathrm{u}$
N191.13.66 A3$^+$ ⊕ H4	√	1	1	√	$6/mmm$	B2$_\mathrm{u}$
N191.13.67 A3$^-$ ⊕ K1	√	1	1	√	$6/mmm$	B2$_\mathrm{u}$
N191.13.68 A3$^-$ ⊕ K2	√	1	1	√	$6/mmm$	B2$_\mathrm{u}$
N191.13.69 A3$^-$ ⊕ K3	√	1	1	√	$6/mmm$	B2$_\mathrm{u}$
N191.13.70 A3$^-$ ⊕ K4	√	1	1	√	$6/mmm$	B2$_\mathrm{u}$
N191.13.71 A3$^-$ ⊕ H1	√	1	1	√	$6/mmm$	B2$_\mathrm{u}$
N191.13.72 A3$^-$ ⊕ H3	√	1	1	√	$6/mmm$	B2$_\mathrm{u}$
N191.13.73 A3$^-$ ⊕ H2	√	1	1	√	$6/mmm$	B2$_\mathrm{u}$
N191.13.74 A3$^-$ ⊕ H4	√	1	1	√	$6/mmm$	B2$_\mathrm{u}$
N191.14.1 GM1$^-$ ⊕ DT1	√	1	1	√	$6/mmm$	A2$_\mathrm{u}$
N191.14.2 GM1$^-$ ⊕ DT2	√	1	1	√	$6/mmm$	A2$_\mathrm{u}$
N191.14.3 GM1$^-$ ⊕ DT3	√	1	1	√	$6/mmm$	A2$_\mathrm{u}$
N191.14.4 GM1$^-$ ⊕ DT4	√	1	1	√	$6/mmm$	A2$_\mathrm{u}$
N191.14.5 GM2$^+$ ⊕ DT1	√	1	1	√	622	A2
N191.14.6 GM2$^+$ ⊕ DT2	√	1	1	√	622	A2
N191.14.7 GM2$^+$ ⊕ DT3	√	1	1	√	622	A2
N191.14.8 GM2$^+$ ⊕ DT4	√	1	1	√	622	A2
N191.14.9 GM2$^-$ ⊕ DT1	√	1	1	√	$6/mmm$	A2$_\mathrm{u}$
N191.14.10 GM2$^-$ ⊕ DT2	√	1	1	√	$6/mmm$	A2$_\mathrm{u}$

Non-coplanar SSGs with parent space group $P6/mmm$ (No. 191) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N191.14.11 $\mathrm{GM2}^- \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N191.14.12 $\mathrm{GM2}^- \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N191.14.13 $\mathrm{GM3}^+ \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	$\bar{6}m2$	$\mathrm{A2''}$
N191.14.14 $\mathrm{GM3}^+ \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	$\bar{6}m2$	$\mathrm{A2''}$
N191.14.15 $\mathrm{GM3}^+ \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	$\bar{6}m2$	$\mathrm{A2''}$
N191.14.16 $\mathrm{GM3}^+ \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	$\bar{6}m2$	$\mathrm{A2''}$
N191.14.17 $\mathrm{GM3}^- \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N191.14.18 $\mathrm{GM3}^- \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N191.14.19 $\mathrm{GM3}^- \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N191.14.20 $\mathrm{GM3}^- \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N191.14.21 $\mathrm{GM4}^+ \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	$\bar{6}2m$	$\mathrm{A2''}$
N191.14.22 $\mathrm{GM4}^+ \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	$\bar{6}2m$	$\mathrm{A2''}$
N191.14.23 $\mathrm{GM4}^+ \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	$\bar{6}2m$	$\mathrm{A2''}$
N191.14.24 $\mathrm{GM4}^+ \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	$\bar{6}2m$	$\mathrm{A2''}$
N191.14.25 $\mathrm{GM4}^- \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N191.14.26 $\mathrm{GM4}^- \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N191.14.27 $\mathrm{GM4}^- \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N191.14.28 $\mathrm{GM4}^- \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N191.14.29 $\mathrm{A1}^+ \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N191.14.30 $\mathrm{A1}^+ \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N191.14.31 $\mathrm{A1}^+ \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N191.14.32 $\mathrm{A1}^+ \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N191.14.33 $\mathrm{A1}^- \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N191.14.34 $\mathrm{A1}^- \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N191.14.35 $\mathrm{A1}^- \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N191.14.36 $\mathrm{A1}^- \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N191.14.37 $\mathrm{A3}^+ \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N191.14.38 $\mathrm{A3}^+ \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N191.14.39 $\mathrm{A3}^+ \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N191.14.40 $\mathrm{A3}^+ \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N191.14.41 $\mathrm{A3}^- \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N191.14.42 $\mathrm{A3}^- \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N191.14.43 $\mathrm{A3}^- \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N191.14.44 $\mathrm{A3}^- \oplus \mathrm{DT4}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N191.16.1 $\mathrm{M1}^+$	$\times$	-	-	-	-	-
N191.16.2 $\mathrm{M1}^-$	$\times$	-	-	-	-	-
N191.16.3 $\mathrm{M2}^+$	$\times$	-	-	-	-	-
N191.16.4 $\mathrm{M2}^-$	$\times$	-	-	-	-	-
N191.16.5 $\mathrm{M3}^+$	$\times$	-	-	-	-	-
N191.16.6 $\mathrm{M3}^-$	$\times$	-	-	-	-	-
N191.16.7 $\mathrm{M4}^+$	$\times$	-	-	-	-	-
N191.16.8 $\mathrm{M4}^-$	$\times$	-	-	-	-	-
N191.16.9 $\mathrm{L1}^+$	$\times$	-	-	-	-	-
N191.16.10 $\mathrm{L1}^-$	$\times$	-	-	-	-	-
N191.16.11 $\mathrm{L3}^+$	$\times$	-	-	-	-	-
N191.16.12 $\mathrm{L3}^-$	$\times$	-	-	-	-	-

Collinear SSGs with parent space group $P6/mcc$ (No. 192)(continued)

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation

TABLE S574: Collinear SSGs with parent space group $P6/mcc$ (No. 192).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L192.1.1 $\mathrm{GM1}^{+}$	1	$6/mmm$	$\mathrm{A1_g}$
L192.2.1 $\mathrm{GM1}^{-}$	0	-	-
L192.2.2 $\mathrm{GM2}^{+}$	1	$6/mmm$	$\mathrm{A2_g}$
L192.2.3 $\mathrm{GM2}^{-}$	0	-	-
L192.2.4 $\mathrm{GM3}^{+}$	1	$6/mmm$	$\mathrm{B2_g}$
L192.2.5 $\mathrm{GM3}^{-}$	0	-	-
L192.2.6 $\mathrm{GM4}^{+}$	1	$6/mmm$	$\mathrm{B1_g}$
L192.2.7 $\mathrm{GM4}^{-}$	0	-	-

TABLE S575: Coplanar SSGs with parent space group $P6/mcc$ (No. 192).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P192.1.1 $\mathrm{GM1}^{+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}$
P192.2.1 $\mathrm{GM1}^{-}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}$
P192.2.2 $\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_g}$
P192.2.3 $\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_u}$
P192.2.4 $\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_g}$
P192.2.5 $\mathrm{GM3}^{-}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_u}$
P192.2.6 $\mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}$
P192.2.7 $\mathrm{GM4}^{-}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}$
P192.3.1 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}$	$\surd$	0	0	$\surd$	-	-
P192.3.2 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A2_g}\oplus\mathrm{A2_u}$
P192.3.3 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
P192.3.4 $\mathrm{GM1}^{-}\oplus\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{B2_g}\oplus\mathrm{B2_u}$
P192.3.5 $\mathrm{GM1}^{-}\oplus\mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
P192.3.6 $\mathrm{GM1}^{-}\oplus\mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_u}$
P192.3.7 $\mathrm{GM1}^{-}\oplus\mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
P192.3.8 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A2_g}\oplus\mathrm{A2_g}$
P192.3.9 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A1_u}\oplus\mathrm{A2_g}$
P192.3.10 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A2_g}\oplus\mathrm{B2_g}$
P192.3.11 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{-}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A2_g}\oplus\mathrm{B1_u}$
P192.3.12 $\mathrm{GM2}^{+}\oplus\mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A2_g}\oplus\mathrm{B1_g}$
P192.3.13 $\mathrm{GM2}^{+}\oplus\mathrm{GM4}^{-}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A2_g}\oplus\mathrm{B2_u}$
P192.3.14 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
P192.3.15 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{B2_g}\oplus\mathrm{B1_u}$
P192.3.16 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
P192.3.17 $\mathrm{GM2}^{-}\oplus\mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{B2_u}\oplus\mathrm{B1_g}$
P192.3.18 $\mathrm{GM2}^{-}\oplus\mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
P192.3.19 $\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{B2_g}\oplus\mathrm{B2_g}$
P192.3.20 $\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{-}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A1_u}\oplus\mathrm{B2_g}$
P192.3.21 $\mathrm{GM3}^{+}\oplus\mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{B2_g}\oplus\mathrm{B1_g}$
P192.3.22 $\mathrm{GM3}^{+}\oplus\mathrm{GM4}^{-}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A2_u}\oplus\mathrm{B2_g}$

Coplanar SSGs with parent space group $P6/mcc$ (No. 192) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P192.3.23 $\mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
P192.3.24 $\mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{B1_g}$
P192.3.25 $\mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
P192.3.26 $\mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
P192.3.27 $\mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g}$
P192.3.28 $\mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
P192.6.1 $\mathrm{GM5}^+$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{E2_g}$
P192.6.2 $\mathrm{GM5}^-$	$\surd$	0	0	$\surd$	-	-
P192.6.3 $\mathrm{GM6}^+$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{E1_g}$
P192.6.4 $\mathrm{GM6}^-$	$\surd$	0	0	$\surd$	-	-
P192.6.5 A5	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
P192.6.6 A6	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
P192.7.1 K1	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{B2_u}$
P192.7.2 K2	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{B2_u}$
P192.7.3 K3	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{B2_u}$
P192.7.4 K4	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{B2_u}$
P192.8.1 DT1	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
P192.8.2 DT3	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$

TABLE S576: Non-coplanar SSGs with parent space group $P6/mcc$ (No. 192).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N192.1.1 $\mathrm{GM1}^+$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A1_g}$
N192.2.1 $\mathrm{GM1}^-$	$\surd$	2	2	$\surd$	622	$\mathrm{A1} \oplus \mathrm{A1}$
N192.2.2 $\mathrm{GM2}^+$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A2_g}$
N192.2.3 $\mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$6mm$	$\mathrm{A1} \oplus \mathrm{A1}$
N192.2.4 $\mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{B2_g}$
N192.2.5 $\mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$\bar{6}2m$	$\mathrm{A1}' \oplus \mathrm{A1}'$
N192.2.6 $\mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{B1_g}$
N192.2.7 $\mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$\bar{6}m2$	$\mathrm{A1}' \oplus \mathrm{A1}'$
N192.3.1 $\mathrm{GM1}^- \oplus \mathrm{GM1}^-$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{A1_u}$
N192.3.2 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$6mm$	$\mathrm{A1} \oplus \mathrm{A2}$
N192.3.3 $\mathrm{GM1}^- \oplus \mathrm{GM2}^-$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{A2_u}$
N192.3.4 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$\bar{6}2m$	$\mathrm{A1}' \oplus \mathrm{A1}''$
N192.3.5 $\mathrm{GM1}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{B2_u}$
N192.3.6 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$\bar{6}m2$	$\mathrm{A1}' \oplus \mathrm{A2}'$
N192.3.7 $\mathrm{GM1}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{B1_u}$
N192.3.8 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
N192.3.9 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	2	2	$\surd$	622	$\mathrm{A1} \oplus \mathrm{A2}$
N192.3.10 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g} \oplus \mathrm{B2_g}$
N192.3.11 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$\bar{6}m2$	$\mathrm{A1}' \oplus \mathrm{A1}''$
N192.3.12 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g} \oplus \mathrm{B1_g}$
N192.3.13 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$\bar{6}2m$	$\mathrm{A1}' \oplus \mathrm{A2}'$
N192.3.14 $\mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N192.3.15 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$\bar{6}m2$	$\mathrm{A1}' \oplus \mathrm{A2}''$
N192.3.16 $\mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$

Non-coplanar SSGs with parent space group $P6/mcc$ (No. 192) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N192.3.17 $\mathrm{GM2}^{-}\oplus\mathrm{GM4}^{+}$	√	2	2	√	$\bar{6}2m$	$\mathrm{A1}'\oplus\mathrm{A2}''$
N192.3.18 $\mathrm{GM2}^{-}\oplus\mathrm{GM4}^{-}$	√	3	3	√	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_u}\oplus\mathrm{B1_u}$
N192.3.19 $\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{+}$	√	3	3	√	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_g}\oplus\mathrm{B2_g}$
N192.3.20 $\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{-}$	√	2	2	√	622	$\mathrm{A1}\oplus\mathrm{B2}$
N192.3.21 $\mathrm{GM3}^{+}\oplus\mathrm{GM4}^{+}$	√	3	3	√	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_g}\oplus\mathrm{B1_g}$
N192.3.22 $\mathrm{GM3}^{+}\oplus\mathrm{GM4}^{-}$	√	2	2	√	$6mm$	$\mathrm{A1}\oplus\mathrm{B1}$
N192.3.23 $\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}$	√	3	3	√	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_u}\oplus\mathrm{B2_u}$
N192.3.24 $\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{+}$	√	2	2	√	$6mm$	$\mathrm{A1}\oplus\mathrm{B2}$
N192.3.25 $\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{-}$	√	3	3	√	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_u}\oplus\mathrm{B1_u}$
N192.3.26 $\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{+}$	√	3	3	√	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}\oplus\mathrm{B1_g}$
N192.3.27 $\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{-}$	√	2	2	√	622	$\mathrm{A1}\oplus\mathrm{B1}$
N192.3.28 $\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}$	√	3	3	√	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}\oplus\mathrm{B1_u}$
N192.6.1 $\mathrm{GM5}^{+}$	√	3	3	√	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{E2_g}$
N192.6.2 $\mathrm{GM5}^{-}$	√	3	3	√	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{E2_u}$
N192.6.3 $\mathrm{GM6}^{+}$	√	3	3	√	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{E1_g}$
N192.6.4 $\mathrm{GM6}^{-}$	√	3	3	√	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{E1_u}$
N192.6.5 A5	√	1	1	√	$6mm$	A1
N192.6.6 A6	√	1	1	√	$6mm$	A1
N192.7.1 K1	√	1	1	√	$\bar{6}2m$	$\mathrm{A1}'$
N192.7.2 K2	√	1	1	√	$\bar{6}2m$	$\mathrm{A1}'$
N192.7.3 K3	√	1	1	√	$\bar{6}2m$	$\mathrm{A1}'$
N192.7.4 K4	√	1	1	√	$\bar{6}2m$	$\mathrm{A1}'$
N192.8.1 DT1	√	1	1	√	$6mm$	A1
N192.8.2 DT3	√	1	1	√	$6mm$	A1
N192.9.1 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}$	√	0	0	√	-	-
N192.9.2 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}$	√	3	3	√	$6/mmm$	$\mathrm{A2_g}\oplus\mathrm{A2_u}\oplus\mathrm{A2_u}$
N192.9.3 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{-}$	√	0	0	√	-	-
N192.9.4 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}\oplus\mathrm{GM3}^{+}$	√	3	3	√	$6/mmm$	$\mathrm{B2_g}\oplus\mathrm{B2_u}\oplus\mathrm{B2_u}$
N192.9.5 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}\oplus\mathrm{GM3}^{-}$	√	0	0	√	-	-
N192.9.6 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}\oplus\mathrm{GM4}^{+}$	√	3	3	√	$6/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_u}\oplus\mathrm{B1_u}$
N192.9.7 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}\oplus\mathrm{GM4}^{-}$	√	0	0	√	-	-
N192.9.8 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}$	√	2	2	√	622	$\mathrm{A2}\oplus\mathrm{A2}$
N192.9.9 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}$	√	3	3	√	$6/mmm$	$\mathrm{A1_u}\oplus\mathrm{A2_g}\oplus\mathrm{A2_u}$
N192.9.10 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{+}$	√	2	2	√	$\bar{6}m2$	$\mathrm{A1}''\oplus\mathrm{A2}''$
N192.9.11 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{-}$	√	3	3	√	$6/mmm$	$\mathrm{A2_g}\oplus\mathrm{A2_u}\oplus\mathrm{B1_u}$
N192.9.12 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}\oplus\mathrm{GM4}^{+}$	√	2	2	√	$\bar{6}2m$	$\mathrm{A2}''\oplus\mathrm{A2}'$
N192.9.13 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}\oplus\mathrm{GM4}^{-}$	√	3	3	√	$6/mmm$	$\mathrm{A2_g}\oplus\mathrm{A2_u}\oplus\mathrm{B2_u}$
N192.9.14 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}$	√	0	0	√	-	-
N192.9.15 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{+}$	√	3	3	√	$6/mmm$	$\mathrm{B2_g}\oplus\mathrm{B2_u}\oplus\mathrm{B1_u}$
N192.9.16 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}$	√	0	0	√	-	-
N192.9.17 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{GM4}^{+}$	√	3	3	√	$6/mmm$	$\mathrm{B2_u}\oplus\mathrm{B1_g}\oplus\mathrm{B1_u}$
N192.9.18 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{GM4}^{-}$	√	0	0	√	-	-
N192.9.19 $\mathrm{GM1}^{-}\oplus\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{+}$	√	2	2	√	622	$\mathrm{B2}\oplus\mathrm{B2}$
N192.9.20 $\mathrm{GM1}^{-}\oplus\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{-}$	√	3	3	√	$6/mmm$	$\mathrm{A1_u}\oplus\mathrm{B2_g}\oplus\mathrm{B2_u}$
N192.9.21 $\mathrm{GM1}^{-}\oplus\mathrm{GM3}^{+}\oplus\mathrm{GM4}^{+}$	√	2	2	√	$6mm$	$\mathrm{B2}\oplus\mathrm{B1}$
N192.9.22 $\mathrm{GM1}^{-}\oplus\mathrm{GM3}^{+}\oplus\mathrm{GM4}^{-}$	√	3	3	√	$6/mmm$	$\mathrm{A2_u}\oplus\mathrm{B2_g}\oplus\mathrm{B2_u}$

Non-coplanar SSGs with parent space group $P6/mcc$ (No. 192) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N192.9.23 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N192.9.24 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N192.9.25 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N192.9.26 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	622	$\mathrm{B1} \oplus \mathrm{B1}$
N192.9.27 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N192.9.28 $\mathrm{GM1}^- \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N192.9.29 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
N192.9.30 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$6mm$	$\mathrm{A2} \oplus \mathrm{A2}$
N192.9.31 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{B2_g}$
N192.9.32 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$\bar{6}2m$	$\mathrm{A2'} \oplus \mathrm{A2'}$
N192.9.33 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{B1_g}$
N192.9.34 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$\bar{6}m2$	$\mathrm{A1''} \oplus \mathrm{A1''}$
N192.9.35 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A2_g}$
N192.9.36 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$\bar{6}2m$	$\mathrm{A1''} \oplus \mathrm{A2'}$
N192.9.37 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{B1_u}$
N192.9.38 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$\bar{6}m2$	$\mathrm{A1''} \oplus \mathrm{A2'}$
N192.9.39 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{B2_u}$
N192.9.40 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N192.9.41 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$6mm$	$\mathrm{A2} \oplus \mathrm{B1}$
N192.9.42 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B1_g}$
N192.9.43 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	622	$\mathrm{A2} \oplus \mathrm{B2}$
N192.9.44 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N192.9.45 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	622	$\mathrm{A2} \oplus \mathrm{B1}$
N192.9.46 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_u} \oplus \mathrm{B1_u}$
N192.9.47 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N192.9.48 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$6mm$	$\mathrm{A2} \oplus \mathrm{B2}$
N192.9.49 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N192.9.50 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
N192.9.51 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{B2_g} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N192.9.52 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N192.9.53 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{B2_u} \oplus \mathrm{B2_u} \oplus \mathrm{B1_g}$
N192.9.54 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N192.9.55 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$6mm$	$\mathrm{B1} \oplus \mathrm{B1}$
N192.9.56 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B1_u}$
N192.9.57 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	622	$\mathrm{B2} \oplus \mathrm{B1}$
N192.9.58 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g} \oplus \mathrm{B1_u}$
N192.9.59 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N192.9.60 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_u} \oplus \mathrm{B1_g}$
N192.9.61 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N192.9.62 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$6mm$	$\mathrm{B2} \oplus \mathrm{B2}$
N192.9.63 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B1_g}$
N192.9.64 $\mathrm{GM2}^- \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N192.9.65 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N192.9.66 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$\bar{6}2m$	$\mathrm{A1''} \oplus \mathrm{A1''}$
N192.9.67 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B1_g}$
N192.9.68 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$\bar{6}m2$	$\mathrm{A2''} \oplus \mathrm{A2''}$

Non-coplanar SSGs with parent space group $P6/mcc$ (No. 192) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N192.9.69 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	√	3	3	√	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{B2_g}$
N192.9.70 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^+$	√	2	2	√	$\bar{6}m2$	$\mathrm{A2''} \oplus \mathrm{A2'}$
N192.9.71 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	√	3	3	√	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$
N192.9.72 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	√	3	3	√	$6/mmm$	$\mathrm{B2_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N192.9.73 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	√	2	2	√	$\bar{6}2m$	$\mathrm{A1''} \oplus \mathrm{A2''}$
N192.9.74 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	√	3	3	√	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$
N192.9.75 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	√	0	0	√	-	-
N192.9.76 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^+$	√	3	3	√	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u} \oplus \mathrm{B1_g}$
N192.9.77 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	√	0	0	√	-	-
N192.9.78 $\mathrm{GM3}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	√	2	2	√	$\bar{6}2m$	$\mathrm{A2''} \oplus \mathrm{A2''}$
N192.9.79 $\mathrm{GM3}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	√	3	3	√	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u} \oplus \mathrm{B1_g}$
N192.9.80 $\mathrm{GM3}^- \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	√	0	0	√	-	-
N192.9.81 $\mathrm{GM4}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	√	3	3	√	$6/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N192.9.82 $\mathrm{GM4}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	√	2	2	√	$\bar{6}m2$	$\mathrm{A2'} \oplus \mathrm{A2'}$
N192.9.83 $\mathrm{GM4}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	√	3	3	√	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{B1_g}$
N192.9.84 $\mathrm{GM4}^- \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	√	0	0	√	-	-
N192.12.1 $\mathrm{GM1}^- \oplus \mathrm{GM5}^+$	√	2	2	√	$6mm$	E2
N192.12.2 $\mathrm{GM1}^- \oplus \mathrm{GM5}^-$	√	0	0	√	-	-
N192.12.3 $\mathrm{GM1}^- \oplus \mathrm{GM6}^+$	√	2	2	√	$6mm$	E1
N192.12.4 $\mathrm{GM1}^- \oplus \mathrm{GM6}^-$	√	0	0	√	-	-
N192.12.5 $\mathrm{GM1}^- \oplus \mathrm{A5}$	√	1	1	√	$6/mmm$	$\mathrm{A2_u}$
N192.12.6 $\mathrm{GM1}^- \oplus \mathrm{A6}$	√	1	1	√	$6/mmm$	$\mathrm{A2_u}$
N192.12.7 $\mathrm{GM2}^+ \oplus \mathrm{GM5}^+$	√	3	3	√	$6/mmm$	$\mathrm{A2_g} \oplus \mathrm{E2_g}$
N192.12.8 $\mathrm{GM2}^+ \oplus \mathrm{GM5}^-$	√	3	3	√	$6/mmm$	$\mathrm{A2_g} \oplus \mathrm{E2_u}$
N192.12.9 $\mathrm{GM2}^+ \oplus \mathrm{GM6}^+$	√	3	3	√	$6/mmm$	$\mathrm{A2_g} \oplus \mathrm{E1_g}$
N192.12.10 $\mathrm{GM2}^+ \oplus \mathrm{GM6}^-$	√	3	3	√	$6/mmm$	$\mathrm{A2_g} \oplus \mathrm{E1_u}$
N192.12.11 $\mathrm{GM2}^+ \oplus \mathrm{A5}$	√	1	1	√	622	A2
N192.12.12 $\mathrm{GM2}^+ \oplus \mathrm{A6}$	√	1	1	√	622	A2
N192.12.13 $\mathrm{GM2}^- \oplus \mathrm{GM5}^+$	√	2	2	√	622	E2
N192.12.14 $\mathrm{GM2}^- \oplus \mathrm{GM5}^-$	√	0	0	√	-	-
N192.12.15 $\mathrm{GM2}^- \oplus \mathrm{GM6}^+$	√	2	2	√	622	E1
N192.12.16 $\mathrm{GM2}^- \oplus \mathrm{GM6}^-$	√	0	0	√	-	-
N192.12.17 $\mathrm{GM2}^- \oplus \mathrm{A5}$	√	1	1	√	$6/mmm$	$\mathrm{A2_u}$
N192.12.18 $\mathrm{GM2}^- \oplus \mathrm{A6}$	√	1	1	√	$6/mmm$	$\mathrm{A2_u}$
N192.12.19 $\mathrm{GM3}^+ \oplus \mathrm{GM5}^+$	√	3	3	√	$6/mmm$	$\mathrm{B2_g} \oplus \mathrm{E2_g}$
N192.12.20 $\mathrm{GM3}^+ \oplus \mathrm{GM5}^-$	√	3	3	√	$6/mmm$	$\mathrm{B2_g} \oplus \mathrm{E1_u}$
N192.12.21 $\mathrm{GM3}^+ \oplus \mathrm{GM6}^+$	√	3	3	√	$6/mmm$	$\mathrm{B2_g} \oplus \mathrm{E1_g}$
N192.12.22 $\mathrm{GM3}^+ \oplus \mathrm{GM6}^-$	√	3	3	√	$6/mmm$	$\mathrm{B2_g} \oplus \mathrm{E2_u}$
N192.12.23 $\mathrm{GM3}^+ \oplus \mathrm{A5}$	√	1	1	√	$\bar{6}m2$	$\mathrm{A2''}$
N192.12.24 $\mathrm{GM3}^+ \oplus \mathrm{A6}$	√	1	1	√	$\bar{6}m2$	$\mathrm{A2''}$
N192.12.25 $\mathrm{GM3}^- \oplus \mathrm{GM5}^+$	√	2	2	√	$\bar{6}m2$	$\mathrm{E'}$
N192.12.26 $\mathrm{GM3}^- \oplus \mathrm{GM5}^-$	√	0	0	√	-	-
N192.12.27 $\mathrm{GM3}^- \oplus \mathrm{GM6}^+$	√	2	2	√	$\bar{6}m2$	$\mathrm{E''}$
N192.12.28 $\mathrm{GM3}^- \oplus \mathrm{GM6}^-$	√	0	0	√	-	-
N192.12.29 $\mathrm{GM3}^- \oplus \mathrm{A5}$	√	1	1	√	$6/mmm$	$\mathrm{A2_u}$
N192.12.30 $\mathrm{GM3}^- \oplus \mathrm{A6}$	√	1	1	√	$6/mmm$	$\mathrm{A2_u}$

Non-coplanar SSGs with parent space group $P6/mcc$ (No. 192) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N192.12.31 $\mathrm{GM4}^{+}\oplus\mathrm{GM5}^{+}$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{B1_g}\oplus\mathrm{E2_g}$
N192.12.32 $\mathrm{GM4}^{+}\oplus\mathrm{GM5}^{-}$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{B1_g}\oplus\mathrm{E1_u}$
N192.12.33 $\mathrm{GM4}^{+}\oplus\mathrm{GM6}^{+}$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{B1_g}\oplus\mathrm{E1_g}$
N192.12.34 $\mathrm{GM4}^{+}\oplus\mathrm{GM6}^{-}$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{B1_g}\oplus\mathrm{E2_u}$
N192.12.35 $\mathrm{GM4}^{+}\oplus\mathrm{A5}$	$\surd$	1	1	$\surd$	$\bar{6}2m$	$\mathrm{A2''}$
N192.12.36 $\mathrm{GM4}^{+}\oplus\mathrm{A6}$	$\surd$	1	1	$\surd$	$\bar{6}2m$	$\mathrm{A2''}$
N192.12.37 $\mathrm{GM4}^{-}\oplus\mathrm{GM5}^{+}$	$\surd$	2	2	$\surd$	$\bar{6}2m$	$\mathrm{E'}$
N192.12.38 $\mathrm{GM4}^{-}\oplus\mathrm{GM5}^{-}$	$\surd$	0	0	$\surd$	-	-
N192.12.39 $\mathrm{GM4}^{-}\oplus\mathrm{GM6}^{+}$	$\surd$	2	2	$\surd$	$\bar{6}2m$	$\mathrm{E''}$
N192.12.40 $\mathrm{GM4}^{-}\oplus\mathrm{GM6}^{-}$	$\surd$	0	0	$\surd$	-	-
N192.12.41 $\mathrm{GM4}^{-}\oplus\mathrm{A5}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N192.12.42 $\mathrm{GM4}^{-}\oplus\mathrm{A6}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N192.13.1 $\mathrm{GM1}^{-}\oplus\mathrm{K1}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{B2_u}$
N192.13.2 $\mathrm{GM1}^{-}\oplus\mathrm{K2}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{B2_u}$
N192.13.3 $\mathrm{GM1}^{-}\oplus\mathrm{K3}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{B2_u}$
N192.13.4 $\mathrm{GM1}^{-}\oplus\mathrm{K4}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{B2_u}$
N192.13.5 $\mathrm{GM2}^{+}\oplus\mathrm{K1}$	$\surd$	1	1	$\surd$	$\bar{6}m2$	$\mathrm{A1''}$
N192.13.6 $\mathrm{GM2}^{+}\oplus\mathrm{K2}$	$\surd$	1	1	$\surd$	$\bar{6}m2$	$\mathrm{A1''}$
N192.13.7 $\mathrm{GM2}^{+}\oplus\mathrm{K3}$	$\surd$	1	1	$\surd$	$\bar{6}m2$	$\mathrm{A1''}$
N192.13.8 $\mathrm{GM2}^{+}\oplus\mathrm{K4}$	$\surd$	1	1	$\surd$	$\bar{6}m2$	$\mathrm{A1''}$
N192.13.9 $\mathrm{GM2}^{-}\oplus\mathrm{K1}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{B2_u}$
N192.13.10 $\mathrm{GM2}^{-}\oplus\mathrm{K2}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{B2_u}$
N192.13.11 $\mathrm{GM2}^{-}\oplus\mathrm{K3}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{B2_u}$
N192.13.12 $\mathrm{GM2}^{-}\oplus\mathrm{K4}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{B2_u}$
N192.13.13 $\mathrm{GM3}^{+}\oplus\mathrm{K1}$	$\surd$	1	1	$\surd$	622	B2
N192.13.14 $\mathrm{GM3}^{+}\oplus\mathrm{K2}$	$\surd$	1	1	$\surd$	622	B2
N192.13.15 $\mathrm{GM3}^{+}\oplus\mathrm{K3}$	$\surd$	1	1	$\surd$	622	B2
N192.13.16 $\mathrm{GM3}^{+}\oplus\mathrm{K4}$	$\surd$	1	1	$\surd$	622	B2
N192.13.17 $\mathrm{GM3}^{-}\oplus\mathrm{K1}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{B2_u}$
N192.13.18 $\mathrm{GM3}^{-}\oplus\mathrm{K2}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{B2_u}$
N192.13.19 $\mathrm{GM3}^{-}\oplus\mathrm{K3}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{B2_u}$
N192.13.20 $\mathrm{GM3}^{-}\oplus\mathrm{K4}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{B2_u}$
N192.13.21 $\mathrm{GM4}^{+}\oplus\mathrm{K1}$	$\surd$	1	1	$\surd$	$6mm$	B2
N192.13.22 $\mathrm{GM4}^{+}\oplus\mathrm{K2}$	$\surd$	1	1	$\surd$	$6mm$	B2
N192.13.23 $\mathrm{GM4}^{+}\oplus\mathrm{K3}$	$\surd$	1	1	$\surd$	$6mm$	B2
N192.13.24 $\mathrm{GM4}^{+}\oplus\mathrm{K4}$	$\surd$	1	1	$\surd$	$6mm$	B2
N192.13.25 $\mathrm{GM4}^{-}\oplus\mathrm{K1}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{B2_u}$
N192.13.26 $\mathrm{GM4}^{-}\oplus\mathrm{K2}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{B2_u}$
N192.13.27 $\mathrm{GM4}^{-}\oplus\mathrm{K3}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{B2_u}$
N192.13.28 $\mathrm{GM4}^{-}\oplus\mathrm{K4}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{B2_u}$
N192.14.1 $\mathrm{GM1}^{-}\oplus\mathrm{DT1}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N192.14.2 $\mathrm{GM1}^{-}\oplus\mathrm{DT3}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N192.14.3 $\mathrm{GM2}^{+}\oplus\mathrm{DT1}$	$\surd$	1	1	$\surd$	622	A2
N192.14.4 $\mathrm{GM2}^{+}\oplus\mathrm{DT3}$	$\surd$	1	1	$\surd$	622	A2
N192.14.5 $\mathrm{GM2}^{-}\oplus\mathrm{DT1}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N192.14.6 $\mathrm{GM2}^{-}\oplus\mathrm{DT3}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$

Non-coplanar SSGs with parent space group $P6/mcc$ (No. 192) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N192.14.7 $\mathrm{GM3}^{+} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	$\bar{6}m2$	$\mathrm{A2}''$
N192.14.8 $\mathrm{GM3}^{+} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	$\bar{6}m2$	$\mathrm{A2}''$
N192.14.9 $\mathrm{GM3}^{-} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N192.14.10 $\mathrm{GM3}^{-} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N192.14.11 $\mathrm{GM4}^{+} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	$\bar{6}2m$	$\mathrm{A2}''$
N192.14.12 $\mathrm{GM4}^{+} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	$\bar{6}2m$	$\mathrm{A2}''$
N192.14.13 $\mathrm{GM4}^{-} \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N192.14.14 $\mathrm{GM4}^{-} \oplus \mathrm{DT3}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N192.16.1 $\mathrm{M1}^{+}$	$\times$	-	-	-	-	-
N192.16.2 $\mathrm{M1}^{-}$	$\times$	-	-	-	-	-
N192.16.3 $\mathrm{M2}^{+}$	$\times$	-	-	-	-	-
N192.16.4 $\mathrm{M2}^{-}$	$\times$	-	-	-	-	-
N192.16.5 $\mathrm{M3}^{+}$	$\times$	-	-	-	-	-
N192.16.6 $\mathrm{M3}^{-}$	$\times$	-	-	-	-	-
N192.16.7 $\mathrm{M4}^{+}$	$\times$	-	-	-	-	-
N192.16.8 $\mathrm{M4}^{-}$	$\times$	-	-	-	-	-

TABLE S577: Collinear SSGs with parent space group $P6_3/mcm$ (No. 193).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L193.1.1 $\mathrm{GM1}^{+}$	1	$6/mmm$	$\mathrm{A1_g}$
L193.2.1 $\mathrm{GM1}^{-}$	0	-	-
L193.2.2 $\mathrm{GM2}^{+}$	1	$6/mmm$	$\mathrm{A2_g}$
L193.2.3 $\mathrm{GM2}^{-}$	0	-	-
L193.2.4 $\mathrm{GM3}^{+}$	1	$6/mmm$	$\mathrm{B2_g}$
L193.2.5 $\mathrm{GM3}^{-}$	0	-	-
L193.2.6 $\mathrm{GM4}^{+}$	1	$6/mmm$	$\mathrm{B1_g}$
L193.2.7 $\mathrm{GM4}^{-}$	0	-	-

TABLE S578: Coplanar SSGs with parent space group $P6_3/mcm$ (No. 193).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P193.1.1 $\mathrm{GM1}^{+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g}$
P193.2.1 $\mathrm{GM1}^{-}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u}$
P193.2.2 $\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g}$
P193.2.3 $\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_u}$
P193.2.4 $\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_g}$
P193.2.5 $\mathrm{GM3}^{-}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_u}$
P193.2.6 $\mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g}$
P193.2.7 $\mathrm{GM4}^{-}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u}$
P193.3.1 $\mathrm{GM1}^{-} \oplus \mathrm{GM1}^{-}$	$\surd$	0	0	$\surd$	-	-
P193.3.2 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u}$
P193.3.3 $\mathrm{GM1}^{-} \oplus \mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
P193.3.4 $\mathrm{GM1}^{-} \oplus \mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_u}$
P193.3.5 $\mathrm{GM1}^{-} \oplus \mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-

Coplanar SSGs with parent space group $P6_3/mcm$ (No. 193) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P193.3.6 $\mathrm{GM1^-} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u}$
P193.3.7 $\mathrm{GM1^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
P193.3.8 $\mathrm{GM2^+} \oplus \mathrm{GM2^+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g}$
P193.3.9 $\mathrm{GM2^+} \oplus \mathrm{GM2^-}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g}$
P193.3.10 $\mathrm{GM2^+} \oplus \mathrm{GM3^+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g}$
P193.3.11 $\mathrm{GM2^+} \oplus \mathrm{GM3^-}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A2_g} \oplus \mathrm{B1_u}$
P193.3.12 $\mathrm{GM2^+} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A2_g} \oplus \mathrm{B1_g}$
P193.3.13 $\mathrm{GM2^+} \oplus \mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_u}$
P193.3.14 $\mathrm{GM2^-} \oplus \mathrm{GM2^-}$	$\surd$	0	0	$\surd$	-	-
P193.3.15 $\mathrm{GM2^-} \oplus \mathrm{GM3^+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{B2_g} \oplus \mathrm{B1_u}$
P193.3.16 $\mathrm{GM2^-} \oplus \mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
P193.3.17 $\mathrm{GM2^-} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{B2_u} \oplus \mathrm{B1_g}$
P193.3.18 $\mathrm{GM2^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
P193.3.19 $\mathrm{GM3^+} \oplus \mathrm{GM3^+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_g}$
P193.3.20 $\mathrm{GM3^+} \oplus \mathrm{GM3^-}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g}$
P193.3.21 $\mathrm{GM3^+} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{B2_g} \oplus \mathrm{B1_g}$
P193.3.22 $\mathrm{GM3^+} \oplus \mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g}$
P193.3.23 $\mathrm{GM3^-} \oplus \mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
P193.3.24 $\mathrm{GM3^-} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{B1_g}$
P193.3.25 $\mathrm{GM3^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
P193.3.26 $\mathrm{GM4^+} \oplus \mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g}$
P193.3.27 $\mathrm{GM4^+} \oplus \mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g}$
P193.3.28 $\mathrm{GM4^-} \oplus \mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
P193.6.1 $\mathrm{GM5^+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{E2_g}$
P193.6.2 $\mathrm{GM5^-}$	$\surd$	0	0	$\surd$	-	-
P193.6.3 $\mathrm{GM6^+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{E1_g}$
P193.6.4 $\mathrm{GM6^-}$	$\surd$	0	0	$\surd$	-	-
P193.6.5 A1	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
P193.6.6 A2	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
P193.7.1 K1	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{B2_u}$
P193.7.2 K2	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{B2_u}$
P193.7.3 K3	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{B2_u}$
P193.7.4 K4	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{B2_u}$
P193.8.1 DT1	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
P193.8.2 DT2	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$

TABLE S579: Non-coplanar SSGs with parent space group $P6_3/mcm$ (No. 193).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N193.1.1 $\mathrm{GM1^+}$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A1_g}$
N193.2.1 $\mathrm{GM1^-}$	$\surd$	2	2	$\surd$	622	$\mathrm{A1} \oplus \mathrm{A1}$
N193.2.2 $\mathrm{GM2^+}$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A2_g}$
N193.2.3 $\mathrm{GM2^-}$	$\surd$	2	2	$\surd$	$6mm$	$\mathrm{A1} \oplus \mathrm{A1}$
N193.2.4 $\mathrm{GM3^+}$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{B2_g}$
N193.2.5 $\mathrm{GM3^-}$	$\surd$	2	2	$\surd$	$\bar{6}2m$	$\mathrm{A1'} \oplus \mathrm{A1'}$
N193.2.6 $\mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{B1_g}$

Non-coplanar SSGs with parent space group $P6_3/mcm$ (No. 193) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N193.2.7 $\mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$\bar{6}m2$	$\mathrm{A1}' \oplus \mathrm{A1}'$
N193.3.1 $\mathrm{GM1}^- \oplus \mathrm{GM1}^-$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{A1_u}$
N193.3.2 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$6mm$	$\mathrm{A1} \oplus \mathrm{A2}$
N193.3.3 $\mathrm{GM1}^- \oplus \mathrm{GM2}^-$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{A2_u}$
N193.3.4 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$\bar{6}2m$	$\mathrm{A1}' \oplus \mathrm{A1}''$
N193.3.5 $\mathrm{GM1}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{B2_u}$
N193.3.6 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$\bar{6}m2$	$\mathrm{A1}' \oplus \mathrm{A2}'$
N193.3.7 $\mathrm{GM1}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{B1_u}$
N193.3.8 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
N193.3.9 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	2	2	$\surd$	622	$\mathrm{A1} \oplus \mathrm{A2}$
N193.3.10 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g} \oplus \mathrm{B2_g}$
N193.3.11 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$\bar{6}m2$	$\mathrm{A1}' \oplus \mathrm{A1}''$
N193.3.12 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_g} \oplus \mathrm{B1_g}$
N193.3.13 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$\bar{6}2m$	$\mathrm{A1}' \oplus \mathrm{A2}'$
N193.3.14 $\mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N193.3.15 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$\bar{6}m2$	$\mathrm{A1}' \oplus \mathrm{A2}''$
N193.3.16 $\mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N193.3.17 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$\bar{6}2m$	$\mathrm{A1}' \oplus \mathrm{A2}''$
N193.3.18 $\mathrm{GM2}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{A2_u} \oplus \mathrm{B1_u}$
N193.3.19 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N193.3.20 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	622	$\mathrm{A1} \oplus \mathrm{B2}$
N193.3.21 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_g} \oplus \mathrm{B1_g}$
N193.3.22 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$6mm$	$\mathrm{A1} \oplus \mathrm{B1}$
N193.3.23 $\mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N193.3.24 $\mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$6mm$	$\mathrm{A1} \oplus \mathrm{B2}$
N193.3.25 $\mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{B2_u} \oplus \mathrm{B1_u}$
N193.3.26 $\mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N193.3.27 $\mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	622	$\mathrm{A1} \oplus \mathrm{B1}$
N193.3.28 $\mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N193.6.1 $\mathrm{GM5}^+$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{E2_g}$
N193.6.2 $\mathrm{GM5}^-$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{E2_u}$
N193.6.3 $\mathrm{GM6}^+$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{E1_g}$
N193.6.4 $\mathrm{GM6}^-$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g} \oplus \mathrm{E1_u}$
N193.6.5 A1	$\surd$	1	1	$\surd$	$6mm$	A1
N193.6.6 A2	$\surd$	1	1	$\surd$	$6mm$	A1
N193.7.1 K1	$\surd$	1	1	$\surd$	$\bar{6}2m$	$\mathrm{A1}'$
N193.7.2 K2	$\surd$	1	1	$\surd$	$\bar{6}2m$	$\mathrm{A1}'$
N193.7.3 K3	$\surd$	1	1	$\surd$	$\bar{6}2m$	$\mathrm{A1}'$
N193.7.4 K4	$\surd$	1	1	$\surd$	$\bar{6}2m$	$\mathrm{A1}'$
N193.8.1 DT1	$\surd$	1	1	$\surd$	$6mm$	A1
N193.8.2 DT2	$\surd$	1	1	$\surd$	$6mm$	A1
N193.9.1 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{GM1}^-$	$\surd$	0	0	$\surd$	-	-
N193.9.2 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{GM2}^+$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N193.9.3 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
N193.9.4 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N193.9.5 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-

Non-coplanar SSGs with parent space group $P6_3/mcm$ (No. 193) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N193.9.6 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N193.9.7 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N193.9.8 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	2	2	$\surd$	622	$\mathrm{A2} \oplus \mathrm{A2}$
N193.9.9 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
N193.9.10 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$\bar{6}m2$	$\mathrm{A1}'' \oplus \mathrm{A2}''$
N193.9.11 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u} \oplus \mathrm{B1_u}$
N193.9.12 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$\bar{6}2m$	$\mathrm{A2}'' \oplus \mathrm{A2}'$
N193.9.13 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_u} \oplus \mathrm{B2_u}$
N193.9.14 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
N193.9.15 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_u} \oplus \mathrm{B1_u}$
N193.9.16 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N193.9.17 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{B2_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N193.9.18 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N193.9.19 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	622	$\mathrm{B2} \oplus \mathrm{B2}$
N193.9.20 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N193.9.21 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$6mm$	$\mathrm{B2} \oplus \mathrm{B1}$
N193.9.22 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g} \oplus \mathrm{B2_u}$
N193.9.23 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N193.9.24 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N193.9.25 $\mathrm{GM1}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N193.9.26 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	622	$\mathrm{B1} \oplus \mathrm{B1}$
N193.9.27 $\mathrm{GM1}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{B1_g} \oplus \mathrm{B1_u}$
N193.9.28 $\mathrm{GM1}^- \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N193.9.29 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
N193.9.30 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$6mm$	$\mathrm{A2} \oplus \mathrm{A2}$
N193.9.31 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{B2_g}$
N193.9.32 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$\bar{6}2m$	$\mathrm{A2}' \oplus \mathrm{A2}'$
N193.9.33 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{B1_g}$
N193.9.34 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$\bar{6}m2$	$\mathrm{A1}'' \oplus \mathrm{A1}''$
N193.9.35 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A2_g}$
N193.9.36 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$\bar{6}2m$	$\mathrm{A1}'' \oplus \mathrm{A2}'$
N193.9.37 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{B1_u}$
N193.9.38 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$\bar{6}m2$	$\mathrm{A1}'' \oplus \mathrm{A2}'$
N193.9.39 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{B2_u}$
N193.9.40 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N193.9.41 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$6mm$	$\mathrm{A2} \oplus \mathrm{B1}$
N193.9.42 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B1_g}$
N193.9.43 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	622	$\mathrm{A2} \oplus \mathrm{B2}$
N193.9.44 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N193.9.45 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	622	$\mathrm{A2} \oplus \mathrm{B1}$
N193.9.46 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_u} \oplus \mathrm{B1_u}$
N193.9.47 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N193.9.48 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$6mm$	$\mathrm{A2} \oplus \mathrm{B2}$
N193.9.49 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N193.9.50 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
N193.9.51 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{B2_g} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$

Non-coplanar SSGs with parent space group $P6_3/mcm$ (No. 193) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N193.9.52 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N193.9.53 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{B2_u} \oplus \mathrm{B2_u} \oplus \mathrm{B1_g}$
N193.9.54 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N193.9.55 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$6mm$	$\mathrm{B1} \oplus \mathrm{B1}$
N193.9.56 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B1_u}$
N193.9.57 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	622	$\mathrm{B2} \oplus \mathrm{B1}$
N193.9.58 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g} \oplus \mathrm{B1_u}$
N193.9.59 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N193.9.60 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_u} \oplus \mathrm{B1_g}$
N193.9.61 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N193.9.62 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$6mm$	$\mathrm{B2} \oplus \mathrm{B2}$
N193.9.63 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B1_g}$
N193.9.64 $\mathrm{GM2}^- \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N193.9.65 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N193.9.66 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$\bar{6}2m$	$\mathrm{A1}'' \oplus \mathrm{A1}''$
N193.9.67 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B1_g}$
N193.9.68 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$\bar{6}m2$	$\mathrm{A2}'' \oplus \mathrm{A2}''$
N193.9.69 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{B2_g}$
N193.9.70 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$\bar{6}m2$	$\mathrm{A2}'' \oplus \mathrm{A2}'$
N193.9.71 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$
N193.9.72 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{B2_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N193.9.73 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$\bar{6}2m$	$\mathrm{A1}'' \oplus \mathrm{A2}''$
N193.9.74 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$
N193.9.75 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N193.9.76 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u} \oplus \mathrm{B1_g}$
N193.9.77 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N193.9.78 $\mathrm{GM3}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$\bar{6}2m$	$\mathrm{A2}'' \oplus \mathrm{A2}''$
N193.9.79 $\mathrm{GM3}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u} \oplus \mathrm{B1_g}$
N193.9.80 $\mathrm{GM3}^- \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N193.9.81 $\mathrm{GM4}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N193.9.82 $\mathrm{GM4}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$\bar{6}m2$	$\mathrm{A2}' \oplus \mathrm{A2}'$
N193.9.83 $\mathrm{GM4}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{B1_g}$
N193.9.84 $\mathrm{GM4}^- \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N193.12.1 $\mathrm{GM1}^- \oplus \mathrm{GM5}^+$	$\surd$	2	2	$\surd$	$6mm$	E2
N193.12.2 $\mathrm{GM1}^- \oplus \mathrm{GM5}^-$	$\surd$	0	0	$\surd$	-	-
N193.12.3 $\mathrm{GM1}^- \oplus \mathrm{GM6}^+$	$\surd$	2	2	$\surd$	$6mm$	E1
N193.12.4 $\mathrm{GM1}^- \oplus \mathrm{GM6}^-$	$\surd$	0	0	$\surd$	-	-
N193.12.5 $\mathrm{GM1}^- \oplus \mathrm{A1}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N193.12.6 $\mathrm{GM1}^- \oplus \mathrm{A2}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N193.12.7 $\mathrm{GM2}^+ \oplus \mathrm{GM5}^+$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g} \oplus \mathrm{E2_g}$
N193.12.8 $\mathrm{GM2}^+ \oplus \mathrm{GM5}^-$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g} \oplus \mathrm{E2_u}$
N193.12.9 $\mathrm{GM2}^+ \oplus \mathrm{GM6}^+$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g} \oplus \mathrm{E1_g}$
N193.12.10 $\mathrm{GM2}^+ \oplus \mathrm{GM6}^-$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g} \oplus \mathrm{E1_u}$
N193.12.11 $\mathrm{GM2}^+ \oplus \mathrm{A1}$	$\surd$	1	1	$\surd$	622	A2
N193.12.12 $\mathrm{GM2}^+ \oplus \mathrm{A2}$	$\surd$	1	1	$\surd$	622	A2
N193.12.13 $\mathrm{GM2}^- \oplus \mathrm{GM5}^+$	$\surd$	2	2	$\surd$	622	E2

Non-coplanar SSGs with parent space group $P6_3/mcm$ (No. 193) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N193.12.14 $\mathrm{GM2}^{-} \oplus \mathrm{GM5}^{-}$	$\surd$	0	0	$\surd$	-	-
N193.12.15 $\mathrm{GM2}^{-} \oplus \mathrm{GM6}^{+}$	$\surd$	2	2	$\surd$	622	E1
N193.12.16 $\mathrm{GM2}^{-} \oplus \mathrm{GM6}^{-}$	$\surd$	0	0	$\surd$	-	-
N193.12.17 $\mathrm{GM2}^{-} \oplus \mathrm{A1}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N193.12.18 $\mathrm{GM2}^{-} \oplus \mathrm{A2}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N193.12.19 $\mathrm{GM3}^{+} \oplus \mathrm{GM5}^{+}$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{B2_g} \oplus \mathrm{E2_g}$
N193.12.20 $\mathrm{GM3}^{+} \oplus \mathrm{GM5}^{-}$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{B2_g} \oplus \mathrm{E1_u}$
N193.12.21 $\mathrm{GM3}^{+} \oplus \mathrm{GM6}^{+}$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{B2_g} \oplus \mathrm{E1_g}$
N193.12.22 $\mathrm{GM3}^{+} \oplus \mathrm{GM6}^{-}$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{B2_g} \oplus \mathrm{E2_u}$
N193.12.23 $\mathrm{GM3}^{+} \oplus \mathrm{A1}$	$\surd$	1	1	$\surd$	$\bar{6}m2$	$\mathrm{A2''}$
N193.12.24 $\mathrm{GM3}^{+} \oplus \mathrm{A2}$	$\surd$	1	1	$\surd$	$\bar{6}m2$	$\mathrm{A2''}$
N193.12.25 $\mathrm{GM3}^{-} \oplus \mathrm{GM5}^{+}$	$\surd$	2	2	$\surd$	$\bar{6}m2$	$\mathrm{E'}$
N193.12.26 $\mathrm{GM3}^{-} \oplus \mathrm{GM5}^{-}$	$\surd$	0	0	$\surd$	-	-
N193.12.27 $\mathrm{GM3}^{-} \oplus \mathrm{GM6}^{+}$	$\surd$	2	2	$\surd$	$\bar{6}m2$	$\mathrm{E''}$
N193.12.28 $\mathrm{GM3}^{-} \oplus \mathrm{GM6}^{-}$	$\surd$	0	0	$\surd$	-	-
N193.12.29 $\mathrm{GM3}^{-} \oplus \mathrm{A1}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N193.12.30 $\mathrm{GM3}^{-} \oplus \mathrm{A2}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N193.12.31 $\mathrm{GM4}^{+} \oplus \mathrm{GM5}^{+}$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{B1_g} \oplus \mathrm{E2_g}$
N193.12.32 $\mathrm{GM4}^{+} \oplus \mathrm{GM5}^{-}$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{B1_g} \oplus \mathrm{E1_u}$
N193.12.33 $\mathrm{GM4}^{+} \oplus \mathrm{GM6}^{+}$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{B1_g} \oplus \mathrm{E1_g}$
N193.12.34 $\mathrm{GM4}^{+} \oplus \mathrm{GM6}^{-}$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{B1_g} \oplus \mathrm{E2_u}$
N193.12.35 $\mathrm{GM4}^{+} \oplus \mathrm{A1}$	$\surd$	1	1	$\surd$	$\bar{6}2m$	$\mathrm{A2''}$
N193.12.36 $\mathrm{GM4}^{+} \oplus \mathrm{A2}$	$\surd$	1	1	$\surd$	$\bar{6}2m$	$\mathrm{A2''}$
N193.12.37 $\mathrm{GM4}^{-} \oplus \mathrm{GM5}^{+}$	$\surd$	2	2	$\surd$	$\bar{6}2m$	$\mathrm{E'}$
N193.12.38 $\mathrm{GM4}^{-} \oplus \mathrm{GM5}^{-}$	$\surd$	0	0	$\surd$	-	-
N193.12.39 $\mathrm{GM4}^{-} \oplus \mathrm{GM6}^{+}$	$\surd$	2	2	$\surd$	$\bar{6}2m$	$\mathrm{E''}$
N193.12.40 $\mathrm{GM4}^{-} \oplus \mathrm{GM6}^{-}$	$\surd$	0	0	$\surd$	-	-
N193.12.41 $\mathrm{GM4}^{-} \oplus \mathrm{A1}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N193.12.42 $\mathrm{GM4}^{-} \oplus \mathrm{A2}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N193.13.1 $\mathrm{GM1}^{-} \oplus \mathrm{K1}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{B2_u}$
N193.13.2 $\mathrm{GM1}^{-} \oplus \mathrm{K2}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{B2_u}$
N193.13.3 $\mathrm{GM1}^{-} \oplus \mathrm{K3}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{B2_u}$
N193.13.4 $\mathrm{GM1}^{-} \oplus \mathrm{K4}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{B2_u}$
N193.13.5 $\mathrm{GM2}^{+} \oplus \mathrm{K1}$	$\surd$	1	1	$\surd$	$\bar{6}m2$	$\mathrm{A1''}$
N193.13.6 $\mathrm{GM2}^{+} \oplus \mathrm{K2}$	$\surd$	1	1	$\surd$	$\bar{6}m2$	$\mathrm{A1''}$
N193.13.7 $\mathrm{GM2}^{+} \oplus \mathrm{K3}$	$\surd$	1	1	$\surd$	$\bar{6}m2$	$\mathrm{A1''}$
N193.13.8 $\mathrm{GM2}^{+} \oplus \mathrm{K4}$	$\surd$	1	1	$\surd$	$\bar{6}m2$	$\mathrm{A1''}$
N193.13.9 $\mathrm{GM2}^{-} \oplus \mathrm{K1}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{B2_u}$
N193.13.10 $\mathrm{GM2}^{-} \oplus \mathrm{K2}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{B2_u}$
N193.13.11 $\mathrm{GM2}^{-} \oplus \mathrm{K3}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{B2_u}$
N193.13.12 $\mathrm{GM2}^{-} \oplus \mathrm{K4}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{B2_u}$
N193.13.13 $\mathrm{GM3}^{+} \oplus \mathrm{K1}$	$\surd$	1	1	$\surd$	622	B2
N193.13.14 $\mathrm{GM3}^{+} \oplus \mathrm{K2}$	$\surd$	1	1	$\surd$	622	B2
N193.13.15 $\mathrm{GM3}^{+} \oplus \mathrm{K3}$	$\surd$	1	1	$\surd$	622	B2
N193.13.16 $\mathrm{GM3}^{+} \oplus \mathrm{K4}$	$\surd$	1	1	$\surd$	622	B2
N193.13.17 $\mathrm{GM3}^{-} \oplus \mathrm{K1}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{B2_u}$

Non-coplanar SSGs with parent space group $P6_3/mcm$ (No. 193) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N193.13.18 $\mathrm{GM3}^- \oplus \mathrm{K2}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{B2_u}$
N193.13.19 $\mathrm{GM3}^- \oplus \mathrm{K3}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{B2_u}$
N193.13.20 $\mathrm{GM3}^- \oplus \mathrm{K4}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{B2_u}$
N193.13.21 $\mathrm{GM4}^+ \oplus \mathrm{K1}$	$\surd$	1	1	$\surd$	$6mm$	B2
N193.13.22 $\mathrm{GM4}^+ \oplus \mathrm{K2}$	$\surd$	1	1	$\surd$	$6mm$	B2
N193.13.23 $\mathrm{GM4}^+ \oplus \mathrm{K3}$	$\surd$	1	1	$\surd$	$6mm$	B2
N193.13.24 $\mathrm{GM4}^+ \oplus \mathrm{K4}$	$\surd$	1	1	$\surd$	$6mm$	B2
N193.13.25 $\mathrm{GM4}^- \oplus \mathrm{K1}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{B2_u}$
N193.13.26 $\mathrm{GM4}^- \oplus \mathrm{K2}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{B2_u}$
N193.13.27 $\mathrm{GM4}^- \oplus \mathrm{K3}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{B2_u}$
N193.13.28 $\mathrm{GM4}^- \oplus \mathrm{K4}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{B2_u}$
N193.14.1 $\mathrm{GM1}^- \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N193.14.2 $\mathrm{GM1}^- \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N193.14.3 $\mathrm{GM2}^+ \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	622	A2
N193.14.4 $\mathrm{GM2}^+ \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	622	A2
N193.14.5 $\mathrm{GM2}^- \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N193.14.6 $\mathrm{GM2}^- \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N193.14.7 $\mathrm{GM3}^+ \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	$\bar{6}m2$	$\mathrm{A2''}$
N193.14.8 $\mathrm{GM3}^+ \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	$\bar{6}m2$	$\mathrm{A2''}$
N193.14.9 $\mathrm{GM3}^- \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N193.14.10 $\mathrm{GM3}^- \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N193.14.11 $\mathrm{GM4}^+ \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	$\bar{6}2m$	$\mathrm{A2''}$
N193.14.12 $\mathrm{GM4}^+ \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	$\bar{6}2m$	$\mathrm{A2''}$
N193.14.13 $\mathrm{GM4}^- \oplus \mathrm{DT1}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N193.14.14 $\mathrm{GM4}^- \oplus \mathrm{DT2}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N193.16.1 $\mathrm{M1}^+$	$\times$	-	-	-	-	-
N193.16.2 $\mathrm{M1}^-$	$\times$	-	-	-	-	-
N193.16.3 $\mathrm{M2}^+$	$\times$	-	-	-	-	-
N193.16.4 $\mathrm{M2}^-$	$\times$	-	-	-	-	-
N193.16.5 $\mathrm{M3}^+$	$\times$	-	-	-	-	-
N193.16.6 $\mathrm{M3}^-$	$\times$	-	-	-	-	-
N193.16.7 $\mathrm{M4}^+$	$\times$	-	-	-	-	-
N193.16.8 $\mathrm{M4}^-$	$\times$	-	-	-	-	-

TABLE S580: Collinear SSGs with parent space group $P6_3/mmc$ (No. 194).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L194.1.1 $\mathrm{GM1}^+$	1	$6/mmm$	$\mathrm{A1_g}$
L194.2.1 $\mathrm{GM1}^-$	0	-	-
L194.2.2 $\mathrm{GM2}^+$	1	$6/mmm$	$\mathrm{A2_g}$
L194.2.3 $\mathrm{GM2}^-$	0	-	-
L194.2.4 $\mathrm{GM3}^+$	1	$6/mmm$	$\mathrm{B2_g}$
L194.2.5 $\mathrm{GM3}^-$	0	-	-
L194.2.6 $\mathrm{GM4}^+$	1	$6/mmm$	$\mathrm{B1_g}$
L194.2.7 $\mathrm{GM4}^-$	0	-	-

TABLE S581: Coplanar SSGs with parent space group $P6_3/mmc$ (No. 194).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P194.1.1 $\mathrm{GM1}^{+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_g}$
P194.2.1 $\mathrm{GM1}^{-}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{A1_u}$
P194.2.2 $\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_g}$
P194.2.3 $\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{A2_u}$
P194.2.4 $\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_g}$
P194.2.5 $\mathrm{GM3}^{-}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{B2_u}$
P194.2.6 $\mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_g}$
P194.2.7 $\mathrm{GM4}^{-}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A1_g}\oplus\mathrm{B1_u}$
P194.3.1 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}$	$\surd$	0	0	$\surd$	-	-
P194.3.2 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A2_g}\oplus\mathrm{A2_u}$
P194.3.3 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
P194.3.4 $\mathrm{GM1}^{-}\oplus\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{B2_g}\oplus\mathrm{B2_u}$
P194.3.5 $\mathrm{GM1}^{-}\oplus\mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
P194.3.6 $\mathrm{GM1}^{-}\oplus\mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_u}$
P194.3.7 $\mathrm{GM1}^{-}\oplus\mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
P194.3.8 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A2_g}\oplus\mathrm{A2_g}$
P194.3.9 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A1_u}\oplus\mathrm{A2_g}$
P194.3.10 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A2_g}\oplus\mathrm{B2_g}$
P194.3.11 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{-}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A2_g}\oplus\mathrm{B1_u}$
P194.3.12 $\mathrm{GM2}^{+}\oplus\mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A2_g}\oplus\mathrm{B1_g}$
P194.3.13 $\mathrm{GM2}^{+}\oplus\mathrm{GM4}^{-}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A2_g}\oplus\mathrm{B2_u}$
P194.3.14 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
P194.3.15 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{B2_g}\oplus\mathrm{B1_u}$
P194.3.16 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
P194.3.17 $\mathrm{GM2}^{-}\oplus\mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{B2_u}\oplus\mathrm{B1_g}$
P194.3.18 $\mathrm{GM2}^{-}\oplus\mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
P194.3.19 $\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{B2_g}\oplus\mathrm{B2_g}$
P194.3.20 $\mathrm{GM3}^{+}\oplus\mathrm{GM3}^{-}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A1_u}\oplus\mathrm{B2_g}$
P194.3.21 $\mathrm{GM3}^{+}\oplus\mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{B2_g}\oplus\mathrm{B1_g}$
P194.3.22 $\mathrm{GM3}^{+}\oplus\mathrm{GM4}^{-}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A2_u}\oplus\mathrm{B2_g}$
P194.3.23 $\mathrm{GM3}^{-}\oplus\mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
P194.3.24 $\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A2_u}\oplus\mathrm{B1_g}$
P194.3.25 $\mathrm{GM3}^{-}\oplus\mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
P194.3.26 $\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_g}$
P194.3.27 $\mathrm{GM4}^{+}\oplus\mathrm{GM4}^{-}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{A1_u}\oplus\mathrm{B1_g}$
P194.3.28 $\mathrm{GM4}^{-}\oplus\mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
P194.6.1 $\mathrm{GM5}^{+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{E2_g}$
P194.6.2 $\mathrm{GM5}^{-}$	$\surd$	0	0	$\surd$	-	-
P194.6.3 $\mathrm{GM6}^{+}$	$\surd$	2	2	$\surd$	$6/mmm$	$\mathrm{E1_g}$
P194.6.4 $\mathrm{GM6}^{-}$	$\surd$	0	0	$\surd$	-	-
P194.6.5 A1	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
P194.6.6 A2	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
P194.7.1 K1	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{B2_u}$
P194.7.2 K2	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{B2_u}$
P194.7.3 K3	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{B2_u}$
P194.7.4 K4	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{B2_u}$

Coplanar SSGs with parent space group $P6_3/mmc$ (No. 194) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P194.8.1 DT1	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
P194.8.2 DT2	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$

TABLE S582: Non-coplanar SSGs with parent space group $P6_3/mmc$ (No. 194).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N194.1.1 $\mathrm{GM1^+}$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g \oplus A1_g \oplus A1_g}$
N194.2.1 $\mathrm{GM1^-}$	$\surd$	2	2	$\surd$	622	$\mathrm{A1 \oplus A1}$
N194.2.2 $\mathrm{GM2^+}$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g \oplus A1_g \oplus A2_g}$
N194.2.3 $\mathrm{GM2^-}$	$\surd$	2	2	$\surd$	$6mm$	$\mathrm{A1 \oplus A1}$
N194.2.4 $\mathrm{GM3^+}$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g \oplus A1_g \oplus B2_g}$
N194.2.5 $\mathrm{GM3^-}$	$\surd$	2	2	$\surd$	$\bar{6}2m$	$\mathrm{A1' \oplus A1'}$
N194.2.6 $\mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g \oplus A1_g \oplus B1_g}$
N194.2.7 $\mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$\bar{6}m2$	$\mathrm{A1' \oplus A1'}$
N194.3.1 $\mathrm{GM1^- \oplus GM1^-}$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g \oplus A1_u \oplus A1_u}$
N194.3.2 $\mathrm{GM1^- \oplus GM2^+}$	$\surd$	2	2	$\surd$	$6mm$	$\mathrm{A1 \oplus A2}$
N194.3.3 $\mathrm{GM1^- \oplus GM2^-}$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g \oplus A1_u \oplus A2_u}$
N194.3.4 $\mathrm{GM1^- \oplus GM3^+}$	$\surd$	2	2	$\surd$	$\bar{6}2m$	$\mathrm{A1' \oplus A1''}$
N194.3.5 $\mathrm{GM1^- \oplus GM3^-}$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g \oplus A1_u \oplus B2_u}$
N194.3.6 $\mathrm{GM1^- \oplus GM4^+}$	$\surd$	2	2	$\surd$	$\bar{6}m2$	$\mathrm{A1' \oplus A2'}$
N194.3.7 $\mathrm{GM1^- \oplus GM4^-}$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g \oplus A1_u \oplus B1_u}$
N194.3.8 $\mathrm{GM2^+ \oplus GM2^+}$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g \oplus A2_g \oplus A2_g}$
N194.3.9 $\mathrm{GM2^+ \oplus GM2^-}$	$\surd$	2	2	$\surd$	622	$\mathrm{A1 \oplus A2}$
N194.3.10 $\mathrm{GM2^+ \oplus GM3^+}$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g \oplus A2_g \oplus B2_g}$
N194.3.11 $\mathrm{GM2^+ \oplus GM3^-}$	$\surd$	2	2	$\surd$	$\bar{6}m2$	$\mathrm{A1' \oplus A1''}$
N194.3.12 $\mathrm{GM2^+ \oplus GM4^+}$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g \oplus A2_g \oplus B1_g}$
N194.3.13 $\mathrm{GM2^+ \oplus GM4^-}$	$\surd$	2	2	$\surd$	$\bar{6}2m$	$\mathrm{A1' \oplus A2'}$
N194.3.14 $\mathrm{GM2^- \oplus GM2^-}$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g \oplus A2_u \oplus A2_u}$
N194.3.15 $\mathrm{GM2^- \oplus GM3^+}$	$\surd$	2	2	$\surd$	$\bar{6}m2$	$\mathrm{A1' \oplus A2''}$
N194.3.16 $\mathrm{GM2^- \oplus GM3^-}$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g \oplus A2_u \oplus B2_u}$
N194.3.17 $\mathrm{GM2^- \oplus GM4^+}$	$\surd$	2	2	$\surd$	$\bar{6}2m$	$\mathrm{A1' \oplus A2''}$
N194.3.18 $\mathrm{GM2^- \oplus GM4^-}$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g \oplus A2_u \oplus B1_u}$
N194.3.19 $\mathrm{GM3^+ \oplus GM3^+}$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g \oplus B2_g \oplus B2_g}$
N194.3.20 $\mathrm{GM3^+ \oplus GM3^-}$	$\surd$	2	2	$\surd$	622	$\mathrm{A1 \oplus B2}$
N194.3.21 $\mathrm{GM3^+ \oplus GM4^+}$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g \oplus B2_g \oplus B1_g}$
N194.3.22 $\mathrm{GM3^+ \oplus GM4^-}$	$\surd$	2	2	$\surd$	$6mm$	$\mathrm{A1 \oplus B1}$
N194.3.23 $\mathrm{GM3^- \oplus GM3^-}$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g \oplus B2_u \oplus B2_u}$
N194.3.24 $\mathrm{GM3^- \oplus GM4^+}$	$\surd$	2	2	$\surd$	$6mm$	$\mathrm{A1 \oplus B2}$
N194.3.25 $\mathrm{GM3^- \oplus GM4^-}$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g \oplus B2_u \oplus B1_u}$
N194.3.26 $\mathrm{GM4^+ \oplus GM4^+}$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g \oplus B1_g \oplus B1_g}$
N194.3.27 $\mathrm{GM4^+ \oplus GM4^-}$	$\surd$	2	2	$\surd$	622	$\mathrm{A1 \oplus B1}$
N194.3.28 $\mathrm{GM4^- \oplus GM4^-}$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g \oplus B1_u \oplus B1_u}$
N194.6.1 $\mathrm{GM5^+}$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g \oplus E2_g}$
N194.6.2 $\mathrm{GM5^-}$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g \oplus E2_u}$
N194.6.3 $\mathrm{GM6^+}$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g \oplus E1_g}$
N194.6.4 $\mathrm{GM6^-}$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_g \oplus E1_u}$

Non-coplanar SSGs with parent space group $P6_3/mmc$ (No. 194) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N194.6.5 A1	$\surd$	1	1	$\surd$	$6mm$	A1
N194.6.6 A2	$\surd$	1	1	$\surd$	$6mm$	A1
N194.7.1 K1	$\surd$	1	1	$\surd$	$\bar{6}2m$	A1′
N194.7.2 K2	$\surd$	1	1	$\surd$	$\bar{6}2m$	A1′
N194.7.3 K3	$\surd$	1	1	$\surd$	$\bar{6}2m$	A1′
N194.7.4 K4	$\surd$	1	1	$\surd$	$\bar{6}2m$	A1′
N194.8.1 DT1	$\surd$	1	1	$\surd$	$6mm$	A1
N194.8.2 DT2	$\surd$	1	1	$\surd$	$6mm$	A1
N194.9.1 $\mathrm{GM1^-}\oplus\mathrm{GM1^-}\oplus\mathrm{GM1^-}$	$\surd$	0	0	$\surd$	-	-
N194.9.2 $\mathrm{GM1^-}\oplus\mathrm{GM1^-}\oplus\mathrm{GM2^+}$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g}\oplus\mathrm{A2_u}\oplus\mathrm{A2_u}$
N194.9.3 $\mathrm{GM1^-}\oplus\mathrm{GM1^-}\oplus\mathrm{GM2^-}$	$\surd$	0	0	$\surd$	-	-
N194.9.4 $\mathrm{GM1^-}\oplus\mathrm{GM1^-}\oplus\mathrm{GM3^+}$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{B2_g}\oplus\mathrm{B2_u}\oplus\mathrm{B2_u}$
N194.9.5 $\mathrm{GM1^-}\oplus\mathrm{GM1^-}\oplus\mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
N194.9.6 $\mathrm{GM1^-}\oplus\mathrm{GM1^-}\oplus\mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{B1_g}\oplus\mathrm{B1_u}\oplus\mathrm{B1_u}$
N194.9.7 $\mathrm{GM1^-}\oplus\mathrm{GM1^-}\oplus\mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N194.9.8 $\mathrm{GM1^-}\oplus\mathrm{GM2^+}\oplus\mathrm{GM2^+}$	$\surd$	2	2	$\surd$	622	$\mathrm{A2}\oplus\mathrm{A2}$
N194.9.9 $\mathrm{GM1^-}\oplus\mathrm{GM2^+}\oplus\mathrm{GM2^-}$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u}\oplus\mathrm{A2_g}\oplus\mathrm{A2_u}$
N194.9.10 $\mathrm{GM1^-}\oplus\mathrm{GM2^+}\oplus\mathrm{GM3^+}$	$\surd$	2	2	$\surd$	$\bar{6}m2$	$\mathrm{A1''}\oplus\mathrm{A2''}$
N194.9.11 $\mathrm{GM1^-}\oplus\mathrm{GM2^+}\oplus\mathrm{GM3^-}$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g}\oplus\mathrm{A2_u}\oplus\mathrm{B1_u}$
N194.9.12 $\mathrm{GM1^-}\oplus\mathrm{GM2^+}\oplus\mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$\bar{6}2m$	$\mathrm{A2''}\oplus\mathrm{A2'}$
N194.9.13 $\mathrm{GM1^-}\oplus\mathrm{GM2^+}\oplus\mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g}\oplus\mathrm{A2_u}\oplus\mathrm{B2_u}$
N194.9.14 $\mathrm{GM1^-}\oplus\mathrm{GM2^-}\oplus\mathrm{GM2^-}$	$\surd$	0	0	$\surd$	-	-
N194.9.15 $\mathrm{GM1^-}\oplus\mathrm{GM2^-}\oplus\mathrm{GM3^+}$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{B2_g}\oplus\mathrm{B2_u}\oplus\mathrm{B1_u}$
N194.9.16 $\mathrm{GM1^-}\oplus\mathrm{GM2^-}\oplus\mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
N194.9.17 $\mathrm{GM1^-}\oplus\mathrm{GM2^-}\oplus\mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{B2_u}\oplus\mathrm{B1_g}\oplus\mathrm{B1_u}$
N194.9.18 $\mathrm{GM1^-}\oplus\mathrm{GM2^-}\oplus\mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N194.9.19 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{GM3^+}$	$\surd$	2	2	$\surd$	622	$\mathrm{B2}\oplus\mathrm{B2}$
N194.9.20 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{GM3^-}$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u}\oplus\mathrm{B2_g}\oplus\mathrm{B2_u}$
N194.9.21 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$6mm$	$\mathrm{B2}\oplus\mathrm{B1}$
N194.9.22 $\mathrm{GM1^-}\oplus\mathrm{GM3^+}\oplus\mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_u}\oplus\mathrm{B2_g}\oplus\mathrm{B2_u}$
N194.9.23 $\mathrm{GM1^-}\oplus\mathrm{GM3^-}\oplus\mathrm{GM3^-}$	$\surd$	0	0	$\surd$	-	-
N194.9.24 $\mathrm{GM1^-}\oplus\mathrm{GM3^-}\oplus\mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_u}\oplus\mathrm{B1_g}\oplus\mathrm{B1_u}$
N194.9.25 $\mathrm{GM1^-}\oplus\mathrm{GM3^-}\oplus\mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N194.9.26 $\mathrm{GM1^-}\oplus\mathrm{GM4^+}\oplus\mathrm{GM4^+}$	$\surd$	2	2	$\surd$	622	$\mathrm{B1}\oplus\mathrm{B1}$
N194.9.27 $\mathrm{GM1^-}\oplus\mathrm{GM4^+}\oplus\mathrm{GM4^-}$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u}\oplus\mathrm{B1_g}\oplus\mathrm{B1_u}$
N194.9.28 $\mathrm{GM1^-}\oplus\mathrm{GM4^-}\oplus\mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N194.9.29 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{GM2^+}$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_g}$
N194.9.30 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{GM2^-}$	$\surd$	2	2	$\surd$	$6mm$	$\mathrm{A2}\oplus\mathrm{A2}$
N194.9.31 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{GM3^+}$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g}\oplus\mathrm{A2_g}\oplus\mathrm{B2_g}$
N194.9.32 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{GM3^-}$	$\surd$	2	2	$\surd$	$\bar{6}2m$	$\mathrm{A2'}\oplus\mathrm{A2'}$
N194.9.33 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g}\oplus\mathrm{A2_g}\oplus\mathrm{B1_g}$
N194.9.34 $\mathrm{GM2^+}\oplus\mathrm{GM2^+}\oplus\mathrm{GM4^-}$	$\surd$	2	2	$\surd$	$\bar{6}m2$	$\mathrm{A1''}\oplus\mathrm{A1''}$
N194.9.35 $\mathrm{GM2^+}\oplus\mathrm{GM2^-}\oplus\mathrm{GM2^-}$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u}\oplus\mathrm{A1_u}\oplus\mathrm{A2_g}$
N194.9.36 $\mathrm{GM2^+}\oplus\mathrm{GM2^-}\oplus\mathrm{GM3^+}$	$\surd$	2	2	$\surd$	$\bar{6}2m$	$\mathrm{A1''}\oplus\mathrm{A2'}$
N194.9.37 $\mathrm{GM2^+}\oplus\mathrm{GM2^-}\oplus\mathrm{GM3^-}$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u}\oplus\mathrm{A2_g}\oplus\mathrm{B1_u}$
N194.9.38 $\mathrm{GM2^+}\oplus\mathrm{GM2^-}\oplus\mathrm{GM4^+}$	$\surd$	2	2	$\surd$	$\bar{6}m2$	$\mathrm{A1''}\oplus\mathrm{A2'}$

Non-coplanar SSGs with parent space group $P6_3/mmc$ (No. 194) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N194.9.39 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{B2_u}$
N194.9.40 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N194.9.41 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$6mm$	$\mathrm{A2} \oplus \mathrm{B1}$
N194.9.42 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B1_g}$
N194.9.43 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	622	$\mathrm{A2} \oplus \mathrm{B2}$
N194.9.44 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N194.9.45 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	622	$\mathrm{A2} \oplus \mathrm{B1}$
N194.9.46 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_u} \oplus \mathrm{B1_u}$
N194.9.47 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N194.9.48 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$6mm$	$\mathrm{A2} \oplus \mathrm{B2}$
N194.9.49 $\mathrm{GM2}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g} \oplus \mathrm{B2_u} \oplus \mathrm{B2_u}$
N194.9.50 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
N194.9.51 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{B2_g} \oplus \mathrm{B1_u} \oplus \mathrm{B1_u}$
N194.9.52 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N194.9.53 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{B2_u} \oplus \mathrm{B2_u} \oplus \mathrm{B1_g}$
N194.9.54 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N194.9.55 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$6mm$	$\mathrm{B1} \oplus \mathrm{B1}$
N194.9.56 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_g} \oplus \mathrm{B1_u}$
N194.9.57 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	622	$\mathrm{B2} \oplus \mathrm{B1}$
N194.9.58 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_g} \oplus \mathrm{B1_u}$
N194.9.59 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N194.9.60 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{B2_u} \oplus \mathrm{B1_g}$
N194.9.61 $\mathrm{GM2}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N194.9.62 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$6mm$	$\mathrm{B2} \oplus \mathrm{B2}$
N194.9.63 $\mathrm{GM2}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{B2_u} \oplus \mathrm{B1_g}$
N194.9.64 $\mathrm{GM2}^- \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N194.9.65 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B2_g}$
N194.9.66 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM3}^-$	$\surd$	2	2	$\surd$	$\bar{6}2m$	$\mathrm{A1}'' \oplus \mathrm{A1}''$
N194.9.67 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{B2_g} \oplus \mathrm{B2_g} \oplus \mathrm{B1_g}$
N194.9.68 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$\bar{6}m2$	$\mathrm{A2}'' \oplus \mathrm{A2}''$
N194.9.69 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{B2_g}$
N194.9.70 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$\bar{6}m2$	$\mathrm{A2}'' \oplus \mathrm{A2}'$
N194.9.71 $\mathrm{GM3}^+ \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$
N194.9.72 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{B2_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N194.9.73 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$\bar{6}2m$	$\mathrm{A1}'' \oplus \mathrm{A2}''$
N194.9.74 $\mathrm{GM3}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u} \oplus \mathrm{B2_g}$
N194.9.75 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N194.9.76 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_u} \oplus \mathrm{A2_u} \oplus \mathrm{B1_g}$
N194.9.77 $\mathrm{GM3}^- \oplus \mathrm{GM3}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N194.9.78 $\mathrm{GM3}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	2	2	$\surd$	$\bar{6}2m$	$\mathrm{A2}'' \oplus \mathrm{A2}''$
N194.9.79 $\mathrm{GM3}^- \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{A2_u} \oplus \mathrm{B1_g}$
N194.9.80 $\mathrm{GM3}^- \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N194.9.81 $\mathrm{GM4}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{B1_g} \oplus \mathrm{B1_g} \oplus \mathrm{B1_g}$
N194.9.82 $\mathrm{GM4}^+ \oplus \mathrm{GM4}^+ \oplus \mathrm{GM4}^-$	$\surd$	2	2	$\surd$	$\bar{6}m2$	$\mathrm{A2}' \oplus \mathrm{A2}'$
N194.9.83 $\mathrm{GM4}^+ \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{B1_g}$
N194.9.84 $\mathrm{GM4}^- \oplus \mathrm{GM4}^- \oplus \mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-

Non-coplanar SSGs with parent space group $P6_3/mmc$ (No. 194) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N194.12.1 $\mathrm{GM1}^- \oplus \mathrm{GM5}^+$	$\surd$	2	2	$\surd$	$6mm$	$\mathrm{E2}$
N194.12.2 $\mathrm{GM1}^- \oplus \mathrm{GM5}^-$	$\surd$	0	0	$\surd$	-	-
N194.12.3 $\mathrm{GM1}^- \oplus \mathrm{GM6}^+$	$\surd$	2	2	$\surd$	$6mm$	$\mathrm{E1}$
N194.12.4 $\mathrm{GM1}^- \oplus \mathrm{GM6}^-$	$\surd$	0	0	$\surd$	-	-
N194.12.5 $\mathrm{GM1}^- \oplus \mathrm{A1}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N194.12.6 $\mathrm{GM1}^- \oplus \mathrm{A2}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N194.12.7 $\mathrm{GM2}^+ \oplus \mathrm{GM5}^+$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g} \oplus \mathrm{E2_g}$
N194.12.8 $\mathrm{GM2}^+ \oplus \mathrm{GM5}^-$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g} \oplus \mathrm{E2_u}$
N194.12.9 $\mathrm{GM2}^+ \oplus \mathrm{GM6}^+$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g} \oplus \mathrm{E1_g}$
N194.12.10 $\mathrm{GM2}^+ \oplus \mathrm{GM6}^-$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{A2_g} \oplus \mathrm{E1_u}$
N194.12.11 $\mathrm{GM2}^+ \oplus \mathrm{A1}$	$\surd$	1	1	$\surd$	622	$\mathrm{A2}$
N194.12.12 $\mathrm{GM2}^+ \oplus \mathrm{A2}$	$\surd$	1	1	$\surd$	622	$\mathrm{A2}$
N194.12.13 $\mathrm{GM2}^- \oplus \mathrm{GM5}^+$	$\surd$	2	2	$\surd$	622	$\mathrm{E2}$
N194.12.14 $\mathrm{GM2}^- \oplus \mathrm{GM5}^-$	$\surd$	0	0	$\surd$	-	-
N194.12.15 $\mathrm{GM2}^- \oplus \mathrm{GM6}^+$	$\surd$	2	2	$\surd$	622	$\mathrm{E1}$
N194.12.16 $\mathrm{GM2}^- \oplus \mathrm{GM6}^-$	$\surd$	0	0	$\surd$	-	-
N194.12.17 $\mathrm{GM2}^- \oplus \mathrm{A1}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N194.12.18 $\mathrm{GM2}^- \oplus \mathrm{A2}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N194.12.19 $\mathrm{GM3}^+ \oplus \mathrm{GM5}^+$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{B2_g} \oplus \mathrm{E2_g}$
N194.12.20 $\mathrm{GM3}^+ \oplus \mathrm{GM5}^-$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{B2_g} \oplus \mathrm{E1_u}$
N194.12.21 $\mathrm{GM3}^+ \oplus \mathrm{GM6}^+$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{B2_g} \oplus \mathrm{E1_g}$
N194.12.22 $\mathrm{GM3}^+ \oplus \mathrm{GM6}^-$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{B2_g} \oplus \mathrm{E2_u}$
N194.12.23 $\mathrm{GM3}^+ \oplus \mathrm{A1}$	$\surd$	1	1	$\surd$	$\bar{6}m2$	$\mathrm{A2''}$
N194.12.24 $\mathrm{GM3}^+ \oplus \mathrm{A2}$	$\surd$	1	1	$\surd$	$\bar{6}m2$	$\mathrm{A2''}$
N194.12.25 $\mathrm{GM3}^- \oplus \mathrm{GM5}^+$	$\surd$	2	2	$\surd$	$\bar{6}m2$	$\mathrm{E'}$
N194.12.26 $\mathrm{GM3}^- \oplus \mathrm{GM5}^-$	$\surd$	0	0	$\surd$	-	-
N194.12.27 $\mathrm{GM3}^- \oplus \mathrm{GM6}^+$	$\surd$	2	2	$\surd$	$\bar{6}m2$	$\mathrm{E''}$
N194.12.28 $\mathrm{GM3}^- \oplus \mathrm{GM6}^-$	$\surd$	0	0	$\surd$	-	-
N194.12.29 $\mathrm{GM3}^- \oplus \mathrm{A1}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N194.12.30 $\mathrm{GM3}^- \oplus \mathrm{A2}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N194.12.31 $\mathrm{GM4}^+ \oplus \mathrm{GM5}^+$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{B1_g} \oplus \mathrm{E2_g}$
N194.12.32 $\mathrm{GM4}^+ \oplus \mathrm{GM5}^-$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{B1_g} \oplus \mathrm{E1_u}$
N194.12.33 $\mathrm{GM4}^+ \oplus \mathrm{GM6}^+$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{B1_g} \oplus \mathrm{E1_g}$
N194.12.34 $\mathrm{GM4}^+ \oplus \mathrm{GM6}^-$	$\surd$	3	3	$\surd$	$6/mmm$	$\mathrm{B1_g} \oplus \mathrm{E2_u}$
N194.12.35 $\mathrm{GM4}^+ \oplus \mathrm{A1}$	$\surd$	1	1	$\surd$	$\bar{6}2m$	$\mathrm{A2''}$
N194.12.36 $\mathrm{GM4}^+ \oplus \mathrm{A2}$	$\surd$	1	1	$\surd$	$\bar{6}2m$	$\mathrm{A2''}$
N194.12.37 $\mathrm{GM4}^- \oplus \mathrm{GM5}^+$	$\surd$	2	2	$\surd$	$\bar{6}2m$	$\mathrm{E'}$
N194.12.38 $\mathrm{GM4}^- \oplus \mathrm{GM5}^-$	$\surd$	0	0	$\surd$	-	-
N194.12.39 $\mathrm{GM4}^- \oplus \mathrm{GM6}^+$	$\surd$	2	2	$\surd$	$\bar{6}2m$	$\mathrm{E''}$
N194.12.40 $\mathrm{GM4}^- \oplus \mathrm{GM6}^-$	$\surd$	0	0	$\surd$	-	-
N194.12.41 $\mathrm{GM4}^- \oplus \mathrm{A1}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N194.12.42 $\mathrm{GM4}^- \oplus \mathrm{A2}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N194.13.1 $\mathrm{GM1}^- \oplus \mathrm{K1}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{B2_u}$
N194.13.2 $\mathrm{GM1}^- \oplus \mathrm{K2}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{B2_u}$
N194.13.3 $\mathrm{GM1}^- \oplus \mathrm{K3}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{B2_u}$
N194.13.4 $\mathrm{GM1}^- \oplus \mathrm{K4}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{B2_u}$

Non-coplanar SSGs with parent space group $P6_3/mmc$ (No. 194) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N194.13.5 $\mathrm{GM2}^{+}\oplus\mathrm{K1}$	$\surd$	1	1	$\surd$	$\bar{6}m2$	$\mathrm{A1}''$
N194.13.6 $\mathrm{GM2}^{+}\oplus\mathrm{K2}$	$\surd$	1	1	$\surd$	$\bar{6}m2$	$\mathrm{A1}''$
N194.13.7 $\mathrm{GM2}^{+}\oplus\mathrm{K3}$	$\surd$	1	1	$\surd$	$\bar{6}m2$	$\mathrm{A1}''$
N194.13.8 $\mathrm{GM2}^{+}\oplus\mathrm{K4}$	$\surd$	1	1	$\surd$	$\bar{6}m2$	$\mathrm{A1}''$
N194.13.9 $\mathrm{GM2}^{-}\oplus\mathrm{K1}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{B2_u}$
N194.13.10 $\mathrm{GM2}^{-}\oplus\mathrm{K2}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{B2_u}$
N194.13.11 $\mathrm{GM2}^{-}\oplus\mathrm{K3}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{B2_u}$
N194.13.12 $\mathrm{GM2}^{-}\oplus\mathrm{K4}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{B2_u}$
N194.13.13 $\mathrm{GM3}^{+}\oplus\mathrm{K1}$	$\surd$	1	1	$\surd$	622	B2
N194.13.14 $\mathrm{GM3}^{+}\oplus\mathrm{K2}$	$\surd$	1	1	$\surd$	622	B2
N194.13.15 $\mathrm{GM3}^{+}\oplus\mathrm{K3}$	$\surd$	1	1	$\surd$	622	B2
N194.13.16 $\mathrm{GM3}^{+}\oplus\mathrm{K4}$	$\surd$	1	1	$\surd$	622	B2
N194.13.17 $\mathrm{GM3}^{-}\oplus\mathrm{K1}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{B2_u}$
N194.13.18 $\mathrm{GM3}^{-}\oplus\mathrm{K2}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{B2_u}$
N194.13.19 $\mathrm{GM3}^{-}\oplus\mathrm{K3}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{B2_u}$
N194.13.20 $\mathrm{GM3}^{-}\oplus\mathrm{K4}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{B2_u}$
N194.13.21 $\mathrm{GM4}^{+}\oplus\mathrm{K1}$	$\surd$	1	1	$\surd$	$6mm$	B2
N194.13.22 $\mathrm{GM4}^{+}\oplus\mathrm{K2}$	$\surd$	1	1	$\surd$	$6mm$	B2
N194.13.23 $\mathrm{GM4}^{+}\oplus\mathrm{K3}$	$\surd$	1	1	$\surd$	$6mm$	B2
N194.13.24 $\mathrm{GM4}^{+}\oplus\mathrm{K4}$	$\surd$	1	1	$\surd$	$6mm$	B2
N194.13.25 $\mathrm{GM4}^{-}\oplus\mathrm{K1}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{B2_u}$
N194.13.26 $\mathrm{GM4}^{-}\oplus\mathrm{K2}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{B2_u}$
N194.13.27 $\mathrm{GM4}^{-}\oplus\mathrm{K3}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{B2_u}$
N194.13.28 $\mathrm{GM4}^{-}\oplus\mathrm{K4}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{B2_u}$
N194.14.1 $\mathrm{GM1}^{-}\oplus\mathrm{DT1}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N194.14.2 $\mathrm{GM1}^{-}\oplus\mathrm{DT2}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N194.14.3 $\mathrm{GM2}^{+}\oplus\mathrm{DT1}$	$\surd$	1	1	$\surd$	622	A2
N194.14.4 $\mathrm{GM2}^{+}\oplus\mathrm{DT2}$	$\surd$	1	1	$\surd$	622	A2
N194.14.5 $\mathrm{GM2}^{-}\oplus\mathrm{DT1}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N194.14.6 $\mathrm{GM2}^{-}\oplus\mathrm{DT2}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N194.14.7 $\mathrm{GM3}^{+}\oplus\mathrm{DT1}$	$\surd$	1	1	$\surd$	$\bar{6}m2$	$\mathrm{A2}''$
N194.14.8 $\mathrm{GM3}^{+}\oplus\mathrm{DT2}$	$\surd$	1	1	$\surd$	$\bar{6}m2$	$\mathrm{A2}''$
N194.14.9 $\mathrm{GM3}^{-}\oplus\mathrm{DT1}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N194.14.10 $\mathrm{GM3}^{-}\oplus\mathrm{DT2}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N194.14.11 $\mathrm{GM4}^{+}\oplus\mathrm{DT1}$	$\surd$	1	1	$\surd$	$\bar{6}2m$	$\mathrm{A2}''$
N194.14.12 $\mathrm{GM4}^{+}\oplus\mathrm{DT2}$	$\surd$	1	1	$\surd$	$\bar{6}2m$	$\mathrm{A2}''$
N194.14.13 $\mathrm{GM4}^{-}\oplus\mathrm{DT1}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N194.14.14 $\mathrm{GM4}^{-}\oplus\mathrm{DT2}$	$\surd$	1	1	$\surd$	$6/mmm$	$\mathrm{A2_u}$
N194.16.1 $\mathrm{M1}^{+}$	$\times$	-	-	-	-	-
N194.16.2 $\mathrm{M1}^{-}$	$\times$	-	-	-	-	-
N194.16.3 $\mathrm{M2}^{+}$	$\times$	-	-	-	-	-
N194.16.4 $\mathrm{M2}^{-}$	$\times$	-	-	-	-	-
N194.16.5 $\mathrm{M3}^{+}$	$\times$	-	-	-	-	-
N194.16.6 $\mathrm{M3}^{-}$	$\times$	-	-	-	-	-
N194.16.7 $\mathrm{M4}^{+}$	$\times$	-	-	-	-	-
N194.16.8 $\mathrm{M4}^{-}$	$\times$	-	-	-	-	-

Collinear SSGs with parent space group $P23$ (No. 195)(continued)

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation

TABLE S583: Collinear SSGs with parent space group $P23$ (No. 195).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L195.1.1 GM1	1	$m\bar{3}$	$\mathrm{A_g}$
L195.2.1 R1	0	-	-

TABLE S584: Coplanar SSGs with parent space group $P23$ (No. 195).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P195.1.1 GM1	$\surd$	3	3	$\surd$	$m\bar{3}$	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{A_u}$
P195.2.1 R1	$\surd$	1	1	$\surd$	$m\bar{3}$	$\mathrm{A_g}$
P195.3.1 R1 $\oplus$ R1	$\surd$	1	1	$\times$	-	-
P195.4.1 GM2GM3	$\surd$	3	3	$\surd$	$m\bar{3}$	$\mathrm{A_u}\oplus{}^1\mathrm{E_g}\oplus{}^2\mathrm{E_g}$
P195.4.2 R2R3	$\surd$	1	1	$\times$	-	-

TABLE S585: Non-coplanar SSGs with parent space group $P23$ (No. 195).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N195.1.1 GM1	$\surd$	3	3	$\surd$	23	$\mathrm{A}\oplus\mathrm{A}\oplus\mathrm{A}$
N195.2.1 R1	$\surd$	3	3	$\surd$	$m\bar{3}$	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{A_u}$
N195.3.1 R1 $\oplus$ R1	$\surd$	1	1	$\surd$	23	A
N195.4.1 GM2GM3	$\surd$	3	3	$\surd$	23	$\mathrm{A}\oplus{}^1\mathrm{E}\oplus{}^2\mathrm{E}$
N195.4.2 R2R3	$\surd$	1	1	$\surd$	23	A
N195.9.1 R1 $\oplus$ R1 $\oplus$ R1	$\surd$	3	3	$\surd$	$m\bar{3}$	$\mathrm{A_u}\oplus\mathrm{A_u}\oplus\mathrm{A_u}$
N195.10.1 R1 $\oplus$ GM2GM3	$\surd$	3	3	$\surd$	$m\bar{3}$	$\mathrm{A_u}\oplus{}^1\mathrm{E_g}\oplus{}^2\mathrm{E_g}$
N195.10.2 R1 $\oplus$ R2R3	$\surd$	3	3	$\surd$	$m\bar{3}$	$\mathrm{A_u}\oplus{}^1\mathrm{E_u}\oplus{}^2\mathrm{E_u}$
N195.15.1 GM4	$\surd$	3	3	$\surd$	23	T
N195.15.2 R4	$\surd$	3	3	$\surd$	$m\bar{3}$	$\mathrm{T_u}$
N195.16.1 M1	$\times$	-	-	-	-	-
N195.16.2 M3	$\times$	-	-	-	-	-
N195.16.3 X1	$\times$	-	-	-	-	-
N195.16.4 X2	$\times$	-	-	-	-	-

TABLE S586: Collinear SSGs with parent space group $F23$ (No. 196).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L196.1.1 GM1	1	$m\bar{3}$	$\mathrm{A_g}$

TABLE S587: Coplanar SSGs with parent space group $F23$ (No. 196).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P196.1.1 GM1	$\surd$	3	3	$\surd$	$m\bar{3}$	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{A_u}$
P196.4.1 GM2GM3	$\surd$	3	3	$\surd$	$m\bar{3}$	$\mathrm{A_u}\oplus{}^1\mathrm{E_g}\oplus{}^2\mathrm{E_g}$

Non-coplanar SSGs with parent space group $F23$ (No. 196) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation

TABLE S588: Non-coplanar SSGs with parent space group $F23$ (No. 196).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N196.1.1 GM1	$\surd$	3	3	$\surd$	23	$\mathrm{A}\oplus\mathrm{A}\oplus\mathrm{A}$
N196.4.1 GM2GM3	$\surd$	3	3	$\surd$	23	$\mathrm{A}\oplus{}^1\mathrm{E}\oplus{}^2\mathrm{E}$
N196.15.1 GM4	$\surd$	3	3	$\surd$	23	T
N196.16.1 X1	$\times$	-	-	-	-	-
N196.16.2 X2	$\times$	-	-	-	-	-

TABLE S589: Collinear SSGs with parent space group $I23$ (No. 197).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L197.1.1 GM1	1	$m\bar{3}$	$\mathrm{A_g}$
L197.2.1 H1	0	-	-

TABLE S590: Coplanar SSGs with parent space group $I23$ (No. 197).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P197.1.1 GM1	$\surd$	3	3	$\surd$	$m\bar{3}$	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{A_u}$
P197.2.1 H1	$\surd$	1	1	$\surd$	$m\bar{3}$	$\mathrm{A_g}$
P197.3.1 H1 $\oplus$ H1	$\surd$	1	1	$\surd$	$m\bar{3}$	$\mathrm{A_u}$
P197.4.1 GM2GM3	$\surd$	3	3	$\surd$	$m\bar{3}$	$\mathrm{A_u}\oplus{}^1\mathrm{E_g}\oplus{}^2\mathrm{E_g}$
P197.4.2 H2H3	$\surd$	1	1	$\surd$	$m\bar{3}$	$\mathrm{A_u}$
P197.4.3 P1PA1	$\surd$	1	1	$\times$	-	-
P197.4.4 P2PA2	$\surd$	1	1	$\times$	-	-
P197.4.5 P3PA3	$\surd$	1	1	$\times$	-	-

TABLE S591: Non-coplanar SSGs with parent space group $I23$ (No. 197).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N197.1.1 GM1	$\surd$	3	3	$\surd$	23	$\mathrm{A}\oplus\mathrm{A}\oplus\mathrm{A}$
N197.2.1 H1	$\surd$	3	3	$\surd$	$m\bar{3}$	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{A_u}$
N197.3.1 H1 $\oplus$ H1	$\surd$	1	1	$\surd$	23	A
N197.4.1 GM2GM3	$\surd$	3	3	$\surd$	23	$\mathrm{A}\oplus{}^1\mathrm{E}\oplus{}^2\mathrm{E}$
N197.4.2 H2H3	$\surd$	1	1	$\surd$	23	A
N197.4.3 P1PA1	$\surd$	1	1	$\surd$	23	A
N197.4.4 P2PA2	$\surd$	1	1	$\surd$	23	A
N197.4.5 P3PA3	$\surd$	1	1	$\surd$	23	A
N197.9.1 H1 $\oplus$ H1 $\oplus$ H1	$\surd$	3	3	$\surd$	$m\bar{3}$	$\mathrm{A_u}\oplus\mathrm{A_u}\oplus\mathrm{A_u}$
N197.10.1 H1 $\oplus$ GM2GM3	$\surd$	3	3	$\surd$	$m\bar{3}$	$\mathrm{A_u}\oplus{}^1\mathrm{E_g}\oplus{}^2\mathrm{E_g}$
N197.10.2 H1 $\oplus$ H2H3	$\surd$	3	3	$\surd$	$m\bar{3}$	$\mathrm{A_u}\oplus{}^1\mathrm{E_u}\oplus{}^2\mathrm{E_u}$
N197.10.3 H1 $\oplus$ P1PA1	$\surd$	1	1	$\times$	-	-
N197.10.4 H1 $\oplus$ P2PA2	$\surd$	1	1	$\times$	-	-
N197.10.5 H1 $\oplus$ P3PA3	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $I23$ (No. 197) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N197.15.1 GM4	$\surd$	3	3	$\surd$	23	T
N197.15.2 H4	$\surd$	3	3	$\surd$	$m\bar{3}$	$\mathrm{T_u}$

TABLE S592: Collinear SSGs with parent space group $P2_13$ (No. 198).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L198.1.1 GM1	1	$m\bar{3}$	$\mathrm{A_g}$

TABLE S593: Coplanar SSGs with parent space group $P2_13$ (No. 198).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P198.1.1 GM1	$\surd$	3	3	$\surd$	$m\bar{3}$	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{A_u}$
P198.4.1 GM2GM3	$\surd$	3	3	$\surd$	$m\bar{3}$	$\mathrm{A_u}\oplus{}^1\mathrm{E_g}\oplus{}^2\mathrm{E_g}$

TABLE S594: Non-coplanar SSGs with parent space group $P2_13$ (No. 198).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N198.1.1 GM1	$\surd$	3	3	$\surd$	23	$\mathrm{A}\oplus\mathrm{A}\oplus\mathrm{A}$
N198.4.1 GM2GM3	$\surd$	3	3	$\surd$	23	$\mathrm{A}\oplus{}^1\mathrm{E}\oplus{}^2\mathrm{E}$
N198.15.1 GM4	$\surd$	3	3	$\surd$	23	T

TABLE S595: Collinear SSGs with parent space group $I2_13$ (No. 199).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L199.1.1 GM1	1	$m\bar{3}$	$\mathrm{A_g}$
L199.2.1 H1	0	-	-

TABLE S596: Coplanar SSGs with parent space group $I2_13$ (No. 199).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P199.1.1 GM1	$\surd$	3	3	$\surd$	$m\bar{3}$	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{A_u}$
P199.2.1 H1	$\surd$	1	1	$\surd$	$m\bar{3}$	$\mathrm{A_g}$
P199.3.1 H1 $\oplus$ H1	$\surd$	1	1	$\surd$	$m\bar{3}$	$\mathrm{A_u}$
P199.4.1 GM2GM3	$\surd$	3	3	$\surd$	$m\bar{3}$	$\mathrm{A_u}\oplus{}^1\mathrm{E_g}\oplus{}^2\mathrm{E_g}$
P199.4.2 H2H3	$\surd$	1	1	$\surd$	$m\bar{3}$	$\mathrm{A_u}$

TABLE S597: Non-coplanar SSGs with parent space group $I2_13$ (No. 199).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N199.1.1 GM1	$\surd$	3	3	$\surd$	23	$\mathrm{A}\oplus\mathrm{A}\oplus\mathrm{A}$
N199.2.1 H1	$\surd$	3	3	$\surd$	$m\bar{3}$	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{A_u}$
N199.3.1 H1 $\oplus$ H1	$\surd$	1	1	$\surd$	23	A

Non-coplanar SSGs with parent space group $I2_13$ (No. 199) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N199.4.1 GM2GM3	$\surd$	3	3	$\surd$	23	$\mathrm{A}\oplus{}^1\mathrm{E}\oplus{}^2\mathrm{E}$
N199.4.2 H2H3	$\surd$	1	1	$\surd$	23	A
N199.9.1 H1 $\oplus$ H1 $\oplus$ H1	$\surd$	3	3	$\surd$	$m\bar{3}$	$\mathrm{A_u}\oplus\mathrm{A_u}\oplus\mathrm{A_u}$
N199.10.1 H1 $\oplus$ GM2GM3	$\surd$	3	3	$\surd$	$m\bar{3}$	$\mathrm{A_u}\oplus{}^1\mathrm{E_g}\oplus{}^2\mathrm{E_g}$
N199.10.2 H1 $\oplus$ H2H3	$\surd$	3	3	$\surd$	$m\bar{3}$	$\mathrm{A_u}\oplus{}^1\mathrm{E_u}\oplus{}^2\mathrm{E_u}$
N199.15.1 GM4	$\surd$	3	3	$\surd$	23	T
N199.15.2 H4	$\surd$	3	3	$\surd$	$m\bar{3}$	$\mathrm{T_u}$

TABLE S598: Collinear SSGs with parent space group $Pm\bar{3}$ (No. 200).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L200.1.1 $\mathrm{GM1^+}$	1	$m\bar{3}$	$\mathrm{A_g}$
L200.2.1 $\mathrm{GM1^-}$	0	-	-
L200.2.2 $\mathrm{R1^+}$	0	-	-

TABLE S599: Coplanar SSGs with parent space group $Pm\bar{3}$ (No. 200).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P200.1.1 $\mathrm{GM1^+}$	$\surd$	2	2	$\surd$	$m\bar{3}$	$\mathrm{A_g}\oplus\mathrm{A_g}$
P200.2.1 $\mathrm{GM1^-}$	$\surd$	2	2	$\surd$	$m\bar{3}$	$\mathrm{A_g}\oplus\mathrm{A_u}$
P200.2.2 $\mathrm{R1^+}$	$\surd$	1	1	$\surd$	$m\bar{3}$	$\mathrm{A_g}$
P200.3.1 $\mathrm{GM1^-}\oplus\mathrm{GM1^-}$	$\surd$	0	0	$\surd$	-	-
P200.3.2 $\mathrm{GM1^-}\oplus\mathrm{R1^+}$	$\surd$	1	1	$\times$	-	-
P200.3.3 $\mathrm{R1^+}\oplus\mathrm{R1^+}$	$\surd$	1	0	$\times$	-	-
P200.3.4 $\mathrm{R1^+}\oplus\mathrm{R1^-}$	$\surd$	1	1	$\times$	-	-
P200.4.1 $\mathrm{GM2^+GM3^+}$	$\surd$	2	2	$\surd$	$m\bar{3}$	${}^1\mathrm{E_g}\oplus{}^2\mathrm{E_g}$
P200.4.2 $\mathrm{GM2^-GM3^-}$	$\surd$	0	0	$\surd$	-	-
P200.4.3 $\mathrm{R2^+R3^+}$	$\surd$	1	0	$\times$	-	-

TABLE S600: Non-coplanar SSGs with parent space group $Pm\bar{3}$ (No. 200).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N200.1.1 $\mathrm{GM1^+}$	$\surd$	3	3	$\surd$	$m\bar{3}$	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{A_g}$
N200.2.1 $\mathrm{GM1^-}$	$\surd$	2	2	$\surd$	23	$\mathrm{A}\oplus\mathrm{A}$
N200.2.2 $\mathrm{R1^+}$	$\surd$	2	2	$\surd$	$m\bar{3}$	$\mathrm{A_g}\oplus\mathrm{A_g}$
N200.3.1 $\mathrm{GM1^-}\oplus\mathrm{GM1^-}$	$\surd$	3	3	$\surd$	$m\bar{3}$	$\mathrm{A_g}\oplus\mathrm{A_u}\oplus\mathrm{A_u}$
N200.3.2 $\mathrm{GM1^-}\oplus\mathrm{R1^+}$	$\surd$	2	2	$\surd$	$m\bar{3}$	$\mathrm{A_g}\oplus\mathrm{A_u}$
N200.3.3 $\mathrm{R1^+}\oplus\mathrm{R1^+}$	$\surd$	1	1	$\surd$	$m\bar{3}$	$\mathrm{A_g}$
N200.3.4 $\mathrm{R1^+}\oplus\mathrm{R1^-}$	$\surd$	1	1	$\surd$	23	A
N200.4.1 $\mathrm{GM2^+GM3^+}$	$\surd$	3	3	$\surd$	$m\bar{3}$	$\mathrm{A_g}\oplus{}^1\mathrm{E_g}\oplus{}^2\mathrm{E_g}$
N200.4.2 $\mathrm{GM2^-GM3^-}$	$\surd$	3	3	$\surd$	$m\bar{3}$	$\mathrm{A_g}\oplus{}^1\mathrm{E_u}\oplus{}^2\mathrm{E_u}$
N200.4.3 $\mathrm{R2^+R3^+}$	$\surd$	1	1	$\surd$	$m\bar{3}$	$\mathrm{A_g}$
N200.9.1 $\mathrm{GM1^-}\oplus\mathrm{GM1^-}\oplus\mathrm{GM1^-}$	$\surd$	0	0	$\surd$	-	-
N200.9.2 $\mathrm{GM1^-}\oplus\mathrm{GM1^-}\oplus\mathrm{R1^+}$	$\surd$	0	0	$\surd$	-	-

Non-coplanar SSGs with parent space group $Pm\bar{3}$ (No. 200) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N200.9.3 $\mathrm{GM1^-} \oplus \mathrm{R1^+} \oplus \mathrm{R1^+}$	$\surd$	1	0	$\times$	-	-
N200.9.4 $\mathrm{GM1^-} \oplus \mathrm{R1^+} \oplus \mathrm{R1^-}$	$\surd$	1	1	$\times$	-	-
N200.9.5 $\mathrm{R1^+} \oplus \mathrm{R1^+} \oplus \mathrm{R1^+}$	$\surd$	0	0	$\surd$	-	-
N200.9.6 $\mathrm{R1^+} \oplus \mathrm{R1^+} \oplus \mathrm{R1^-}$	$\surd$	2	2	$\surd$	$m\bar{3}$	$\mathrm{A_u} \oplus \mathrm{A_u}$
N200.10.1 $\mathrm{GM1^-} \oplus \mathrm{GM2^+GM3^+}$	$\surd$	2	2	$\surd$	23	$^1\mathrm{E} \oplus {}^2\mathrm{E}$
N200.10.2 $\mathrm{GM1^-} \oplus \mathrm{GM2^-GM3^-}$	$\surd$	0	0	$\surd$	-	-
N200.10.3 $\mathrm{GM1^-} \oplus \mathrm{R2^+R3^+}$	$\surd$	1	0	$\times$	-	-
N200.10.4 $\mathrm{R1^+} \oplus \mathrm{GM2^+GM3^+}$	$\surd$	2	2	$\surd$	$m\bar{3}$	$^1\mathrm{E_g} \oplus {}^2\mathrm{E_g}$
N200.10.5 $\mathrm{R1^+} \oplus \mathrm{GM2^-GM3^-}$	$\surd$	0	0	$\surd$	-	-
N200.10.6 $\mathrm{R1^+} \oplus \mathrm{R2^+R3^+}$	$\surd$	0	0	$\surd$	-	-
N200.10.7 $\mathrm{R1^+} \oplus \mathrm{R2^-R3^-}$	$\surd$	2	2	$\surd$	$m\bar{3}$	$^1\mathrm{E_u} \oplus {}^2\mathrm{E_u}$
N200.15.1 $\mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$m\bar{3}$	$\mathrm{T_g}$
N200.15.2 $\mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N200.15.3 $\mathrm{R4^+}$	$\surd$	0	0	$\surd$	-	-
N200.16.1 $\mathrm{M1^+}$	$\times$	-	-	-	-	-
N200.16.2 $\mathrm{M1^-}$	$\times$	-	-	-	-	-
N200.16.3 $\mathrm{M3^+}$	$\times$	-	-	-	-	-
N200.16.4 $\mathrm{M3^-}$	$\times$	-	-	-	-	-
N200.16.5 $\mathrm{X1^+}$	$\times$	-	-	-	-	-
N200.16.6 $\mathrm{X1^-}$	$\times$	-	-	-	-	-
N200.16.7 $\mathrm{X2^+}$	$\times$	-	-	-	-	-

TABLE S601: Collinear SSGs with parent space group $Pn\bar{3}$ (No. 201).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L201.1.1 $\mathrm{GM1^+}$	1	$m\bar{3}$	$\mathrm{A_g}$
L201.2.1 $\mathrm{GM1^-}$	0	-	-
L201.2.2 $\mathrm{R1^+}$	0	-	-

TABLE S602: Coplanar SSGs with parent space group $Pn\bar{3}$ (No. 201).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P201.1.1 $\mathrm{GM1^+}$	$\surd$	2	2	$\surd$	$m\bar{3}$	$\mathrm{A_g} \oplus \mathrm{A_g}$
P201.2.1 $\mathrm{GM1^-}$	$\surd$	2	2	$\surd$	$m\bar{3}$	$\mathrm{A_g} \oplus \mathrm{A_u}$
P201.2.2 $\mathrm{R1^+}$	$\surd$	1	1	$\surd$	$m\bar{3}$	$\mathrm{A_g}$
P201.3.1 $\mathrm{GM1^-} \oplus \mathrm{GM1^-}$	$\surd$	0	0	$\surd$	-	-
P201.3.2 $\mathrm{GM1^-} \oplus \mathrm{R1^+}$	$\surd$	1	1	$\times$	-	-
P201.3.3 $\mathrm{R1^+} \oplus \mathrm{R1^+}$	$\surd$	1	0	$\times$	-	-
P201.3.4 $\mathrm{R1^+} \oplus \mathrm{R1^-}$	$\surd$	1	1	$\times$	-	-
P201.4.1 $\mathrm{GM2^+GM3^+}$	$\surd$	2	2	$\surd$	$m\bar{3}$	$^1\mathrm{E_g} \oplus {}^2\mathrm{E_g}$
P201.4.2 $\mathrm{GM2^-GM3^-}$	$\surd$	0	0	$\surd$	-	-
P201.4.3 $\mathrm{R2^+R3^+}$	$\surd$	1	0	$\times$	-	-

TABLE S603: Non-coplanar SSGs with parent space group $Pn\bar{3}$ (No. 201).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N201.1.1 $\mathrm{GM1}^+$	$\surd$	3	3	$\surd$	$m\bar{3}$	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{A_g}$
N201.2.1 $\mathrm{GM1}^-$	$\surd$	2	2	$\surd$	23	$\mathrm{A}\oplus\mathrm{A}$
N201.2.2 $\mathrm{R1}^+$	$\surd$	2	2	$\surd$	$m\bar{3}$	$\mathrm{A_g}\oplus\mathrm{A_g}$
N201.3.1 $\mathrm{GM1}^-\oplus\mathrm{GM1}^-$	$\surd$	3	3	$\surd$	$m\bar{3}$	$\mathrm{A_g}\oplus\mathrm{A_u}\oplus\mathrm{A_u}$
N201.3.2 $\mathrm{GM1}^-\oplus\mathrm{R1}^+$	$\surd$	2	2	$\surd$	$m\bar{3}$	$\mathrm{A_g}\oplus\mathrm{A_u}$
N201.3.3 $\mathrm{R1}^+\oplus\mathrm{R1}^+$	$\surd$	1	1	$\surd$	$m\bar{3}$	$\mathrm{A_g}$
N201.3.4 $\mathrm{R1}^+\oplus\mathrm{R1}^-$	$\surd$	1	1	$\surd$	23	A
N201.4.1 $\mathrm{GM2}^+\mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$m\bar{3}$	$\mathrm{A_g}\oplus{}^1\mathrm{E_g}\oplus{}^2\mathrm{E_g}$
N201.4.2 $\mathrm{GM2}^-\mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$m\bar{3}$	$\mathrm{A_g}\oplus{}^1\mathrm{E_u}\oplus{}^2\mathrm{E_u}$
N201.4.3 $\mathrm{R2}^+\mathrm{R3}^+$	$\surd$	1	1	$\surd$	$m\bar{3}$	$\mathrm{A_g}$
N201.9.1 $\mathrm{GM1}^-\oplus\mathrm{GM1}^-\oplus\mathrm{GM1}^-$	$\surd$	0	0	$\surd$	-	-
N201.9.2 $\mathrm{GM1}^-\oplus\mathrm{GM1}^-\oplus\mathrm{R1}^+$	$\surd$	0	0	$\surd$	-	-
N201.9.3 $\mathrm{GM1}^-\oplus\mathrm{R1}^+\oplus\mathrm{R1}^+$	$\surd$	1	0	$\times$	-	-
N201.9.4 $\mathrm{GM1}^-\oplus\mathrm{R1}^+\oplus\mathrm{R1}^-$	$\surd$	1	1	$\times$	-	-
N201.9.5 $\mathrm{R1}^+\oplus\mathrm{R1}^+\oplus\mathrm{R1}^+$	$\surd$	0	0	$\surd$	-	-
N201.9.6 $\mathrm{R1}^+\oplus\mathrm{R1}^+\oplus\mathrm{R1}^-$	$\surd$	2	2	$\surd$	$m\bar{3}$	$\mathrm{A_u}\oplus\mathrm{A_u}$
N201.10.1 $\mathrm{GM1}^-\oplus\mathrm{GM2}^+\mathrm{GM3}^+$	$\surd$	2	2	$\surd$	23	${}^1\mathrm{E}\oplus{}^2\mathrm{E}$
N201.10.2 $\mathrm{GM1}^-\oplus\mathrm{GM2}^-\mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N201.10.3 $\mathrm{GM1}^-\oplus\mathrm{R2}^+\mathrm{R3}^+$	$\surd$	1	0	$\times$	-	-
N201.10.4 $\mathrm{R1}^+\oplus\mathrm{GM2}^+\mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$m\bar{3}$	${}^1\mathrm{E_g}\oplus{}^2\mathrm{E_g}$
N201.10.5 $\mathrm{R1}^+\oplus\mathrm{GM2}^-\mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N201.10.6 $\mathrm{R1}^+\oplus\mathrm{R2}^+\mathrm{R3}^+$	$\surd$	0	0	$\surd$	-	-
N201.10.7 $\mathrm{R1}^+\oplus\mathrm{R2}^-\mathrm{R3}^-$	$\surd$	2	2	$\surd$	$m\bar{3}$	${}^1\mathrm{E_u}\oplus{}^2\mathrm{E_u}$
N201.15.1 $\mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$m\bar{3}$	$\mathrm{T_g}$
N201.15.2 $\mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N201.15.3 $\mathrm{R4}^+$	$\surd$	0	0	$\surd$	-	-

TABLE S604: Collinear SSGs with parent space group $Fm\bar{3}$ (No. 202).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L202.1.1 $\mathrm{GM1}^+$	1	$m\bar{3}$	$\mathrm{A_g}$
L202.2.1 $\mathrm{GM1}^-$	0	-	-

TABLE S605: Coplanar SSGs with parent space group $Fm\bar{3}$ (No. 202).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P202.1.1 $\mathrm{GM1}^+$	$\surd$	2	2	$\surd$	$m\bar{3}$	$\mathrm{A_g}\oplus\mathrm{A_g}$
P202.2.1 $\mathrm{GM1}^-$	$\surd$	2	2	$\surd$	$m\bar{3}$	$\mathrm{A_g}\oplus\mathrm{A_u}$
P202.3.1 $\mathrm{GM1}^-\oplus\mathrm{GM1}^-$	$\surd$	0	0	$\surd$	-	-
P202.4.1 $\mathrm{GM2}^+\mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$m\bar{3}$	${}^1\mathrm{E_g}\oplus{}^2\mathrm{E_g}$
P202.4.2 $\mathrm{GM2}^-\mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-

TABLE S606: Non-coplanar SSGs with parent space group $Fm\bar{3}$ (No. 202).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N202.1.1 $\mathrm{GM1}^+$	$\surd$	3	3	$\surd$	$m\bar{3}$	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{A_g}$

Non-coplanar SSGs with parent space group $Fm\bar{3}$ (No. 202) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N202.2.1 $\mathrm{GM1}^-$	$\surd$	2	2	$\surd$	23	$\mathrm{A}\oplus\mathrm{A}$
N202.3.1 $\mathrm{GM1}^-\oplus\mathrm{GM1}^-$	$\surd$	3	3	$\surd$	$m\bar{3}$	$\mathrm{A_g}\oplus\mathrm{A_u}\oplus\mathrm{A_u}$
N202.4.1 $\mathrm{GM2}^+\mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$m\bar{3}$	$\mathrm{A_g}\oplus{}^1\mathrm{E_g}\oplus{}^2\mathrm{E_g}$
N202.4.2 $\mathrm{GM2}^-\mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$m\bar{3}$	$\mathrm{A_g}\oplus{}^1\mathrm{E_u}\oplus{}^2\mathrm{E_u}$
N202.9.1 $\mathrm{GM1}^-\oplus\mathrm{GM1}^-\oplus\mathrm{GM1}^-$	$\surd$	0	0	$\surd$	-	-
N202.10.1 $\mathrm{GM1}^-\oplus\mathrm{GM2}^+\mathrm{GM3}^+$	$\surd$	2	2	$\surd$	23	${}^1\mathrm{E}\oplus{}^2\mathrm{E}$
N202.10.2 $\mathrm{GM1}^-\oplus\mathrm{GM2}^-\mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N202.15.1 $\mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$m\bar{3}$	$\mathrm{T_g}$
N202.15.2 $\mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N202.16.1 $\mathrm{X1}^+$	$\times$	-	-	-	-	-
N202.16.2 $\mathrm{X1}^-$	$\times$	-	-	-	-	-
N202.16.3 $\mathrm{X2}^+$	$\times$	-	-	-	-	-
N202.16.4 $\mathrm{X2}^-$	$\times$	-	-	-	-	-
N202.16.5 $\mathrm{X4}^+$	$\times$	-	-	-	-	-
N202.16.6 $\mathrm{X4}^-$	$\times$	-	-	-	-	-

TABLE S607: Collinear SSGs with parent space group $Fd\bar{3}$ (No. 203).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L203.1.1 $\mathrm{GM1}^+$	1	$m\bar{3}$	$\mathrm{A_g}$
L203.2.1 $\mathrm{GM1}^-$	0	-	-

TABLE S608: Coplanar SSGs with parent space group $Fd\bar{3}$ (No. 203).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P203.1.1 $\mathrm{GM1}^+$	$\surd$	2	2	$\surd$	$m\bar{3}$	$\mathrm{A_g}\oplus\mathrm{A_g}$
P203.2.1 $\mathrm{GM1}^-$	$\surd$	2	2	$\surd$	$m\bar{3}$	$\mathrm{A_g}\oplus\mathrm{A_u}$
P203.3.1 $\mathrm{GM1}^-\oplus\mathrm{GM1}^-$	$\surd$	0	0	$\surd$	-	-
P203.4.1 $\mathrm{GM2}^+\mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$m\bar{3}$	${}^1\mathrm{E_g}\oplus{}^2\mathrm{E_g}$
P203.4.2 $\mathrm{GM2}^-\mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-

TABLE S609: Non-coplanar SSGs with parent space group $Fd\bar{3}$ (No. 203).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N203.1.1 $\mathrm{GM1}^+$	$\surd$	3	3	$\surd$	$m\bar{3}$	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{A_g}$
N203.2.1 $\mathrm{GM1}^-$	$\surd$	2	2	$\surd$	23	$\mathrm{A}\oplus\mathrm{A}$
N203.3.1 $\mathrm{GM1}^-\oplus\mathrm{GM1}^-$	$\surd$	3	3	$\surd$	$m\bar{3}$	$\mathrm{A_g}\oplus\mathrm{A_u}\oplus\mathrm{A_u}$
N203.4.1 $\mathrm{GM2}^+\mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$m\bar{3}$	$\mathrm{A_g}\oplus{}^1\mathrm{E_g}\oplus{}^2\mathrm{E_g}$
N203.4.2 $\mathrm{GM2}^-\mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$m\bar{3}$	$\mathrm{A_g}\oplus{}^1\mathrm{E_u}\oplus{}^2\mathrm{E_u}$
N203.9.1 $\mathrm{GM1}^-\oplus\mathrm{GM1}^-\oplus\mathrm{GM1}^-$	$\surd$	0	0	$\surd$	-	-
N203.10.1 $\mathrm{GM1}^-\oplus\mathrm{GM2}^+\mathrm{GM3}^+$	$\surd$	2	2	$\surd$	23	${}^1\mathrm{E}\oplus{}^2\mathrm{E}$
N203.10.2 $\mathrm{GM1}^-\oplus\mathrm{GM2}^-\mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N203.15.1 $\mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$m\bar{3}$	$\mathrm{T_g}$
N203.15.2 $\mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-

Collinear SSGs with parent space group $Im\bar{3}$ (No. 204)(continued)

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation

TABLE S610: Collinear SSGs with parent space group $Im\bar{3}$ (No. 204).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L204.1.1 $\mathrm{GM1}^{+}$	1	$m\bar{3}$	$\mathrm{A_g}$
L204.2.1 $\mathrm{GM1}^{-}$	0	-	-
L204.2.2 $\mathrm{H1}^{+}$	0	-	-
L204.2.3 $\mathrm{H1}^{-}$	0	-	-

TABLE S611: Coplanar SSGs with parent space group $Im\bar{3}$ (No. 204).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P204.1.1 $\mathrm{GM1}^{+}$	$\surd$	2	2	$\surd$	$m\bar{3}$	$\mathrm{A_g}\oplus\mathrm{A_g}$
P204.2.1 $\mathrm{GM1}^{-}$	$\surd$	2	2	$\surd$	$m\bar{3}$	$\mathrm{A_g}\oplus\mathrm{A_u}$
P204.2.2 $\mathrm{H1}^{+}$	$\surd$	1	1	$\surd$	$m\bar{3}$	$\mathrm{A_g}$
P204.2.3 $\mathrm{H1}^{-}$	$\surd$	1	1	$\surd$	$m\bar{3}$	$\mathrm{A_g}$
P204.3.1 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}$	$\surd$	0	0	$\surd$	-	-
P204.3.2 $\mathrm{GM1}^{-}\oplus\mathrm{H1}^{+}$	$\surd$	1	1	$\times$	-	-
P204.3.3 $\mathrm{GM1}^{-}\oplus\mathrm{H1}^{-}$	$\surd$	1	1	$\times$	-	-
P204.3.4 $\mathrm{H1}^{+}\oplus\mathrm{H1}^{+}$	$\surd$	1	0	$\times$	-	-
P204.3.5 $\mathrm{H1}^{+}\oplus\mathrm{H1}^{-}$	$\surd$	1	1	$\surd$	$m\bar{3}$	$\mathrm{A_u}$
P204.3.6 $\mathrm{H1}^{-}\oplus\mathrm{H1}^{-}$	$\surd$	1	0	$\times$	-	-
P204.4.1 $\mathrm{GM2}^{+}\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	$m\bar{3}$	${}^{1}\mathrm{E_g}\oplus{}^{2}\mathrm{E_g}$
P204.4.2 $\mathrm{GM2}^{-}\mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
P204.4.3 $\mathrm{H2}^{+}\mathrm{H3}^{+}$	$\surd$	1	0	$\times$	-	-
P204.4.4 $\mathrm{H2}^{-}\mathrm{H3}^{-}$	$\surd$	1	0	$\times$	-	-
P204.7.1 P1	$\surd$	1	1	$\times$	-	-

TABLE S612: Non-coplanar SSGs with parent space group $Im\bar{3}$ (No. 204).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N204.1.1 $\mathrm{GM1}^{+}$	$\surd$	3	3	$\surd$	$m\bar{3}$	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{A_g}$
N204.2.1 $\mathrm{GM1}^{-}$	$\surd$	2	2	$\surd$	23	$\mathrm{A}\oplus\mathrm{A}$
N204.2.2 $\mathrm{H1}^{+}$	$\surd$	2	2	$\surd$	$m\bar{3}$	$\mathrm{A_g}\oplus\mathrm{A_g}$
N204.2.3 $\mathrm{H1}^{-}$	$\surd$	2	2	$\surd$	$m\bar{3}$	$\mathrm{A_g}\oplus\mathrm{A_g}$
N204.3.1 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}$	$\surd$	3	3	$\surd$	$m\bar{3}$	$\mathrm{A_g}\oplus\mathrm{A_u}\oplus\mathrm{A_u}$
N204.3.2 $\mathrm{GM1}^{-}\oplus\mathrm{H1}^{+}$	$\surd$	2	2	$\surd$	$m\bar{3}$	$\mathrm{A_g}\oplus\mathrm{A_u}$
N204.3.3 $\mathrm{GM1}^{-}\oplus\mathrm{H1}^{-}$	$\surd$	2	2	$\surd$	$m\bar{3}$	$\mathrm{A_g}\oplus\mathrm{A_u}$
N204.3.4 $\mathrm{H1}^{+}\oplus\mathrm{H1}^{+}$	$\surd$	1	1	$\surd$	$m\bar{3}$	$\mathrm{A_g}$
N204.3.5 $\mathrm{H1}^{+}\oplus\mathrm{H1}^{-}$	$\surd$	1	1	$\surd$	23	A
N204.3.6 $\mathrm{H1}^{-}\oplus\mathrm{H1}^{-}$	$\surd$	1	1	$\surd$	$m\bar{3}$	$\mathrm{A_g}$
N204.4.1 $\mathrm{GM2}^{+}\mathrm{GM3}^{+}$	$\surd$	3	3	$\surd$	$m\bar{3}$	$\mathrm{A_g}\oplus{}^{1}\mathrm{E_g}\oplus{}^{2}\mathrm{E_g}$
N204.4.2 $\mathrm{GM2}^{-}\mathrm{GM3}^{-}$	$\surd$	3	3	$\surd$	$m\bar{3}$	$\mathrm{A_g}\oplus{}^{1}\mathrm{E_u}\oplus{}^{2}\mathrm{E_u}$
N204.4.3 $\mathrm{H2}^{+}\mathrm{H3}^{+}$	$\surd$	1	1	$\surd$	$m\bar{3}$	$\mathrm{A_g}$
N204.4.4 $\mathrm{H2}^{-}\mathrm{H3}^{-}$	$\surd$	1	1	$\surd$	$m\bar{3}$	$\mathrm{A_g}$

Non-coplanar SSGs with parent space group $Im\bar{3}$ (No. 204) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N204.7.1 P1	$\surd$	1	1	$\surd$	23	A
N204.9.1 $\mathrm{GM1^-}\oplus\mathrm{GM1^-}\oplus\mathrm{GM1^-}$	$\surd$	0	0	$\surd$	-	-
N204.9.2 $\mathrm{GM1^-}\oplus\mathrm{GM1^-}\oplus\mathrm{H1^+}$	$\surd$	0	0	$\surd$	-	-
N204.9.3 $\mathrm{GM1^-}\oplus\mathrm{GM1^-}\oplus\mathrm{H1^-}$	$\surd$	0	0	$\surd$	-	-
N204.9.4 $\mathrm{GM1^-}\oplus\mathrm{H1^+}\oplus\mathrm{H1^+}$	$\surd$	1	0	$\times$	-	-
N204.9.5 $\mathrm{GM1^-}\oplus\mathrm{H1^+}\oplus\mathrm{H1^-}$	$\surd$	1	1	$\surd$	$m\bar{3}$	$\mathrm{A_u}$
N204.9.6 $\mathrm{GM1^-}\oplus\mathrm{H1^-}\oplus\mathrm{H1^-}$	$\surd$	1	0	$\times$	-	-
N204.9.7 $\mathrm{H1^+}\oplus\mathrm{H1^+}\oplus\mathrm{H1^+}$	$\surd$	0	0	$\surd$	-	-
N204.9.8 $\mathrm{H1^+}\oplus\mathrm{H1^+}\oplus\mathrm{H1^-}$	$\surd$	2	2	$\surd$	$m\bar{3}$	$\mathrm{A_u}\oplus\mathrm{A_u}$
N204.9.9 $\mathrm{H1^+}\oplus\mathrm{H1^-}\oplus\mathrm{H1^-}$	$\surd$	2	2	$\surd$	$m\bar{3}$	$\mathrm{A_u}\oplus\mathrm{A_u}$
N204.9.10 $\mathrm{H1^-}\oplus\mathrm{H1^-}\oplus\mathrm{H1^-}$	$\surd$	0	0	$\surd$	-	-
N204.10.1 $\mathrm{GM1^-}\oplus\mathrm{GM2^+GM3^+}$	$\surd$	2	2	$\surd$	23	$^1\mathrm{E}\oplus{}^2\mathrm{E}$
N204.10.2 $\mathrm{GM1^-}\oplus\mathrm{GM2^-GM3^-}$	$\surd$	0	0	$\surd$	-	-
N204.10.3 $\mathrm{GM1^-}\oplus\mathrm{H2^+H3^+}$	$\surd$	1	0	$\times$	-	-
N204.10.4 $\mathrm{GM1^-}\oplus\mathrm{H2^-H3^-}$	$\surd$	1	0	$\times$	-	-
N204.10.5 $\mathrm{H1^+}\oplus\mathrm{GM2^+GM3^+}$	$\surd$	2	2	$\surd$	$m\bar{3}$	$^1\mathrm{E_g}\oplus{}^2\mathrm{E_g}$
N204.10.6 $\mathrm{H1^+}\oplus\mathrm{GM2^-GM3^-}$	$\surd$	0	0	$\surd$	-	-
N204.10.7 $\mathrm{H1^+}\oplus\mathrm{H2^+H3^+}$	$\surd$	0	0	$\surd$	-	-
N204.10.8 $\mathrm{H1^+}\oplus\mathrm{H2^-H3^-}$	$\surd$	2	2	$\surd$	$m\bar{3}$	$^1\mathrm{E_u}\oplus{}^2\mathrm{E_u}$
N204.10.9 $\mathrm{H1^-}\oplus\mathrm{GM2^+GM3^+}$	$\surd$	2	2	$\surd$	$m\bar{3}$	$^1\mathrm{E_g}\oplus{}^2\mathrm{E_g}$
N204.10.10 $\mathrm{H1^-}\oplus\mathrm{GM2^-GM3^-}$	$\surd$	0	0	$\surd$	-	-
N204.10.11 $\mathrm{H1^-}\oplus\mathrm{H2^+H3^+}$	$\surd$	2	2	$\surd$	$m\bar{3}$	$^1\mathrm{E_u}\oplus{}^2\mathrm{E_u}$
N204.10.12 $\mathrm{H1^-}\oplus\mathrm{H2^-H3^-}$	$\surd$	0	0	$\surd$	-	-
N204.13.1 $\mathrm{GM1^-}\oplus\mathrm{P1}$	$\surd$	1	1	$\times$	-	-
N204.13.2 $\mathrm{H1^+}\oplus\mathrm{P1}$	$\surd$	1	1	$\times$	-	-
N204.13.3 $\mathrm{H1^-}\oplus\mathrm{P1}$	$\surd$	1	1	$\times$	-	-
N204.15.1 $\mathrm{GM4^+}$	$\surd$	3	3	$\surd$	$m\bar{3}$	$\mathrm{T_g}$
N204.15.2 $\mathrm{GM4^-}$	$\surd$	0	0	$\surd$	-	-
N204.15.3 $\mathrm{H4^+}$	$\surd$	0	0	$\surd$	-	-
N204.15.4 $\mathrm{H4^-}$	$\surd$	0	0	$\surd$	-	-

TABLE S613: Collinear SSGs with parent space group $Pa\bar{3}$ (No. 205).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L205.1.1 $\mathrm{GM1^+}$	1	$m\bar{3}$	$\mathrm{A_g}$
L205.2.1 $\mathrm{GM1^-}$	0	-	-

TABLE S614: Coplanar SSGs with parent space group $Pa\bar{3}$ (No. 205).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P205.1.1 $\mathrm{GM1^+}$	$\surd$	2	2	$\surd$	$m\bar{3}$	$\mathrm{A_g}\oplus\mathrm{A_g}$
P205.2.1 $\mathrm{GM1^-}$	$\surd$	2	2	$\surd$	$m\bar{3}$	$\mathrm{A_g}\oplus\mathrm{A_u}$
P205.3.1 $\mathrm{GM1^-}\oplus\mathrm{GM1^-}$	$\surd$	0	0	$\surd$	-	-
P205.4.1 $\mathrm{GM2^+GM3^+}$	$\surd$	2	2	$\surd$	$m\bar{3}$	$^1\mathrm{E_g}\oplus{}^2\mathrm{E_g}$
P205.4.2 $\mathrm{GM2^-GM3^-}$	$\surd$	0	0	$\surd$	-	-

Non-coplanar SSGs with parent space group $Pa\bar{3}$ (No. 205) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation

TABLE S615: Non-coplanar SSGs with parent space group $Pa\bar{3}$ (No. 205).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N205.1.1 $\mathrm{GM1}^+$	$\surd$	3	3	$\surd$	$m\bar{3}$	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{A_g}$
N205.2.1 $\mathrm{GM1}^-$	$\surd$	2	2	$\surd$	23	$\mathrm{A}\oplus\mathrm{A}$
N205.3.1 $\mathrm{GM1}^-\oplus\mathrm{GM1}^-$	$\surd$	3	3	$\surd$	$m\bar{3}$	$\mathrm{A_g}\oplus\mathrm{A_u}\oplus\mathrm{A_u}$
N205.4.1 $\mathrm{GM2}^+\mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$m\bar{3}$	$\mathrm{A_g}\oplus{}^1\mathrm{E_g}\oplus{}^2\mathrm{E_g}$
N205.4.2 $\mathrm{GM2}^-\mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$m\bar{3}$	$\mathrm{A_g}\oplus{}^1\mathrm{E_u}\oplus{}^2\mathrm{E_u}$
N205.9.1 $\mathrm{GM1}^-\oplus\mathrm{GM1}^-\oplus\mathrm{GM1}^-$	$\surd$	0	0	$\surd$	-	-
N205.10.1 $\mathrm{GM1}^-\oplus\mathrm{GM2}^+\mathrm{GM3}^+$	$\surd$	2	2	$\surd$	23	${}^1\mathrm{E}\oplus{}^2\mathrm{E}$
N205.10.2 $\mathrm{GM1}^-\oplus\mathrm{GM2}^-\mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N205.15.1 $\mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$m\bar{3}$	$\mathrm{T_g}$
N205.15.2 $\mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-

TABLE S616: Collinear SSGs with parent space group $Ia\bar{3}$ (No. 206).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L206.1.1 $\mathrm{GM1}^+$	1	$m\bar{3}$	$\mathrm{A_g}$
L206.2.1 $\mathrm{GM1}^-$	0	-	-
L206.2.2 $\mathrm{H1}^+$	0	-	-

TABLE S617: Coplanar SSGs with parent space group $Ia\bar{3}$ (No. 206).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P206.1.1 $\mathrm{GM1}^+$	$\surd$	2	2	$\surd$	$m\bar{3}$	$\mathrm{A_g}\oplus\mathrm{A_g}$
P206.2.1 $\mathrm{GM1}^-$	$\surd$	2	2	$\surd$	$m\bar{3}$	$\mathrm{A_g}\oplus\mathrm{A_u}$
P206.2.2 $\mathrm{H1}^+$	$\surd$	1	1	$\surd$	$m\bar{3}$	$\mathrm{A_g}$
P206.3.1 $\mathrm{GM1}^-\oplus\mathrm{GM1}^-$	$\surd$	0	0	$\surd$	-	-
P206.3.2 $\mathrm{GM1}^-\oplus\mathrm{H1}^+$	$\surd$	1	1	$\times$	-	-
P206.3.3 $\mathrm{H1}^+\oplus\mathrm{H1}^+$	$\surd$	1	0	$\times$	-	-
P206.3.4 $\mathrm{H1}^+\oplus\mathrm{H1}^-$	$\surd$	1	1	$\surd$	$m\bar{3}$	$\mathrm{A_u}$
P206.4.1 $\mathrm{GM2}^+\mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$m\bar{3}$	${}^1\mathrm{E_g}\oplus{}^2\mathrm{E_g}$
P206.4.2 $\mathrm{GM2}^-\mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
P206.4.3 $\mathrm{H2}^+\mathrm{H3}^+$	$\surd$	1	0	$\times$	-	-

TABLE S618: Non-coplanar SSGs with parent space group $Ia\bar{3}$ (No. 206).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N206.1.1 $\mathrm{GM1}^+$	$\surd$	3	3	$\surd$	$m\bar{3}$	$\mathrm{A_g}\oplus\mathrm{A_g}\oplus\mathrm{A_g}$
N206.2.1 $\mathrm{GM1}^-$	$\surd$	2	2	$\surd$	23	$\mathrm{A}\oplus\mathrm{A}$
N206.2.2 $\mathrm{H1}^+$	$\surd$	2	2	$\surd$	$m\bar{3}$	$\mathrm{A_g}\oplus\mathrm{A_g}$

Non-coplanar SSGs with parent space group $Ia\bar{3}$ (No. 206) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N206.3.1 $\mathrm{GM1^-}\oplus\mathrm{GM1^-}$	√	3	3	√	$m\bar{3}$	$\mathrm{A_g}\oplus\mathrm{A_u}\oplus\mathrm{A_u}$
N206.3.2 $\mathrm{GM1^-}\oplus\mathrm{H1^+}$	√	2	2	√	$m\bar{3}$	$\mathrm{A_g}\oplus\mathrm{A_u}$
N206.3.3 $\mathrm{H1^+}\oplus\mathrm{H1^+}$	√	1	1	√	$m\bar{3}$	$\mathrm{A_g}$
N206.3.4 $\mathrm{H1^+}\oplus\mathrm{H1^-}$	√	1	1	√	23	A
N206.4.1 $\mathrm{GM2^+GM3^+}$	√	3	3	√	$m\bar{3}$	$\mathrm{A_g}\oplus{}^1\mathrm{E_g}\oplus{}^2\mathrm{E_g}$
N206.4.2 $\mathrm{GM2^-GM3^-}$	√	3	3	√	$m\bar{3}$	$\mathrm{A_g}\oplus{}^1\mathrm{E_u}\oplus{}^2\mathrm{E_u}$
N206.4.3 $\mathrm{H2^+H3^+}$	√	1	1	√	$m\bar{3}$	$\mathrm{A_g}$
N206.9.1 $\mathrm{GM1^-}\oplus\mathrm{GM1^-}\oplus\mathrm{GM1^-}$	√	0	0	√	-	-
N206.9.2 $\mathrm{GM1^-}\oplus\mathrm{GM1^-}\oplus\mathrm{H1^+}$	√	0	0	√	-	-
N206.9.3 $\mathrm{GM1^-}\oplus\mathrm{H1^+}\oplus\mathrm{H1^+}$	√	1	0	×	-	-
N206.9.4 $\mathrm{GM1^-}\oplus\mathrm{H1^+}\oplus\mathrm{H1^-}$	√	1	1	√	$m\bar{3}$	$\mathrm{A_u}$
N206.9.5 $\mathrm{H1^+}\oplus\mathrm{H1^+}\oplus\mathrm{H1^+}$	√	0	0	√	-	-
N206.9.6 $\mathrm{H1^+}\oplus\mathrm{H1^+}\oplus\mathrm{H1^-}$	√	2	2	√	$m\bar{3}$	$\mathrm{A_u}\oplus\mathrm{A_u}$
N206.10.1 $\mathrm{GM1^-}\oplus\mathrm{GM2^+GM3^+}$	√	2	2	√	23	${}^1\mathrm{E}\oplus{}^2\mathrm{E}$
N206.10.2 $\mathrm{GM1^-}\oplus\mathrm{GM2^-GM3^-}$	√	0	0	√	-	-
N206.10.3 $\mathrm{GM1^-}\oplus\mathrm{H2^+H3^+}$	√	1	0	×	-	-
N206.10.4 $\mathrm{H1^+}\oplus\mathrm{GM2^+GM3^+}$	√	2	2	√	$m\bar{3}$	${}^1\mathrm{E_g}\oplus{}^2\mathrm{E_g}$
N206.10.5 $\mathrm{H1^+}\oplus\mathrm{GM2^-GM3^-}$	√	0	0	√	-	-
N206.10.6 $\mathrm{H1^+}\oplus\mathrm{H2^+H3^+}$	√	0	0	√	-	-
N206.10.7 $\mathrm{H1^+}\oplus\mathrm{H2^-H3^-}$	√	2	2	√	$m\bar{3}$	${}^1\mathrm{E_u}\oplus{}^2\mathrm{E_u}$
N206.15.1 $\mathrm{GM4^+}$	√	3	3	√	$m\bar{3}$	$\mathrm{T_g}$
N206.15.2 $\mathrm{GM4^-}$	√	0	0	√	-	-
N206.15.3 $\mathrm{H4^+}$	√	0	0	√	-	-

TABLE S619: Collinear SSGs with parent space group $P432$ (No. 207).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L207.1.1 GM1	1	$m\bar{3}m$	$\mathrm{A1_g}$
L207.2.1 GM2	1	$m\bar{3}m$	$\mathrm{A2_g}$
L207.2.2 R1	0	-	-

TABLE S620: Coplanar SSGs with parent space group $P432$ (No. 207).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P207.1.1 GM1	√	3	3	√	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A1_u}$
P207.2.1 GM2	√	3	3	√	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_u}$
P207.2.2 R1	√	1	1	√	$m\bar{3}m$	$\mathrm{A1_g}$
P207.3.1 $\mathrm{GM2}\oplus\mathrm{GM2}$	√	3	3	√	$m\bar{3}m$	$\mathrm{A1_u}\oplus\mathrm{A2_g}\oplus\mathrm{A2_g}$
P207.3.2 $\mathrm{GM2}\oplus\mathrm{R1}$	√	1	1	×	-	-
P207.3.3 $\mathrm{R1}\oplus\mathrm{R1}$	√	1	1	×	-	-
P207.3.4 $\mathrm{R1}\oplus\mathrm{R2}$	√	1	1	×	-	-
P207.6.1 GM3	√	3	3	√	$m\bar{3}m$	$\mathrm{A2_u}\oplus\mathrm{E_g}$
P207.6.2 R3	√	1	1	×	-	-

TABLE S621: Non-coplanar SSGs with parent space group $P432$ (No. 207).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N207.1.1 GM1	$\surd$	3	3	$\surd$	432	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{A1}$
N207.2.1 GM2	$\surd$	3	3	$\surd$	$\bar{4}3m$	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{A2}$
N207.2.2 R1	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A1_u}$
N207.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	432	$\mathrm{A1}\oplus\mathrm{A2}\oplus\mathrm{A2}$
N207.3.2 GM2 $\oplus$ R1	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_u}$
N207.3.3 R1 $\oplus$ R1	$\surd$	1	1	$\surd$	432	A1
N207.3.4 R1 $\oplus$ R2	$\surd$	1	1	$\surd$	$\bar{4}3m$	A1
N207.6.1 GM3	$\surd$	3	3	$\surd$	$\bar{4}3m$	$\mathrm{A1}\oplus\mathrm{E}$
N207.6.2 R3	$\surd$	1	1	$\surd$	$\bar{4}3m$	A1
N207.9.1 GM2 $\oplus$ GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$\bar{4}3m$	$\mathrm{A2}\oplus\mathrm{A2}\oplus\mathrm{A2}$
N207.9.2 GM2 $\oplus$ GM2 $\oplus$ R1	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_u}\oplus\mathrm{A2_g}\oplus\mathrm{A2_g}$
N207.9.3 GM2 $\oplus$ R1 $\oplus$ R1	$\surd$	1	1	$\times$	-	-
N207.9.4 GM2 $\oplus$ R1 $\oplus$ R2	$\surd$	1	1	$\times$	-	-
N207.9.5 R1 $\oplus$ R1 $\oplus$ R1	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_u}\oplus\mathrm{A1_u}\oplus\mathrm{A1_u}$
N207.9.6 R1 $\oplus$ R1 $\oplus$ R2	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_u}\oplus\mathrm{A2_u}\oplus\mathrm{A2_u}$
N207.12.1 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	432	$\mathrm{A2}\oplus\mathrm{E}$
N207.12.2 GM2 $\oplus$ R3	$\surd$	1	1	$\times$	-	-
N207.12.3 R1 $\oplus$ GM3	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A2_u}\oplus\mathrm{E_g}$
N207.12.4 R1 $\oplus$ R3	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A2_u}\oplus\mathrm{E_u}$
N207.15.1 GM4	$\surd$	3	3	$\surd$	432	T1
N207.15.2 GM5	$\surd$	3	3	$\surd$	$\bar{4}3m$	T2
N207.15.3 R4	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{T1_u}$
N207.16.1 M1	$\times$	-	-	-	-	-
N207.16.2 M2	$\times$	-	-	-	-	-
N207.16.3 X1	$\times$	-	-	-	-	-
N207.16.4 X2	$\times$	-	-	-	-	-

TABLE S622: Collinear SSGs with parent space group $P4_232$ (No. 208).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L208.1.1 GM1	1	$m\bar{3}m$	$\mathrm{A1_g}$
L208.2.1 GM2	1	$m\bar{3}m$	$\mathrm{A2_g}$
L208.2.2 R1	0	-	-

TABLE S623: Coplanar SSGs with parent space group $P4_232$ (No. 208).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P208.1.1 GM1	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A1_u}$
P208.2.1 GM2	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_u}$
P208.2.2 R1	$\surd$	1	1	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}$
P208.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_u}\oplus\mathrm{A2_g}\oplus\mathrm{A2_g}$
P208.3.2 GM2 $\oplus$ R1	$\surd$	1	1	$\times$	-	-
P208.3.3 R1 $\oplus$ R1	$\surd$	1	1	$\times$	-	-
P208.3.4 R1 $\oplus$ R2	$\surd$	1	1	$\times$	-	-
P208.6.1 GM3	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A2_u}\oplus\mathrm{E_g}$
P208.6.2 R3	$\surd$	1	1	$\times$	-	-

Coplanar SSGs with parent space group $P4_232$ (No. 208) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation

TABLE S624: Non-coplanar SSGs with parent space group $P4_232$ (No. 208).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N208.1.1 GM1	$\surd$	3	3	$\surd$	432	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{A1}$
N208.2.1 GM2	$\surd$	3	3	$\surd$	$\bar{4}3m$	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{A2}$
N208.2.2 R1	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A1_u}$
N208.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	432	$\mathrm{A1}\oplus\mathrm{A2}\oplus\mathrm{A2}$
N208.3.2 GM2 $\oplus$ R1	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_u}$
N208.3.3 R1 $\oplus$ R1	$\surd$	1	1	$\surd$	432	A1
N208.3.4 R1 $\oplus$ R2	$\surd$	1	1	$\surd$	$\bar{4}3m$	A1
N208.6.1 GM3	$\surd$	3	3	$\surd$	$\bar{4}3m$	$\mathrm{A1}\oplus\mathrm{E}$
N208.6.2 R3	$\surd$	1	1	$\surd$	$\bar{4}3m$	A1
N208.9.1 GM2 $\oplus$ GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$\bar{4}3m$	$\mathrm{A2}\oplus\mathrm{A2}\oplus\mathrm{A2}$
N208.9.2 GM2 $\oplus$ GM2 $\oplus$ R1	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_u}\oplus\mathrm{A2_g}\oplus\mathrm{A2_g}$
N208.9.3 GM2 $\oplus$ R1 $\oplus$ R1	$\surd$	1	1	$\times$	-	-
N208.9.4 GM2 $\oplus$ R1 $\oplus$ R2	$\surd$	1	1	$\times$	-	-
N208.9.5 R1 $\oplus$ R1 $\oplus$ R1	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_u}\oplus\mathrm{A1_u}\oplus\mathrm{A1_u}$
N208.9.6 R1 $\oplus$ R1 $\oplus$ R2	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_u}\oplus\mathrm{A2_u}\oplus\mathrm{A2_u}$
N208.12.1 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	432	$\mathrm{A2}\oplus\mathrm{E}$
N208.12.2 GM2 $\oplus$ R3	$\surd$	1	1	$\times$	-	-
N208.12.3 R1 $\oplus$ GM3	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A2_u}\oplus\mathrm{E_g}$
N208.12.4 R1 $\oplus$ R3	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A2_u}\oplus\mathrm{E_u}$
N208.15.1 GM4	$\surd$	3	3	$\surd$	432	T1
N208.15.2 GM5	$\surd$	3	3	$\surd$	$\bar{4}3m$	T2
N208.15.3 R4	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{T1_u}$
N208.16.1 M1	$\times$	-	-	-	-	-
N208.16.2 M2	$\times$	-	-	-	-	-
N208.16.3 X1	$\times$	-	-	-	-	-
N208.16.4 X2	$\times$	-	-	-	-	-

TABLE S625: Collinear SSGs with parent space group $F432$ (No. 209).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L209.1.1 GM1	1	$m\bar{3}m$	$\mathrm{A1_g}$
L209.2.1 GM2	1	$m\bar{3}m$	$\mathrm{A2_g}$

TABLE S626: Coplanar SSGs with parent space group $F432$ (No. 209).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P209.1.1 GM1	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A1_u}$
P209.2.1 GM2	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_u}$
P209.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_u}\oplus\mathrm{A2_g}\oplus\mathrm{A2_g}$
P209.6.1 GM3	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A2_u}\oplus\mathrm{E_g}$

Non-coplanar SSGs with parent space group $F432$ (No. 209) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation

TABLE S627: Non-coplanar SSGs with parent space group $F432$ (No. 209).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N209.1.1 GM1	$\surd$	3	3	$\surd$	432	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{A1}$
N209.2.1 GM2	$\surd$	3	3	$\surd$	$\bar{4}3m$	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{A2}$
N209.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	432	$\mathrm{A1}\oplus\mathrm{A2}\oplus\mathrm{A2}$
N209.6.1 GM3	$\surd$	3	3	$\surd$	$\bar{4}3m$	$\mathrm{A1}\oplus\mathrm{E}$
N209.9.1 GM2 $\oplus$ GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$\bar{4}3m$	$\mathrm{A2}\oplus\mathrm{A2}\oplus\mathrm{A2}$
N209.12.1 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	432	$\mathrm{A2}\oplus\mathrm{E}$
N209.15.1 GM4	$\surd$	3	3	$\surd$	432	T1
N209.15.2 GM5	$\surd$	3	3	$\surd$	$\bar{4}3m$	T2
N209.16.1 X1	$\times$	-	-	-	-	-
N209.16.2 X2	$\times$	-	-	-	-	-
N209.16.3 X3	$\times$	-	-	-	-	-
N209.16.4 X4	$\times$	-	-	-	-	-

TABLE S628: Collinear SSGs with parent space group $F4_132$ (No. 210).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L210.1.1 GM1	1	$m\bar{3}m$	$\mathrm{A1_g}$
L210.2.1 GM2	1	$m\bar{3}m$	$\mathrm{A2_g}$

TABLE S629: Coplanar SSGs with parent space group $F4_132$ (No. 210).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P210.1.1 GM1	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A1_u}$
P210.2.1 GM2	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_u}$
P210.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_u}\oplus\mathrm{A2_g}\oplus\mathrm{A2_g}$
P210.6.1 GM3	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A2_u}\oplus\mathrm{E_g}$

TABLE S630: Non-coplanar SSGs with parent space group $F4_132$ (No. 210).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N210.1.1 GM1	$\surd$	3	3	$\surd$	432	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{A1}$
N210.2.1 GM2	$\surd$	3	3	$\surd$	$\bar{4}3m$	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{A2}$
N210.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	432	$\mathrm{A1}\oplus\mathrm{A2}\oplus\mathrm{A2}$
N210.6.1 GM3	$\surd$	3	3	$\surd$	$\bar{4}3m$	$\mathrm{A1}\oplus\mathrm{E}$
N210.9.1 GM2 $\oplus$ GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$\bar{4}3m$	$\mathrm{A2}\oplus\mathrm{A2}\oplus\mathrm{A2}$
N210.12.1 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	432	$\mathrm{A2}\oplus\mathrm{E}$
N210.15.1 GM4	$\surd$	3	3	$\surd$	432	T1
N210.15.2 GM5	$\surd$	3	3	$\surd$	$\bar{4}3m$	T2

Non-coplanar SSGs with parent space group $F4_132$ (No. 210) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N210.16.1 X1	×	-	-	-	-	-
N210.16.2 X2	×	-	-	-	-	-
N210.16.3 X3	×	-	-	-	-	-
N210.16.4 X4	×	-	-	-	-	-

TABLE S631: Collinear SSGs with parent space group $I432$ (No. 211).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L211.1.1 GM1	1	$m\bar{3}m$	$\mathrm{A1_g}$
L211.2.1 GM2	1	$m\bar{3}m$	$\mathrm{A2_g}$
L211.2.2 H1	0	-	-
L211.2.3 H2	0	-	-

TABLE S632: Coplanar SSGs with parent space group $I432$ (No. 211).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P211.1.1 GM1	√	3	3	√	$m\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A1_u}$
P211.2.1 GM2	√	3	3	√	$m\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
P211.2.2 H1	√	1	1	√	$m\bar{3}m$	$\mathrm{A1_g}$
P211.2.3 H2	√	1	1	√	$m\bar{3}m$	$\mathrm{A1_g}$
P211.3.1 GM2 ⊕ GM2	√	3	3	√	$m\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
P211.3.2 GM2 ⊕ H1	√	1	1	×	-	-
P211.3.3 GM2 ⊕ H2	√	1	1	×	-	-
P211.3.4 H1 ⊕ H1	√	1	1	×	-	-
P211.3.5 H1 ⊕ H2	√	1	1	√	$m\bar{3}m$	$\mathrm{A2_u}$
P211.3.6 H2 ⊕ H2	√	1	1	×	-	-
P211.6.1 GM3	√	3	3	√	$m\bar{3}m$	$\mathrm{A2_u} \oplus \mathrm{E_g}$
P211.6.2 H3	√	1	1	√	$m\bar{3}m$	$\mathrm{A2_u}$
P211.7.1 P1	√	1	1	×	-	-
P211.7.2 P2	√	1	1	×	-	-
P211.7.3 P3	√	1	1	×	-	-

TABLE S633: Non-coplanar SSGs with parent space group $I432$ (No. 211).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N211.1.1 GM1	√	3	3	√	432	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{A1}$
N211.2.1 GM2	√	3	3	√	$\bar{4}3m$	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{A2}$
N211.2.2 H1	√	3	3	√	$m\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A1_u}$
N211.2.3 H2	√	3	3	√	$m\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A1_u}$
N211.3.1 GM2 ⊕ GM2	√	3	3	√	432	$\mathrm{A1} \oplus \mathrm{A2} \oplus \mathrm{A2}$
N211.3.2 GM2 ⊕ H1	√	3	3	√	$m\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
N211.3.3 GM2 ⊕ H2	√	3	3	√	$m\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
N211.3.4 H1 ⊕ H1	√	1	1	√	432	A1
N211.3.5 H1 ⊕ H2	√	1	1	√	$\bar{4}3m$	A1
N211.3.6 H2 ⊕ H2	√	1	1	√	432	A1

Non-coplanar SSGs with parent space group $I432$ (No. 211) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N211.6.1 GM3	$\surd$	3	3	$\surd$	$\bar{4}3m$	$\mathrm{A1}\oplus\mathrm{E}$
N211.6.2 H3	$\surd$	1	1	$\surd$	$\bar{4}3m$	A1
N211.7.1 P1	$\surd$	1	1	$\surd$	$\bar{4}3m$	A1
N211.7.2 P2	$\surd$	1	1	$\surd$	$\bar{4}3m$	A1
N211.7.3 P3	$\surd$	1	1	$\surd$	$\bar{4}3m$	A1
N211.9.1 GM2 $\oplus$ GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$\bar{4}3m$	$\mathrm{A2}\oplus\mathrm{A2}\oplus\mathrm{A2}$
N211.9.2 GM2 $\oplus$ GM2 $\oplus$ H1	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_u}\oplus\mathrm{A2_g}\oplus\mathrm{A2_g}$
N211.9.3 GM2 $\oplus$ GM2 $\oplus$ H2	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_u}\oplus\mathrm{A2_g}\oplus\mathrm{A2_g}$
N211.9.4 GM2 $\oplus$ H1 $\oplus$ H1	$\surd$	1	1	$\times$	-	-
N211.9.5 GM2 $\oplus$ H1 $\oplus$ H2	$\surd$	1	1	$\surd$	432	A2
N211.9.6 GM2 $\oplus$ H2 $\oplus$ H2	$\surd$	1	1	$\times$	-	-
N211.9.7 H1 $\oplus$ H1 $\oplus$ H1	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_u}\oplus\mathrm{A1_u}\oplus\mathrm{A1_u}$
N211.9.8 H1 $\oplus$ H1 $\oplus$ H2	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_u}\oplus\mathrm{A2_u}\oplus\mathrm{A2_u}$
N211.9.9 H1 $\oplus$ H2 $\oplus$ H2	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_u}\oplus\mathrm{A2_u}\oplus\mathrm{A2_u}$
N211.9.10 H2 $\oplus$ H2 $\oplus$ H2	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_u}\oplus\mathrm{A1_u}\oplus\mathrm{A1_u}$
N211.12.1 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	432	$\mathrm{A2}\oplus\mathrm{E}$
N211.12.2 GM2 $\oplus$ H3	$\surd$	1	1	$\surd$	432	A2
N211.12.3 H1 $\oplus$ GM3	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A2_u}\oplus\mathrm{E_g}$
N211.12.4 H1 $\oplus$ H3	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A2_u}\oplus\mathrm{E_u}$
N211.12.5 H2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A2_u}\oplus\mathrm{E_g}$
N211.12.6 H2 $\oplus$ H3	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A2_u}\oplus\mathrm{E_u}$
N211.13.1 GM2 $\oplus$ P1	$\surd$	1	1	$\times$	-	-
N211.13.2 GM2 $\oplus$ P2	$\surd$	1	1	$\times$	-	-
N211.13.3 GM2 $\oplus$ P3	$\surd$	1	1	$\times$	-	-
N211.13.4 H1 $\oplus$ P1	$\surd$	1	1	$\times$	-	-
N211.13.5 H1 $\oplus$ P2	$\surd$	1	1	$\times$	-	-
N211.13.6 H1 $\oplus$ P3	$\surd$	1	1	$\times$	-	-
N211.13.7 H2 $\oplus$ P1	$\surd$	1	1	$\times$	-	-
N211.13.8 H2 $\oplus$ P2	$\surd$	1	1	$\times$	-	-
N211.13.9 H2 $\oplus$ P3	$\surd$	1	1	$\times$	-	-
N211.15.1 GM4	$\surd$	3	3	$\surd$	432	T1
N211.15.2 GM5	$\surd$	3	3	$\surd$	$\bar{4}3m$	T2
N211.15.3 H4	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{T1_u}$
N211.15.4 H5	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{T1_u}$

TABLE S634: Collinear SSGs with parent space group $P4_332$ (No. 212).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L212.1.1 GM1	1	$m\bar{3}m$	$\mathrm{A1_g}$
L212.2.1 GM2	1	$m\bar{3}m$	$\mathrm{A2_g}$

TABLE S635: Coplanar SSGs with parent space group $P4_332$ (No. 212).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P212.1.1 GM1	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A1_u}$

Coplanar SSGs with parent space group $P4_332$ (No. 212) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P212.2.1 GM2	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_u}$
P212.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_u}\oplus\mathrm{A2_g}\oplus\mathrm{A2_g}$
P212.6.1 GM3	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A2_u}\oplus\mathrm{E_g}$

TABLE S636: Non-coplanar SSGs with parent space group $P4_332$ (No. 212).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N212.1.1 GM1	$\surd$	3	3	$\surd$	432	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{A1}$
N212.2.1 GM2	$\surd$	3	3	$\surd$	$\bar{4}3m$	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{A2}$
N212.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	432	$\mathrm{A1}\oplus\mathrm{A2}\oplus\mathrm{A2}$
N212.6.1 GM3	$\surd$	3	3	$\surd$	$\bar{4}3m$	$\mathrm{A1}\oplus\mathrm{E}$
N212.9.1 GM2 $\oplus$ GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$\bar{4}3m$	$\mathrm{A2}\oplus\mathrm{A2}\oplus\mathrm{A2}$
N212.12.1 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	432	$\mathrm{A2}\oplus\mathrm{E}$
N212.15.1 GM4	$\surd$	3	3	$\surd$	432	T1
N212.15.2 GM5	$\surd$	3	3	$\surd$	$\bar{4}3m$	T2

TABLE S637: Collinear SSGs with parent space group $P4_132$ (No. 213).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L213.1.1 GM1	1	$m\bar{3}m$	$\mathrm{A1_g}$
L213.2.1 GM2	1	$m\bar{3}m$	$\mathrm{A2_g}$

TABLE S638: Coplanar SSGs with parent space group $P4_132$ (No. 213).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P213.1.1 GM1	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A1_u}$
P213.2.1 GM2	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_u}$
P213.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_u}\oplus\mathrm{A2_g}\oplus\mathrm{A2_g}$
P213.6.1 GM3	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A2_u}\oplus\mathrm{E_g}$

TABLE S639: Non-coplanar SSGs with parent space group $P4_132$ (No. 213).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N213.1.1 GM1	$\surd$	3	3	$\surd$	432	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{A1}$
N213.2.1 GM2	$\surd$	3	3	$\surd$	$\bar{4}3m$	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{A2}$
N213.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	432	$\mathrm{A1}\oplus\mathrm{A2}\oplus\mathrm{A2}$
N213.6.1 GM3	$\surd$	3	3	$\surd$	$\bar{4}3m$	$\mathrm{A1}\oplus\mathrm{E}$
N213.9.1 GM2 $\oplus$ GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$\bar{4}3m$	$\mathrm{A2}\oplus\mathrm{A2}\oplus\mathrm{A2}$
N213.12.1 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	432	$\mathrm{A2}\oplus\mathrm{E}$
N213.15.1 GM4	$\surd$	3	3	$\surd$	432	T1
N213.15.2 GM5	$\surd$	3	3	$\surd$	$\bar{4}3m$	T2

Collinear SSGs with parent space group $I4_132$ (No. 214)(continued)

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation

TABLE S640: Collinear SSGs with parent space group $I4_132$ (No. 214).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L214.1.1 GM1	1	$m\bar{3}m$	$\mathrm{A1_g}$
L214.2.1 GM2	1	$m\bar{3}m$	$\mathrm{A2_g}$
L214.2.2 H1	0	-	-
L214.2.3 H2	0	-	-

TABLE S641: Coplanar SSGs with parent space group $I4_132$ (No. 214).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P214.1.1 GM1	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A1_u}$
P214.2.1 GM2	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_u}$
P214.2.2 H1	$\surd$	1	1	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}$
P214.2.3 H2	$\surd$	1	1	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}$
P214.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_u}\oplus\mathrm{A2_g}\oplus\mathrm{A2_g}$
P214.3.2 GM2 $\oplus$ H1	$\surd$	1	1	$\times$	-	-
P214.3.3 GM2 $\oplus$ H2	$\surd$	1	1	$\times$	-	-
P214.3.4 H1 $\oplus$ H1	$\surd$	1	1	$\times$	-	-
P214.3.5 H1 $\oplus$ H2	$\surd$	1	1	$\surd$	$m\bar{3}m$	$\mathrm{A2_u}$
P214.3.6 H2 $\oplus$ H2	$\surd$	1	1	$\times$	-	-
P214.6.1 GM3	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A2_u}\oplus\mathrm{E_g}$
P214.6.2 H3	$\surd$	1	1	$\surd$	$m\bar{3}m$	$\mathrm{A2_u}$

TABLE S642: Non-coplanar SSGs with parent space group $I4_132$ (No. 214).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N214.1.1 GM1	$\surd$	3	3	$\surd$	432	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{A1}$
N214.2.1 GM2	$\surd$	3	3	$\surd$	$\bar{4}3m$	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{A2}$
N214.2.2 H1	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A1_u}$
N214.2.3 H2	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A1_u}$
N214.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	432	$\mathrm{A1}\oplus\mathrm{A2}\oplus\mathrm{A2}$
N214.3.2 GM2 $\oplus$ H1	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_u}$
N214.3.3 GM2 $\oplus$ H2	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_u}$
N214.3.4 H1 $\oplus$ H1	$\surd$	1	1	$\surd$	432	A1
N214.3.5 H1 $\oplus$ H2	$\surd$	1	1	$\surd$	$\bar{4}3m$	A1
N214.3.6 H2 $\oplus$ H2	$\surd$	1	1	$\surd$	432	A1
N214.6.1 GM3	$\surd$	3	3	$\surd$	$\bar{4}3m$	$\mathrm{A1}\oplus\mathrm{E}$
N214.6.2 H3	$\surd$	1	1	$\surd$	$\bar{4}3m$	A1
N214.9.1 GM2 $\oplus$ GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$\bar{4}3m$	$\mathrm{A2}\oplus\mathrm{A2}\oplus\mathrm{A2}$
N214.9.2 GM2 $\oplus$ GM2 $\oplus$ H1	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_u}\oplus\mathrm{A2_g}\oplus\mathrm{A2_g}$
N214.9.3 GM2 $\oplus$ GM2 $\oplus$ H2	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_u}\oplus\mathrm{A2_g}\oplus\mathrm{A2_g}$
N214.9.4 GM2 $\oplus$ H1 $\oplus$ H1	$\surd$	1	1	$\times$	-	-
N214.9.5 GM2 $\oplus$ H1 $\oplus$ H2	$\surd$	1	1	$\surd$	432	A2

Non-coplanar SSGs with parent space group $I4_132$ (No. 214) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N214.9.6 GM2 ⊕ H2 ⊕ H2	√	1	1	×	-	-
N214.9.7 H1 ⊕ H1 ⊕ H1	√	3	3	√	$m\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A1_u}$
N214.9.8 H1 ⊕ H1 ⊕ H2	√	3	3	√	$m\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N214.9.9 H1 ⊕ H2 ⊕ H2	√	3	3	√	$m\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N214.9.10 H2 ⊕ H2 ⊕ H2	√	3	3	√	$m\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A1_u}$
N214.12.1 GM2 ⊕ GM3	√	3	3	√	432	$\mathrm{A2} \oplus \mathrm{E}$
N214.12.2 GM2 ⊕ H3	√	1	1	√	432	A2
N214.12.3 H1 ⊕ GM3	√	3	3	√	$m\bar{3}m$	$\mathrm{A2_u} \oplus \mathrm{E_g}$
N214.12.4 H1 ⊕ H3	√	3	3	√	$m\bar{3}m$	$\mathrm{A2_u} \oplus \mathrm{E_u}$
N214.12.5 H2 ⊕ GM3	√	3	3	√	$m\bar{3}m$	$\mathrm{A2_u} \oplus \mathrm{E_g}$
N214.12.6 H2 ⊕ H3	√	3	3	√	$m\bar{3}m$	$\mathrm{A2_u} \oplus \mathrm{E_u}$
N214.15.1 GM4	√	3	3	√	432	T1
N214.15.2 GM5	√	3	3	√	$\bar{4}3m$	T2
N214.15.3 H4	√	3	3	√	$m\bar{3}m$	$\mathrm{T1_u}$
N214.15.4 H5	√	3	3	√	$m\bar{3}m$	$\mathrm{T1_u}$

TABLE S643: Collinear SSGs with parent space group $P\bar{4}3m$ (No. 215).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L215.1.1 GM1	1	$m\bar{3}m$	$\mathrm{A1_g}$
L215.2.1 GM2	1	$m\bar{3}m$	$\mathrm{A2_g}$
L215.2.2 R1	0	-	-
L215.2.3 R2	0	-	-

TABLE S644: Coplanar SSGs with parent space group $P\bar{4}3m$ (No. 215).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P215.1.1 GM1	√	3	3	√	$m\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A2_u}$
P215.2.1 GM2	√	3	3	√	$m\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{A2_g}$
P215.2.2 R1	√	1	1	√	$m\bar{3}m$	$\mathrm{A1_g}$
P215.2.3 R2	√	1	1	√	$m\bar{3}m$	$\mathrm{A1_g}$
P215.3.1 GM2 ⊕ GM2	√	3	3	√	$m\bar{3}m$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
P215.3.2 GM2 ⊕ R1	√	1	1	×	-	-
P215.3.3 GM2 ⊕ R2	√	1	1	×	-	-
P215.3.4 R1 ⊕ R1	√	1	1	×	-	-
P215.3.5 R1 ⊕ R2	√	1	1	×	-	-
P215.3.6 R2 ⊕ R2	√	1	1	×	-	-
P215.6.1 GM3	√	3	3	√	$m\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{E_g}$
P215.6.2 R3	√	1	1	×	-	-

TABLE S645: Non-coplanar SSGs with parent space group $P\bar{4}3m$ (No. 215).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N215.1.1 GM1	√	3	3	√	$\bar{4}3m$	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{A1}$

Non-coplanar SSGs with parent space group $P\bar{4}3m$ (No. 215) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N215.2.1 GM2	$\surd$	3	3	$\surd$	432	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{A2}$
N215.2.2 R1	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A2_u}$
N215.2.3 R2	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A2_u}$
N215.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$\bar{4}3m$	$\mathrm{A1}\oplus\mathrm{A2}\oplus\mathrm{A2}$
N215.3.2 GM2 $\oplus$ R1	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{A2_g}$
N215.3.3 GM2 $\oplus$ R2	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{A2_g}$
N215.3.4 R1 $\oplus$ R1	$\surd$	1	1	$\surd$	$\bar{4}3m$	A1
N215.3.5 R1 $\oplus$ R2	$\surd$	1	1	$\surd$	432	A1
N215.3.6 R2 $\oplus$ R2	$\surd$	1	1	$\surd$	$\bar{4}3m$	A1
N215.6.1 GM3	$\surd$	3	3	$\surd$	432	$\mathrm{A1}\oplus\mathrm{E}$
N215.6.2 R3	$\surd$	1	1	$\surd$	432	A1
N215.9.1 GM2 $\oplus$ GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	432	$\mathrm{A2}\oplus\mathrm{A2}\oplus\mathrm{A2}$
N215.9.2 GM2 $\oplus$ GM2 $\oplus$ R1	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A2_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_u}$
N215.9.3 GM2 $\oplus$ GM2 $\oplus$ R2	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A2_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_u}$
N215.9.4 GM2 $\oplus$ R1 $\oplus$ R1	$\surd$	1	1	$\times$	-	-
N215.9.5 GM2 $\oplus$ R1 $\oplus$ R2	$\surd$	1	1	$\times$	-	-
N215.9.6 GM2 $\oplus$ R2 $\oplus$ R2	$\surd$	1	1	$\times$	-	-
N215.9.7 R1 $\oplus$ R1 $\oplus$ R1	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A2_u}\oplus\mathrm{A2_u}\oplus\mathrm{A2_u}$
N215.9.8 R1 $\oplus$ R1 $\oplus$ R2	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_u}\oplus\mathrm{A1_u}\oplus\mathrm{A2_u}$
N215.9.9 R1 $\oplus$ R2 $\oplus$ R2	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_u}\oplus\mathrm{A1_u}\oplus\mathrm{A2_u}$
N215.9.10 R2 $\oplus$ R2 $\oplus$ R2	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A2_u}\oplus\mathrm{A2_u}\oplus\mathrm{A2_u}$
N215.12.1 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$\bar{4}3m$	$\mathrm{A2}\oplus\mathrm{E}$
N215.12.2 GM2 $\oplus$ R3	$\surd$	1	1	$\times$	-	-
N215.12.3 R1 $\oplus$ GM3	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_u}\oplus\mathrm{E_g}$
N215.12.4 R1 $\oplus$ R3	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_u}\oplus\mathrm{E_u}$
N215.12.5 R2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_u}\oplus\mathrm{E_g}$
N215.12.6 R2 $\oplus$ R3	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_u}\oplus\mathrm{E_u}$
N215.15.1 GM4	$\surd$	3	3	$\surd$	432	T2
N215.15.2 GM5	$\surd$	3	3	$\surd$	$\bar{4}3m$	T1
N215.15.3 R4	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{T2_u}$
N215.15.4 R5	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{T2_u}$
N215.16.1 M1	$\times$	-	-	-	-	-
N215.16.2 M2	$\times$	-	-	-	-	-
N215.16.3 X1	$\times$	-	-	-	-	-
N215.16.4 X2	$\times$	-	-	-	-	-

TABLE S646: Collinear SSGs with parent space group $F\bar{4}3m$ (No. 216).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L216.1.1 GM1	1	$m\bar{3}m$	$\mathrm{A1_g}$
L216.2.1 GM2	1	$m\bar{3}m$	$\mathrm{A2_g}$

TABLE S647: Coplanar SSGs with parent space group $F\bar{4}3m$ (No. 216).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P216.1.1 GM1	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A2_u}$

Coplanar SSGs with parent space group $F\bar{4}3m$ (No. 216) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P216.2.1 GM2	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{A2_g}$
P216.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
P216.6.1 GM3	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{E_g}$

TABLE S648: Non-coplanar SSGs with parent space group $F\bar{4}3m$ (No. 216).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N216.1.1 GM1	$\surd$	3	3	$\surd$	$\bar{4}3m$	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{A1}$
N216.2.1 GM2	$\surd$	3	3	$\surd$	432	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{A2}$
N216.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$\bar{4}3m$	$\mathrm{A1} \oplus \mathrm{A2} \oplus \mathrm{A2}$
N216.6.1 GM3	$\surd$	3	3	$\surd$	432	$\mathrm{A1} \oplus \mathrm{E}$
N216.9.1 GM2 $\oplus$ GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	432	$\mathrm{A2} \oplus \mathrm{A2} \oplus \mathrm{A2}$
N216.12.1 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$\bar{4}3m$	$\mathrm{A2} \oplus \mathrm{E}$
N216.15.1 GM4	$\surd$	3	3	$\surd$	432	T2
N216.15.2 GM5	$\surd$	3	3	$\surd$	$\bar{4}3m$	T1
N216.16.1 X1	$\times$	-	-	-	-	-
N216.16.2 X2	$\times$	-	-	-	-	-

TABLE S649: Collinear SSGs with parent space group $I\bar{4}3m$ (No. 217).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L217.1.1 GM1	1	$m\bar{3}m$	$\mathrm{A1_g}$
L217.2.1 GM2	1	$m\bar{3}m$	$\mathrm{A2_g}$
L217.2.2 H1	0	-	-
L217.2.3 H2	0	-	-

TABLE S650: Coplanar SSGs with parent space group $I\bar{4}3m$ (No. 217).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P217.1.1 GM1	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A2_u}$
P217.2.1 GM2	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{A2_g}$
P217.2.2 H1	$\surd$	1	1	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}$
P217.2.3 H2	$\surd$	1	1	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}$
P217.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
P217.3.2 GM2 $\oplus$ H1	$\surd$	1	1	$\times$	-	-
P217.3.3 GM2 $\oplus$ H2	$\surd$	1	1	$\times$	-	-
P217.3.4 H1 $\oplus$ H1	$\surd$	1	1	$\surd$	$m\bar{3}m$	$\mathrm{A2_u}$
P217.3.5 H1 $\oplus$ H2	$\surd$	1	1	$\times$	-	-
P217.3.6 H2 $\oplus$ H2	$\surd$	1	1	$\surd$	$m\bar{3}m$	$\mathrm{A2_u}$
P217.4.1 P1PA1	$\surd$	1	1	$\times$	-	-
P217.4.2 P2PA2	$\surd$	1	1	$\times$	-	-
P217.6.1 GM3	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{E_g}$
P217.6.2 H3	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $I\bar{4}3m$ (No. 217) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation

TABLE S651: Non-coplanar SSGs with parent space group $I\bar{4}3m$ (No. 217).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N217.1.1 GM1	$\surd$	3	3	$\surd$	$\bar{4}3m$	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{A1}$
N217.2.1 GM2	$\surd$	3	3	$\surd$	432	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{A2}$
N217.2.2 H1	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A2_u}$
N217.2.3 H2	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A2_u}$
N217.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$\bar{4}3m$	$\mathrm{A1}\oplus\mathrm{A2}\oplus\mathrm{A2}$
N217.3.2 GM2 $\oplus$ H1	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{A2_g}$
N217.3.3 GM2 $\oplus$ H2	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{A2_g}$
N217.3.4 H1 $\oplus$ H1	$\surd$	1	1	$\surd$	$\bar{4}3m$	A1
N217.3.5 H1 $\oplus$ H2	$\surd$	1	1	$\surd$	432	A1
N217.3.6 H2 $\oplus$ H2	$\surd$	1	1	$\surd$	$\bar{4}3m$	A1
N217.4.1 P1PA1	$\surd$	1	1	$\surd$	$\bar{4}3m$	A1
N217.4.2 P2PA2	$\surd$	1	1	$\surd$	$\bar{4}3m$	A1
N217.6.1 GM3	$\surd$	3	3	$\surd$	432	$\mathrm{A1}\oplus\mathrm{E}$
N217.6.2 H3	$\surd$	1	1	$\surd$	432	A1
N217.9.1 GM2 $\oplus$ GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	432	$\mathrm{A2}\oplus\mathrm{A2}\oplus\mathrm{A2}$
N217.9.2 GM2 $\oplus$ GM2 $\oplus$ H1	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A2_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_u}$
N217.9.3 GM2 $\oplus$ GM2 $\oplus$ H2	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A2_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_u}$
N217.9.4 GM2 $\oplus$ H1 $\oplus$ H1	$\surd$	1	1	$\surd$	432	A2
N217.9.5 GM2 $\oplus$ H1 $\oplus$ H2	$\surd$	1	1	$\times$	-	-
N217.9.6 GM2 $\oplus$ H2 $\oplus$ H2	$\surd$	1	1	$\surd$	432	A2
N217.9.7 H1 $\oplus$ H1 $\oplus$ H1	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A2_u}\oplus\mathrm{A2_u}\oplus\mathrm{A2_u}$
N217.9.8 H1 $\oplus$ H1 $\oplus$ H2	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_u}\oplus\mathrm{A1_u}\oplus\mathrm{A2_u}$
N217.9.9 H1 $\oplus$ H2 $\oplus$ H2	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_u}\oplus\mathrm{A1_u}\oplus\mathrm{A2_u}$
N217.9.10 H2 $\oplus$ H2 $\oplus$ H2	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A2_u}\oplus\mathrm{A2_u}\oplus\mathrm{A2_u}$
N217.10.1 GM2 $\oplus$ P1PA1	$\surd$	1	1	$\times$	-	-
N217.10.2 GM2 $\oplus$ P2PA2	$\surd$	1	1	$\times$	-	-
N217.10.3 H1 $\oplus$ P1PA1	$\surd$	1	1	$\times$	-	-
N217.10.4 H1 $\oplus$ P2PA2	$\surd$	1	1	$\times$	-	-
N217.10.5 H2 $\oplus$ P1PA1	$\surd$	1	1	$\times$	-	-
N217.10.6 H2 $\oplus$ P2PA2	$\surd$	1	1	$\times$	-	-
N217.12.1 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$\bar{4}3m$	$\mathrm{A2}\oplus\mathrm{E}$
N217.12.2 GM2 $\oplus$ H3	$\surd$	1	1	$\times$	-	-
N217.12.3 H1 $\oplus$ GM3	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_u}\oplus\mathrm{E_g}$
N217.12.4 H1 $\oplus$ H3	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_u}\oplus\mathrm{E_u}$
N217.12.5 H2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_u}\oplus\mathrm{E_g}$
N217.12.6 H2 $\oplus$ H3	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_u}\oplus\mathrm{E_u}$
N217.15.1 GM4	$\surd$	3	3	$\surd$	432	T2
N217.15.2 GM5	$\surd$	3	3	$\surd$	$\bar{4}3m$	T1
N217.15.3 H4	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{T2_u}$
N217.15.4 H5	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{T2_u}$

TABLE S652: Collinear SSGs with parent space group $P\bar{4}3n$ (No. 218).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L218.1.1 GM1	1	$m\bar{3}m$	$\mathrm{A1_g}$
L218.2.1 GM2	1	$m\bar{3}m$	$\mathrm{A2_g}$

TABLE S653: Coplanar SSGs with parent space group $P\bar{4}3n$ (No. 218).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P218.1.1 GM1	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A2_u}$
P218.2.1 GM2	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{A2_g}$
P218.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
P218.4.1 R1R2	$\surd$	1	1	$\times$	-	-
P218.6.1 GM3	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{E_g}$

TABLE S654: Non-coplanar SSGs with parent space group $P\bar{4}3n$ (No. 218).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N218.1.1 GM1	$\surd$	3	3	$\surd$	$\bar{4}3m$	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{A1}$
N218.2.1 GM2	$\surd$	3	3	$\surd$	432	$\mathrm{A1} \oplus \mathrm{A1} \oplus \mathrm{A2}$
N218.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$\bar{4}3m$	$\mathrm{A1} \oplus \mathrm{A2} \oplus \mathrm{A2}$
N218.4.1 R1R2	$\surd$	1	1	$\surd$	$\bar{4}3m$	$\mathrm{A1}$
N218.6.1 GM3	$\surd$	3	3	$\surd$	432	$\mathrm{A1} \oplus \mathrm{E}$
N218.9.1 GM2 $\oplus$ GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	432	$\mathrm{A2} \oplus \mathrm{A2} \oplus \mathrm{A2}$
N218.10.1 GM2 $\oplus$ R1R2	$\surd$	1	1	$\times$	-	-
N218.12.1 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$\bar{4}3m$	$\mathrm{A2} \oplus \mathrm{E}$
N218.15.1 GM4	$\surd$	3	3	$\surd$	432	$\mathrm{T2}$
N218.15.2 GM5	$\surd$	3	3	$\surd$	$\bar{4}3m$	$\mathrm{T1}$
N218.16.1 M1	$\times$	-	-	-	-	-
N218.16.2 M2	$\times$	-	-	-	-	-

TABLE S655: Collinear SSGs with parent space group $F\bar{4}3c$ (No. 219).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L219.1.1 GM1	1	$m\bar{3}m$	$\mathrm{A1_g}$
L219.2.1 GM2	1	$m\bar{3}m$	$\mathrm{A2_g}$

TABLE S656: Coplanar SSGs with parent space group $F\bar{4}3c$ (No. 219).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P219.1.1 GM1	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A2_u}$
P219.2.1 GM2	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{A2_g}$
P219.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
P219.6.1 GM3	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{E_g}$

Non-coplanar SSGs with parent space group $F\bar{4}3c$ (No. 219) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation

TABLE S657: Non-coplanar SSGs with parent space group $F\bar{4}3c$ (No. 219).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N219.1.1 GM1	$\surd$	3	3	$\surd$	$\bar{4}3m$	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{A1}$
N219.2.1 GM2	$\surd$	3	3	$\surd$	432	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{A2}$
N219.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$\bar{4}3m$	$\mathrm{A1}\oplus\mathrm{A2}\oplus\mathrm{A2}$
N219.6.1 GM3	$\surd$	3	3	$\surd$	432	$\mathrm{A1}\oplus\mathrm{E}$
N219.9.1 GM2 $\oplus$ GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	432	$\mathrm{A2}\oplus\mathrm{A2}\oplus\mathrm{A2}$
N219.12.1 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$\bar{4}3m$	$\mathrm{A2}\oplus\mathrm{E}$
N219.15.1 GM4	$\surd$	3	3	$\surd$	432	T2
N219.15.2 GM5	$\surd$	3	3	$\surd$	$\bar{4}3m$	T1
N219.16.1 X1	$\times$	-	-	-	-	-
N219.16.2 X2	$\times$	-	-	-	-	-

TABLE S658: Collinear SSGs with parent space group $I\bar{4}3d$ (No. 220).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L220.1.1 GM1	1	$m\bar{3}m$	$\mathrm{A1_g}$
L220.2.1 GM2	1	$m\bar{3}m$	$\mathrm{A2_g}$

TABLE S659: Coplanar SSGs with parent space group $I\bar{4}3d$ (No. 220).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P220.1.1 GM1	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A2_u}$
P220.2.1 GM2	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{A2_g}$
P220.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A2_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_u}$
P220.4.1 H1H2	$\surd$	1	1	$\surd$	$m\bar{3}m$	$\mathrm{A2_u}$
P220.6.1 GM3	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_u}\oplus\mathrm{E_g}$

TABLE S660: Non-coplanar SSGs with parent space group $I\bar{4}3d$ (No. 220).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N220.1.1 GM1	$\surd$	3	3	$\surd$	$\bar{4}3m$	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{A1}$
N220.2.1 GM2	$\surd$	3	3	$\surd$	432	$\mathrm{A1}\oplus\mathrm{A1}\oplus\mathrm{A2}$
N220.3.1 GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	$\bar{4}3m$	$\mathrm{A1}\oplus\mathrm{A2}\oplus\mathrm{A2}$
N220.4.1 H1H2	$\surd$	1	1	$\surd$	$\bar{4}3m$	A1
N220.6.1 GM3	$\surd$	3	3	$\surd$	432	$\mathrm{A1}\oplus\mathrm{E}$
N220.9.1 GM2 $\oplus$ GM2 $\oplus$ GM2	$\surd$	3	3	$\surd$	432	$\mathrm{A2}\oplus\mathrm{A2}\oplus\mathrm{A2}$
N220.10.1 GM2 $\oplus$ H1H2	$\surd$	1	1	$\surd$	432	A2
N220.12.1 GM2 $\oplus$ GM3	$\surd$	3	3	$\surd$	$\bar{4}3m$	$\mathrm{A2}\oplus\mathrm{E}$
N220.15.1 GM4	$\surd$	3	3	$\surd$	432	T2
N220.15.2 GM5	$\surd$	3	3	$\surd$	$\bar{4}3m$	T1

Collinear SSGs with parent space group $Pm\bar{3}m$ (No. 221)(continued)

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation

TABLE S661: Collinear SSGs with parent space group $Pm\bar{3}m$ (No. 221).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L221.1.1 $\mathrm{GM1}^{+}$	1	$m\bar{3}m$	$\mathrm{A1_g}$
L221.2.1 $\mathrm{GM1}^{-}$	0	-	-
L221.2.2 $\mathrm{GM2}^{+}$	1	$m\bar{3}m$	$\mathrm{A2_g}$
L221.2.3 $\mathrm{GM2}^{-}$	0	-	-
L221.2.4 $\mathrm{R1}^{+}$	0	-	-
L221.2.5 $\mathrm{R1}^{-}$	0	-	-

TABLE S662: Coplanar SSGs with parent space group $Pm\bar{3}m$ (No. 221).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P221.1.1 $\mathrm{GM1}^{+}$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_g}$
P221.2.1 $\mathrm{GM1}^{-}$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_u}$
P221.2.2 $\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A2_g}$
P221.2.3 $\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A2_u}$
P221.2.4 $\mathrm{R1}^{+}$	$\surd$	1	1	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}$
P221.2.5 $\mathrm{R1}^{-}$	$\surd$	1	1	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}$
P221.3.1 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}$	$\surd$	0	0	$\surd$	-	-
P221.3.2 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A2_g}\oplus\mathrm{A2_u}$
P221.3.3 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
P221.3.4 $\mathrm{GM1}^{-}\oplus\mathrm{R1}^{+}$	$\surd$	1	1	$\times$	-	-
P221.3.5 $\mathrm{GM1}^{-}\oplus\mathrm{R1}^{-}$	$\surd$	1	1	$\times$	-	-
P221.3.6 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A2_g}\oplus\mathrm{A2_g}$
P221.3.7 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_u}\oplus\mathrm{A2_g}$
P221.3.8 $\mathrm{GM2}^{+}\oplus\mathrm{R1}^{+}$	$\surd$	1	0	$\times$	-	-
P221.3.9 $\mathrm{GM2}^{+}\oplus\mathrm{R1}^{-}$	$\surd$	1	0	$\times$	-	-
P221.3.10 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
P221.3.11 $\mathrm{GM2}^{-}\oplus\mathrm{R1}^{+}$	$\surd$	1	1	$\times$	-	-
P221.3.12 $\mathrm{GM2}^{-}\oplus\mathrm{R1}^{-}$	$\surd$	1	1	$\times$	-	-
P221.3.13 $\mathrm{R1}^{+}\oplus\mathrm{R1}^{+}$	$\surd$	1	0	$\times$	-	-
P221.3.14 $\mathrm{R1}^{+}\oplus\mathrm{R2}^{-}$	$\surd$	1	1	$\times$	-	-
P221.3.15 $\mathrm{R1}^{+}\oplus\mathrm{R1}^{-}$	$\surd$	1	1	$\times$	-	-
P221.3.16 $\mathrm{R1}^{+}\oplus\mathrm{R2}^{+}$	$\surd$	1	0	$\times$	-	-
P221.3.17 $\mathrm{R1}^{-}\oplus\mathrm{R1}^{-}$	$\surd$	1	0	$\times$	-	-
P221.3.18 $\mathrm{R1}^{-}\oplus\mathrm{R2}^{+}$	$\surd$	1	1	$\times$	-	-
P221.6.1 $\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{E_g}$
P221.6.2 $\mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
P221.6.3 $\mathrm{R3}^{+}$	$\surd$	1	0	$\times$	-	-

TABLE S663: Non-coplanar SSGs with parent space group $Pm\bar{3}m$ (No. 221).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N221.1.1 $\mathrm{GM1}^{+}$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A1_g}$

Non-coplanar SSGs with parent space group $Pm\bar{3}m$ (No. 221) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N221.2.1 $\mathrm{GM1}^-$	$\surd$	2	2	$\surd$	432	$\mathrm{A1}\oplus\mathrm{A1}$
N221.2.2 $\mathrm{GM2}^+$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A2_g}$
N221.2.3 $\mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$\bar{4}3m$	$\mathrm{A1}\oplus\mathrm{A1}$
N221.2.4 $\mathrm{R1}^+$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_g}$
N221.2.5 $\mathrm{R1}^-$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_g}$
N221.3.1 $\mathrm{GM1}^-\oplus\mathrm{GM1}^-$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{A1_u}$
N221.3.2 $\mathrm{GM1}^-\oplus\mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$\bar{4}3m$	$\mathrm{A1}\oplus\mathrm{A2}$
N221.3.3 $\mathrm{GM1}^-\oplus\mathrm{GM2}^-$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{A2_u}$
N221.3.4 $\mathrm{GM1}^-\oplus\mathrm{R1}^+$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_u}$
N221.3.5 $\mathrm{GM1}^-\oplus\mathrm{R1}^-$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_u}$
N221.3.6 $\mathrm{GM2}^+\oplus\mathrm{GM2}^+$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_g}$
N221.3.7 $\mathrm{GM2}^+\oplus\mathrm{GM2}^-$	$\surd$	2	2	$\surd$	432	$\mathrm{A1}\oplus\mathrm{A2}$
N221.3.8 $\mathrm{GM2}^+\oplus\mathrm{R1}^+$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A2_g}$
N221.3.9 $\mathrm{GM2}^+\oplus\mathrm{R1}^-$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A2_g}$
N221.3.10 $\mathrm{GM2}^-\oplus\mathrm{GM2}^-$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A2_u}\oplus\mathrm{A2_u}$
N221.3.11 $\mathrm{GM2}^-\oplus\mathrm{R1}^+$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A2_u}$
N221.3.12 $\mathrm{GM2}^-\oplus\mathrm{R1}^-$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A2_u}$
N221.3.13 $\mathrm{R1}^+\oplus\mathrm{R1}^+$	$\surd$	1	1	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}$
N221.3.14 $\mathrm{R1}^+\oplus\mathrm{R2}^-$	$\surd$	1	1	$\surd$	$\bar{4}3m$	A1
N221.3.15 $\mathrm{R1}^+\oplus\mathrm{R1}^-$	$\surd$	1	1	$\surd$	432	A1
N221.3.16 $\mathrm{R1}^+\oplus\mathrm{R2}^+$	$\surd$	1	1	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}$
N221.3.17 $\mathrm{R1}^-\oplus\mathrm{R1}^-$	$\surd$	1	1	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}$
N221.3.18 $\mathrm{R1}^-\oplus\mathrm{R2}^+$	$\surd$	1	1	$\surd$	$\bar{4}3m$	A1
N221.6.1 $\mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{E_g}$
N221.6.2 $\mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{E_u}$
N221.6.3 $\mathrm{R3}^+$	$\surd$	1	1	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}$
N221.9.1 $\mathrm{GM1}^-\oplus\mathrm{GM1}^-\oplus\mathrm{GM1}^-$	$\surd$	0	0	$\surd$	-	-
N221.9.2 $\mathrm{GM1}^-\oplus\mathrm{GM1}^-\oplus\mathrm{GM2}^+$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A2_g}\oplus\mathrm{A2_u}\oplus\mathrm{A2_u}$
N221.9.3 $\mathrm{GM1}^-\oplus\mathrm{GM1}^-\oplus\mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
N221.9.4 $\mathrm{GM1}^-\oplus\mathrm{GM1}^-\oplus\mathrm{R1}^+$	$\surd$	0	0	$\surd$	-	-
N221.9.5 $\mathrm{GM1}^-\oplus\mathrm{GM1}^-\oplus\mathrm{R1}^-$	$\surd$	0	0	$\surd$	-	-
N221.9.6 $\mathrm{GM1}^-\oplus\mathrm{GM2}^+\oplus\mathrm{GM2}^+$	$\surd$	2	2	$\surd$	432	$\mathrm{A2}\oplus\mathrm{A2}$
N221.9.7 $\mathrm{GM1}^-\oplus\mathrm{GM2}^+\oplus\mathrm{GM2}^-$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_u}\oplus\mathrm{A2_g}\oplus\mathrm{A2_u}$
N221.9.8 $\mathrm{GM1}^-\oplus\mathrm{GM2}^+\oplus\mathrm{R1}^+$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A2_g}\oplus\mathrm{A2_u}$
N221.9.9 $\mathrm{GM1}^-\oplus\mathrm{GM2}^+\oplus\mathrm{R1}^-$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A2_g}\oplus\mathrm{A2_u}$
N221.9.10 $\mathrm{GM1}^-\oplus\mathrm{GM2}^-\oplus\mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
N221.9.11 $\mathrm{GM1}^-\oplus\mathrm{GM2}^-\oplus\mathrm{R1}^+$	$\surd$	0	0	$\surd$	-	-
N221.9.12 $\mathrm{GM1}^-\oplus\mathrm{GM2}^-\oplus\mathrm{R1}^-$	$\surd$	0	0	$\surd$	-	-
N221.9.13 $\mathrm{GM1}^-\oplus\mathrm{R1}^+\oplus\mathrm{R1}^+$	$\surd$	1	0	$\times$	-	-
N221.9.14 $\mathrm{GM1}^-\oplus\mathrm{R1}^+\oplus\mathrm{R2}^-$	$\surd$	1	1	$\times$	-	-
N221.9.15 $\mathrm{GM1}^-\oplus\mathrm{R1}^+\oplus\mathrm{R1}^-$	$\surd$	1	1	$\times$	-	-
N221.9.16 $\mathrm{GM1}^-\oplus\mathrm{R1}^+\oplus\mathrm{R2}^+$	$\surd$	1	0	$\times$	-	-
N221.9.17 $\mathrm{GM1}^-\oplus\mathrm{R1}^-\oplus\mathrm{R1}^-$	$\surd$	1	0	$\times$	-	-
N221.9.18 $\mathrm{GM1}^-\oplus\mathrm{R1}^-\oplus\mathrm{R2}^+$	$\surd$	1	1	$\times$	-	-
N221.9.19 $\mathrm{GM2}^+\oplus\mathrm{GM2}^+\oplus\mathrm{GM2}^+$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A2_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_g}$
N221.9.20 $\mathrm{GM2}^+\oplus\mathrm{GM2}^+\oplus\mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$\bar{4}3m$	$\mathrm{A2}\oplus\mathrm{A2}$

Non-coplanar SSGs with parent space group $Pm\bar{3}m$ (No. 221) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N221.9.21 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{R1}^+$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A2_g} \oplus \mathrm{A2_g}$
N221.9.22 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{R1}^-$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A2_g} \oplus \mathrm{A2_g}$
N221.9.23 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A2_g}$
N221.9.24 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{R1}^+$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{A2_g}$
N221.9.25 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{R1}^-$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{A2_g}$
N221.9.26 $\mathrm{GM2}^+ \oplus \mathrm{R1}^+ \oplus \mathrm{R1}^+$	$\surd$	1	1	$\times$	-	-
N221.9.27 $\mathrm{GM2}^+ \oplus \mathrm{R1}^+ \oplus \mathrm{R2}^-$	$\surd$	1	1	$\times$	-	-
N221.9.28 $\mathrm{GM2}^+ \oplus \mathrm{R1}^+ \oplus \mathrm{R1}^-$	$\surd$	1	1	$\times$	-	-
N221.9.29 $\mathrm{GM2}^+ \oplus \mathrm{R1}^+ \oplus \mathrm{R2}^+$	$\surd$	1	1	$\times$	-	-
N221.9.30 $\mathrm{GM2}^+ \oplus \mathrm{R1}^- \oplus \mathrm{R1}^-$	$\surd$	1	1	$\times$	-	-
N221.9.31 $\mathrm{GM2}^+ \oplus \mathrm{R1}^- \oplus \mathrm{R2}^+$	$\surd$	1	1	$\times$	-	-
N221.9.32 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
N221.9.33 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{R1}^+$	$\surd$	0	0	$\surd$	-	-
N221.9.34 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{R1}^-$	$\surd$	0	0	$\surd$	-	-
N221.9.35 $\mathrm{GM2}^- \oplus \mathrm{R1}^+ \oplus \mathrm{R1}^+$	$\surd$	1	0	$\times$	-	-
N221.9.36 $\mathrm{GM2}^- \oplus \mathrm{R1}^+ \oplus \mathrm{R2}^-$	$\surd$	1	1	$\times$	-	-
N221.9.37 $\mathrm{GM2}^- \oplus \mathrm{R1}^+ \oplus \mathrm{R1}^-$	$\surd$	1	1	$\times$	-	-
N221.9.38 $\mathrm{GM2}^- \oplus \mathrm{R1}^+ \oplus \mathrm{R2}^+$	$\surd$	1	0	$\times$	-	-
N221.9.39 $\mathrm{GM2}^- \oplus \mathrm{R1}^- \oplus \mathrm{R1}^-$	$\surd$	1	0	$\times$	-	-
N221.9.40 $\mathrm{GM2}^- \oplus \mathrm{R1}^- \oplus \mathrm{R2}^+$	$\surd$	1	1	$\times$	-	-
N221.9.41 $\mathrm{R1}^+ \oplus \mathrm{R1}^+ \oplus \mathrm{R1}^+$	$\surd$	0	0	$\surd$	-	-
N221.9.42 $\mathrm{R1}^+ \oplus \mathrm{R1}^+ \oplus \mathrm{R2}^-$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A2_u} \oplus \mathrm{A2_u}$
N221.9.43 $\mathrm{R1}^+ \oplus \mathrm{R1}^+ \oplus \mathrm{R1}^-$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{A1_u}$
N221.9.44 $\mathrm{R1}^+ \oplus \mathrm{R1}^+ \oplus \mathrm{R2}^+$	$\surd$	0	0	$\surd$	-	-
N221.9.45 $\mathrm{R1}^+ \oplus \mathrm{R2}^- \oplus \mathrm{R1}^-$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{A2_u}$
N221.9.46 $\mathrm{R1}^+ \oplus \mathrm{R1}^- \oplus \mathrm{R1}^-$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{A1_u}$
N221.9.47 $\mathrm{R1}^+ \oplus \mathrm{R1}^- \oplus \mathrm{R2}^+$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{A2_u}$
N221.9.48 $\mathrm{R1}^+ \oplus \mathrm{R2}^+ \oplus \mathrm{R2}^+$	$\surd$	0	0	$\surd$	-	-
N221.9.49 $\mathrm{R1}^- \oplus \mathrm{R1}^- \oplus \mathrm{R1}^-$	$\surd$	0	0	$\surd$	-	-
N221.9.50 $\mathrm{R1}^- \oplus \mathrm{R1}^- \oplus \mathrm{R2}^+$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A2_u} \oplus \mathrm{A2_u}$
N221.12.1 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$\bar{4}3m$	E
N221.12.2 $\mathrm{GM1}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N221.12.3 $\mathrm{GM1}^- \oplus \mathrm{R3}^+$	$\surd$	1	0	$\times$	-	-
N221.12.4 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A2_g} \oplus \mathrm{E_g}$
N221.12.5 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A2_g} \oplus \mathrm{E_u}$
N221.12.6 $\mathrm{GM2}^+ \oplus \mathrm{R3}^+$	$\surd$	1	1	$\times$	-	-
N221.12.7 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	432	E
N221.12.8 $\mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N221.12.9 $\mathrm{GM2}^- \oplus \mathrm{R3}^+$	$\surd$	1	0	$\times$	-	-
N221.12.10 $\mathrm{R1}^+ \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{E_g}$
N221.12.11 $\mathrm{R1}^+ \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N221.12.12 $\mathrm{R1}^+ \oplus \mathrm{R3}^+$	$\surd$	0	0	$\surd$	-	-
N221.12.13 $\mathrm{R1}^+ \oplus \mathrm{R3}^-$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{E_u}$
N221.12.14 $\mathrm{R1}^- \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{E_g}$
N221.12.15 $\mathrm{R1}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N221.12.16 $\mathrm{R1}^- \oplus \mathrm{R3}^+$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{E_u}$

Non-coplanar SSGs with parent space group $Pm\bar{3}m$ (No. 221) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N221.12.17 $\mathrm{R1}^- \oplus \mathrm{R3}^-$	$\surd$	0	0	$\surd$	-	-
N221.15.1 $\mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{T1_g}$
N221.15.2 $\mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N221.15.3 $\mathrm{GM5}^+$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{T2_g}$
N221.15.4 $\mathrm{GM5}^-$	$\surd$	0	0	$\surd$	-	-
N221.15.5 $\mathrm{R4}^+$	$\surd$	0	0	$\surd$	-	-
N221.15.6 $\mathrm{R4}^-$	$\surd$	0	0	$\surd$	-	-
N221.16.1 $\mathrm{M1}^+$	$\times$	-	-	-	-	-
N221.16.2 $\mathrm{M1}^-$	$\times$	-	-	-	-	-
N221.16.3 $\mathrm{M2}^+$	$\times$	-	-	-	-	-
N221.16.4 $\mathrm{M2}^-$	$\times$	-	-	-	-	-
N221.16.5 $\mathrm{X1}^+$	$\times$	-	-	-	-	-
N221.16.6 $\mathrm{X1}^-$	$\times$	-	-	-	-	-
N221.16.7 $\mathrm{X2}^+$	$\times$	-	-	-	-	-
N221.16.8 $\mathrm{X2}^-$	$\times$	-	-	-	-	-

TABLE S664: Collinear SSGs with parent space group $Pn\bar{3}n$ (No. 222).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L222.1.1 $\mathrm{GM1}^+$	1	$m\bar{3}m$	$\mathrm{A1_g}$
L222.2.1 $\mathrm{GM1}^-$	0	-	-
L222.2.2 $\mathrm{GM2}^+$	1	$m\bar{3}m$	$\mathrm{A2_g}$
L222.2.3 $\mathrm{GM2}^-$	0	-	-

TABLE S665: Coplanar SSGs with parent space group $Pn\bar{3}n$ (No. 222).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P222.1.1 $\mathrm{GM1}^+$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A1_g}$
P222.2.1 $\mathrm{GM1}^-$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A1_u}$
P222.2.2 $\mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A2_g}$
P222.2.3 $\mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A2_u}$
P222.3.1 $\mathrm{GM1}^- \oplus \mathrm{GM1}^-$	$\surd$	0	0	$\surd$	-	-
P222.3.2 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A2_g} \oplus \mathrm{A2_u}$
P222.3.3 $\mathrm{GM1}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
P222.3.4 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A2_g} \oplus \mathrm{A2_g}$
P222.3.5 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{A2_g}$
P222.3.6 $\mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
P222.6.1 $\mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{E_g}$
P222.6.2 $\mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
P222.6.3 R1	$\surd$	1	1	$\times$	-	-

TABLE S666: Non-coplanar SSGs with parent space group $Pn\bar{3}n$ (No. 222).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N222.1.1 $\mathrm{GM1}^+$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A1_g}$

Non-coplanar SSGs with parent space group $Pn\bar{3}n$ (No. 222) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N222.2.1 $\mathrm{GM1}^-$	$\surd$	2	2	$\surd$	432	$\mathrm{A1}\oplus\mathrm{A1}$
N222.2.2 $\mathrm{GM2}^+$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A2_g}$
N222.2.3 $\mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$\bar{4}3m$	$\mathrm{A1}\oplus\mathrm{A1}$
N222.3.1 $\mathrm{GM1}^-\oplus\mathrm{GM1}^-$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{A1_u}$
N222.3.2 $\mathrm{GM1}^-\oplus\mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$\bar{4}3m$	$\mathrm{A1}\oplus\mathrm{A2}$
N222.3.3 $\mathrm{GM1}^-\oplus\mathrm{GM2}^-$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{A2_u}$
N222.3.4 $\mathrm{GM2}^+\oplus\mathrm{GM2}^+$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_g}$
N222.3.5 $\mathrm{GM2}^+\oplus\mathrm{GM2}^-$	$\surd$	2	2	$\surd$	432	$\mathrm{A1}\oplus\mathrm{A2}$
N222.3.6 $\mathrm{GM2}^-\oplus\mathrm{GM2}^-$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A2_u}\oplus\mathrm{A2_u}$
N222.6.1 $\mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{E_g}$
N222.6.2 $\mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{E_u}$
N222.6.3 R1	$\surd$	1	1	$\surd$	$\bar{4}3m$	A1
N222.9.1 $\mathrm{GM1}^-\oplus\mathrm{GM1}^-\oplus\mathrm{GM1}^-$	$\surd$	0	0	$\surd$	-	-
N222.9.2 $\mathrm{GM1}^-\oplus\mathrm{GM1}^-\oplus\mathrm{GM2}^+$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A2_g}\oplus\mathrm{A2_u}\oplus\mathrm{A2_u}$
N222.9.3 $\mathrm{GM1}^-\oplus\mathrm{GM1}^-\oplus\mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
N222.9.4 $\mathrm{GM1}^-\oplus\mathrm{GM2}^+\oplus\mathrm{GM2}^+$	$\surd$	2	2	$\surd$	432	$\mathrm{A2}\oplus\mathrm{A2}$
N222.9.5 $\mathrm{GM1}^-\oplus\mathrm{GM2}^+\oplus\mathrm{GM2}^-$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_u}\oplus\mathrm{A2_g}\oplus\mathrm{A2_u}$
N222.9.6 $\mathrm{GM1}^-\oplus\mathrm{GM2}^-\oplus\mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
N222.9.7 $\mathrm{GM2}^+\oplus\mathrm{GM2}^+\oplus\mathrm{GM2}^+$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A2_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_g}$
N222.9.8 $\mathrm{GM2}^+\oplus\mathrm{GM2}^+\oplus\mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$\bar{4}3m$	$\mathrm{A2}\oplus\mathrm{A2}$
N222.9.9 $\mathrm{GM2}^+\oplus\mathrm{GM2}^-\oplus\mathrm{GM2}^-$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_u}\oplus\mathrm{A1_u}\oplus\mathrm{A2_g}$
N222.9.10 $\mathrm{GM2}^-\oplus\mathrm{GM2}^-\oplus\mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
N222.12.1 $\mathrm{GM1}^-\oplus\mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$\bar{4}3m$	E
N222.12.2 $\mathrm{GM1}^-\oplus\mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N222.12.3 $\mathrm{GM1}^-\oplus\mathrm{R1}$	$\surd$	1	1	$\times$	-	-
N222.12.4 $\mathrm{GM2}^+\oplus\mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A2_g}\oplus\mathrm{E_g}$
N222.12.5 $\mathrm{GM2}^+\oplus\mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A2_g}\oplus\mathrm{E_u}$
N222.12.6 $\mathrm{GM2}^+\oplus\mathrm{R1}$	$\surd$	1	1	$\times$	-	-
N222.12.7 $\mathrm{GM2}^-\oplus\mathrm{GM3}^+$	$\surd$	2	2	$\surd$	432	E
N222.12.8 $\mathrm{GM2}^-\oplus\mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N222.12.9 $\mathrm{GM2}^-\oplus\mathrm{R1}$	$\surd$	1	1	$\times$	-	-
N222.15.1 $\mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{T1_g}$
N222.15.2 $\mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N222.15.3 $\mathrm{GM5}^+$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{T2_g}$
N222.15.4 $\mathrm{GM5}^-$	$\surd$	0	0	$\surd$	-	-

TABLE S667: Collinear SSGs with parent space group $Pm\bar{3}n$ (No. 223).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L223.1.1 $\mathrm{GM1}^+$	1	$m\bar{3}m$	$\mathrm{A1_g}$
L223.2.1 $\mathrm{GM1}^-$	0	-	-
L223.2.2 $\mathrm{GM2}^+$	1	$m\bar{3}m$	$\mathrm{A2_g}$
L223.2.3 $\mathrm{GM2}^-$	0	-	-

TABLE S668: Coplanar SSGs with parent space group $Pm\bar{3}n$ (No. 223).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P223.1.1 $\mathrm{GM1}^+$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A1_g}$
P223.2.1 $\mathrm{GM1}^-$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A1_u}$
P223.2.2 $\mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A2_g}$
P223.2.3 $\mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A2_u}$
P223.3.1 $\mathrm{GM1}^- \oplus \mathrm{GM1}^-$	$\surd$	0	0	$\surd$	-	-
P223.3.2 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A2_g} \oplus \mathrm{A2_u}$
P223.3.3 $\mathrm{GM1}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
P223.3.4 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A2_g} \oplus \mathrm{A2_g}$
P223.3.5 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{A2_g}$
P223.3.6 $\mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
P223.6.1 $\mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{E_g}$
P223.6.2 $\mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
P223.6.3 R1	$\surd$	1	1	$\times$	-	-

TABLE S669: Non-coplanar SSGs with parent space group $Pm\bar{3}n$ (No. 223).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N223.1.1 $\mathrm{GM1}^+$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A1_g}$
N223.2.1 $\mathrm{GM1}^-$	$\surd$	2	2	$\surd$	432	$\mathrm{A1} \oplus \mathrm{A1}$
N223.2.2 $\mathrm{GM2}^+$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A2_g}$
N223.2.3 $\mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$\bar{4}3m$	$\mathrm{A1} \oplus \mathrm{A1}$
N223.3.1 $\mathrm{GM1}^- \oplus \mathrm{GM1}^-$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{A1_u}$
N223.3.2 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$\bar{4}3m$	$\mathrm{A1} \oplus \mathrm{A2}$
N223.3.3 $\mathrm{GM1}^- \oplus \mathrm{GM2}^-$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{A2_u}$
N223.3.4 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
N223.3.5 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	2	2	$\surd$	432	$\mathrm{A1} \oplus \mathrm{A2}$
N223.3.6 $\mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N223.6.1 $\mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{E_g}$
N223.6.2 $\mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{E_u}$
N223.6.3 R1	$\surd$	1	1	$\surd$	$\bar{4}3m$	A1
N223.9.1 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{GM1}^-$	$\surd$	0	0	$\surd$	-	-
N223.9.2 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{GM2}^+$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A2_g} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N223.9.3 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
N223.9.4 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	2	2	$\surd$	432	$\mathrm{A2} \oplus \mathrm{A2}$
N223.9.5 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
N223.9.6 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
N223.9.7 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
N223.9.8 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$\bar{4}3m$	$\mathrm{A2} \oplus \mathrm{A2}$
N223.9.9 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A2_g}$
N223.9.10 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
N223.12.1 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$\bar{4}3m$	E
N223.12.2 $\mathrm{GM1}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N223.12.3 $\mathrm{GM1}^- \oplus \mathrm{R1}$	$\surd$	1	1	$\times$	-	-
N223.12.4 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A2_g} \oplus \mathrm{E_g}$
N223.12.5 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A2_g} \oplus \mathrm{E_u}$
N223.12.6 $\mathrm{GM2}^+ \oplus \mathrm{R1}$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $Pm\bar{3}n$ (No. 223) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N223.12.7 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	432	E
N223.12.8 $\mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N223.12.9 $\mathrm{GM2}^- \oplus \mathrm{R1}$	$\surd$	1	1	$\times$	-	-
N223.15.1 $\mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{T1_g}$
N223.15.2 $\mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N223.15.3 $\mathrm{GM5}^+$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{T2_g}$
N223.15.4 $\mathrm{GM5}^-$	$\surd$	0	0	$\surd$	-	-
N223.16.1 $\mathrm{M1}^+$	$\times$	-	-	-	-	-
N223.16.2 $\mathrm{M1}^-$	$\times$	-	-	-	-	-
N223.16.3 $\mathrm{M2}^+$	$\times$	-	-	-	-	-
N223.16.4 $\mathrm{M2}^-$	$\times$	-	-	-	-	-

TABLE S670: Collinear SSGs with parent space group $Pn\bar{3}m$ (No. 224).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L224.1.1 $\mathrm{GM1}^+$	1	$m\bar{3}m$	$\mathrm{A1_g}$
L224.2.1 $\mathrm{GM1}^-$	0	-	-
L224.2.2 $\mathrm{GM2}^+$	1	$m\bar{3}m$	$\mathrm{A2_g}$
L224.2.3 $\mathrm{GM2}^-$	0	-	-
L224.2.4 $\mathrm{R1}^+$	0	-	-
L224.2.5 $\mathrm{R1}^-$	0	-	-

TABLE S671: Coplanar SSGs with parent space group $Pn\bar{3}m$ (No. 224).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P224.1.1 $\mathrm{GM1}^+$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A1_g}$
P224.2.1 $\mathrm{GM1}^-$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A1_u}$
P224.2.2 $\mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A2_g}$
P224.2.3 $\mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A2_u}$
P224.2.4 $\mathrm{R1}^+$	$\surd$	1	1	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}$
P224.2.5 $\mathrm{R1}^-$	$\surd$	1	1	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}$
P224.3.1 $\mathrm{GM1}^- \oplus \mathrm{GM1}^-$	$\surd$	0	0	$\surd$	-	-
P224.3.2 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A2_g} \oplus \mathrm{A2_u}$
P224.3.3 $\mathrm{GM1}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
P224.3.4 $\mathrm{GM1}^- \oplus \mathrm{R1}^+$	$\surd$	1	1	$\times$	-	-
P224.3.5 $\mathrm{GM1}^- \oplus \mathrm{R1}^-$	$\surd$	1	1	$\times$	-	-
P224.3.6 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A2_g} \oplus \mathrm{A2_g}$
P224.3.7 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{A2_g}$
P224.3.8 $\mathrm{GM2}^+ \oplus \mathrm{R1}^+$	$\surd$	1	0	$\times$	-	-
P224.3.9 $\mathrm{GM2}^+ \oplus \mathrm{R1}^-$	$\surd$	1	0	$\times$	-	-
P224.3.10 $\mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
P224.3.11 $\mathrm{GM2}^- \oplus \mathrm{R1}^+$	$\surd$	1	1	$\times$	-	-
P224.3.12 $\mathrm{GM2}^- \oplus \mathrm{R1}^-$	$\surd$	1	1	$\times$	-	-
P224.3.13 $\mathrm{R1}^+ \oplus \mathrm{R1}^+$	$\surd$	1	0	$\times$	-	-
P224.3.14 $\mathrm{R1}^+ \oplus \mathrm{R2}^-$	$\surd$	1	1	$\times$	-	-

Coplanar SSGs with parent space group $Pn\bar{3}m$ (No. 224) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P224.3.15 $\mathrm{R1}^+ \oplus \mathrm{R1}^-$	$\surd$	1	1	$\times$	-	-
P224.3.16 $\mathrm{R1}^+ \oplus \mathrm{R2}^+$	$\surd$	1	0	$\times$	-	-
P224.3.17 $\mathrm{R1}^- \oplus \mathrm{R1}^-$	$\surd$	1	0	$\times$	-	-
P224.3.18 $\mathrm{R1}^- \oplus \mathrm{R2}^+$	$\surd$	1	1	$\times$	-	-
P224.6.1 $\mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{E_g}$
P224.6.2 $\mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
P224.6.3 $\mathrm{R3}^+$	$\surd$	1	0	$\times$	-	-

TABLE S672: Non-coplanar SSGs with parent space group $Pn\bar{3}m$ (No. 224).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N224.1.1 $\mathrm{GM1}^+$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A1_g}$
N224.2.1 $\mathrm{GM1}^-$	$\surd$	2	2	$\surd$	432	$\mathrm{A1} \oplus \mathrm{A1}$
N224.2.2 $\mathrm{GM2}^+$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A2_g}$
N224.2.3 $\mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$\bar{4}3m$	$\mathrm{A1} \oplus \mathrm{A1}$
N224.2.4 $\mathrm{R1}^+$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A1_g}$
N224.2.5 $\mathrm{R1}^-$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A1_g}$
N224.3.1 $\mathrm{GM1}^- \oplus \mathrm{GM1}^-$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{A1_u}$
N224.3.2 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$\bar{4}3m$	$\mathrm{A1} \oplus \mathrm{A2}$
N224.3.3 $\mathrm{GM1}^- \oplus \mathrm{GM2}^-$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{A2_u}$
N224.3.4 $\mathrm{GM1}^- \oplus \mathrm{R1}^+$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A1_u}$
N224.3.5 $\mathrm{GM1}^- \oplus \mathrm{R1}^-$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A1_u}$
N224.3.6 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
N224.3.7 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	2	2	$\surd$	432	$\mathrm{A1} \oplus \mathrm{A2}$
N224.3.8 $\mathrm{GM2}^+ \oplus \mathrm{R1}^+$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A2_g}$
N224.3.9 $\mathrm{GM2}^+ \oplus \mathrm{R1}^-$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A2_g}$
N224.3.10 $\mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N224.3.11 $\mathrm{GM2}^- \oplus \mathrm{R1}^+$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A2_u}$
N224.3.12 $\mathrm{GM2}^- \oplus \mathrm{R1}^-$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A2_u}$
N224.3.13 $\mathrm{R1}^+ \oplus \mathrm{R1}^+$	$\surd$	1	1	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}$
N224.3.14 $\mathrm{R1}^+ \oplus \mathrm{R2}^-$	$\surd$	1	1	$\surd$	$\bar{4}3m$	A1
N224.3.15 $\mathrm{R1}^+ \oplus \mathrm{R1}^-$	$\surd$	1	1	$\surd$	432	A1
N224.3.16 $\mathrm{R1}^+ \oplus \mathrm{R2}^+$	$\surd$	1	1	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}$
N224.3.17 $\mathrm{R1}^- \oplus \mathrm{R1}^-$	$\surd$	1	1	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}$
N224.3.18 $\mathrm{R1}^- \oplus \mathrm{R2}^+$	$\surd$	1	1	$\surd$	$\bar{4}3m$	A1
N224.6.1 $\mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{E_g}$
N224.6.2 $\mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{E_u}$
N224.6.3 $\mathrm{R3}^+$	$\surd$	1	1	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}$
N224.9.1 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{GM1}^-$	$\surd$	0	0	$\surd$	-	-
N224.9.2 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{GM2}^+$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A2_g} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N224.9.3 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
N224.9.4 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{R1}^+$	$\surd$	0	0	$\surd$	-	-
N224.9.5 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{R1}^-$	$\surd$	0	0	$\surd$	-	-
N224.9.6 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	2	2	$\surd$	432	$\mathrm{A2} \oplus \mathrm{A2}$
N224.9.7 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
N224.9.8 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{R1}^+$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A2_g} \oplus \mathrm{A2_u}$

Non-coplanar SSGs with parent space group $Pn\bar{3}m$ (No. 224) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N224.9.9 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{R1}^-$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A2_g} \oplus \mathrm{A2_u}$
N224.9.10 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
N224.9.11 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{R1}^+$	$\surd$	0	0	$\surd$	-	-
N224.9.12 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{R1}^-$	$\surd$	0	0	$\surd$	-	-
N224.9.13 $\mathrm{GM1}^- \oplus \mathrm{R1}^+ \oplus \mathrm{R1}^+$	$\surd$	1	0	$\times$	-	-
N224.9.14 $\mathrm{GM1}^- \oplus \mathrm{R1}^+ \oplus \mathrm{R2}^-$	$\surd$	1	1	$\times$	-	-
N224.9.15 $\mathrm{GM1}^- \oplus \mathrm{R1}^+ \oplus \mathrm{R1}^-$	$\surd$	1	1	$\times$	-	-
N224.9.16 $\mathrm{GM1}^- \oplus \mathrm{R1}^+ \oplus \mathrm{R2}^+$	$\surd$	1	0	$\times$	-	-
N224.9.17 $\mathrm{GM1}^- \oplus \mathrm{R1}^- \oplus \mathrm{R1}^-$	$\surd$	1	0	$\times$	-	-
N224.9.18 $\mathrm{GM1}^- \oplus \mathrm{R1}^- \oplus \mathrm{R2}^+$	$\surd$	1	1	$\times$	-	-
N224.9.19 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
N224.9.20 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$\bar{4}3m$	$\mathrm{A2} \oplus \mathrm{A2}$
N224.9.21 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{R1}^+$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A2_g} \oplus \mathrm{A2_g}$
N224.9.22 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{R1}^-$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A2_g} \oplus \mathrm{A2_g}$
N224.9.23 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A2_g}$
N224.9.24 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{R1}^+$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{A2_g}$
N224.9.25 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{R1}^-$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{A2_g}$
N224.9.26 $\mathrm{GM2}^+ \oplus \mathrm{R1}^+ \oplus \mathrm{R1}^+$	$\surd$	1	1	$\times$	-	-
N224.9.27 $\mathrm{GM2}^+ \oplus \mathrm{R1}^+ \oplus \mathrm{R2}^-$	$\surd$	1	1	$\times$	-	-
N224.9.28 $\mathrm{GM2}^+ \oplus \mathrm{R1}^+ \oplus \mathrm{R1}^-$	$\surd$	1	1	$\times$	-	-
N224.9.29 $\mathrm{GM2}^+ \oplus \mathrm{R1}^+ \oplus \mathrm{R2}^+$	$\surd$	1	1	$\times$	-	-
N224.9.30 $\mathrm{GM2}^+ \oplus \mathrm{R1}^- \oplus \mathrm{R1}^-$	$\surd$	1	1	$\times$	-	-
N224.9.31 $\mathrm{GM2}^+ \oplus \mathrm{R1}^- \oplus \mathrm{R2}^+$	$\surd$	1	1	$\times$	-	-
N224.9.32 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
N224.9.33 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{R1}^+$	$\surd$	0	0	$\surd$	-	-
N224.9.34 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{R1}^-$	$\surd$	0	0	$\surd$	-	-
N224.9.35 $\mathrm{GM2}^- \oplus \mathrm{R1}^+ \oplus \mathrm{R1}^+$	$\surd$	1	0	$\times$	-	-
N224.9.36 $\mathrm{GM2}^- \oplus \mathrm{R1}^+ \oplus \mathrm{R2}^-$	$\surd$	1	1	$\times$	-	-
N224.9.37 $\mathrm{GM2}^- \oplus \mathrm{R1}^+ \oplus \mathrm{R1}^-$	$\surd$	1	1	$\times$	-	-
N224.9.38 $\mathrm{GM2}^- \oplus \mathrm{R1}^+ \oplus \mathrm{R2}^+$	$\surd$	1	0	$\times$	-	-
N224.9.39 $\mathrm{GM2}^- \oplus \mathrm{R1}^- \oplus \mathrm{R1}^-$	$\surd$	1	0	$\times$	-	-
N224.9.40 $\mathrm{GM2}^- \oplus \mathrm{R1}^- \oplus \mathrm{R2}^+$	$\surd$	1	1	$\times$	-	-
N224.9.41 $\mathrm{R1}^+ \oplus \mathrm{R1}^+ \oplus \mathrm{R1}^+$	$\surd$	0	0	$\surd$	-	-
N224.9.42 $\mathrm{R1}^+ \oplus \mathrm{R1}^+ \oplus \mathrm{R2}^-$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A2_u} \oplus \mathrm{A2_u}$
N224.9.43 $\mathrm{R1}^+ \oplus \mathrm{R1}^+ \oplus \mathrm{R1}^-$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{A1_u}$
N224.9.44 $\mathrm{R1}^+ \oplus \mathrm{R1}^+ \oplus \mathrm{R2}^+$	$\surd$	0	0	$\surd$	-	-
N224.9.45 $\mathrm{R1}^+ \oplus \mathrm{R2}^- \oplus \mathrm{R1}^-$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{A2_u}$
N224.9.46 $\mathrm{R1}^+ \oplus \mathrm{R1}^- \oplus \mathrm{R1}^-$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{A1_u}$
N224.9.47 $\mathrm{R1}^+ \oplus \mathrm{R1}^- \oplus \mathrm{R2}^+$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{A2_u}$
N224.9.48 $\mathrm{R1}^+ \oplus \mathrm{R2}^+ \oplus \mathrm{R2}^+$	$\surd$	0	0	$\surd$	-	-
N224.9.49 $\mathrm{R1}^- \oplus \mathrm{R1}^- \oplus \mathrm{R1}^-$	$\surd$	0	0	$\surd$	-	-
N224.9.50 $\mathrm{R1}^- \oplus \mathrm{R1}^- \oplus \mathrm{R2}^+$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A2_u} \oplus \mathrm{A2_u}$
N224.12.1 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$\bar{4}3m$	E
N224.12.2 $\mathrm{GM1}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N224.12.3 $\mathrm{GM1}^- \oplus \mathrm{R3}^+$	$\surd$	1	0	$\times$	-	-
N224.12.4 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A2_g} \oplus \mathrm{E_g}$

Non-coplanar SSGs with parent space group $Pn\bar{3}m$ (No. 224) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N224.12.5 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{-}$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A2_g}\oplus\mathrm{E_u}$
N224.12.6 $\mathrm{GM2}^{+}\oplus\mathrm{R3}^{+}$	$\surd$	1	1	$\times$	-	-
N224.12.7 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	432	E
N224.12.8 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
N224.12.9 $\mathrm{GM2}^{-}\oplus\mathrm{R3}^{+}$	$\surd$	1	0	$\times$	-	-
N224.12.10 $\mathrm{R1}^{+}\oplus\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{E_g}$
N224.12.11 $\mathrm{R1}^{+}\oplus\mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
N224.12.12 $\mathrm{R1}^{+}\oplus\mathrm{R3}^{+}$	$\surd$	0	0	$\surd$	-	-
N224.12.13 $\mathrm{R1}^{+}\oplus\mathrm{R3}^{-}$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{E_u}$
N224.12.14 $\mathrm{R1}^{-}\oplus\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{E_g}$
N224.12.15 $\mathrm{R1}^{-}\oplus\mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
N224.12.16 $\mathrm{R1}^{-}\oplus\mathrm{R3}^{+}$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{E_u}$
N224.12.17 $\mathrm{R1}^{-}\oplus\mathrm{R3}^{-}$	$\surd$	0	0	$\surd$	-	-
N224.15.1 $\mathrm{GM4}^{+}$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{T1_g}$
N224.15.2 $\mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
N224.15.3 $\mathrm{GM5}^{+}$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{T2_g}$
N224.15.4 $\mathrm{GM5}^{-}$	$\surd$	0	0	$\surd$	-	-
N224.15.5 $\mathrm{R4}^{+}$	$\surd$	0	0	$\surd$	-	-
N224.15.6 $\mathrm{R4}^{-}$	$\surd$	0	0	$\surd$	-	-

TABLE S673: Collinear SSGs with parent space group $Fm\bar{3}m$ (No. 225).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L225.1.1 $\mathrm{GM1}^{+}$	1	$m\bar{3}m$	$\mathrm{A1_g}$
L225.2.1 $\mathrm{GM1}^{-}$	0	-	-
L225.2.2 $\mathrm{GM2}^{+}$	1	$m\bar{3}m$	$\mathrm{A2_g}$
L225.2.3 $\mathrm{GM2}^{-}$	0	-	-

TABLE S674: Coplanar SSGs with parent space group $Fm\bar{3}m$ (No. 225).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P225.1.1 $\mathrm{GM1}^{+}$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_g}$
P225.2.1 $\mathrm{GM1}^{-}$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_u}$
P225.2.2 $\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A2_g}$
P225.2.3 $\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A2_u}$
P225.3.1 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}$	$\surd$	0	0	$\surd$	-	-
P225.3.2 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A2_g}\oplus\mathrm{A2_u}$
P225.3.3 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
P225.3.4 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A2_g}\oplus\mathrm{A2_g}$
P225.3.5 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_u}\oplus\mathrm{A2_g}$
P225.3.6 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
P225.6.1 $\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{E_g}$
P225.6.2 $\mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-

TABLE S675: Non-coplanar SSGs with parent space group $Fm\bar{3}m$ (No. 225).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N225.1.1 $\mathrm{GM1}^{+}$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A1_g}$
N225.2.1 $\mathrm{GM1}^{-}$	$\surd$	2	2	$\surd$	432	$\mathrm{A1}\oplus\mathrm{A1}$
N225.2.2 $\mathrm{GM2}^{+}$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A2_g}$
N225.2.3 $\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	$\bar{4}3m$	$\mathrm{A1}\oplus\mathrm{A1}$
N225.3.1 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{A1_u}$
N225.3.2 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	$\bar{4}3m$	$\mathrm{A1}\oplus\mathrm{A2}$
N225.3.3 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{A2_u}$
N225.3.4 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_g}$
N225.3.5 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	432	$\mathrm{A1}\oplus\mathrm{A2}$
N225.3.6 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A2_u}\oplus\mathrm{A2_u}$
N225.6.1 $\mathrm{GM3}^{+}$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{E_g}$
N225.6.2 $\mathrm{GM3}^{-}$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{E_u}$
N225.9.1 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}$	$\surd$	0	0	$\surd$	-	-
N225.9.2 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A2_g}\oplus\mathrm{A2_u}\oplus\mathrm{A2_u}$
N225.9.3 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
N225.9.4 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	432	$\mathrm{A2}\oplus\mathrm{A2}$
N225.9.5 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_u}\oplus\mathrm{A2_g}\oplus\mathrm{A2_u}$
N225.9.6 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
N225.9.7 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A2_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_g}$
N225.9.8 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	$\bar{4}3m$	$\mathrm{A2}\oplus\mathrm{A2}$
N225.9.9 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_u}\oplus\mathrm{A1_u}\oplus\mathrm{A2_g}$
N225.9.10 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
N225.12.1 $\mathrm{GM1}^{-}\oplus\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	$\bar{4}3m$	E
N225.12.2 $\mathrm{GM1}^{-}\oplus\mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
N225.12.3 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{+}$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A2_g}\oplus\mathrm{E_g}$
N225.12.4 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{-}$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A2_g}\oplus\mathrm{E_u}$
N225.12.5 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	432	E
N225.12.6 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
N225.15.1 $\mathrm{GM4}^{+}$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{T1_g}$
N225.15.2 $\mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
N225.15.3 $\mathrm{GM5}^{+}$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{T2_g}$
N225.15.4 $\mathrm{GM5}^{-}$	$\surd$	0	0	$\surd$	-	-
N225.16.1 $\mathrm{X1}^{+}$	$\times$	-	-	-	-	-
N225.16.2 $\mathrm{X1}^{-}$	$\times$	-	-	-	-	-
N225.16.3 $\mathrm{X2}^{+}$	$\times$	-	-	-	-	-
N225.16.4 $\mathrm{X2}^{-}$	$\times$	-	-	-	-	-
N225.16.5 $\mathrm{X3}^{+}$	$\times$	-	-	-	-	-
N225.16.6 $\mathrm{X3}^{-}$	$\times$	-	-	-	-	-
N225.16.7 $\mathrm{X4}^{+}$	$\times$	-	-	-	-	-
N225.16.8 $\mathrm{X4}^{-}$	$\times$	-	-	-	-	-

TABLE S676: Collinear SSGs with parent space group $Fm\bar{3}c$ (No. 226).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L226.1.1 $\mathrm{GM1}^{+}$	1	$m\bar{3}m$	$\mathrm{A1_g}$
L226.2.1 $\mathrm{GM1}^{-}$	0	-	-

Collinear SSGs with parent space group $Fm\bar{3}c$ (No. 226)(continued)

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L226.2.2 $\mathrm{GM2}^{+}$	1	$m\bar{3}m$	$\mathrm{A2_g}$
L226.2.3 $\mathrm{GM2}^{-}$	0	-	-

TABLE S677: Coplanar SSGs with parent space group $Fm\bar{3}c$ (No. 226).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P226.1.1 $\mathrm{GM1}^{+}$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_g}$
P226.2.1 $\mathrm{GM1}^{-}$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_u}$
P226.2.2 $\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A2_g}$
P226.2.3 $\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A2_u}$
P226.3.1 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}$	$\surd$	0	0	$\surd$	-	-
P226.3.2 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A2_g}\oplus\mathrm{A2_u}$
P226.3.3 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
P226.3.4 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A2_g}\oplus\mathrm{A2_g}$
P226.3.5 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_u}\oplus\mathrm{A2_g}$
P226.3.6 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
P226.6.1 $\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{E_g}$
P226.6.2 $\mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-

TABLE S678: Non-coplanar SSGs with parent space group $Fm\bar{3}c$ (No. 226).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N226.1.1 $\mathrm{GM1}^{+}$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A1_g}$
N226.2.1 $\mathrm{GM1}^{-}$	$\surd$	2	2	$\surd$	432	$\mathrm{A1}\oplus\mathrm{A1}$
N226.2.2 $\mathrm{GM2}^{+}$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A2_g}$
N226.2.3 $\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	$\bar{4}3m$	$\mathrm{A1}\oplus\mathrm{A1}$
N226.3.1 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{A1_u}$
N226.3.2 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	$\bar{4}3m$	$\mathrm{A1}\oplus\mathrm{A2}$
N226.3.3 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{A2_u}$
N226.3.4 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_g}$
N226.3.5 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	432	$\mathrm{A1}\oplus\mathrm{A2}$
N226.3.6 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A2_u}\oplus\mathrm{A2_u}$
N226.6.1 $\mathrm{GM3}^{+}$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{E_g}$
N226.6.2 $\mathrm{GM3}^{-}$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{E_u}$
N226.9.1 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}$	$\surd$	0	0	$\surd$	-	-
N226.9.2 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A2_g}\oplus\mathrm{A2_u}\oplus\mathrm{A2_u}$
N226.9.3 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
N226.9.4 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	432	$\mathrm{A2}\oplus\mathrm{A2}$
N226.9.5 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_u}\oplus\mathrm{A2_g}\oplus\mathrm{A2_u}$
N226.9.6 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
N226.9.7 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A2_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_g}$
N226.9.8 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	$\bar{4}3m$	$\mathrm{A2}\oplus\mathrm{A2}$
N226.9.9 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_u}\oplus\mathrm{A1_u}\oplus\mathrm{A2_g}$
N226.9.10 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-

Non-coplanar SSGs with parent space group $Fm\bar{3}c$ (No. 226) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N226.12.1 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$\bar{4}3m$	E
N226.12.2 $\mathrm{GM1}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N226.12.3 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A2_g} \oplus \mathrm{E_g}$
N226.12.4 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A2_g} \oplus \mathrm{E_u}$
N226.12.5 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	432	E
N226.12.6 $\mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N226.15.1 $\mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{T1_g}$
N226.15.2 $\mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N226.15.3 $\mathrm{GM5}^+$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{T2_g}$
N226.15.4 $\mathrm{GM5}^-$	$\surd$	0	0	$\surd$	-	-
N226.16.1 $\mathrm{X1}^+$	$\times$	-	-	-	-	-
N226.16.2 $\mathrm{X1}^-$	$\times$	-	-	-	-	-
N226.16.3 $\mathrm{X2}^+$	$\times$	-	-	-	-	-
N226.16.4 $\mathrm{X2}^-$	$\times$	-	-	-	-	-
N226.16.5 $\mathrm{X3}^+$	$\times$	-	-	-	-	-
N226.16.6 $\mathrm{X3}^-$	$\times$	-	-	-	-	-
N226.16.7 $\mathrm{X4}^+$	$\times$	-	-	-	-	-
N226.16.8 $\mathrm{X4}^-$	$\times$	-	-	-	-	-

TABLE S679: Collinear SSGs with parent space group $Fd\bar{3}m$ (No. 227).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L227.1.1 $\mathrm{GM1}^+$	1	$m\bar{3}m$	$\mathrm{A1_g}$
L227.2.1 $\mathrm{GM1}^-$	0	-	-
L227.2.2 $\mathrm{GM2}^+$	1	$m\bar{3}m$	$\mathrm{A2_g}$
L227.2.3 $\mathrm{GM2}^-$	0	-	-

TABLE S680: Coplanar SSGs with parent space group $Fd\bar{3}m$ (No. 227).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P227.1.1 $\mathrm{GM1}^+$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A1_g}$
P227.2.1 $\mathrm{GM1}^-$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A1_u}$
P227.2.2 $\mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A2_g}$
P227.2.3 $\mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A2_u}$
P227.3.1 $\mathrm{GM1}^- \oplus \mathrm{GM1}^-$	$\surd$	0	0	$\surd$	-	-
P227.3.2 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A2_g} \oplus \mathrm{A2_u}$
P227.3.3 $\mathrm{GM1}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
P227.3.4 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A2_g} \oplus \mathrm{A2_g}$
P227.3.5 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{A2_g}$
P227.3.6 $\mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
P227.6.1 $\mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{E_g}$
P227.6.2 $\mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-

TABLE S681: Non-coplanar SSGs with parent space group $Fd\bar{3}m$ (No. 227).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N227.1.1 $\mathrm{GM1}^{+}$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A1_g}$
N227.2.1 $\mathrm{GM1}^{-}$	$\surd$	2	2	$\surd$	432	$\mathrm{A1}\oplus\mathrm{A1}$
N227.2.2 $\mathrm{GM2}^{+}$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A2_g}$
N227.2.3 $\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	$\bar{4}3m$	$\mathrm{A1}\oplus\mathrm{A1}$
N227.3.1 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{A1_u}$
N227.3.2 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	$\bar{4}3m$	$\mathrm{A1}\oplus\mathrm{A2}$
N227.3.3 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{A2_u}$
N227.3.4 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_g}$
N227.3.5 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	432	$\mathrm{A1}\oplus\mathrm{A2}$
N227.3.6 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A2_u}\oplus\mathrm{A2_u}$
N227.6.1 $\mathrm{GM3}^{+}$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{E_g}$
N227.6.2 $\mathrm{GM3}^{-}$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{E_u}$
N227.9.1 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}$	$\surd$	0	0	$\surd$	-	-
N227.9.2 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A2_g}\oplus\mathrm{A2_u}\oplus\mathrm{A2_u}$
N227.9.3 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
N227.9.4 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	432	$\mathrm{A2}\oplus\mathrm{A2}$
N227.9.5 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_u}\oplus\mathrm{A2_g}\oplus\mathrm{A2_u}$
N227.9.6 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
N227.9.7 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A2_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_g}$
N227.9.8 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	$\bar{4}3m$	$\mathrm{A2}\oplus\mathrm{A2}$
N227.9.9 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_u}\oplus\mathrm{A1_u}\oplus\mathrm{A2_g}$
N227.9.10 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
N227.12.1 $\mathrm{GM1}^{-}\oplus\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	$\bar{4}3m$	E
N227.12.2 $\mathrm{GM1}^{-}\oplus\mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
N227.12.3 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{+}$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A2_g}\oplus\mathrm{E_g}$
N227.12.4 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{-}$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A2_g}\oplus\mathrm{E_u}$
N227.12.5 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	432	E
N227.12.6 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
N227.15.1 $\mathrm{GM4}^{+}$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{T1_g}$
N227.15.2 $\mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
N227.15.3 $\mathrm{GM5}^{+}$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{T2_g}$
N227.15.4 $\mathrm{GM5}^{-}$	$\surd$	0	0	$\surd$	-	-

TABLE S682: Collinear SSGs with parent space group $Fd\bar{3}c$ (No. 228).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L228.1.1 $\mathrm{GM1}^{+}$	1	$m\bar{3}m$	$\mathrm{A1_g}$
L228.2.1 $\mathrm{GM1}^{-}$	0	-	-
L228.2.2 $\mathrm{GM2}^{+}$	1	$m\bar{3}m$	$\mathrm{A2_g}$
L228.2.3 $\mathrm{GM2}^{-}$	0	-	-

TABLE S683: Coplanar SSGs with parent space group $Fd\bar{3}c$ (No. 228).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P228.1.1 $\mathrm{GM1}^{+}$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_g}$

Coplanar SSGs with parent space group $Fd\bar{3}c$ (No. 228) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P228.2.1 $\mathrm{GM1}^-$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A1_u}$
P228.2.2 $\mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A2_g}$
P228.2.3 $\mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A2_u}$
P228.3.1 $\mathrm{GM1}^- \oplus \mathrm{GM1}^-$	$\surd$	0	0	$\surd$	-	-
P228.3.2 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A2_g} \oplus \mathrm{A2_u}$
P228.3.3 $\mathrm{GM1}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
P228.3.4 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A2_g} \oplus \mathrm{A2_g}$
P228.3.5 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{A2_g}$
P228.3.6 $\mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
P228.6.1 $\mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{E_g}$
P228.6.2 $\mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-

TABLE S684: Non-coplanar SSGs with parent space group $Fd\bar{3}c$ (No. 228).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N228.1.1 $\mathrm{GM1}^+$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A1_g}$
N228.2.1 $\mathrm{GM1}^-$	$\surd$	2	2	$\surd$	432	$\mathrm{A1} \oplus \mathrm{A1}$
N228.2.2 $\mathrm{GM2}^+$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A1_g} \oplus \mathrm{A2_g}$
N228.2.3 $\mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$\bar{4}3m$	$\mathrm{A1} \oplus \mathrm{A1}$
N228.3.1 $\mathrm{GM1}^- \oplus \mathrm{GM1}^-$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{A1_u}$
N228.3.2 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$\bar{4}3m$	$\mathrm{A1} \oplus \mathrm{A2}$
N228.3.3 $\mathrm{GM1}^- \oplus \mathrm{GM2}^-$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{A2_u}$
N228.3.4 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
N228.3.5 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	2	2	$\surd$	432	$\mathrm{A1} \oplus \mathrm{A2}$
N228.3.6 $\mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N228.6.1 $\mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{E_g}$
N228.6.2 $\mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{E_u}$
N228.9.1 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{GM1}^-$	$\surd$	0	0	$\surd$	-	-
N228.9.2 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{GM2}^+$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A2_g} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N228.9.3 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
N228.9.4 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	2	2	$\surd$	432	$\mathrm{A2} \oplus \mathrm{A2}$
N228.9.5 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
N228.9.6 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
N228.9.7 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
N228.9.8 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$\bar{4}3m$	$\mathrm{A2} \oplus \mathrm{A2}$
N228.9.9 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A2_g}$
N228.9.10 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
N228.12.1 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	$\bar{4}3m$	E
N228.12.2 $\mathrm{GM1}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N228.12.3 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A2_g} \oplus \mathrm{E_g}$
N228.12.4 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^-$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A2_g} \oplus \mathrm{E_u}$
N228.12.5 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+$	$\surd$	2	2	$\surd$	432	E
N228.12.6 $\mathrm{GM2}^- \oplus \mathrm{GM3}^-$	$\surd$	0	0	$\surd$	-	-
N228.15.1 $\mathrm{GM4}^+$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{T1_g}$
N228.15.2 $\mathrm{GM4}^-$	$\surd$	0	0	$\surd$	-	-
N228.15.3 $\mathrm{GM5}^+$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{T2_g}$

Non-coplanar SSGs with parent space group $Fd\bar{3}c$ (No. 228) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N228.15.4 $\mathrm{GM5}^-$	$\surd$	0	0	$\surd$	-	-

TABLE S685: Collinear SSGs with parent space group $Im\bar{3}m$ (No. 229).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L229.1.1 $\mathrm{GM1}^+$	1	$m\bar{3}m$	$\mathrm{A1_g}$
L229.2.1 $\mathrm{GM1}^-$	0	-	-
L229.2.2 $\mathrm{GM2}^+$	1	$m\bar{3}m$	$\mathrm{A2_g}$
L229.2.3 $\mathrm{GM2}^-$	0	-	-
L229.2.4 $\mathrm{H1}^+$	0	-	-
L229.2.5 $\mathrm{H1}^-$	0	-	-
L229.2.6 $\mathrm{H2}^+$	0	-	-
L229.2.7 $\mathrm{H2}^-$	0	-	-

TABLE S686: Coplanar SSGs with parent space group $Im\bar{3}m$ (No. 229).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P229.1.1 $\mathrm{GM1}^+$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_g}$
P229.2.1 $\mathrm{GM1}^-$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_u}$
P229.2.2 $\mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A2_g}$
P229.2.3 $\mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A2_u}$
P229.2.4 $\mathrm{H1}^+$	$\surd$	1	1	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}$
P229.2.5 $\mathrm{H1}^-$	$\surd$	1	1	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}$
P229.2.6 $\mathrm{H2}^+$	$\surd$	1	1	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}$
P229.2.7 $\mathrm{H2}^-$	$\surd$	1	1	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}$
P229.3.1 $\mathrm{GM1}^-\oplus\mathrm{GM1}^-$	$\surd$	0	0	$\surd$	-	-
P229.3.2 $\mathrm{GM1}^-\oplus\mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A2_g}\oplus\mathrm{A2_u}$
P229.3.3 $\mathrm{GM1}^-\oplus\mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
P229.3.4 $\mathrm{GM1}^-\oplus\mathrm{H1}^+$	$\surd$	1	1	$\times$	-	-
P229.3.5 $\mathrm{GM1}^-\oplus\mathrm{H1}^-$	$\surd$	1	1	$\times$	-	-
P229.3.6 $\mathrm{GM1}^-\oplus\mathrm{H2}^+$	$\surd$	1	1	$\times$	-	-
P229.3.7 $\mathrm{GM1}^-\oplus\mathrm{H2}^-$	$\surd$	1	1	$\times$	-	-
P229.3.8 $\mathrm{GM2}^+\oplus\mathrm{GM2}^+$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A2_g}\oplus\mathrm{A2_g}$
P229.3.9 $\mathrm{GM2}^+\oplus\mathrm{GM2}^-$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_u}\oplus\mathrm{A2_g}$
P229.3.10 $\mathrm{GM2}^+\oplus\mathrm{H1}^+$	$\surd$	1	0	$\times$	-	-
P229.3.11 $\mathrm{GM2}^+\oplus\mathrm{H1}^-$	$\surd$	1	0	$\times$	-	-
P229.3.12 $\mathrm{GM2}^+\oplus\mathrm{H2}^+$	$\surd$	1	0	$\times$	-	-
P229.3.13 $\mathrm{GM2}^+\oplus\mathrm{H2}^-$	$\surd$	1	0	$\times$	-	-
P229.3.14 $\mathrm{GM2}^-\oplus\mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
P229.3.15 $\mathrm{GM2}^-\oplus\mathrm{H1}^+$	$\surd$	1	1	$\times$	-	-
P229.3.16 $\mathrm{GM2}^-\oplus\mathrm{H1}^-$	$\surd$	1	1	$\times$	-	-
P229.3.17 $\mathrm{GM2}^-\oplus\mathrm{H2}^+$	$\surd$	1	1	$\times$	-	-
P229.3.18 $\mathrm{GM2}^-\oplus\mathrm{H2}^-$	$\surd$	1	1	$\times$	-	-
P229.3.19 $\mathrm{H1}^+\oplus\mathrm{H1}^+$	$\surd$	1	0	$\times$	-	-
P229.3.20 $\mathrm{H1}^+\oplus\mathrm{H1}^-$	$\surd$	1	1	$\times$	-	-

Coplanar SSGs with parent space group $Im\bar{3}m$ (No. 229) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P229.3.21 $\mathrm{H1}^{+}\oplus\mathrm{H2}^{+}$	$\surd$	1	0	$\times$	-	-
P229.3.22 $\mathrm{H1}^{+}\oplus\mathrm{H2}^{-}$	$\surd$	1	1	$\surd$	$m\bar{3}m$	$\mathrm{A2_u}$
P229.3.23 $\mathrm{H1}^{-}\oplus\mathrm{H1}^{-}$	$\surd$	1	0	$\times$	-	-
P229.3.24 $\mathrm{H1}^{-}\oplus\mathrm{H2}^{+}$	$\surd$	1	1	$\surd$	$m\bar{3}m$	$\mathrm{A2_u}$
P229.3.25 $\mathrm{H1}^{-}\oplus\mathrm{H2}^{-}$	$\surd$	1	0	$\times$	-	-
P229.3.26 $\mathrm{H2}^{+}\oplus\mathrm{H2}^{+}$	$\surd$	1	0	$\times$	-	-
P229.3.27 $\mathrm{H2}^{+}\oplus\mathrm{H2}^{-}$	$\surd$	1	1	$\times$	-	-
P229.3.28 $\mathrm{H2}^{-}\oplus\mathrm{H2}^{-}$	$\surd$	1	0	$\times$	-	-
P229.6.1 $\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{E_g}$
P229.6.2 $\mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
P229.6.3 $\mathrm{H3}^{+}$	$\surd$	1	0	$\times$	-	-
P229.6.4 $\mathrm{H3}^{-}$	$\surd$	1	0	$\times$	-	-
P229.7.1 P1	$\surd$	1	1	$\times$	-	-
P229.7.2 P2	$\surd$	1	1	$\times$	-	-

TABLE S687: Non-coplanar SSGs with parent space group $Im\bar{3}m$ (No. 229).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N229.1.1 $\mathrm{GM1}^{+}$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A1_g}$
N229.2.1 $\mathrm{GM1}^{-}$	$\surd$	2	2	$\surd$	432	$\mathrm{A1}\oplus\mathrm{A1}$
N229.2.2 $\mathrm{GM2}^{+}$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A2_g}$
N229.2.3 $\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	$\bar{4}3m$	$\mathrm{A1}\oplus\mathrm{A1}$
N229.2.4 $\mathrm{H1}^{+}$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_g}$
N229.2.5 $\mathrm{H1}^{-}$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_g}$
N229.2.6 $\mathrm{H2}^{+}$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_g}$
N229.2.7 $\mathrm{H2}^{-}$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_g}$
N229.3.1 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{A1_u}$
N229.3.2 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	$\bar{4}3m$	$\mathrm{A1}\oplus\mathrm{A2}$
N229.3.3 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_u}\oplus\mathrm{A2_u}$
N229.3.4 $\mathrm{GM1}^{-}\oplus\mathrm{H1}^{+}$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_u}$
N229.3.5 $\mathrm{GM1}^{-}\oplus\mathrm{H1}^{-}$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_u}$
N229.3.6 $\mathrm{GM1}^{-}\oplus\mathrm{H2}^{+}$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_u}$
N229.3.7 $\mathrm{GM1}^{-}\oplus\mathrm{H2}^{-}$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_u}$
N229.3.8 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_g}$
N229.3.9 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	432	$\mathrm{A1}\oplus\mathrm{A2}$
N229.3.10 $\mathrm{GM2}^{+}\oplus\mathrm{H1}^{+}$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A2_g}$
N229.3.11 $\mathrm{GM2}^{+}\oplus\mathrm{H1}^{-}$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A2_g}$
N229.3.12 $\mathrm{GM2}^{+}\oplus\mathrm{H2}^{+}$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A2_g}$
N229.3.13 $\mathrm{GM2}^{+}\oplus\mathrm{H2}^{-}$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A2_g}$
N229.3.14 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A2_u}\oplus\mathrm{A2_u}$
N229.3.15 $\mathrm{GM2}^{-}\oplus\mathrm{H1}^{+}$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A2_u}$
N229.3.16 $\mathrm{GM2}^{-}\oplus\mathrm{H1}^{-}$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A2_u}$
N229.3.17 $\mathrm{GM2}^{-}\oplus\mathrm{H2}^{+}$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A2_u}$
N229.3.18 $\mathrm{GM2}^{-}\oplus\mathrm{H2}^{-}$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A2_u}$
N229.3.19 $\mathrm{H1}^{+}\oplus\mathrm{H1}^{+}$	$\surd$	1	1	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}$
N229.3.20 $\mathrm{H1}^{+}\oplus\mathrm{H1}^{-}$	$\surd$	1	1	$\surd$	432	A1

Non-coplanar SSGs with parent space group $Im\bar{3}m$ (No. 229) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N229.3.21 $\mathrm{H1}^{+}\oplus\mathrm{H2}^{+}$	√	1	1	√	$m\bar{3}m$	$\mathrm{A1_g}$
N229.3.22 $\mathrm{H1}^{+}\oplus\mathrm{H2}^{-}$	√	1	1	√	$\bar{4}3m$	A1
N229.3.23 $\mathrm{H1}^{-}\oplus\mathrm{H1}^{-}$	√	1	1	√	$m\bar{3}m$	$\mathrm{A1_g}$
N229.3.24 $\mathrm{H1}^{-}\oplus\mathrm{H2}^{+}$	√	1	1	√	$\bar{4}3m$	A1
N229.3.25 $\mathrm{H1}^{-}\oplus\mathrm{H2}^{-}$	√	1	1	√	$m\bar{3}m$	$\mathrm{A1_g}$
N229.3.26 $\mathrm{H2}^{+}\oplus\mathrm{H2}^{+}$	√	1	1	√	$m\bar{3}m$	$\mathrm{A1_g}$
N229.3.27 $\mathrm{H2}^{+}\oplus\mathrm{H2}^{-}$	√	1	1	√	432	A1
N229.3.28 $\mathrm{H2}^{-}\oplus\mathrm{H2}^{-}$	√	1	1	√	$m\bar{3}m$	$\mathrm{A1_g}$
N229.6.1 $\mathrm{GM3}^{+}$	√	3	3	√	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{E_g}$
N229.6.2 $\mathrm{GM3}^{-}$	√	3	3	√	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{E_u}$
N229.6.3 $\mathrm{H3}^{+}$	√	1	1	√	$m\bar{3}m$	$\mathrm{A1_g}$
N229.6.4 $\mathrm{H3}^{-}$	√	1	1	√	$m\bar{3}m$	$\mathrm{A1_g}$
N229.7.1 P1	√	1	1	√	$\bar{4}3m$	A1
N229.7.2 P2	√	1	1	√	$\bar{4}3m$	A1
N229.9.1 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}$	√	0	0	√	-	-
N229.9.2 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}$	√	3	3	√	$m\bar{3}m$	$\mathrm{A2_g}\oplus\mathrm{A2_u}\oplus\mathrm{A2_u}$
N229.9.3 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{-}$	√	0	0	√	-	-
N229.9.4 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}\oplus\mathrm{H1}^{+}$	√	0	0	√	-	-
N229.9.5 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}\oplus\mathrm{H1}^{-}$	√	0	0	√	-	-
N229.9.6 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}\oplus\mathrm{H2}^{+}$	√	0	0	√	-	-
N229.9.7 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}\oplus\mathrm{H2}^{-}$	√	0	0	√	-	-
N229.9.8 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}$	√	2	2	√	432	$\mathrm{A2}\oplus\mathrm{A2}$
N229.9.9 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}$	√	3	3	√	$m\bar{3}m$	$\mathrm{A1_u}\oplus\mathrm{A2_g}\oplus\mathrm{A2_u}$
N229.9.10 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}\oplus\mathrm{H1}^{+}$	√	2	2	√	$m\bar{3}m$	$\mathrm{A2_g}\oplus\mathrm{A2_u}$
N229.9.11 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}\oplus\mathrm{H1}^{-}$	√	2	2	√	$m\bar{3}m$	$\mathrm{A2_g}\oplus\mathrm{A2_u}$
N229.9.12 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}\oplus\mathrm{H2}^{+}$	√	2	2	√	$m\bar{3}m$	$\mathrm{A2_g}\oplus\mathrm{A2_u}$
N229.9.13 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}\oplus\mathrm{H2}^{-}$	√	2	2	√	$m\bar{3}m$	$\mathrm{A2_g}\oplus\mathrm{A2_u}$
N229.9.14 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}$	√	0	0	√	-	-
N229.9.15 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{H1}^{+}$	√	0	0	√	-	-
N229.9.16 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{H1}^{-}$	√	0	0	√	-	-
N229.9.17 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{H2}^{+}$	√	0	0	√	-	-
N229.9.18 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{-}\oplus\mathrm{H2}^{-}$	√	0	0	√	-	-
N229.9.19 $\mathrm{GM1}^{-}\oplus\mathrm{H1}^{+}\oplus\mathrm{H1}^{+}$	√	1	0	×	-	-
N229.9.20 $\mathrm{GM1}^{-}\oplus\mathrm{H1}^{+}\oplus\mathrm{H1}^{-}$	√	1	1	×	-	-
N229.9.21 $\mathrm{GM1}^{-}\oplus\mathrm{H1}^{+}\oplus\mathrm{H2}^{+}$	√	1	0	×	-	-
N229.9.22 $\mathrm{GM1}^{-}\oplus\mathrm{H1}^{+}\oplus\mathrm{H2}^{-}$	√	1	1	√	$m\bar{3}m$	$\mathrm{A2_u}$
N229.9.23 $\mathrm{GM1}^{-}\oplus\mathrm{H1}^{-}\oplus\mathrm{H1}^{-}$	√	1	0	×	-	-
N229.9.24 $\mathrm{GM1}^{-}\oplus\mathrm{H1}^{-}\oplus\mathrm{H2}^{+}$	√	1	1	√	$m\bar{3}m$	$\mathrm{A2_u}$
N229.9.25 $\mathrm{GM1}^{-}\oplus\mathrm{H1}^{-}\oplus\mathrm{H2}^{-}$	√	1	0	×	-	-
N229.9.26 $\mathrm{GM1}^{-}\oplus\mathrm{H2}^{+}\oplus\mathrm{H2}^{+}$	√	1	0	×	-	-
N229.9.27 $\mathrm{GM1}^{-}\oplus\mathrm{H2}^{+}\oplus\mathrm{H2}^{-}$	√	1	1	×	-	-
N229.9.28 $\mathrm{GM1}^{-}\oplus\mathrm{H2}^{-}\oplus\mathrm{H2}^{-}$	√	1	0	×	-	-
N229.9.29 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}$	√	3	3	√	$m\bar{3}m$	$\mathrm{A2_g}\oplus\mathrm{A2_g}\oplus\mathrm{A2_g}$
N229.9.30 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}$	√	2	2	√	$\bar{4}3m$	$\mathrm{A2}\oplus\mathrm{A2}$
N229.9.31 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}\oplus\mathrm{H1}^{+}$	√	2	2	√	$m\bar{3}m$	$\mathrm{A2_g}\oplus\mathrm{A2_g}$
N229.9.32 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}\oplus\mathrm{H1}^{-}$	√	2	2	√	$m\bar{3}m$	$\mathrm{A2_g}\oplus\mathrm{A2_g}$

Non-coplanar SSGs with parent space group $Im\bar{3}m$ (No. 229) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N229.9.33 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{H2}^+$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A2_g} \oplus \mathrm{A2_g}$
N229.9.34 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{H2}^-$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A2_g} \oplus \mathrm{A2_g}$
N229.9.35 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A2_g}$
N229.9.36 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{H1}^+$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{A2_g}$
N229.9.37 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{H1}^-$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{A2_g}$
N229.9.38 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{H2}^+$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{A2_g}$
N229.9.39 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{H2}^-$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{A2_g}$
N229.9.40 $\mathrm{GM2}^+ \oplus \mathrm{H1}^+ \oplus \mathrm{H1}^+$	$\surd$	1	1	$\times$	-	-
N229.9.41 $\mathrm{GM2}^+ \oplus \mathrm{H1}^+ \oplus \mathrm{H1}^-$	$\surd$	1	1	$\times$	-	-
N229.9.42 $\mathrm{GM2}^+ \oplus \mathrm{H1}^+ \oplus \mathrm{H2}^+$	$\surd$	1	1	$\times$	-	-
N229.9.43 $\mathrm{GM2}^+ \oplus \mathrm{H1}^+ \oplus \mathrm{H2}^-$	$\surd$	1	1	$\surd$	432	A2
N229.9.44 $\mathrm{GM2}^+ \oplus \mathrm{H1}^- \oplus \mathrm{H1}^-$	$\surd$	1	1	$\times$	-	-
N229.9.45 $\mathrm{GM2}^+ \oplus \mathrm{H1}^- \oplus \mathrm{H2}^+$	$\surd$	1	1	$\surd$	432	A2
N229.9.46 $\mathrm{GM2}^+ \oplus \mathrm{H1}^- \oplus \mathrm{H2}^-$	$\surd$	1	1	$\times$	-	-
N229.9.47 $\mathrm{GM2}^+ \oplus \mathrm{H2}^+ \oplus \mathrm{H2}^+$	$\surd$	1	1	$\times$	-	-
N229.9.48 $\mathrm{GM2}^+ \oplus \mathrm{H2}^+ \oplus \mathrm{H2}^-$	$\surd$	1	1	$\times$	-	-
N229.9.49 $\mathrm{GM2}^+ \oplus \mathrm{H2}^- \oplus \mathrm{H2}^-$	$\surd$	1	1	$\times$	-	-
N229.9.50 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	$\surd$	0	0	$\surd$	-	-
N229.9.51 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{H1}^+$	$\surd$	0	0	$\surd$	-	-
N229.9.52 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{H1}^-$	$\surd$	0	0	$\surd$	-	-
N229.9.53 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{H2}^+$	$\surd$	0	0	$\surd$	-	-
N229.9.54 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{H2}^-$	$\surd$	0	0	$\surd$	-	-
N229.9.55 $\mathrm{GM2}^- \oplus \mathrm{H1}^+ \oplus \mathrm{H1}^+$	$\surd$	1	0	$\times$	-	-
N229.9.56 $\mathrm{GM2}^- \oplus \mathrm{H1}^+ \oplus \mathrm{H1}^-$	$\surd$	1	1	$\times$	-	-
N229.9.57 $\mathrm{GM2}^- \oplus \mathrm{H1}^+ \oplus \mathrm{H2}^+$	$\surd$	1	0	$\times$	-	-
N229.9.58 $\mathrm{GM2}^- \oplus \mathrm{H1}^+ \oplus \mathrm{H2}^-$	$\surd$	1	1	$\surd$	$m\bar{3}m$	$\mathrm{A2_u}$
N229.9.59 $\mathrm{GM2}^- \oplus \mathrm{H1}^- \oplus \mathrm{H1}^-$	$\surd$	1	0	$\times$	-	-
N229.9.60 $\mathrm{GM2}^- \oplus \mathrm{H1}^- \oplus \mathrm{H2}^+$	$\surd$	1	1	$\surd$	$m\bar{3}m$	$\mathrm{A2_u}$
N229.9.61 $\mathrm{GM2}^- \oplus \mathrm{H1}^- \oplus \mathrm{H2}^-$	$\surd$	1	0	$\times$	-	-
N229.9.62 $\mathrm{GM2}^- \oplus \mathrm{H2}^+ \oplus \mathrm{H2}^+$	$\surd$	1	0	$\times$	-	-
N229.9.63 $\mathrm{GM2}^- \oplus \mathrm{H2}^+ \oplus \mathrm{H2}^-$	$\surd$	1	1	$\times$	-	-
N229.9.64 $\mathrm{GM2}^- \oplus \mathrm{H2}^- \oplus \mathrm{H2}^-$	$\surd$	1	0	$\times$	-	-
N229.9.65 $\mathrm{H1}^+ \oplus \mathrm{H1}^+ \oplus \mathrm{H1}^+$	$\surd$	0	0	$\surd$	-	-
N229.9.66 $\mathrm{H1}^+ \oplus \mathrm{H1}^+ \oplus \mathrm{H1}^-$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{A1_u}$
N229.9.67 $\mathrm{H1}^+ \oplus \mathrm{H1}^+ \oplus \mathrm{H2}^+$	$\surd$	0	0	$\surd$	-	-
N229.9.68 $\mathrm{H1}^+ \oplus \mathrm{H1}^+ \oplus \mathrm{H2}^-$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A2_u} \oplus \mathrm{A2_u}$
N229.9.69 $\mathrm{H1}^+ \oplus \mathrm{H1}^- \oplus \mathrm{H1}^-$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{A1_u}$
N229.9.70 $\mathrm{H1}^+ \oplus \mathrm{H1}^- \oplus \mathrm{H2}^+$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{A2_u}$
N229.9.71 $\mathrm{H1}^+ \oplus \mathrm{H1}^- \oplus \mathrm{H2}^-$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{A2_u}$
N229.9.72 $\mathrm{H1}^+ \oplus \mathrm{H2}^+ \oplus \mathrm{H2}^+$	$\surd$	0	0	$\surd$	-	-
N229.9.73 $\mathrm{H1}^+ \oplus \mathrm{H2}^+ \oplus \mathrm{H2}^-$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{A2_u}$
N229.9.74 $\mathrm{H1}^+ \oplus \mathrm{H2}^- \oplus \mathrm{H2}^-$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A2_u} \oplus \mathrm{A2_u}$
N229.9.75 $\mathrm{H1}^- \oplus \mathrm{H1}^- \oplus \mathrm{H1}^-$	$\surd$	0	0	$\surd$	-	-
N229.9.76 $\mathrm{H1}^- \oplus \mathrm{H1}^- \oplus \mathrm{H2}^+$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A2_u} \oplus \mathrm{A2_u}$
N229.9.77 $\mathrm{H1}^- \oplus \mathrm{H1}^- \oplus \mathrm{H2}^-$	$\surd$	0	0	$\surd$	-	-
N229.9.78 $\mathrm{H1}^- \oplus \mathrm{H2}^+ \oplus \mathrm{H2}^+$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A2_u} \oplus \mathrm{A2_u}$

Non-coplanar SSGs with parent space group $Im\bar{3}m$ (No. 229) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N229.9.79 $\mathrm{H1}^{-}\oplus\mathrm{H2}^{+}\oplus\mathrm{H2}^{-}$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_u}\oplus\mathrm{A2_u}$
N229.9.80 $\mathrm{H1}^{-}\oplus\mathrm{H2}^{-}\oplus\mathrm{H2}^{-}$	$\surd$	0	0	$\surd$	-	-
N229.9.81 $\mathrm{H2}^{+}\oplus\mathrm{H2}^{+}\oplus\mathrm{H2}^{+}$	$\surd$	0	0	$\surd$	-	-
N229.9.82 $\mathrm{H2}^{+}\oplus\mathrm{H2}^{+}\oplus\mathrm{H2}^{-}$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_u}\oplus\mathrm{A1_u}$
N229.9.83 $\mathrm{H2}^{+}\oplus\mathrm{H2}^{-}\oplus\mathrm{H2}^{-}$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_u}\oplus\mathrm{A1_u}$
N229.9.84 $\mathrm{H2}^{-}\oplus\mathrm{H2}^{-}\oplus\mathrm{H2}^{-}$	$\surd$	0	0	$\surd$	-	-
N229.12.1 $\mathrm{GM1}^{-}\oplus\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	$\bar{4}3m$	E
N229.12.2 $\mathrm{GM1}^{-}\oplus\mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
N229.12.3 $\mathrm{GM1}^{-}\oplus\mathrm{H3}^{+}$	$\surd$	1	0	$\times$	-	-
N229.12.4 $\mathrm{GM1}^{-}\oplus\mathrm{H3}^{-}$	$\surd$	1	0	$\times$	-	-
N229.12.5 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{+}$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A2_g}\oplus\mathrm{E_g}$
N229.12.6 $\mathrm{GM2}^{+}\oplus\mathrm{GM3}^{-}$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A2_g}\oplus\mathrm{E_u}$
N229.12.7 $\mathrm{GM2}^{+}\oplus\mathrm{H3}^{+}$	$\surd$	1	1	$\times$	-	-
N229.12.8 $\mathrm{GM2}^{+}\oplus\mathrm{H3}^{-}$	$\surd$	1	1	$\times$	-	-
N229.12.9 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	432	E
N229.12.10 $\mathrm{GM2}^{-}\oplus\mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
N229.12.11 $\mathrm{GM2}^{-}\oplus\mathrm{H3}^{+}$	$\surd$	1	0	$\times$	-	-
N229.12.12 $\mathrm{GM2}^{-}\oplus\mathrm{H3}^{-}$	$\surd$	1	0	$\times$	-	-
N229.12.13 $\mathrm{H1}^{+}\oplus\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{E_g}$
N229.12.14 $\mathrm{H1}^{+}\oplus\mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
N229.12.15 $\mathrm{H1}^{+}\oplus\mathrm{H3}^{+}$	$\surd$	0	0	$\surd$	-	-
N229.12.16 $\mathrm{H1}^{+}\oplus\mathrm{H3}^{-}$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{E_u}$
N229.12.17 $\mathrm{H1}^{-}\oplus\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{E_g}$
N229.12.18 $\mathrm{H1}^{-}\oplus\mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
N229.12.19 $\mathrm{H1}^{-}\oplus\mathrm{H3}^{+}$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{E_u}$
N229.12.20 $\mathrm{H1}^{-}\oplus\mathrm{H3}^{-}$	$\surd$	0	0	$\surd$	-	-
N229.12.21 $\mathrm{H2}^{+}\oplus\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{E_g}$
N229.12.22 $\mathrm{H2}^{+}\oplus\mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
N229.12.23 $\mathrm{H2}^{+}\oplus\mathrm{H3}^{+}$	$\surd$	0	0	$\surd$	-	-
N229.12.24 $\mathrm{H2}^{+}\oplus\mathrm{H3}^{-}$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{E_u}$
N229.12.25 $\mathrm{H2}^{-}\oplus\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{E_g}$
N229.12.26 $\mathrm{H2}^{-}\oplus\mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
N229.12.27 $\mathrm{H2}^{-}\oplus\mathrm{H3}^{+}$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{E_u}$
N229.12.28 $\mathrm{H2}^{-}\oplus\mathrm{H3}^{-}$	$\surd$	0	0	$\surd$	-	-
N229.13.1 $\mathrm{GM1}^{-}\oplus\mathrm{P1}$	$\surd$	1	1	$\times$	-	-
N229.13.2 $\mathrm{GM1}^{-}\oplus\mathrm{P2}$	$\surd$	1	1	$\times$	-	-
N229.13.3 $\mathrm{GM2}^{+}\oplus\mathrm{P1}$	$\surd$	1	1	$\times$	-	-
N229.13.4 $\mathrm{GM2}^{+}\oplus\mathrm{P2}$	$\surd$	1	1	$\times$	-	-
N229.13.5 $\mathrm{GM2}^{-}\oplus\mathrm{P1}$	$\surd$	1	1	$\times$	-	-
N229.13.6 $\mathrm{GM2}^{-}\oplus\mathrm{P2}$	$\surd$	1	1	$\times$	-	-
N229.13.7 $\mathrm{H1}^{+}\oplus\mathrm{P1}$	$\surd$	1	1	$\times$	-	-
N229.13.8 $\mathrm{H1}^{+}\oplus\mathrm{P2}$	$\surd$	1	1	$\times$	-	-
N229.13.9 $\mathrm{H1}^{-}\oplus\mathrm{P1}$	$\surd$	1	1	$\times$	-	-
N229.13.10 $\mathrm{H1}^{-}\oplus\mathrm{P2}$	$\surd$	1	1	$\times$	-	-
N229.13.11 $\mathrm{H2}^{+}\oplus\mathrm{P1}$	$\surd$	1	1	$\times$	-	-
N229.13.12 $\mathrm{H2}^{+}\oplus\mathrm{P2}$	$\surd$	1	1	$\times$	-	-

Non-coplanar SSGs with parent space group $Im\bar{3}m$ (No. 229) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N229.13.13 $\mathrm{H2}^{-}\oplus\mathrm{P1}$	$\surd$	1	1	$\times$	-	-
N229.13.14 $\mathrm{H2}^{-}\oplus\mathrm{P2}$	$\surd$	1	1	$\times$	-	-
N229.15.1 $\mathrm{GM4}^{+}$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{T1_g}$
N229.15.2 $\mathrm{GM4}^{-}$	$\surd$	0	0	$\surd$	-	-
N229.15.3 $\mathrm{GM5}^{+}$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{T2_g}$
N229.15.4 $\mathrm{GM5}^{-}$	$\surd$	0	0	$\surd$	-	-
N229.15.5 $\mathrm{H4}^{+}$	$\surd$	0	0	$\surd$	-	-
N229.15.6 $\mathrm{H4}^{-}$	$\surd$	0	0	$\surd$	-	-
N229.15.7 $\mathrm{H5}^{+}$	$\surd$	0	0	$\surd$	-	-
N229.15.8 $\mathrm{H5}^{-}$	$\surd$	0	0	$\surd$	-	-

TABLE S688: Collinear SSGs with parent space group $Ia\bar{3}d$ (No. 230).

SSG	d_{BZ}	Sym of $\vec{S}(\boldsymbol{k})$	Representation
L230.1.1 $\mathrm{GM1}^{+}$	1	$m\bar{3}m$	$\mathrm{A1_g}$
L230.2.1 $\mathrm{GM1}^{-}$	0	-	-
L230.2.2 $\mathrm{GM2}^{+}$	1	$m\bar{3}m$	$\mathrm{A2_g}$
L230.2.3 $\mathrm{GM2}^{-}$	0	-	-

TABLE S689: Coplanar SSGs with parent space group $Ia\bar{3}d$ (No. 230).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
P230.1.1 $\mathrm{GM1}^{+}$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_g}$
P230.2.1 $\mathrm{GM1}^{-}$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_u}$
P230.2.2 $\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A2_g}$
P230.2.3 $\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A2_u}$
P230.3.1 $\mathrm{GM1}^{-}\oplus\mathrm{GM1}^{-}$	$\surd$	0	0	$\surd$	-	-
P230.3.2 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A2_g}\oplus\mathrm{A2_u}$
P230.3.3 $\mathrm{GM1}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
P230.3.4 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{+}$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A2_g}\oplus\mathrm{A2_g}$
P230.3.5 $\mathrm{GM2}^{+}\oplus\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{A1_u}\oplus\mathrm{A2_g}$
P230.3.6 $\mathrm{GM2}^{-}\oplus\mathrm{GM2}^{-}$	$\surd$	0	0	$\surd$	-	-
P230.6.1 $\mathrm{GM3}^{+}$	$\surd$	2	2	$\surd$	$m\bar{3}m$	$\mathrm{E_g}$
P230.6.2 $\mathrm{GM3}^{-}$	$\surd$	0	0	$\surd$	-	-
P230.6.3 H1	$\surd$	1	1	$\surd$	$m\bar{3}m$	$\mathrm{A2_u}$

TABLE S690: Non-coplanar SSGs with parent space group $Ia\bar{3}d$ (No. 230).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N230.1.1 $\mathrm{GM1}^{+}$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A1_g}$
N230.2.1 $\mathrm{GM1}^{-}$	$\surd$	2	2	$\surd$	432	$\mathrm{A1}\oplus\mathrm{A1}$
N230.2.2 $\mathrm{GM2}^{+}$	$\surd$	3	3	$\surd$	$m\bar{3}m$	$\mathrm{A1_g}\oplus\mathrm{A1_g}\oplus\mathrm{A2_g}$
N230.2.3 $\mathrm{GM2}^{-}$	$\surd$	2	2	$\surd$	$\bar{4}3m$	$\mathrm{A1}\oplus\mathrm{A1}$

Non-coplanar SSGs with parent space group $Ia\bar{3}d$ (No. 230) (continued).

SSG	Commute	d_{SBZ}	d_{BZ}	Symmorphic SBZ	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
N230.3.1 $\mathrm{GM1}^- \oplus \mathrm{GM1}^-$	√	3	3	√	$m\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{A1_u}$
N230.3.2 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+$	√	2	2	√	$\bar{4}3m$	$\mathrm{A1} \oplus \mathrm{A2}$
N230.3.3 $\mathrm{GM1}^- \oplus \mathrm{GM2}^-$	√	3	3	√	$m\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A1_u} \oplus \mathrm{A2_u}$
N230.3.4 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	√	3	3	√	$m\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
N230.3.5 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	√	2	2	√	432	$\mathrm{A1} \oplus \mathrm{A2}$
N230.3.6 $\mathrm{GM2}^- \oplus \mathrm{GM2}^-$	√	3	3	√	$m\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N230.6.1 $\mathrm{GM3}^+$	√	3	3	√	$m\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{E_g}$
N230.6.2 $\mathrm{GM3}^-$	√	3	3	√	$m\bar{3}m$	$\mathrm{A1_g} \oplus \mathrm{E_u}$
N230.6.3 H1	√	1	1	√	$\bar{4}3m$	A1
N230.9.1 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{GM1}^-$	√	0	0	√	-	-
N230.9.2 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{GM2}^+$	√	3	3	√	$m\bar{3}m$	$\mathrm{A2_g} \oplus \mathrm{A2_u} \oplus \mathrm{A2_u}$
N230.9.3 $\mathrm{GM1}^- \oplus \mathrm{GM1}^- \oplus \mathrm{GM2}^-$	√	0	0	√	-	-
N230.9.4 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	√	2	2	√	432	$\mathrm{A2} \oplus \mathrm{A2}$
N230.9.5 $\mathrm{GM1}^- \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	√	3	3	√	$m\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{A2_g} \oplus \mathrm{A2_u}$
N230.9.6 $\mathrm{GM1}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	√	0	0	√	-	-
N230.9.7 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^+$	√	3	3	√	$m\bar{3}m$	$\mathrm{A2_g} \oplus \mathrm{A2_g} \oplus \mathrm{A2_g}$
N230.9.8 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^+ \oplus \mathrm{GM2}^-$	√	2	2	√	$\bar{4}3m$	$\mathrm{A2} \oplus \mathrm{A2}$
N230.9.9 $\mathrm{GM2}^+ \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	√	3	3	√	$m\bar{3}m$	$\mathrm{A1_u} \oplus \mathrm{A1_u} \oplus \mathrm{A2_g}$
N230.9.10 $\mathrm{GM2}^- \oplus \mathrm{GM2}^- \oplus \mathrm{GM2}^-$	√	0	0	√	-	-
N230.12.1 $\mathrm{GM1}^- \oplus \mathrm{GM3}^+$	√	2	2	√	$\bar{4}3m$	E
N230.12.2 $\mathrm{GM1}^- \oplus \mathrm{GM3}^-$	√	0	0	√	-	-
N230.12.3 $\mathrm{GM1}^- \oplus \mathrm{H1}$	√	1	1	√	$m\bar{3}m$	$\mathrm{A2_u}$
N230.12.4 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^+$	√	3	3	√	$m\bar{3}m$	$\mathrm{A2_g} \oplus \mathrm{E_g}$
N230.12.5 $\mathrm{GM2}^+ \oplus \mathrm{GM3}^-$	√	3	3	√	$m\bar{3}m$	$\mathrm{A2_g} \oplus \mathrm{E_u}$
N230.12.6 $\mathrm{GM2}^+ \oplus \mathrm{H1}$	√	1	1	√	432	A2
N230.12.7 $\mathrm{GM2}^- \oplus \mathrm{GM3}^+$	√	2	2	√	432	E
N230.12.8 $\mathrm{GM2}^- \oplus \mathrm{GM3}^-$	√	0	0	√	-	-
N230.12.9 $\mathrm{GM2}^- \oplus \mathrm{H1}$	√	1	1	√	$m\bar{3}m$	$\mathrm{A2_u}$
N230.15.1 $\mathrm{GM4}^+$	√	3	3	√	$m\bar{3}m$	$\mathrm{T1_g}$
N230.15.2 $\mathrm{GM4}^-$	√	0	0	√	-	-
N230.15.3 $\mathrm{GM5}^+$	√	3	3	√	$m\bar{3}m$	$\mathrm{T2_g}$
N230.15.4 $\mathrm{GM5}^-$	√	0	0	√	-	-

TABLE S691: SSGs of collinear magnetic structures.

BCSID	Chemical formula	MSG	Trans from parent structure	PSG	Rep	SSG
light-element materials						
0.4	$NiCr_2O_4$	No. 70.4.619 $Fd'd'd$	$a, b, c; 0, 0, 0$	No. 141 $I4_1/amd$	$\mathrm{GM1}^+$	L141.1.1 $\mathrm{GM1}^+$
0.5	Cr_2S_3	No. 2.1.4 $P\bar{1}$	$a, b, c; 0, 0, 0$	No. 148 $R\bar{3}$	$\mathrm{GM1}^+$	L148.1.1 $\mathrm{GM1}^+$
0.15	MnF_2	No. 136.5.1156 $P4_2'/mnm'$	$a, b, c; 0, 0, 0$	No. 136 $P4_2/mnm$	$\mathrm{GM4}^+$	L136.2.6 $\mathrm{GM4}^+$
0.19	$MnTiO_3$	No. 148.3.1249 $R\bar{3}'$	$a, b, c; 0, 0, 0$	No. 148 $R\bar{3}$	$\mathrm{GM1}^-$	L148.2.1 $\mathrm{GM1}^-$
0.23	$Ca_3Mn_2O_7$	No. 36.3.251 $Cm'c2_1'$	$a, b, c; 0, 0, 0$	No. 36 $Cmc2_1$	GM2	L36.2.1 GM2

SSGs of collinear magnetic structures (continued).

BCSID	Chemical formula	MSG	Trans from parent structure	PSG	Rep	SSG
0.24	$LiMnPO_4$	No. 62.9.510 $Pn'm'a'$	$a,b,c;0,0,0$	No. 62 $Pnma$	$GM3^-$	L62.2.5 $GM3^-$
0.35	Cu_2OSeO_3	No. 146.1.1240 $R3$	$a,b,c;0,0,0$	No. 198 $P2_13$	GM1	L198.1.1 GM1
0.38	$GaFeO_3$	No. 33.4.229 $Pna'2_1'$	$a,b,c;0,0,0$	No. 33 $Pna2_1$	GM1	L33.1.1 GM1
0.50	$MnTiO_3$	No. 9.3.47 Cc'	$a,b,c;0,0,0$	No. 161 $R3c$	GM2	L161.2.1 GM2
0.58	$CoAl_2O_4$	No. 141.6.1218 $I4_1'/a'm'd$	$a,b,c;0,0,0$	No. 227 $Fd\bar{3}m$	$GM2^-$	L227.2.3 $GM2^-$
0.59	Cr_2O_3	No. 167.4.1337 $R\bar{3}'c'$	$a,b,c;0,0,0$	No. 167 $R\bar{3}c$	$GM2^-$	L167.2.3 $GM2^-$
0.65	Fe_2O_3-alpha	No. 15.5.96 $C2'/c'$	$a,b,c;0,0,0$	No. 167 $R\bar{3}c$	$GM2^+$	L167.2.2 $GM2^+$
0.66	Fe_2O_3-alpha	No. 2.1.4 $P\bar{1}$	$a,b,c;0,0,0$	No. 167 $R\bar{3}c$	$GM2^+$	L167.2.2 $GM2^+$
0.71	$Li_2Ni(SO_4)_2$	No. 61.5.501 $Pb'c'a'$	$a,b,c;0,0,0$	No. 61 $Pbca$	$GM2^-$	L61.2.3 $GM2^-$
0.83	$LiFeP_2O_7$	No. 4.1.15 $P2_1$	$a,b,c;0,0,0$	No. 4 $P2_1$	GM2	L4.2.1 GM2
0.86	$KMn_4(PO_4)_3$	No. 62.5.506 $Pnma'$	$a,c,-b;0,0,0$	No. 62 $Pnma$	$GM3^-$	L62.2.5 $GM3^-$
0.95	$LiFePO_4$	No. 62.5.506 $Pnma'$	$a,b,c;0,0,0$	No. 62 $Pnma$	$GM3^-$	L62.2.5 $GM3^-$
0.110	Cr_2O_3	No. 15.3.94 $C2'/c$	$a,b,c;0,0,0$	No. 167 $R\bar{3}c$	$GM2^-$	L167.2.3 $GM2^-$
0.112	$FeBO_3$	No. 15.5.96 $C2'/c'$	$a,b,c;0,0,0$	No. 167 $R\bar{3}c$	$GM2^+$	L167.2.2 $GM2^+$
0.113	$NiCO_3$	No. 15.1.92 $C2/c$	$a,b,c;0,0,0$	No. 167 $R\bar{3}c$	$GM2^+$	L167.2.2 $GM2^+$
0.114	$CoCO_3$	No. 15.1.92 $C2/c$	$a,b,c;0,0,0$	No. 167 $R\bar{3}c$	$GM2^+$	L167.2.2 $GM2^+$
0.115	$MnCO_3$	No. 15.1.92 $C2/c$	$a,b,c;0,0,0$	No. 167 $R\bar{3}c$	$GM2^+$	L167.2.2 $GM2^+$
0.116	$FeCO_3$	No. 167.1.1334 $R\bar{3}c$	$a,b,c;0,0,0$	No. 167 $R\bar{3}c$	$GM2^+$	L167.2.2 $GM2^+$
0.125	$MnGeO_3$	No. 148.3.1249 $R\bar{3}'$	$a,b,c;0,0,0$	No. 148 $R\bar{3}$	$GM1^-$	L148.2.1 $GM1^-$
0.128	$FeSO_4F$	No. 15.5.96 $C2'/c'$	$a,b,c;0,0,0$	No. 15 $C2/c$	$GM2^+$	L15.2.2 $GM2^+$
0.131	$Mn(N(CN_2))_2$	No. 58.6.476 $Pnn'm'$	$a,b,c;0,0,0$	No. 58 $Pnnm$	$GM2^+$	L58.2.2 $GM2^+$
0.137	$Cu_2V_2O_7$	No. 43.4.323 $Fd'd'2$	$a,b,c;0,0,0$	No. 43 $Fdd2$	GM4	L43.2.2 GM3
0.155	$CaMnGe_2O_6$	No. 2.3.6 $P\bar{1}'$	$a,b,c;0,0,0$	No. 15 $C2/c$	$GM1^-$	L15.2.1 $GM1^-$
0.156	$CaMnGe_2O_6$	No. 15.3.94 $C2'/c$	$a,b,c;0,0,0$	No. 15 $C2/c$	$GM1^-$	L15.2.1 $GM1^-$
0.161	$CoSe_2O_5$	No. 60.3.490 $Pb'cn$	$a,b,c;0,0,0$	No. 60 $Pbcn$	$GM1^-$	L60.2.1 $GM1^-$
0.163	$MnPS_3$	No. 12.3.68 $C2'/m$	$a,b,c;0,0,0$	No. 12 $C2/m$	$GM1^-$	L12.2.1 $GM1^-$
0.178	CoF_2	No. 136.5.1156 $P4_2'/mnm'$	$a,b,c;0,0,0$	No. 136 $P4_2/mnm$	$GM4^+$	L136.2.6 $GM4^+$
0.180	$MnPSe_3$	No. 2.3.6 $P\bar{1}'$	$a,b,c;0,0,0$	No. 148 $R\bar{3}$	$GM1^-$	L148.2.1 $GM1^-$
0.193	$LiCoPO_4$	No. 62.5.506 $Pnma'$	$a,b,c;0,0,0$	No. 62 $Pnma$	$GM3^-$	L62.2.5 $GM3^-$

SSGs of collinear magnetic structures (continued).

BCSID	Chemical formula	MSG	Trans from parent structure	PSG	Rep	SSG
0.211	Ca_2MnO_4	No. 142.8.1229 $I4_1'/a'cd'$	$a,b,c;0,0,0$	No. 142 $I4_1/acd$	GM2$^-$	L142.2.3 GM2$^-$
0.217	$LiCrGe_2O_6$	No. 14.3.88 $P2_1'/c$	$a,b,c;0,0,0$	No. 14 $P2_1/c$	GM1$^-$	L14.2.1 GM1$^-$
0.222	CuMnAs	No. 59.3.480 $Pm'mn$	$a,b,c;-1/4,1/4,0$	No. 129 $P4/nmm$	GM3$^-$	L129.2.5 GM3$^-$
0.230	$K_2CoP_2O_7$	No. 58.3.473 $Pn'nm$	$a,b,c;0,0,0$	No. 136 $P4_2/mnm$	GM4$^-$	L136.2.7 GM4$^-$
0.243	$Li_2Fe(SO_4)_2$	No. 14.3.88 $P2_1'/c$	$a,b,c;0,0,0$	No. 61 $Pbca$	GM2$^-$	L61.2.3 GM2$^-$
0.244	$Li_2Co(SO_4)_2$	No. 61.5.501 $Pb'c'a'$	$a,b,c;0,0,0$	No. 61 $Pbca$	GM2$^-$	L61.2.3 GM2$^-$
0.246	$LiFe(SO_4)_2$	No. 61.5.501 $Pb'c'a'$	$a,b,c;0,0,0$	No. 61 $Pbca$	GM2$^-$	L61.2.3 GM2$^-$
0.254	$[C(ND_2)_3]Cu(DCOO)_3$	No. 33.1.226 $Pna2_1$	$a,b,c;0,0,0$	No. 33 $Pna2_1$	GM4	L33.2.3 GM4
0.255	$[C(ND_2)_3]Cu(DCOO)_3$	No. 33.5.230 $Pn'a'2_1$	$a,b,c;0,0,0$	No. 33 $Pna2_1$	GM4	L33.2.3 GM4
0.258	$Li_3Fe_2(PO_4)_3$	No. 14.5.90 $P2_1'/c'$	$a,-c,a+b;0,0,0$	No. 14 $P2_1/c$	GM1$^+$	L14.1.1 GM1$^+$
0.259	$Li_3Fe_2(PO_4)_3$	No. 148.1.1247 $R\bar{3}$	$a,b,c;0,0,0$	No. 148 $R\bar{3}$	GM1$^+$	L148.1.1 GM1$^+$
0.260	$CuFePO_5$	No. 62.1.502 $Pnma$	$a,b,c;0,0,0$	No. 62 $Pnma$	GM4$^+$	L62.2.6 GM4$^+$
0.261	$NiFePO_5$	No. 62.1.502 $Pnma$	$a,b,c;0,0,0$	No. 62 $Pnma$	GM4$^+$	L62.2.6 GM4$^+$
0.263	Fe_2PO_5	No. 62.1.502 $Pnma$	$a,b,c;0,0,0$	No. 62 $Pnma$	GM4$^+$	L62.2.6 GM4$^+$
0.264	$Fe_3(PO_4)_2$	No. 14.4.89 $P2_1/c'$	$a,b,c;0,0,0$	No. 14 $P2_1/c$	GM2$^-$	L14.2.3 GM2$^-$
0.274	Mn_4N	No. 166.5.1331 $R\bar{3}m'$	$a,b,c;0,0,0$	No. 221 $Pm\bar{3}m$	GM1$^+$	L221.1.1 GM1$^+$
0.275	Mn_3AlN	No. 166.5.1331 $R\bar{3}m'$	$a,b,c;0,0,0$	No. 221 $Pm\bar{3}m$	GM1$^+$	L221.1.1 GM1$^+$
0.276	Mn_3AlN	No. 65.6.550 $Cmm'm'$	$a,b,c;0,0,0$	No. 123 $P4/mmm$	GM1$^+$	L123.1.1 GM1$^+$
0.277	$MgMnO_3$	No. 148.3.1249 $R\bar{3}'$	$a,b,c;0,0,0$	No. 148 $R\bar{3}$	GM1$^-$	L148.2.1 GM1$^-$
0.286	Mn_5Ge_3	No. 193.8.1492 $P6_3/mc'm'$	$a,b,c;0,0,0$	No. 193 $P6_3/mcm$	GM1$^+$	L193.1.1 GM1$^+$
0.297	$NaCrGe_2O_6$	No. 15.5.96 $C2'/c'$	$a,b,c;0,0,0$	No. 15 $C2/c$	GM1$^+$	L15.1.1 GM1$^+$
0.299	Fe_2O_3	No. 33.4.229 $Pna'2_1'$	$a,b,c;0,0,0$	No. 33 $Pna2_1$	GM1	L33.1.1 GM1
0.300	Fe_2O_3	No. 33.4.229 $Pna'2_1'$	$a,b,c;0,0,0$	No. 33 $Pna2_1$	GM1	L33.1.1 GM1
0.307	$ScCrO_3$	No. 62.1.502 $Pnma$	$a,b,c;0,0,0$	No. 62 $Pnma$	GM4$^+$	L62.2.6 GM4$^+$
0.310	$NaMnFeF_6$	No. 150.3.1257 $P32'1$	$a,b,c;0,0,0$	No. 150 $P321$	GM1	L150.1.1 GM1
0.312	$MnGeO_3$	No. 15.3.94 $C2'/c$	$a,b,c;0,0,0$	No. 15 $C2/c$	GM1$^-$	L15.2.1 GM1$^-$
0.334	CoF_3	No. 167.1.1334 $R\bar{3}c$	$a,b,c;0,0,0$	No. 167 $R\bar{3}c$	GM2$^+$	L167.2.2 GM2$^+$
0.335	FeF_3	No. 15.5.96 $C2'/c'$	$a,b,c;0,0,0$	No. 167 $R\bar{3}c$	GM2$^+$	L167.2.2 GM2$^+$
0.358	$CaFe_5O_7$	No. 11.5.63 $P2_1'/m'$	$a,b,c;0,0,0$	No. 11 $P2_1/m$	GM2$^+$	L11.2.2 GM2$^+$

SSGs of collinear magnetic structures (continued).

BCSID	Chemical formula	MSG	Trans from parent structure	PSG	Rep	SSG
0.363	$KFeCl_5(D_2O)$	No. 62.9.510 $Pn'm'a'$	$a,b,c;0,0,0$	No. 62 $Pnma$	$GM3^-$	L62.2.5 $GM3^-$
0.382	$LiMnPO_4$	No. 62.9.510 $Pn'm'a'$	$a,b,c;0,0,0$	No. 62 $Pnma$	$GM3^-$	L62.2.5 $GM3^-$
0.383	$LiCoPO_4$	No. 62.5.506 $Pnma'$	$a,b,c;0,0,0$	No. 62 $Pnma$	$GM3^-$	L62.2.5 $GM3^-$
0.384	$LiCoPO_4$	No. 14.3.88 $P2_1'/c$	$a,b,c;0,0,0$	No. 62 $Pnma$	$GM3^-$	L62.2.5 $GM3^-$
0.386	Fe_3BO_5	No. 62.4.505 $Pnm'a$	$b,c,a;0,0,0$	No. 62 $Pnma$	$GM2^-$	L62.2.3 $GM2^-$
0.392	$Fe_3(PO_4)_2(OH)_2$	No. 14.1.86 $P2_1/c$	$a,b,-a+c;0,0,0$	No. 14 $P2_1/c$	$GM2^+$	L14.2.2 $GM2^+$
0.399	FeOOH	No. 62.5.506 $Pnma'$	$b,c,a;0,0,0$	No. 62 $Pnma$	$GM3^-$	L62.2.5 $GM3^-$
0.414	$AlFe_2B_2$	No. 65.6.550 $Cmm'm'$	$a,b,c;0,0,0$	No. 65 $Cmmm$	$GM1^+$	L65.1.1 $GM1^+$
0.432	$KMnF_3$	No. 62.8.509 $Pn'ma'$	$a,b,c;0,0,0$	No. 62 $Pnma$	$GM3^+$	L62.2.4 $GM3^+$
0.433	$KMnF_3$	No. 140.1.1196 $I4/mcm$	$a,b,c;0,0,0$	No. 140 $I4/mcm$	$GM3^+$	L140.2.4 $GM3^+$
0.445	MnCoGe	No. 62.6.507 $Pn'm'a$	$a,b,c;0,0,0$	No. 62 $Pnma$	$GM1^+$	L62.1.1 $GM1^+$
0.459	$KFeO_2$	No. 61.3.499 $Pb'ca$	$a,b,c;0,0,0$	No. 61 $Pbca$	$GM2^-$	L61.2.3 $GM2^-$
0.460	$KFeO_2$	No. 61.3.499 $Pb'ca$	$a,b,c;0,0,0$	No. 61 $Pbca$	$GM2^-$	L61.2.3 $GM2^-$
0.462	$MnAl_2O_4$	No. 141.6.1218 $I4_1'/a'm'd$	$a,b,c;0,0,0$	No. 227 $Fd\bar{3}m$	$GM2^-$	L227.2.3 $GM2^-$
0.463	Co_3O_4	No. 141.6.1218 $I4_1'/a'm'd$	$a,b,c;1/8,1/8,1/8$	No. 227 $Fd\bar{3}m$	$GM2^-$	L227.2.3 $GM2^-$
0.501	$LiFe_2F_6$	No. 136.5.1156 $P4_2'/mnm'$	$a,b,c;0,0,0$	No. 136 $P4_2/mnm$	$GM4^+$	L136.2.6 $GM4^+$
0.504	$NaCrSi_2O_6$	No. 2.3.6 $P\bar{1}'$	$a,b,c;0,0,0$	No. 15 $C2/c$	$GM1^-$	L15.2.1 $GM1^-$
0.512	Mn_3As_2	No. 12.1.66 $C2/m$	$a,b,c;0,0,0$	No. 12 $C2/m$	$GM1^+$	L12.1.1 $GM1^+$
0.524	$MnPSe_3$	No. 2.3.6 $P\bar{1}'$	$a,b,c;0,0,0$	No. 148 $R\bar{3}$	$GM1^-$	L148.2.1 $GM1^-$
0.575	$ZnFeF_5(H_2O)_2$	No. 44.1.324 $Imm2$	$a,b,c;0,0,0$	No. 44 $Imm2$	GM4	L44.2.2 GM3
0.581	FeF_3	No. 15.5.96 $C2'/c'$	$a,b,c;0,0,0$	No. 167 $R\bar{3}c$	$GM2^+$	L167.2.2 $GM2^+$
0.582	$Fe_3F_8(H_2O)_2$	No. 12.5.70 $C2'/m'$	$a,b,c;0,0,0$	No. 12 $C2/m$	$GM2^+$	L12.2.2 $GM2^+$
0.598	$AlCr_2$	No. 12.11.76 C_P2'/m'	$a,b,c;0,0,0$	No. 139 $I4/mmm$	$M1^+$	L139.2.8 $M1^+$
0.599	CaMnSi	No. 129.6.1080 $P4'/n'm'm$	$a,b,c;0,0,0$	No. 129 $P4/nmm$	$GM4^-$	L129.2.7 $GM4^-$
0.600	CaMnSi	No. 129.6.1080 $P4'/n'm'm$	$a,b,c;0,0,0$	No. 129 $P4/nmm$	$GM4^-$	L129.2.7 $GM4^-$
0.601	CaMnGe	No. 11.4.62 $P2_1/m'$	$a,b,c;0,0,0$	No. 129 $P4/nmm$	$GM4^-$	L129.2.7 $GM4^-$
0.602	CaMnGe	No. 11.4.62 $P2_1/m'$	$a,b,c;0,0,0$	No. 129 $P4/nmm$	$GM4^-$	L129.2.7 $GM4^-$
0.603	$CaMn_2Ge_2$	No. 139.6.1184 $I4'/m'm'm$	$a,b,c;0,0,0$	No. 139 $I4/mmm$	$GM4^-$	L139.2.7 $GM4^-$
0.604	$CaMn_2Ge_2$	No. 139.6.1184 $I4'/m'm'm$	$a,b,c;0,0,0$	No. 139 $I4/mmm$	$GM4^-$	L139.2.7 $GM4^-$

SSGs of collinear magnetic structures (continued).

BCSID	Chemical formula	MSG	Trans from parent structure	PSG	Rep	SSG
0.613	$FeCr_2S_4$	No. 141.7.1219 $I4_1/am'd'$	$a/2-b/2, a/2+b/2, c; -1/8, -1/8, 1/8$	No. 141 $I4_1/amd$	$GM1^+$	L141.1.1 $GM1^+$
0.614	$FeCr_2S_4$	No. 141.7.1219 $I4_1/am'd'$	$a, b, c; 0, 0, 0$	No. 227 $Fd\bar{3}m$	$GM1^+$	L227.1.1 $GM1^+$
0.615	$FeCr_2S_4$	No. 141.7.1219 $I4_1/am'd'$	$a, b, c; 0, 0, 0$	No. 227 $Fd\bar{3}m$	$GM1^+$	L227.1.1 $GM1^+$
0.626	NaMnP	No. 129.6.1080 $P4'/n'm'm$	$a, b, c; 1/4, -1/4, 0$	No. 129 $P4/nmm$	$GM4^-$	L129.2.7 $GM4^-$
0.627	NaMnP	No. 129.6.1080 $P4'/n'm'm$	$a, b, c; 1/4, -1/4, 0$	No. 129 $P4/nmm$	$GM4^-$	L129.2.7 $GM4^-$
0.628	NaMnP	No. 129.6.1080 $P4'/n'm'm$	$a, b, c; 1/4, -1/4, 0$	No. 129 $P4/nmm$	$GM4^-$	L129.2.7 $GM4^-$
0.629	NaMnAs	No. 129.6.1080 $P4'/n'm'm$	$a, b, c; 1/4, -1/4, 0$	No. 129 $P4/nmm$	$GM4^-$	L129.2.7 $GM4^-$
0.630	NaMnAs	No. 129.6.1080 $P4'/n'm'm$	$a, b, c; 1/4, -1/4, 0$	No. 129 $P4/nmm$	$GM4^-$	L129.2.7 $GM4^-$
0.633	$KFeS_2$	No. 15.3.94 $C2'/c$	$a, b, c; 0, 0, 0$	No. 15 $C2/c$	$GM1^-$	L15.2.1 $GM1^-$
0.637	$KFeSe_2$	No. 15.4.95 $C2/c'$	$a, b, c; 0, 0, 0$	No. 15 $C2/c$	$GM1^-$	L15.2.1 $GM1^-$
0.714	$Li_2Ni(SO_4)_2$	No. 14.1.86 $P2_1/c$	$a, b, c; 0, 0, 0$	No. 14 $P2_1/c$	$GM2^+$	L14.2.2 $GM2^+$
0.755	$Mn_2SeO_3F_2$	No. 62.8.509 $Pn'ma'$	$a, b, c; 0, 0, 0$	No. 62 $Pnma$	$GM3^+$	L62.2.4 $GM3^+$
0.760	$FeOHSO_4$	No. 15.5.96 $C2'/c'$	$a, b, c; 0, 0, 0$	No. 15 $C2/c$	$GM2^+$	L15.2.2 $GM2^+$
0.802	$CuFeS_2$	No. 122.1.994 $I\bar{4}2d$	$a, b, c; 0, 0, 0$	No. 122 $I\bar{4}2d$	GM4	L122.2.3 GM4
0.825	Ca_2MnGaO_5	No. 62.7.508 $Pnm'a'$	$a, b, c; 0, 0, 0$	No. 62 $Pnma$	$GM2^+$	L62.2.2 $GM2^+$
0.827	Na_2MnPO_4F	No. 14.4.89 $P2_1/c'$	$a, b, -a+c; 0, 0, 0$	No. 14 $P2_1/c$	$GM2^-$	L14.2.3 $GM2^-$
0.828	Na_2MnPO_4F	No. 14.4.89 $P2_1/c'$	$a, b, -a+c; 0, 0, 0$	No. 14 $P2_1/c$	$GM2^-$	L14.2.3 $GM2^-$
0.829	Na_2MnPO_4F	No. 14.4.89 $P2_1/c'$	$a, b, -a+c; 0, 0, 0$	No. 14 $P2_1/c$	$GM2^-$	L14.2.3 $GM2^-$
0.830	Na_2MnPO_4F	No. 14.4.89 $P2_1/c'$	$a, b, -a+c; 0, 0, 0$	No. 14 $P2_1/c$	$GM2^-$	L14.2.3 $GM2^-$
0.881	CuMnAs	No. 59.3.480 $Pm'mn$	$a, b, c; 0, 0, 0$	No. 129 $P4/nmm$	$GM3^-$	L129.2.5 $GM3^-$
0.892	$NiCr_2O_4$	No. 70.4.619 $Fd'd'd$	$a, b, c; 0, 0, 0$	No. 141 $I4_1/amd$	$GM1^+$	L141.1.1 $GM1^+$
0.893	$NiCr_2O_4$	No. 70.4.619 $Fd'd'd$	$a, b, c; 0, 0, 0$	No. 141 $I4_1/amd$	$GM1^+$	L141.1.1 $GM1^+$
0.895	$NiCr_2O_4$	No. 74.6.655 $Imm'a'$	$a, b, c; 0, 0, 0$	No. 119 $I\bar{4}m2$	GM1	L119.1.1 GM1
0.896	$NiCrO_4$	No. 63.1.511 $Cmcm$	$a, b, c; 0, 0, 0$	No. 63 $Cmcm$	$GM3^+$	L63.2.4 $GM3^+$
0.955	$Na_2Mn(H_2C_3O_4)_2(H_2O)_2$	No. 61.1.497 $Pbca$	$a, b, c; 0, 0, 0$	No. 61 $Pbca$	$GM2^+$	L61.2.2 $GM2^+$
0.961	$LiCrGe_2O_6$	No. 14.3.88 $P2_1'/c$	$a, b, c; 0, 0, 0$	No. 14 $P2_1/c$	$GM1^-$	L14.2.1 $GM1^-$
0.962	$LiCrGe_2O_6$	No. 14.3.88 $P2_1'/c$	$a, b, c; 0, 0, 0$	No. 14 $P2_1/c$	$GM1^-$	L14.2.1 $GM1^-$
0.963	$LiCrGe_2O_6$	No. 14.3.88 $P2_1'/c$	$a, b, c; 0, 0, 0$	No. 14 $P2_1/c$	$GM1^-$	L14.2.1 $GM1^-$

SSGs of collinear magnetic structures (continued).

BCSID	Chemical formula	MSG	Trans from parent structure	PSG	Rep	SSG
0.964	$LiCrGe_2O_6$	No. 14.3.88 $P2_1'/c$	$a,b,c;0,0,0$	No. 14 $P2_1/c$	GM1$^-$	L14.2.1 GM1$^-$
0.968	$CaFe_2O_4$	No. 62.8.509 $Pn'ma'$	$a,c,-b;0,0,0$	No. 62 $Pnma$	GM1$^+$	L62.1.1 GM1$^+$
0.969	$CaFe_2O_4$	No. 62.5.506 $Pnma'$	$a,c,-b;0,0,0$	No. 62 $Pnma$	GM3$^-$	L62.2.5 GM3$^-$
1.0.21	$K_2Mn_3(VO_4)_2CO_3$	No. 176.3.1376 $P6_3'/m$	$a-b,a+2b,c;0,0,0$	No. 176 $P6_3/m$	GM2$^-$	L176.2.3 GM2$^-$
1.0.47	$MnSe_2$	No. 61.1.497 $Pbca$	$3a,b,c;0,0,0$	No. 61 $Pbca$	GM3$^+$	L61.2.2 GM2$^+$
1.0.48	$MnSe_2$	No. 29.4.201 $Pca'2_1'$	$b,-3a,c;1/4,0,0$	No. 29 $Pca2_1$	GM2	L29.2.1 GM2
1.1	Mn_3O_4	No. 57.11.468 $P_{2a}bc'm$	$a,b,c;0,0,0$	No. 57 $Pbcm$	X4$^+$	L57.2.11 X2$^-$
1.6	NiO	No. 12.8.73 $C_{2c}2/m'$	$a/2-c/2,-a/2+b/2,a+b+c;0,0,0$	No. 166 $R\bar{3}m$	T1$^+$	L166.2.4 T1$^+$
1.9	Li_2VOSiO_4	No. 67.15.591 C_Pmma'	$a-b,a+b,c;0,0,0$	No. 67 $Cmme$	Y3$^+$	L67.2.11 Y3$^+$
1.17	CoV_2O_6-alpha	No. 12.8.73 $C_{2c}2/m'$	$a,b,c;0,0,0$	No. 12 $C2/m$	M2$^-$	L12.2.4 A1$^+$
1.18	MnS_2	No. 29.6.203 $P_{2b}ca2_1$	$-c,b,a;0,1/4,0$	No. 29 $Pca2_1$	Y4	L29.2.5 Y2
1.24	ZnV_2O_4	No. 98.9.822 $I_P4_1'2'2$	$a,b,c;0,1/4,-1/8$	No. 98 $I4_122$	M2	L98.2.5 M2
1.28	CrN	No. 59.9.486 $P_{2c}m'mn$	$c,a/2-b/2,a/2+b/2;-1/2,1/4,-1/4$	No. 59 $Pmmn$	Z2$^-$	L59.2.6 Z1$^+$
1.31	MnO	No. 12.8.73 $C_{2c}2/m'$	$a/2-c/2,-a/2+b/2,a+b+c;0,0,0$	No. 166 $R\bar{3}m$	T1$^+$	L166.2.4 T1$^+$
1.37	VOCl	No. 13.8.84 P_C2/c	$a,b,c;0,0,0$	No. 13 $P2/c$	C1$^+$	L13.2.4 C1$^+$
1.52	$CaFe_2As_2$	No. 69.10.614 $F_Cmm'm'$	$a-b,a+b,c;0,0,0$	No. 69 $Fmmm$	Y4$^+$	L69.2.8 T3$^+$
1.55	Na_2MnF_5	No. 7.5.36 $P_{2b}c$	$a,b,c;0,1/4,0$	No. 7 Pc	Z2	L7.2.4 Z1
1.57	$CuMnO_2$	No. 2.4.7 $P_{2s}\bar{1}$	$a/2+b/2,-a/2+b/2,c;0,0,0$	No. 2 $P\bar{1}$	T1$^+$	L2.2.2 R1$^+$
1.60	$Ca_3Co_2O_6$	No. 15.7.98 C_P2'/c	$a/3-b/3+2c/3,-a-b,a/3-b/3-c/3;1/6,1/3,-1/6$	No. 15 $C2/c$	Y1$^-$	L15.2.4 Y1$^+$
1.62	CuO	No. 14.6.91 $P_{2a}2_1/c$	$a,b,-a+c;1/2,0,0$	No. 14 $P2_1/c$	Y2$^+$	L14.2.4 Y1$^+$
1.66	$Fe(ND_3)_2PO_4$	No. 2.4.7 $P_{2s}\bar{1}$	$a,b,a+c;0,0,0$	No. 2 $P\bar{1}$	U1$^-$	L2.2.2 R1$^+$
1.69	CoO	No. 12.8.73 $C_{2c}2/m'$	$a/2+b/2-c,-a/2+b/2,a/2+b/2;0,0,0$	No. 12 $C2/m$	A1$^+$	L12.2.4 A1$^+$
1.70	CoV_2O_6	No. 12.8.73 $C_{2c}2/m'$	$a,b,c;0,0,0$	No. 12 $C2/m$	M1$^+$	L12.2.4 A1$^+$
1.79	Li_2CoSiO_4	No. 7.6.37 P_Cc	$-c,b,a;0,1/4,0$	No. 7 Pc	C2	L7.2.2 C1
1.86	GeV_4S_8	No. 31.7.218 $P_{2b}m'n2_1'$	$a/2-b/2,a/2+b/2,c;-1/8,3/8,0$	No. 31 $Pmn2_1$	Y3	L31.2.4 Y1
1.97	Li_2MnO_3	No. 12.6.71 $C_{2c}2/m$	$a,b,c;0,0,0$	No. 12 $C2/m$	A1$^-$	L12.2.5 A1$^-$

SSGs of collinear magnetic structures (continued).

BCSID	Chemical formula	MSG	Trans from parent structure	PSG	Rep	SSG
1.110	$ScMn_6Ge_6$	No. 191.13.1475 $P_{2c}6/mm'm'$	$a,b,c;0,0,0$	No. 191 $P6/mmm$	$A1^+$	L191.2.8 $A1^+$
1.121	$NaFeSO_4F$	No. 15.6.97 C_P2/c	$a,b,c;0,0,0$	No. 15 $C2/c$	$Y2^+$	L15.2.5 $Y2^+$
1.130	Cr_2As	No. 59.9.486 $P_{2c}m'mn$	$a,b,c;-1/4,1/4,0$	No. 59 $Pmmn$	$Z2^-$	L59.2.6 $Z1^+$
1.131	Fe_2As	No. 59.9.486 $P_{2c}m'mn$	$a,b,c;-1/4,1/4,0$	No. 129 $P4/nmm$	$Z1^+$	L129.2.8 $Z1^+$
1.132	Mn_2As	No. 59.9.486 $P_{2c}m'mn$	$a,b,c;1/4,1/4,0$	No. 59 $Pmmn$	$Z1^+$	L59.2.6 $Z1^+$
1.134	$Co_2C_{10}O_8H_2$	No. 12.9.74 C_P2'/m	$a,b,c;0,0,0$	No. 12 $C2/m$	$Y1^-$	L12.2.7 $Y1^-$
1.144	$NH_4FeCl_2(HCOO)$	No. 15.7.98 C_P2'/c	$a,b,c;0,0,0$	No. 15 $C2/c$	$Y1^+$	L15.2.4 $Y1^+$
1.145	$Mn_3Ni_{20}P_6$	No. 69.10.614 $F_Cmm'm'$	$a,b,c;0,0,0$	No. 123 $P4/mmm$	$GM1^+$	L123.1.1 $GM1^+$
1.153	Mn_3GaC	No. 166.7.1333 $R_R\bar{3}m'$	$a-b,b-c,a+b+c;0,0,0$	No. 166 $R\bar{3}m$	$T1^+$	L166.2.4 $T1^+$
1.154	$NaFeSi_2O_6$	No. 15.7.98 C_P2'/c	$a,b,c;0,0,0$	No. 15 $C2/c$	$Y1^+$	L15.2.4 $Y1^+$
1.155	$LiFeSO_4F$	No. 2.4.7 $P_{2s}\bar{1}$	$a,b,c;0,0,0$	No. 2 $P\bar{1}$	$V1^+$	L2.2.2 $R1^+$
1.169	$CaCoGe_2O_6$	No. 15.7.98 C_P2'/c	$a,b,c;0,0,0$	No. 15 $C2/c$	$Y1^+$	L15.2.4 $Y1^+$
1.183	$FePS_3$	No. 12.6.71 $C_{2c}2/m$	$a,b,c;0,0,0$	No. 12 $C2/m$	$M1^-$	L12.2.5 $A1^-$
1.199	Sc_2NiMnO_6	No. 14.6.91 $P_{2a}2_1/c$	$a,b,a+c;0,0,0$	No. 14 $P2_1/c$	$Y2^+$	L14.2.4 $Y1^+$
1.210	$FePSe_3$	No. 2.4.7 $P_{2s}\bar{1}$	$a,-a/3+b/3+c/3,c;0,0,0$	No. 2 $P\bar{1}$	$U1^+$	L2.2.2 $R1^+$
1.219	CuF_2	No. 2.4.7 $P_{2s}\bar{1}$	$a,b,c;0,0,0$	No. 14 $P2_1/c$	$Y2^+$	L14.2.4 $Y1^+$
1.225	$ScMn_6Ge_6$	No. 191.13.1475 $P_{2c}6/mm'm'$	$a,b,c;0,0,0$	No. 191 $P6/mmm$	$A1^+$	L191.2.8 $A1^+$
1.230	$NiPS_3$	No. 12.9.74 C_P2'/m	$a,b,c;0,0,0$	No. 12 $C2/m$	$Y1^-$	L12.2.7 $Y1^-$
1.239	$MnBr_2$	No. 12.6.71 $C_{2c}2/m$	$a+2b-2c,-a,a+2b;0,0,1/2$	No. 12 $C2/m$	$A1^+$	L12.2.4 $A1^+$
1.241	$FeCl_2$	No. 166.7.1333 $R_R\bar{3}m'$	$a,b,c;0,0,0$	No. 166 $R\bar{3}m$	$T1^+$	L166.2.4 $T1^+$
1.242	$FeBr_2$	No. 164.7.1321 $P_{2c}\bar{3}m'1$	$a,b,c;0,0,0$	No. 164 $P\bar{3}m1$	$A1^+$	L164.2.4 $A1^+$
1.244	$CrCl_3$	No. 2.4.7 $P_{2s}\bar{1}$	$a,b,c;0,0,0$	No. 148 $R\bar{3}$	$T1^+$	L148.2.2 $T1^+$
1.245	$CoBr_2$	No. 12.8.73 $C_{2c}2/m'$	$a,b,c;0,0,0$	No. 164 $P\bar{3}m1$	$A1^+$	L164.2.4 $A1^+$
1.246	$CoCl_2$	No. 12.8.73 $C_{2c}2/m'$	$a,b,c;0,0,0$	No. 166 $R\bar{3}m$	$T1^+$	L166.2.4 $T1^+$
1.247	$NiCl_2$	No. 12.8.73 $C_{2c}2/m'$	$a,b,c;0,0,0$	No. 166 $R\bar{3}m$	$T1^+$	L166.2.4 $T1^+$
1.248	$NiBr_2$	No. 12.8.73 $C_{2c}2/m'$	$a,b,c;0,0,0$	No. 166 $R\bar{3}m$	$T1^+$	L166.2.4 $T1^+$
1.249	K_2NiF_4	No. 69.10.614 $F_Cmm'm'$	$a-b,a+b,c;0,0,0$	No. 69 $Fmmm$	$T1^+$	L69.2.4 $T1^+$
1.250	$KNiF_3$	No. 123.19.1017 $P_I4/mm'm'$	$a,b,c;0,0,0$	No. 221 $Pm\bar{3}m$	$R1^+$	L221.2.4 $R1^+$

SSGs of collinear magnetic structures (continued).

BCSID	Chemical formula	MSG	Trans from parent structure	PSG	Rep	SSG
1.252	$CaCo_2P_2$	No. 71.7.627 $I_Pm'mm$	$a,b,c;0,0,0$	No. 139 $I4/mmm$	$M3^-$	L139.2.13 $M3^-$
1.260	$NaMnGe_2O_6$	No. 2.4.7 $P_{2s}\bar{1}$	$-a/2+b/2,a/2+b/2,-2c;0,0,1/2$	No. 2 $P\bar{1}$	$Z1^+$	L2.2.2 $R1^+$
1.264	$CoPS_3$	No. 12.9.74 C_P2'/m	$a,b,c;0,0,0$	No. 12 $C2/m$	$Y1^-$	L12.2.7 $Y1^-$
1.277	$LiFeCr_4O_8$	No. 119.5.975 $I\bar{4}m'2'$	$a,b,c;0,0,0$	No. 216 $F\bar{4}3m$	GM1	L216.1.1 GM1
1.278	$Cu(NCS)_2$	No. 2.4.7 $P_{2s}\bar{1}$	$a,b,c;0,0,0$	No. 2 $P\bar{1}$	$U1^+$	L2.2.2 $R1^+$
1.287	V_2O_3	No. 15.7.98 C_P2'/c	$-a-c,b,a;0,0,0$	No. 15 $C2/c$	$Y1^+$	L15.2.4 $Y1^+$
1.297	$CuFe_2(P_2O_7)_2$	No. 14.6.91 $P_{2a}2_1/c$	$a,b,a+c;0,0,0$	No. 14 $P2_1/c$	$Y2^+$	L14.2.4 $Y1^+$
1.304	$ZnMnO_3$	No. 2.4.7 $P_{2s}\bar{1}$	$a/3-b/3+2c/3,-a/3+b/3+c/3,-a/3-2b/3+c/3;0,1/2,0$	No. 2 $P\bar{1}$	$Z1^+$	L2.2.2 $R1^+$
1.305	Mn_5Si_3	No. 63.16.526 $C_Pm'cm'$	$a+2b,-a,c;0,0,0$	No. 63 $Cmcm$	$Y2^+$	L63.2.10 $Y2^+$
1.314	$NaFeSi_2O_6$	No. 15.7.98 C_P2'/c	$a,b,c;0,0,0$	No. 15 $C2/c$	$Y1^+$	L15.2.4 $Y1^+$
1.347	$CuFeO_2$	No. 13.8.84 P_C2/c	$2a/3+b/3+c/3,b,-2a/3-b/3+2c/3;1/2,0,0$	No. 13 $P2/c$	$C2^-$	L13.2.4 $C1^+$
1.369	HFe_2Ge_2	No. 69.10.614 $F_Cmm'm'$	$a-b,a+b,c;0,0,0$	No. 69 $Fmmm$	$Y1^+$	L69.2.4 $T1^+$
1.370	Li_2CuO_2	No. 71.8.628 $I_Pm'm'm$	$a,b,c;0,0,0$	No. 71 $Immm$	$X1^+$	L71.2.4 $X1^+$
1.397	$Cu_3Mg(OD)_6Br_2$	No. 12.6.71 $C_{2c}2/m$	$a,b,c;0,0,0$	No. 164 $P\bar{3}m1$	$A1^+$	L164.2.4 $A1^+$
1.409	$NaMnO_2$	No. 2.4.7 $P_{2s}\bar{1}$	$c,a/2-b/2,a/2+b/2;0,0,0$	No. 2 $P\bar{1}$	$Z1^+$	L2.2.2 $R1^+$
1.430	$Mn_5(VO_4)_2(OH)_4$	No. 13.7.83 $P_{2b}2/c$	$c,b,-a;1/4,1/4,0$	No. 13 $P2/c$	$Z1^+$	L13.2.6 $Z1^+$
1.440	$CrPS_4$	No. 5.4.22 $C_{2c}2$	$a,b,c;0,0,0$	No. 5 $C2$	A1	L5.2.2 A1
1.454	$Mn_6Ni_{16}Si_7$	No. 69.10.614 $F_Cmm'm'$	$a/2-b/2,a/2+b/2,c;0,0,0$	No. 139 $I4/mmm$	$M4^+$	L139.2.14 $M4^+$
1.472	CaOFeS	No. 36.7.255 $C_Pm'c2_1'$	$a+b,-a+b,c;0,0,0$	No. 36 $Cmc2_1$	Y3	L36.2.6 Y3
1.473	$CuBr(C_4H_4N_2)_2(BF_4)$	No. 50.9.385 $P_{2c}b'an$	$a,b,c;0,0,0$	No. 125 $P4/nbm$	$Z1^-$	L125.2.9 $Z1^-$
1.474	$CuCl(C_4H_4N_2)_2(BF_4)$	No. 50.9.385 $P_{2c}b'an$	$a,b,c;0,0,0$	No. 125 $P4/nbm$	$Z1^-$	L125.2.9 $Z1^-$
1.478	$CoTi_2O_5$	No. 11.6.64 $P_{2a}2_1/m$	$a/2+b/2,c,a/2-b/2;1/4,1/4,0$	No. 11 $P2_1/m$	$Y1^+$	L11.2.4 $B1^+$
1.508	Mn_2AlB_2	No. 65.12.556 $C_{2c}mm'm'$	$a,b,c;0,0,0$	No. 65 $Cmmm$	$Z1^+$	L65.2.15 $Z1^+$
1.520	$NiSO_4$	No. 63.16.526 $C_Pm'cm'$	$a,b,c;0,0,0$	No. 63 $Cmcm$	$Y1^+$	L63.2.8 $Y1^+$
1.521	$FeSO_4$	No. 63.16.526 $C_Pm'cm'$	$a,b,c;0,0,0$	No. 63 $Cmcm$	$Y1^+$	L63.2.8 $Y1^+$
1.522	$CrVO_4$	No. 2.1.4 $P\bar{1}$	$a,b,c;0,0,0$	No. 63 $Cmcm$	$GM3^+$	L63.2.4 $GM3^+$

SSGs of collinear magnetic structures (continued).

BCSID	Chemical formula	MSG	Trans from parent structure	PSG	Rep	SSG
1.523	VPO_4	No. 57.11.468 $P_{2a}bc'm$	$a,b,c;1/4,1/4,0$	No. 57 $Pbcm$	$X1^-$	L57.2.9 $X1^-$
1.526	$LiCoF_4$	No. 14.6.91 $P_{2a}2_1/c$	$a,b,c;0,0,0$	No. 14 $P2_1/c$	$Y2^+$	L14.2.4 $Y1^+$
1.539	KMnP	No. 129.11.1085 $P_{2c}4'/nm'm$	$a,b,c;1/4,-1/4,0$	No. 129 $P4/nmm$	$Z4^-$	L129.2.10 $Z2^+$
1.540	KMnP	No. 129.11.1085 $P_{2c}4'/nm'm$	$a,b,c;1/4,-1/4,0$	No. 129 $P4/nmm$	$Z4^-$	L129.2.10 $Z2^+$
1.550	LiMnAs	No. 129.11.1085 $P_{2c}4'/nm'm$	$a,b,c;1/4,-1/4,0$	No. 129 $P4/nmm$	$Z4^-$	L129.2.10 $Z2^+$
1.551	LiMnAs	No. 129.11.1085 $P_{2c}4'/nm'm$	$a,b,c;1/4,-1/4,0$	No. 129 $P4/nmm$	$Z4^-$	L129.2.10 $Z2^+$
1.552	LiMnAs	No. 129.11.1085 $P_{2c}4'/nm'm$	$a,b,c;1/4,-1/4,0$	No. 129 $P4/nmm$	$Z4^-$	L129.2.10 $Z2^+$
1.553	KMnAs	No. 129.11.1085 $P_{2c}4'/nm'm$	$a,b,c;1/4,-1/4,0$	No. 129 $P4/nmm$	$Z4^-$	L129.2.10 $Z2^+$
1.554	KMnAs	No. 129.11.1085 $P_{2c}4'/nm'm$	$a,b,c;1/4,-1/4,0$	No. 129 $P4/nmm$	$Z4^-$	L129.2.10 $Z2^+$
1.555	Mn_3B_4	No. 71.8.628 $I_Pm'm'm$	$a,b,c;0,0,0$	No. 71 $Immm$	$X1^+$	L71.2.4 $X1^+$
1.557	$FeGe_2$	No. 72.12.641 $I_Pb'am'$	$a,b,c;0,0,0$	No. 140 $I4/mcm$	$M1^+$	L140.2.8 $M1^+$
1.560	$GeNi_2O_4$	No. 12.6.71 $C_{2c}2/m$	$a/2-c/2,-a/2+b/2,a+b+c;0,0,0$	No. 166 $R\bar{3}m$	$T1^+$	L166.2.4 $T1^+$
1.561	$GeNi_2O_4$	No. 8.4.41 $C_{2c}m$	$a/2-c/2,-a/2+b/2,a+b+c;0,0,0$	No. 160 $R3m$	T1	L160.2.2 T1
1.563	$GeNi_2O_4$	No. 8.4.41 $C_{2c}m$	$a/2-c/2,-a/2+b/2,a+b+c;0,0,0$	No. 160 $R3m$	T1	L160.2.2 T1
1.573	$FeSO_4$	No. 11.7.65 $P_{2c}2_1/m'$	$b,c,a;0,0,0$	No. 11 $P2_1/m$	$A1^+$	L11.2.4 $B1^+$
1.580	$NiTiO_3$	No. 2.4.7 $P_{2s}\bar{1}$	$a,b,c;0,0,0$	No. 148 $R\bar{3}$	$T1^+$	L148.2.2 $T1^+$
1.618	CoO	No. 12.8.73 $C_{2c}2/m'$	$a/2-c/2,-a/2+b/2,a+b+c;0,0,0$	No. 166 $R\bar{3}m$	$T1^+$	L166.2.4 $T1^+$
1.619	MnS	No. 12.6.71 $C_{2c}2/m$	$a/2-c/2,-a/2+b/2,a+b+c;0,0,0$	No. 166 $R\bar{3}m$	$T1^+$	L166.2.4 $T1^+$
1.629	FeGe	No. 191.13.1475 $P_{2c}6/mm'm'$	$a,b,c;0,0,0$	No. 191 $P6/mmm$	$A1^+$	L191.2.8 $A1^+$
1.659	$MnCl_2(CO(NH_2)_2)_2$	No. 45.6.336 $I_Pba'2'$	$a,b,c;0,0,0$	No. 45 $Iba2$	X2	L45.2.4 X2
1.678	CrN	No. 59.9.486 $P_{2c}m'mn$	$c,-a/2+b/2,-a/2-b/2;1/2,3/4,1/4$	No. 59 $Pmmn$	$Z1^+$	L59.2.6 $Z1^+$
1.682	$Na_2CuSO_4Cl_2$	No. 31.6.217 $P_{2b}mn2_1$	$b,-a,c;1/4,1/4,0$	No. 31 $Pmn2_1$	Y3	L31.2.4 Y1
1.685	$NiCr_2O_4$	No. 22.5.144 $F_C22'2'$	$c,a+b,-a+b;0,-5/4,1/8$	No. 22 $F222$	Z4	L22.2.3 T2
1.695	Mn_3Ni_2Si	No. 12.6.71 $C_{2c}2/m$	$a/2-c/2,-a/2+b/2,a+b+c;0,0,0$	No. 160 $R3m$	T1	L160.2.2 T1
1.708	$CrPS_4$	No. 5.4.22 $C_{2c}2$	$a,b,c;0,0,0$	No. 5 $C2$	A1	L5.2.2 A1
1.723	$NaMn_2O_4$	No. 7.6.37 P_Cc	$-c,a,-b+c;1/4,0,0$	No. 7 Pc	C2	L7.2.2 C1
1.734	Cu_2FeGeS_4	No. 1.3.3 $P_{2s}1$	$a+c,b,c;0,0,0$	No. 5 $C2$	A1	L5.2.2 A1

SSGs of collinear magnetic structures (continued).

BCSID	Chemical formula	MSG	Trans from parent structure	PSG	Rep	SSG
1.735	Li_2FeGeS_4	No. 7.6.37 P_Cc	$a, b, -a+c; 0, 0, 0$	No. 7 Pc	C2	L7.2.2 C1
1.736	$Mn(N_2H_5)_2(SO_4)_2$	No. 2.4.7 $P_{2s}\bar{1}$	$a, b, c; 0, 0, 0$	No. 2 $P\bar{1}$	$U1^+$	L2.2.2 $R1^+$
1.741	$KNiAsO_4$	No. 2.4.7 $P_{2s}\bar{1}$	$a, a/3+2b/3-c/3, -a/3+b/3+c/3; 0, 0, 0$	No. 2 $P\bar{1}$	$R1^+$	L2.2.2 $R1^+$
1.742	$KNiAsO_4$	No. 2.4.7 $P_{2s}\bar{1}$	$a, a/3+2b/3-c/3, -a/3+b/3+c/3; 0, 0, 0$	No. 2 $P\bar{1}$	$R1^-$	L2.2.2 $R1^+$
2.15	$Mn_3Ni_{20}P_6$	No. 65.6.550 $Cmm'm'$	$a/2+b/2, -a/2+b/2, 2c; 0, 0, 1/2$	No. 123 $P4/mmm$	$GM1^+$	L123.1.1 $GM1^+$
heavy-element materials						
0.1	$LaMnO_3$	No. 62.8.509 $Pn'ma'$	$a, b, c; 0, 0, 0$	No. 62 $Pnma$	$GM2^+$	L62.2.2 $GM2^+$
0.3	Ca_3LiOsO_6	No. 15.5.96 $C2'/c'$	$a, b, c; 0, 0, 0$	No. 167 $R\bar{3}c$	$GM2^+$	L167.2.2 $GM2^+$
0.14	Gd_5Ge_4	No. 62.4.505 $Pnm'a$	$a, b, c; 0, 0, 0$	No. 62 $Pnma$	$GM3^-$	L62.2.5 $GM3^-$
0.16	$EuTiO_3$	No. 69.3.607 $Fm'mm$	$a, b, c; 0, 0, 0$	No. 140 $I4/mcm$	$GM2^-$	L140.2.3 $GM2^-$
0.18	$BaMn_2As_2$	No. 139.6.1184 $I4'/m'm'm$	$a, b, c; 0, 0, 0$	No. 139 $I4/mmm$	$GM4^-$	L139.2.7 $GM4^-$
0.21	$PbNiO_3$	No. 161.1.1300 $R3c$	$a, b, c; 0, 0, 0$	No. 161 $R3c$	GM2	L161.2.1 GM2
0.22	DyB_4	No. 55.3.443 $Pb'am$	$a, b, c; 0, 0, 0$	No. 55 $Pbam$	$GM3^-$	L55.2.5 $GM3^-$
0.25	$NaOsO_3$	No. 62.8.509 $Pn'ma'$	$a, b, c; 0, 0, 0$	No. 62 $Pnma$	$GM3^+$	L62.2.4 $GM3^+$
0.45	La_2NiO_4	No. 56.5.455 $Pc'c'n$	$a, b, c; 0, 0, 0$	No. 56 $Pccn$	$GM4^+$	L56.2.4 $GM3^+$
0.56	$Ba_2CoGe_2O_7$	No. 35.3.238 $Cm'm2'$	$a, b, c; 0, 0, 0$	No. 113 $P\bar{4}2_1m$	GM4	L113.2.3 GM4
0.62	$SrMn_2V_2O_8$	No. 45.3.333 $Ib'a2'$	$a, b, c; 0, 0, 0$	No. 110 $I4_1cd$	GM2	L110.2.1 GM2
0.72	$CaMnBi_2$	No. 129.6.1080 $P4'/n'm'm$	$a, b, c; 0, 0, 0$	No. 129 $P4/nmm$	$GM4^-$	L129.2.7 $GM4^-$
0.73	$SrMnBi_2$	No. 139.6.1184 $I4'/m'm'm$	$a, b, c; 0, 0, 0$	No. 139 $I4/mmm$	$GM4^-$	L139.2.7 $GM4^-$
0.75	Cr_2WO_6	No. 58.3.473 $Pn'nm$	$a, b, c; 0, 0, 0$	No. 136 $P4_2/mnm$	$GM2^-$	L136.2.3 $GM2^-$
0.76	Cr_2TeO_6	No. 58.3.473 $Pn'nm$	$a, b, c; 0, 0, 0$	No. 136 $P4_2/mnm$	$GM3^-$	L136.2.5 $GM3^-$
0.79	$CaIrO_3$	No. 63.8.518 $Cm'cm'$	$a, b, c; 0, 0, 0$	No. 63 $Cmcm$	$GM3^+$	L63.2.4 $GM3^+$
0.89	$BaMn_2Bi_2$	No. 139.6.1184 $I4'/m'm'm$	$a, b, c; 0, 0, 0$	No. 139 $I4/mmm$	$GM4^-$	L139.2.7 $GM4^-$
0.92	$CaMn_2Sb_2$	No. 12.3.68 $C2'/m$	$a, b, c; 0, 0, 0$	No. 164 $P\bar{3}m1$	$GM2^-$	L164.2.3 $GM2^-$
0.105	$ErVO_3$	No. 14.1.86 $P2_1/c$	$-c, -a, b; 0, 0, 0$	No. 14 $P2_1/c$	$GM2^+$	L14.2.2 $GM2^+$
0.111	$Co_4Nb_2O_9$	No. 165.4.1325 $P\bar{3}'c'1$	$a, b, c; 0, 0, 0$	No. 165 $P\bar{3}c1$	$GM2^-$	L165.2.3 $GM2^-$
0.118	$Ba_5Co_5ClO_{13}$	No. 194.6.1499 $P6_3'/m'm'c$	$a, b, c; 0, 0, 0$	No. 194 $P6_3/mmc$	$GM3^+$	L194.2.4 $GM3^+$

SSGs of collinear magnetic structures (continued).

BCSID	Chemical formula	MSG	Trans from parent structure	PSG	Rep	SSG
0.126	$NpCo_2$	No. 141.6.1218 $I4_1'/a'm'd$	$a,b,c;1/8,1/8,1/8$	No. 227 $Fd\bar{3}m$	$GM2^-$	L227.2.3 $GM2^-$
0.138	$BiCrO_3$	No. 15.1.92 $C2/c$	$a,b,c;0,0,0$	No. 15 $C2/c$	$GM1^+$	L15.1.1 $GM1^+$
0.139	$BiCrO_3$	No. 2.1.4 $P\bar{1}$	$a,b,c;0,0,0$	No. 15 $C2/c$	$GM1^+$	L15.1.1 $GM1^+$
0.142	Fe_2TeO_6	No. 136.9.1160 $P4_2/m'n'm'$	$a,b,c;0,0,0$	No. 136 $P4_2/mnm$	$GM3^-$	L136.2.5 $GM3^-$
0.143	Cr_2TeO_6	No. 58.3.473 $Pn'nm$	$a,b,c;0,0,0$	No. 136 $P4_2/mnm$	$GM3^-$	L136.2.5 $GM3^-$
0.144	Cr_2WO_6	No. 58.3.473 $Pn'nm$	$a,b,c;0,0,0$	No. 136 $P4_2/mnm$	$GM2^-$	L136.2.3 $GM2^-$
0.146	$EuZrO_3$	No. 62.4.505 $Pnm'a$	$a,b,c;0,0,0$	No. 62 $Pnma$	$GM2^-$	L62.2.3 $GM2^-$
0.147	$EuZrO_3$	No. 62.9.510 $Pn'm'a'$	$a,b,c;0,0,0$	No. 62 $Pnma$	$GM2^-$	L62.2.3 $GM2^-$
0.148	La_2LiRuO_6	No. 14.1.86 $P2_1/c$	$a,b,a+c;0,0,0$	No. 14 $P2_1/c$	$GM2^+$	L14.2.2 $GM2^+$
0.149	$Nd_3Ru_4Al_{12}$	No. 63.6.516 $Cm'c'm$	$a,a+2b,c;0,0,0$	No. 63 $Cmcm$	$GM1^+$	L63.1.1 $GM1^+$
0.154	$Er_2Ru_2O_7$	No. 141.4.1216 $I4_1'/am'd$	$-b/2+c/2,b/2+c/2,-a;0,0,0$	No. 141 $I4_1/amd$	$GM2^+$	L141.2.2 $GM2^+$
0.173	$Pr_3Ru_4Al_{12}$	No. 63.6.516 $Cm'c'm$	$a,a+2b,c;0,0,0$	No. 63 $Cmcm$	$GM1^+$	L63.1.1 $GM1^+$
0.176	$Mn_3Ti_2Te_6$	No. 15.5.96 $C2'/c'$	$a,b,c;0,0,0$	No. 163 $P\bar{3}1c$	$GM1^+$	L163.1.1 $GM1^+$
0.186	CeMnAsO	No. 129.6.1080 $P4'/n'm'm$	$a,b,c;0,0,0$	No. 129 $P4/nmm$	$GM4^-$	L129.2.7 $GM4^-$
0.187	CeMnAsO	No. 59.3.480 $Pm'mn$	$a,b,c;0,0,0$	No. 59 $Pmmn$	$GM2^-$	L59.2.3 $GM2^-$
0.189	$CeMn_2Ge_4O_{12}$	No. 125.5.1035 $P4'/nbm'$	$a,b,c;0,0,0$	No. 125 $P4/nbm$	$GM4^+$	L125.2.6 $GM4^+$
0.194	UPt_2Si_2	No. 129.9.1083 $P4/n'm'm'$	$a,b,c;0,0,0$	No. 129 $P4/nmm$	$GM3^-$	L129.2.5 $GM3^-$
0.198	$GdVO_4$	No. 141.6.1218 $I4_1'/a'm'd$	$a,b,c;0,-1/4,1/8$	No. 141 $I4_1/amd$	$GM4^-$	L141.2.7 $GM4^-$
0.212	$Sr_2Mn_3As_2O_2$	No. 139.6.1184 $I4'/m'm'm$	$a,b,c;0,0,0$	No. 139 $I4/mmm$	$GM4^-$	L139.2.7 $GM4^-$
0.215	$BaNi_2P_2O_8$	No. 2.3.6 $P\bar{1}'$	$a,b,c;0,0,0$	No. 148 $R\bar{3}$	$GM1^-$	L148.2.1 $GM1^-$
0.216	$SrEr_2O_4$	No. 62.5.506 $Pnma'$	$a,c,-b;0,0,0$	No. 62 $Pnma$	$GM3^-$	L62.2.5 $GM3^-$
0.226	$NdCo_2$	No. 15.5.96 $C2'/c'$	$a,b,c;0,0,0$	No. 227 $Fd\bar{3}m$	$GM1^+$	L227.1.1 $GM1^+$
0.227	$NdCo_2$	No. 141.7.1219 $I4_1/am'd'$	$a/2-b/2,a/2+b/2,c;1/4,1/4,0$	No. 141 $I4_1/amd$	$GM1^+$	L141.1.1 $GM1^+$
0.228	$TbCo_2$	No. 166.5.1331 $R\bar{3}m'$	$a/2-c/2,-a/2+b/2,a+b+c;0,0,0$	No. 166 $R\bar{3}m$	$GM1^+$	L166.1.1 $GM1^+$
0.229	$Ba_2MnSi_2O_7$	No. 113.1.929 $P\bar{4}2_1m$	$a,b,c;0,0,0$	No. 113 $P\bar{4}2_1m$	GM4	L113.2.3 GM4
0.231	$TmMn_3O_6$	No. 59.6.483 $Pmm'n'$	$a,b,c;0,0,0$	No. 59 $Pmmn$	$GM1^+$	L59.1.1 $GM1^+$
0.232	$TmMn_3O_6$	No. 59.5.482 $Pm'm'n$	$a,b,c;0,0,0$	No. 59 $Pmmn$	$GM1^+$	L59.1.1 $GM1^+$
0.234	$MnLaMnSbO_6$	No. 13.5.81 $P2'/c'$	$a,b,c;0,0,0$	No. 86 $P4_2/n$	$GM1^+$	L86.1.1 $GM1^+$

SSGs of collinear magnetic structures (continued).

BCSID	Chemical formula	MSG	Trans from parent structure	PSG	Rep	SSG
0.235	$MnPrMnSbO_6$	No. 86.1.727 $P4_2/n$	$a,b,c;0,0,0$	No. 86 $P4_2/n$	$GM1^+$	L86.1.1 $GM1^+$
0.239	Ca_3LiRuO_6	No. 15.5.96 $C2'/c'$	$a,b,c;0,0,0$	No. 167 $R\bar{3}c$	$GM2^+$	L167.2.2 $GM2^+$
0.252	$Cs_2FeCl_5.D_2O$	No. 15.3.94 $C2'/c$	$a+c,b,c;0,0,0$	No. 15 $C2/c$	$GM2^-$	L15.2.3 $GM2^-$
0.266	$Na_2BaCo(VO_4)_2$	No. 164.5.1319 $P\bar{3}m'1$	$a,b,c;0,0,0$	No. 164 $P\bar{3}m1$	$GM1^+$	L164.1.1 $GM1^+$
0.267	$YbMnBi_2$	No. 129.6.1080 $P4'/n'm'm$	$a,b,c;0,0,0$	No. 129 $P4/nmm$	$GM4^-$	L129.2.7 $GM4^-$
0.282	$U_{14}Au_{51}$	No. 175.3.1369 $P6'/m$	$a,b,c;0,0,0$	No. 175 $P6/m$	$GM2^-$	L175.2.3 $GM2^-$
0.284	$KOsO_4$	No. 88.5.746 $I4_1'/a'$	$a,b,c;0,0,0$	No. 88 $I4_1/a$	$GM2^-$	L88.2.3 $GM2^-$
0.285	$KRuO_4$	No. 88.5.746 $I4_1'/a'$	$a,b,c;0,0,0$	No. 88 $I4_1/a$	$GM2^-$	L88.2.3 $GM2^-$
0.290	$CeCu_2$	No. 74.7.656 $Im'm'a'$	$a,b,c;0,0,0$	No. 74 $Imma$	$GM2^-$	L74.2.3 $GM2^-$
0.301	Sr_2CoTeO_6	No. 14.1.86 $P2_1/c$	$a,b,-a+c;0,0,0$	No. 14 $P2_1/c$	$GM2^+$	L14.2.2 $GM2^+$
0.303	$BaCrF_5$	No. 19.3.121 $P2_1'2_1'2_1$	$a,b,c;0,0,0$	No. 19 $P2_12_12_1$	GM3	L19.2.1 GM2
0.308	$InCrO_3$	No. 62.1.502 $Pnma$	$a,b,c;0,0,0$	No. 62 $Pnma$	$GM4^+$	L62.2.6 $GM4^+$
0.309	$TlCrO_3$	No. 62.1.502 $Pnma$	$a,b,c;0,0,0$	No. 62 $Pnma$	$GM4^+$	L62.2.6 $GM4^+$
0.315	$ZrMn_2Ge_4O_{12}$	No. 125.5.1035 $P4'/nbm'$	$a,b,c;0,0,0$	No. 125 $P4/nbm$	$GM4^+$	L125.2.6 $GM4^+$
0.317	Ho_2CoMnO_6	No. 14.5.90 $P2_1'/c'$	$a,b,a+c;0,0,0$	No. 14 $P2_1/c$	$GM1^+$	L14.1.1 $GM1^+$
0.323	$LaCrO_3$	No. 62.1.502 $Pnma$	$a,b,c;0,0,0$	No. 62 $Pnma$	$GM3^+$	L62.2.4 $GM3^+$
0.327	$CsMnF_4$	No. 59.6.483 $Pmm'n'$	$a,b,c;0,0,0$	No. 129 $P4/nmm$	$GM1^+$	L129.1.1 $GM1^+$
0.329	$RbMnF_4$	No. 2.1.4 $P\bar{1}$	$-c,b,a;0,0,0$	No. 14 $P2_1/c$	$GM2^+$	L14.2.2 $GM2^+$
0.330	$ErGe_3$	No. 11.4.62 $P2_1/m'$	$a,b,c;0,0,0$	No. 63 $Cmcm$	$GM4^-$	L63.2.7 $GM4^-$
0.331	$Fe_2Mo_3O_8$	No. 186.3.1436 $P6_3'm'c$	$a,b,c;0,0,0$	No. 186 $P6_3mc$	GM4	L186.2.3 GM4
0.332	$Co_2Mo_3O_8$	No. 186.3.1436 $P6_3'm'c$	$a,b,c;0,0,0$	No. 186 $P6_3mc$	GM4	L186.2.3 GM4
0.333	$Mn_2Mo_3O_8$	No. 186.5.1438 $P6_3m'c'$	$a,b,c;0,0,0$	No. 186 $P6_3mc$	GM1	L186.1.1 GM1
0.336	$NdFeO_3$	No. 62.8.509 $Pn'ma'$	$b,c,a;0,0,0$	No. 62 $Pnma$	$GM3^+$	L62.2.4 $GM3^+$
0.338	$Co_2Mo_3O_8$	No. 186.3.1436 $P6_3'm'c$	$a,b,c;0,0,0$	No. 186 $P6_3mc$	GM4	L186.2.3 GM4
0.343	$TbGe_2$	No. 65.3.547 $Cm'mm$	$a,b,c;0,0,0$	No. 65 $Cmmm$	$GM4^-$	L65.2.5 $GM3^-$
0.345	Tb_2C_3	No. 43.3.322 $Fd'd2'$	$-b-c,b-c,a;0,0,-1/4$	No. 43 $Fdd2$	GM2	L43.2.1 GM2
0.346	Tb_2ReC_2	No. 62.5.506 $Pnma'$	$a,b,c;0,0,0$	No. 62 $Pnma$	$GM3^-$	L62.2.5 $GM3^-$
0.348	Bi_2CuO_4	No. 130.9.1096 $P4/n'c'c'$	$a,b,c;0,0,0$	No. 130 $P4/ncc$	$GM3^-$	L130.2.5 $GM3^-$
0.351	$TbFeO_3$	No. 62.8.509 $Pn'ma'$	$-b,-c,a;0,0,0$	No. 62 $Pnma$	$GM3^+$	L62.2.4 $GM3^+$

SSGs of collinear magnetic structures (continued).

BCSID	Chemical formula	MSG	Trans from parent structure	PSG	Rep	SSG
0.354	$TbCrO_3$	No. 62.6.507 $Pn'm'a$	$-b,-c,a;0,0,0$	No. 62 $Pnma$	$GM3^+$	L62.2.4 $GM3^+$
0.361	Sr_3LiRuO_6	No. 15.5.96 $C2'/c'$	$a,b,c;0,0,0$	No. 167 $R\bar{3}c$	$GM2^+$	L167.2.2 $GM2^+$
0.362	$RbFeCl_5(D_2O)$	No. 62.9.510 $Pn'm'a'$	$a,b,c;0,0,0$	No. 62 $Pnma$	$GM3^-$	L62.2.5 $GM3^-$
0.364	$SrCr_2As_2$	No. 139.6.1184 $I4'/m'm'm$	$a,b,c;0,0,0$	No. 139 $I4/mmm$	$GM4^-$	L139.2.7 $GM4^-$
0.365	$BaCr_2As_2$	No. 139.6.1184 $I4'/m'm'm$	$a,b,c;0,0,0$	No. 139 $I4/mmm$	$GM4^-$	L139.2.7 $GM4^-$
0.367	$EuCr_2As_2$	No. 119.5.975 $I\bar{4}m'2'$	$a,b,c;0,0,0$	No. 119 $I\bar{4}m2$	GM1	L119.1.1 GM1
0.372	$DyCrO_4$	No. 15.3.94 $C2'/c$	$a,b,c;0,0,0$	No. 88 $I4_1/a$	$GM2^-$	L88.2.3 $GM2^-$
0.374	YNi_4Si	No. 65.6.550 $Cmm'm'$	$a,b,c;0,0,0$	No. 65 $Cmmm$	$GM1^+$	L65.1.1 $GM1^+$
0.378	UBi_2	No. 129.9.1083 $P4/n'm'm'$	$a,b,c;0,0,0$	No. 129 $P4/nmm$	$GM3^-$	L129.2.5 $GM3^-$
0.379	$SmFeO_3$	No. 62.6.507 $Pn'm'a$	$b,c,a;0,0,0$	No. 62 $Pnma$	$GM3^+$	L62.2.4 $GM3^+$
0.380	$SmFeO_3$	No. 62.8.509 $Pn'ma'$	$b,c,a;0,0,0$	No. 62 $Pnma$	$GM3^+$	L62.2.4 $GM3^+$
0.395	MnPtGa	No. 63.6.516 $Cm'c'm$	$a,a+2b,c;0,0,0$	No. 63 $Cmcm$	$GM1^+$	L63.1.1 $GM1^+$
0.397	$Mn_3Si_2Te_6$	No. 15.5.96 $C2'/c'$	$a,b,c;0,0,0$	No. 163 $P\bar{3}1c$	$GM1^+$	L163.1.1 $GM1^+$
0.401	$Sr_4Fe_4O_{11}$	No. 65.7.551 $Cm'm'm'$	$a,b,c;0,0,0$	No. 65 $Cmmm$	$GM4^-$	L65.2.5 $GM3^-$
0.402	$Sr_4Fe_4O_{11}$	No. 65.6.550 $Cmm'm'$	$a,b,c;0,0,0$	No. 65 $Cmmm$	$GM2^+$	L65.2.2 $GM2^+$
0.403	$NdCo_2$	No. 74.6.655 $Imm'a'$	$-a/2+b/2,a/2+b/2,-c;1/2,1/2,1/2$	No. 74 $Imma$	$GM1^+$	L74.1.1 $GM1^+$
0.404	Sr_3NaRuO_6	No. 15.5.96 $C2'/c'$	$a,b,c;0,0,0$	No. 167 $R\bar{3}c$	$GM2^+$	L167.2.2 $GM2^+$
0.405	$CsCoF_4$	No. 82.3.701 $I\bar{4}'$	$a,b,c;0,0,0$	No. 82 $I\bar{4}$	GM2	L82.2.1 GM2
0.406	$GdNiSi_3$	No. 65.4.548 $Cmmm'$	$a,b,c;0,0,0$	No. 65 $Cmmm$	$GM4^-$	L65.2.5 $GM3^-$
0.410	$GdAlO_3$	No. 62.9.510 $Pn'm'a'$	$b,c,a;0,0,0$	No. 62 $Pnma$	$GM2^-$	L62.2.3 $GM2^-$
0.413	UGeSe	No. 139.9.1187 $I4/m'm'm'$	$a,b,c;0,0,0$	No. 139 $I4/mmm$	$GM3^-$	L139.2.5 $GM3^-$
0.415	$EuFe_2P_2$	No. 12.5.70 $C2'/m'$	$a,b,c;0,0,0$	No. 139 $I4/mmm$	$GM1^+$	L139.1.1 $GM1^+$
0.416	$LaCrO_3$	No. 167.1.1334 $R\bar{3}c$	$a,b,c;0,0,0$	No. 167 $R\bar{3}c$	$GM2^+$	L167.2.2 $GM2^+$
0.417	$LaCrO_3$	No. 62.8.509 $Pn'ma'$	$b,c,a;0,0,0$	No. 62 $Pnma$	$GM3^+$	L62.2.4 $GM3^+$
0.420	Sr_2LuRuO_6	No. 14.1.86 $P2_1/c$	$a,b,-a+c;0,0,0$	No. 14 $P2_1/c$	$GM2^+$	L14.2.2 $GM2^+$
0.421	$EuMnSb_2$	No. 62.9.510 $Pn'm'a'$	$a,b,c;0,0,0$	No. 62 $Pnma$	$GM3^-$	L62.2.5 $GM3^-$
0.423	$EuMnSb_2$	No. 62.9.510 $Pn'm'a'$	$a,b,c;0,0,0$	No. 62 $Pnma$	$GM3^-$	L62.2.5 $GM3^-$
0.426	$EuMnBi_2$	No. 139.6.1184 $I4'/m'm'm$	$a,b,c;0,0,0$	No. 139 $I4/mmm$	$GM4^-$	L139.2.7 $GM4^-$
0.428	$BaMn_2Si_2O_7$	No. 15.1.92 $C2/c$	$a,b,c;0,0,0$	No. 15 $C2/c$	$GM1^+$	L15.1.1 $GM1^+$

SSGs of collinear magnetic structures (continued).

BCSID	Chemical formula	MSG	Trans from parent structure	PSG	Rep	SSG
0.434	K_2ReI_6	No. 14.1.86 $P2_1/c$	$a, b, -a+c; 0, 0, 0$	No. 14 $P2_1/c$	$GM2^+$	L14.2.2 $GM2^+$
0.436	$TbNi_4Si$	No. 65.6.550 $Cmm'm'$	$a, b, c; 0, 0, 0$	No. 65 $Cmmm$	$GM1^+$	L65.1.1 $GM1^+$
0.439	Tb_3NiGe_2	No. 62.8.509 $Pn'ma'$	$a, b, c; 0, 0, 0$	No. 62 $Pnma$	$GM1^+$	L62.1.1 $GM1^+$
0.442	$Fe_4Nb_2O_9$	No. 15.4.95 $C2/c'$	$a, b, c; 0, 0, 0$	No. 15 $C2/c$	$GM2^-$	L15.2.3 $GM2^-$
0.443	$Fe_4Nb_2O_9$	No. 15.4.95 $C2/c'$	$a, b, c; 0, 0, 0$	No. 165 $P\bar{3}c1$	$GM2^-$	L165.2.3 $GM2^-$
0.444	$YbCl_3$	No. 12.3.68 $C2'/m$	$a, b, c; 0, 0, 0$	No. 12 $C2/m$	$GM1^-$	L12.2.1 $GM1^-$
0.448	Ce_4Ge_3	No. 122.1.994 $I\bar{4}2d$	$a, b, c; 0, -1/4, 1/8$	No. 122 $I\bar{4}2d$	GM4	L122.2.3 GM4
0.451	DyRuAsO	No. 59.3.480 $Pm'mn$	$a, b, c; 0, 0, 0$	No. 59 $Pmmn$	$GM2^-$	L59.2.3 $GM2^-$
0.452	TbRuAsO	No. 59.3.480 $Pm'mn$	$a, b, c; 0, 0, 0$	No. 129 $P4/nmm$	$GM3^-$	L129.2.5 $GM3^-$
0.453	$DyCoSi_2$	No. 63.3.513 $Cm'cm$	$a, b, c; 0, 0, 0$	No. 63 $Cmcm$	$GM4^-$	L63.2.7 $GM4^-$
0.454	PrScSb	No. 139.15.1193 $I_P4/mm'm'$	$a, b, c; 0, 0, 0$	No. 139 $I4/mmm$	$M1^+$	L139.2.8 $M1^+$
0.455	$RbFeO_2$	No. 61.5.501 $Pb'c'a'$	$a, b, c; 0, 0, 0$	No. 61 $Pbca$	$GM2^-$	L61.2.3 $GM2^-$
0.456	$RbFeO_2$	No. 141.6.1218 $I4_1'/a'm'd$	$a, b, c; 0, 0, 0$	No. 227 $Fd\bar{3}m$	$GM2^-$	L227.2.3 $GM2^-$
0.457	$CsFeO_2$	No. 61.5.501 $Pb'c'a'$	$a, b, c; 0, 0, 0$	No. 61 $Pbca$	$GM2^-$	L61.2.3 $GM2^-$
0.458	$CsFeO_2$	No. 141.6.1218 $I4_1'/a'm'd$	$a, b, c; 0, 0, 0$	No. 227 $Fd\bar{3}m$	$GM2^-$	L227.2.3 $GM2^-$
0.461	$CoRh_2O_4$	No. 141.6.1218 $I4_1'/a'm'd$	$a, b, c; 1/8, 1/8, 1/8$	No. 227 $Fd\bar{3}m$	$GM2^-$	L227.2.3 $GM2^-$
0.464	$BaMn_2P_2$	No. 139.6.1184 $I4'/m'm'm$	$a, b, c; 0, 0, 0$	No. 139 $I4/mmm$	$GM4^-$	L139.2.7 $GM4^-$
0.465	$HoCr_2Si_2$	No. 139.6.1184 $I4'/m'm'm$	$a, b, c; 0, 0, 0$	No. 139 $I4/mmm$	$GM4^-$	L139.2.7 $GM4^-$
0.466	$ThCr_2Si_2$	No. 71.3.623 $Im'mm$	$a, b, c; 0, 0, 0$	No. 139 $I4/mmm$	$GM4^-$	L139.2.7 $GM4^-$
0.467	$TbPO_4$	No. 141.6.1218 $I4_1'/a'm'd$	$a, b, c; 0, 0, 0$	No. 141 $I4_1/amd$	$GM4^-$	L141.2.7 $GM4^-$
0.468	ErB_4	No. 55.3.443 $Pb'am$	$a, b, c; 0, 0, 0$	No. 55 $Pbam$	$GM4^-$	L55.2.5 $GM3^-$
0.469	TbB_4	No. 55.7.447 $Pb'a'm'$	$a, b, c; 0, 0, 0$	No. 55 $Pbam$	$GM4^-$	L55.2.5 $GM3^-$
0.470	$BaMn_2Sb_2$	No. 139.6.1184 $I4'/m'm'm$	$a, b, c; 0, 0, 0$	No. 139 $I4/mmm$	$GM4^-$	L139.2.7 $GM4^-$
0.471	$Ba_2Mn_3Sb_2O_2$	No. 139.6.1184 $I4'/m'm'm$	$a, b, c; 0, 0, 0$	No. 139 $I4/mmm$	$GM4^-$	L139.2.7 $GM4^-$
0.472	$LaMn_2Si_2$	No. 139.6.1184 $I4'/m'm'm$	$a, b, c; 0, 0, 0$	No. 139 $I4/mmm$	$GM4^-$	L139.2.7 $GM4^-$
0.474	$EuMn_2Ge_2$	No. 139.6.1184 $I4'/m'm'm$	$a, b, c; 0, 0, 0$	No. 139 $I4/mmm$	$GM4^-$	L139.2.7 $GM4^-$
0.475	Sr_2TbIrO_6	No. 14.1.86 $P2_1/c$	$a, b, -a+c; 0, 0, 0$	No. 14 $P2_1/c$	$GM2^+$	L14.2.2 $GM2^+$
0.476	$Cs_2[FeCl_5(H_2O)]$	No. 15.3.94 $C2'/c$	$a+c, b, c; 0, 0, 0$	No. 15 $C2/c$	$GM2^-$	L15.2.3 $GM2^-$
0.477	$Mn_4Ta_2O_9$	No. 165.4.1325 $P\bar{3}'c'1$	$a, b, c; 0, 0, 0$	No. 165 $P\bar{3}c1$	$GM2^-$	L165.2.3 $GM2^-$

SSGs of collinear magnetic structures (continued).

BCSID	Chemical formula	MSG	Trans from parent structure	PSG	Rep	SSG
0.482	$SrMn_2As_2$	No. 12.3.68 $C2'/m$	$a,b,c;0,0,0$	No. 164 $P\bar{3}m1$	$GM2^-$	L164.2.3 $GM2^-$
0.483	$YbMn_2Sb_2$	No. 2.3.6 $P\bar{1}'$	$a,b,c;0,0,0$	No. 164 $P\bar{3}m1$	$GM2^-$	L164.2.3 $GM2^-$
0.484	U_2N_2S	No. 164.4.1318 $P\bar{3}'m'1$	$a,b,c;0,0,0$	No. 164 $P\bar{3}m1$	$GM2^-$	L164.2.3 $GM2^-$
0.485	U_2N_2Se	No. 164.4.1318 $P\bar{3}'m'1$	$a,b,c;0,0,0$	No. 164 $P\bar{3}m1$	$GM2^-$	L164.2.3 $GM2^-$
0.486	$ErCr_2Si_2$	No. 139.6.1184 $I4'/m'm'm$	$a,b,c;0,0,0$	No. 139 $I4/mmm$	$GM4^-$	L139.2.7 $GM4^-$
0.498	$LaMn_2Si_2$	No. 139.6.1184 $I4'/m'm'm$	$a,b,c;0,0,0$	No. 139 $I4/mmm$	$GM4^-$	L139.2.7 $GM4^-$
0.499	UCr_2Si_2C	No. 47.4.350 $Pm'm'm$	$a,b,c;0,0,0$	No. 123 $P4/mmm$	$GM2^+$	L123.2.2 $GM2^+$
0.505	$Pb_2VO(PO_4)_2$	No. 14.4.89 $P2_1/c'$	$-c,b,a;0,0,0$	No. 14 $P2_1/c$	$GM1^-$	L14.2.1 $GM1^-$
0.507	$Mn_4Nb_2O_9$	No. 165.4.1325 $P\bar{3}'c'1$	$a,b,c;0,0,0$	No. 165 $P\bar{3}c1$	$GM2^-$	L165.2.3 $GM2^-$
0.509	$BaFe_{12}O_{19}$	No. 194.8.1501 $P6_3/mm'c'$	$a,b,c;0,0,0$	No. 194 $P6_3/mmc$	$GM1^+$	L194.1.1 $GM1^+$
0.513	$YRuO_3$	No. 62.8.509 $Pn'ma'$	$a,b,c;0,0,0$	No. 62 $Pnma$	$GM3^+$	L62.2.4 $GM3^+$
0.518	$TbCr_2Si_2$	No. 139.6.1184 $I4'/m'm'm$	$a,b,c;0,0,0$	No. 139 $I4/mmm$	$GM4^-$	L139.2.7 $GM4^-$
0.519	$HoCr_2Si_2$	No. 139.6.1184 $I4'/m'm'm$	$a,b,c;0,0,0$	No. 139 $I4/mmm$	$GM4^-$	L139.2.7 $GM4^-$
0.523	$CaMn_2Sb_2$	No. 2.3.6 $P\bar{1}'$	$a,b,c;0,0,0$	No. 164 $P\bar{3}m1$	$GM2^-$	L164.2.3 $GM2^-$
0.525	$NaCeO_2$	No. 141.6.1218 $I4_1'/a'm'd$	$a,b,c;0,-1/4,1/8$	No. 141 $I4_1/amd$	$GM4^-$	L141.2.7 $GM4^-$
0.526	$Mn_4Ta_2O_9$	No. 165.4.1325 $P\bar{3}'c'1$	$a,b,c;0,0,0$	No. 165 $P\bar{3}c1$	$GM2^-$	L165.2.3 $GM2^-$
0.527	$Er_2Si_2O_7$	No. 12.3.68 $C2'/m$	$a,b,c;0,0,0$	No. 12 $C2/m$	$GM1^-$	L12.2.1 $GM1^-$
0.528	CrSb	No. 194.6.1499 $P6_3'/m'm'c$	$a,b,c;0,0,0$	No. 194 $P6_3/mmc$	$GM3^+$	L194.2.4 $GM3^+$
0.541	Mn_2FeReO_6	No. 14.5.90 $P2_1'/c'$	$a,b,-a+c;0,0,0$	No. 14 $P2_1/c$	$GM1^+$	L14.1.1 $GM1^+$
0.542	Mn_2FeReO_6	No. 2.1.4 $P\bar{1}$	$a,b,c;0,0,0$	No. 2 $P\bar{1}$	$GM1^+$	L2.1.1 $GM1^+$
0.543	Mn_2FeReO_6	No. 2.1.4 $P\bar{1}$	$a,b,c;0,0,0$	No. 2 $P\bar{1}$	$GM1^+$	L2.1.1 $GM1^+$
0.553	K_2ReI_6	No. 14.1.86 $P2_1/c$	$a,b,-a+c;0,0,0$	No. 14 $P2_1/c$	$GM2^+$	L14.2.2 $GM2^+$
0.561	$NdNiGe_2$	No. 63.6.516 $Cm'c'm$	$a,b,c;0,0,0$	No. 63 $Cmcm$	$GM1^+$	L63.1.1 $GM1^+$
0.562	$Ce_2Ni_3Ge_5$	No. 72.12.641 $I_Pb'am'$	$a,b,c;0,0,0$	No. 72 $Ibam$	$X1^+$	L72.2.6 $X1^+$
0.563	$Ce_2Ni_3Ge_5$	No. 72.10.639 I_Pbam'	$a,b,c;0,0,0$	No. 72 $Ibam$	$X4^-$	L72.2.11 $X3^-$
0.566	$TbNiGe_2$	No. 63.3.513 $Cm'cm$	$a,b,c;0,0,0$	No. 63 $Cmcm$	$GM4^-$	L63.2.7 $GM4^-$
0.585	$YbCl_3$	No. 12.3.68 $C2'/m$	$a,b,c;0,0,0$	No. 12 $C2/m$	$GM1^-$	L12.2.1 $GM1^-$
0.586	$YCrO_3$	No. 62.8.509 $Pn'ma'$	$b,c,a;0,0,0$	No. 62 $Pnma$	$GM3^+$	L62.2.4 $GM3^+$
0.587	$TmCrO_3$	No. 62.8.509 $Pn'ma'$	$b,c,a;0,0,0$	No. 62 $Pnma$	$GM3^+$	L62.2.4 $GM3^+$

SSGs of collinear magnetic structures (continued).

BCSID	Chemical formula	MSG	Trans from parent structure	PSG	Rep	SSG
0.591	$ErCrO_3$	No. 62.8.509 $Pn'ma'$	$b,c,a;0,0,0$	No. 62 $Pnma$	$GM3^+$	L62.2.4 $GM3^+$
0.592	$DyCrO_3$	No. 62.6.507 $Pn'm'a$	$b,c,a;0,0,0$	No. 62 $Pnma$	$GM3^+$	L62.2.4 $GM3^+$
0.593	UPSe	No. 129.7.1081 $P4/nm'm'$	$a,b,c;0,0,0$	No. 129 $P4/nmm$	$GM1^+$	L129.1.1 $GM1^+$
0.594	UAsS	No. 129.7.1081 $P4/nm'm'$	$a,b,c;0,0,0$	No. 129 $P4/nmm$	$GM1^+$	L129.1.1 $GM1^+$
0.595	UPTe	No. 139.7.1185 $I4/mm'm'$	$a,b,c;0,0,0$	No. 139 $I4/mmm$	$GM1^+$	L139.1.1 $GM1^+$
0.596	UAsTe	No. 139.7.1185 $I4/mm'm'$	$a,b,c;0,0,0$	No. 139 $I4/mmm$	$GM1^+$	L139.1.1 $GM1^+$
0.605	$BaMn_2Ge_2$	No. 139.6.1184 $I4'/m'm'm$	$a,b,c;0,0,0$	No. 139 $I4/mmm$	$GM4^-$	L139.2.7 $GM4^-$
0.606	$BaMn_2Ge_2$	No. 139.6.1184 $I4'/m'm'm$	$a,b,c;0,0,0$	No. 139 $I4/mmm$	$GM4^-$	L139.2.7 $GM4^-$
0.607	RuO_2	No. 136.5.1156 $P4_2'/mnm'$	$a,b,c;0,0,0$	No. 136 $P4_2/mnm$	$GM4^+$	L136.2.6 $GM4^+$
0.608	$PrMnO_3$	No. 62.8.509 $Pn'ma'$	$b,c,a;0,0,0$	No. 62 $Pnma$	$GM2^+$	L62.2.2 $GM2^+$
0.609	$NdMnO_3$	No. 11.1.59 $P2_1/m$	$b,c,a;0,0,0$	No. 62 $Pnma$	$GM2^+$	L62.2.2 $GM2^+$
0.611	$BaMnSb_2$	No. 139.6.1184 $I4'/m'm'm$	$a,b,c;0,0,0$	No. 139 $I4/mmm$	$GM4^-$	L139.2.7 $GM4^-$
0.616	HoB_2	No. 12.5.70 $C2'/m'$	$a,b,c;0,0,0$	No. 191 $P6/mmm$	$GM1^+$	L191.1.1 $GM1^+$
0.617	KMnSb	No. 129.6.1080 $P4'/n'm'm$	$a,b,c;1/4,-1/4,0$	No. 129 $P4/nmm$	$GM4^-$	L129.2.7 $GM4^-$
0.618	KMnBi	No. 129.6.1080 $P4'/n'm'm$	$a,b,c;1/4,-1/4,0$	No. 129 $P4/nmm$	$GM4^-$	L129.2.7 $GM4^-$
0.619	LaMnAsO	No. 129.6.1080 $P4'/n'm'm$	$a,b,c;0,0,0$	No. 129 $P4/nmm$	$GM4^-$	L129.2.7 $GM4^-$
0.620	NdMnAsO	No. 129.6.1080 $P4'/n'm'm$	$a,b,c;0,0,0$	No. 129 $P4/nmm$	$GM4^-$	L129.2.7 $GM4^-$
0.621	NdMnAsO	No. 59.3.480 $Pm'mn$	$a,b,c;1/2,0,1/2$	No. 59 $Pmmn$	$GM2^-$	L59.2.3 $GM2^-$
0.622	NdMnAsO	No. 59.3.480 $Pm'mn$	$a,b,c;0,0,0$	No. 59 $Pmmn$	$GM2^-$	L59.2.3 $GM2^-$
0.623	NdMnAsO	No. 129.6.1080 $P4'/n'm'm$	$a,b,c;0,0,0$	No. 129 $P4/nmm$	$GM4^-$	L129.2.7 $GM4^-$
0.624	LaMnAsO	No. 129.6.1080 $P4'/n'm'm$	$a,b,c;0,0,0$	No. 129 $P4/nmm$	$GM4^-$	L129.2.7 $GM4^-$
0.631	NaMnSb	No. 129.6.1080 $P4'/n'm'm$	$a,b,c;1/4,-1/4,0$	No. 129 $P4/nmm$	$GM4^-$	L129.2.7 $GM4^-$
0.632	NaMnSb	No. 129.6.1080 $P4'/n'm'm$	$a,b,c;1/4,-1/4,0$	No. 129 $P4/nmm$	$GM4^-$	L129.2.7 $GM4^-$
0.634	NaMnBi	No. 129.6.1080 $P4'/n'm'm$	$a,b,c;1/4,-1/4,0$	No. 129 $P4/nmm$	$GM4^-$	L129.2.7 $GM4^-$
0.635	NaMnBi	No. 129.6.1080 $P4'/n'm'm$	$a,b,c;1/4,-1/4,0$	No. 129 $P4/nmm$	$GM4^-$	L129.2.7 $GM4^-$
0.636	$RbFeS_2$	No. 15.3.94 $C2'/c$	$a,b,c;0,0,0$	No. 15 $C2/c$	$GM1^-$	L15.2.1 $GM1^-$
0.638	$RbFeSe_2$	No. 15.4.95 $C2/c'$	$a,b,c;0,0,0$	No. 15 $C2/c$	$GM1^-$	L15.2.1 $GM1^-$
0.639	Mn_2Au	No. 71.3.623 $Im'mm$	$a,b,c;0,0,0$	No. 139 $I4/mmm$	$GM3^-$	L139.2.5 $GM3^-$
0.640	Mn_2Au	No. 71.3.623 $Im'mm$	$a,b,c;0,0,0$	No. 139 $I4/mmm$	$GM3^-$	L139.2.5 $GM3^-$

SSGs of collinear magnetic structures (continued).

BCSID	Chemical formula	MSG	Trans from parent structure	PSG	Rep	SSG
0.642	$LaMnO_3$	No. 62.8.509 $Pn'ma'$	$a,b,c;0,0,0$	No. 62 $Pnma$	$GM2^+$	L62.2.2 $GM2^+$
0.650	$ErSi_2O_7$	No. 12.3.68 $C2'/m$	$a,b,c;0,0,0$	No. 12 $C2/m$	$GM1^-$	L12.2.1 $GM1^-$
0.651	$Er_3Cu_4Sn_4$	No. 12.6.71 $C_{2c}2/m$	$a,b,c;0,0,0$	No. 12 $C2/m$	$A2^-$	L12.2.4 $A1^+$
0.662	Mn_3Sn_2	No. 62.8.509 $Pn'ma'$	$a,b,c;0,0,0$	No. 62 $Pnma$	$GM1^+$	L62.1.1 $GM1^+$
0.665	CeMnSbO	No. 129.6.1080 $P4'/n'm'm$	$a,b,c;0,0,0$	No. 129 $P4/nmm$	$GM4^-$	L129.2.7 $GM4^-$
0.666	CeMnSbO	No. 59.3.480 $Pm'mn$	$a,b,c;0,0,0$	No. 59 $Pmmn$	$GM2^-$	L59.2.3 $GM2^-$
0.667	LaMnSbO	No. 129.6.1080 $P4'/n'm'm$	$a,b,c;0,0,0$	No. 129 $P4/nmm$	$GM4^-$	L129.2.7 $GM4^-$
0.668	PrMnSbO	No. 59.3.480 $Pm'mn$	$a,b,c;0,0,0$	No. 59 $Pmmn$	$GM2^-$	L59.2.3 $GM2^-$
0.671	Sr_2TmRuO_6	No. 14.1.86 $P2_1/c$	$a,b,-a+c;0,0,0$	No. 14 $P2_1/c$	$GM2^+$	L14.2.2 $GM2^+$
0.672	$CaCu_3Fe_2Sb_2O_{12}$	No. 48.4.361 $Pn'n'n$	$a,b,c;0,0,0$	No. 201 $Pn\bar{3}$	$GM1^+$	L201.1.1 $GM1^+$
0.681	Ce_4Sb_3	No. 122.4.997 $I\bar{4}'2d'$	$a,b,c;0,-1/4,1/8$	No. 122 $I\bar{4}2d$	GM3	L122.2.2 GM3
0.682	Ca_2FeOsO_6	No. 14.5.90 $P2_1'/c'$	$a,b,-a+c;0,0,0$	No. 14 $P2_1/c$	$GM1^+$	L14.1.1 $GM1^+$
0.689	PrPt	No. 63.6.516 $Cm'c'm$	$a,b,c;0,0,0$	No. 63 $Cmcm$	$GM1^+$	L63.1.1 $GM1^+$
0.690	NdPt	No. 15.5.96 $C2'/c'$	$a,b,c;0,0,0$	No. 63 $Cmcm$	$GM1^+$	L63.1.1 $GM1^+$
0.692	$Ba_4Ru_3O_{10}$	No. 64.3.530 $Cm'ca$	$a,b,c;0,0,0$	No. 64 $Cmce$	$GM2^-$	L64.2.3 $GM2^-$
0.693	$Ba_4Ru_3O_{10}$	No. 64.4.531 $Cmc'a$	$a,b,c;0,0,0$	No. 64 $Cmce$	$GM2^-$	L64.2.3 $GM2^-$
0.694	Bi_2CuO_4	No. 130.9.1096 $P4/n'c'c'$	$a,b,c;1/4,-1/4,0$	No. 130 $P4/ncc$	$GM3^-$	L130.2.5 $GM3^-$
0.695	Bi_2CuO_4	No. 56.3.453 $Pc'cn$	$a,b,c;0,0,0$	No. 130 $P4/ncc$	$GM3^-$	L130.2.5 $GM3^-$
0.699	$LiMn_6Sn_6$	No. 65.6.550 $Cmm'm'$	$a,b,c;0,0,0$	No. 191 $P6/mmm$	$GM1^+$	L191.1.1 $GM1^+$
0.700	$TbMn_6Sn_6$	No. 191.8.1470 $P6/mm'm'$	$a,b,c;0,0,0$	No. 191 $P6/mmm$	$GM1^+$	L191.1.1 $GM1^+$
0.701	$TbMn_6Sn_6$	No. 191.8.1470 $P6/mm'm'$	$a,b,c;0,0,0$	No. 191 $P6/mmm$	$GM1^+$	L191.1.1 $GM1^+$
0.705	$HoMn_6Sn_6$	No. 65.6.550 $Cmm'm'$	$a,b,c;0,0,0$	No. 191 $P6/mmm$	$GM1^+$	L191.1.1 $GM1^+$
0.706	$Tb_2Ir_3Ga_9$	No. 63.8.518 $Cm'cm'$	$a,b,c;0,0,0$	No. 63 $Cmcm$	$GM2^+$	L63.2.2 $GM2^+$
0.708	$CrNb_4S_8$	No. 194.6.1499 $P6_3'/m'm'c$	$a,b,c;0,0,0$	No. 194 $P6_3/mmc$	$GM3^+$	L194.2.4 $GM3^+$
0.709	$MnNb_4S_8$	No. 63.7.517 $Cmc'm'$	$a,b,c;0,0,0$	No. 194 $P6_3/mmc$	$GM1^+$	L194.1.1 $GM1^+$
0.710	$MnNb_3S_6$	No. 20.4.125 $C22'2_1'$	$a,b,c;0,0,0$	No. 182 $P6_322$	GM1	L182.1.1 GM1
0.711	$MnTa_4S_8$	No. 63.7.517 $Cmc'm'$	$a,b,c;0,0,0$	No. 194 $P6_3/mmc$	$GM1^+$	L194.1.1 $GM1^+$
0.712	VNb_3S_6	No. 20.3.124 $C2'2'2_1$	$a,b,c;0,0,0$	No. 182 $P6_322$	GM4	L182.2.3 GM4
0.722	$Mn_4Nb_2O_9$	No. 9.1.45 Cc	$a,b,c;0,0,0$	No. 9 Cc	GM2	L9.2.1 GM2

SSGs of collinear magnetic structures (continued).

BCSID	Chemical formula	MSG	Trans from parent structure	PSG	Rep	SSG
0.723	$YbCl_3$	No. 12.3.68 $C2'/m$	$a,b,c;0,0,0$	No. 12 $C2/m$	$GM1^-$	L12.2.1 $GM1^-$
0.728	MoP_3SiO_{11}	No. 15.4.95 $C2/c'$	$a,b,c;0,0,0$	No. 167 $R\bar{3}c$	$GM2^-$	L167.2.3 $GM2^-$
0.729	$ErNi_4B$	No. 191.8.1470 $P6/mm'm'$	$a,b,c;0,0,0$	No. 191 $P6/mmm$	$GM1^+$	L191.1.1 $GM1^+$
0.730	$TbNi_4B$	No. 12.5.70 $C2'/m'$	$a,b,c;0,0,0$	No. 191 $P6/mmm$	$GM1^+$	L191.1.1 $GM1^+$
0.731	$HoNi_4B$	No. 12.5.70 $C2'/m'$	$a,b,c;0,0,0$	No. 191 $P6/mmm$	$GM1^+$	L191.1.1 $GM1^+$
0.732	$SrRuO_3$	No. 62.6.507 $Pn'm'a$	$a,b,c;0,0,0$	No. 62 $Pnma$	$GM1^+$	L62.1.1 $GM1^+$
0.733	$AgRuO_3$	No. 167.4.1337 $R\bar{3}'c'$	$a,b,c;0,0,0$	No. 167 $R\bar{3}c$	$GM2^-$	L167.2.3 $GM2^-$
0.734	$Mn_3Ta_2O_8$	No. 15.3.94 $C2'/c$	$a,b,c;0,0,0$	No. 88 $I4_1/a$	$GM2^-$	L88.2.3 $GM2^-$
0.735	$LaBaMn_2O_5$	No. 129.7.1081 $P4/nm'm'$	$a,b,c;0,0,0$	No. 129 $P4/nmm$	$GM1^+$	L129.1.1 $GM1^+$
0.737	$LaBaMn_2O_6$	No. 123.7.1005 $P4/mm'm'$	$a,b,c;0,0,0$	No. 123 $P4/mmm$	$GM1^+$	L123.1.1 $GM1^+$
0.738	$LaBaMn_2O_6$	No. 123.7.1005 $P4/mm'm'$	$a,b,c;0,0,0$	No. 123 $P4/mmm$	$GM1^+$	L123.1.1 $GM1^+$
0.739	$YBaMn_2O_5$	No. 129.7.1081 $P4/nm'm'$	$a,b,c;0,0,0$	No. 129 $P4/nmm$	$GM1^+$	L129.1.1 $GM1^+$
0.747	$Ba_3CoIr_2O_9$	No. 15.1.92 $C2/c$	$a,b,c;0,0,0$	No. 15 $C2/c$	$GM2^+$	L15.2.2 $GM2^+$
0.748	$Ba_3NiRu_2O_9$	No. 194.6.1499 $P6_3'/m'm'c$	$a,b,c;0,0,0$	No. 194 $P6_3/mmc$	$GM3^+$	L194.2.4 $GM3^+$
0.749	$Ba_3CoRu_2O_9$	No. 63.14.524 $C_Pm'c'm$	$a,b,c;0,0,0$	No. 63 $Cmcm$	$Y3^+$	L63.2.12 $Y3^+$
0.750	$Ba_3CoRu_2O_9$	No. 63.14.524 $C_Pm'c'm$	$b,2a+b,-c;0,0,0$	No. 63 $Cmcm$	$Y3^+$	L63.2.12 $Y3^+$
0.757	$CeFeO_3$	No. 62.8.509 $Pn'ma'$	$b,c,a;0,0,0$	No. 62 $Pnma$	$GM3^+$	L62.2.4 $GM3^+$
0.758	$CeFeO_3$	No. 62.1.502 $Pnma$	$b,c,a;0,0,0$	No. 62 $Pnma$	$GM3^+$	L62.2.4 $GM3^+$
0.766	$YbMnSb_2$	No. 129.6.1080 $P4'/n'm'm$	$a,b,c;1/4,-1/4,0$	No. 129 $P4/nmm$	$GM4^-$	L129.2.7 $GM4^-$
0.767	$SrMnSb_2$	No. 62.8.509 $Pn'ma'$	$a,b,c;0,0,0$	No. 62 $Pnma$	$GM1^+$	L62.1.1 $GM1^+$
0.769	$YbMnBi_2$	No. 129.6.1080 $P4'/n'm'm$	$a,b,c;1/4,-1/4,0$	No. 129 $P4/nmm$	$GM4^-$	L129.2.7 $GM4^-$
0.771	$PrMnSi_2$	No. 63.8.518 $Cm'cm'$	$a,b,c;0,0,0$	No. 63 $Cmcm$	$GM1^+$	L63.1.1 $GM1^+$
0.772	$PrMnSi_2$	No. 63.8.518 $Cm'cm'$	$a,b,c;0,0,0$	No. 63 $Cmcm$	$GM1^+$	L63.1.1 $GM1^+$
0.774	$NdMnSi_2$	No. 63.8.518 $Cm'cm'$	$a,b,c;0,0,0$	No. 63 $Cmcm$	$GM1^+$	L63.1.1 $GM1^+$
0.775	$NdMnSi_2$	No. 63.8.518 $Cm'cm'$	$a,b,c;0,0,0$	No. 63 $Cmcm$	$GM1^+$	L63.1.1 $GM1^+$
0.776	$CeMnSi_2$	No. 63.8.518 $Cm'cm'$	$a,b,c;0,0,0$	No. 63 $Cmcm$	$GM1^+$	L63.1.1 $GM1^+$
0.777	$CeMnSi_2$	No. 63.8.518 $Cm'cm'$	$a,b,c;0,0,0$	No. 63 $Cmcm$	$GM1^+$	L63.1.1 $GM1^+$
0.778	$LaMnSi_2$	No. 63.8.518 $Cm'cm'$	$a,b,c;0,0,0$	No. 63 $Cmcm$	$GM1^+$	L63.1.1 $GM1^+$
0.779	$LaMnSi_2$	No. 63.8.518 $Cm'cm'$	$a,b,c;0,0,0$	No. 63 $Cmcm$	$GM1^+$	L63.1.1 $GM1^+$

SSGs of collinear magnetic structures (continued).

BCSID	Chemical formula	MSG	Trans from parent structure	PSG	Rep	SSG
0.780	$LaMnSi_2$	No. 63.8.518 $Cm'cm'$	$a,b,c;0,0,0$	No. 63 $Cmcm$	$GM1^+$	L63.1.1 $GM1^+$
0.781	$CeMnSi_2$	No. 63.8.518 $Cm'cm'$	$a,b,c;0,0,0$	No. 63 $Cmcm$	$GM1^+$	L63.1.1 $GM1^+$
0.784	$NdCoO_3$	No. 62.1.502 $Pnma$	$b,c,a;0,0,0$	No. 62 $Pnma$	$GM4^+$	L62.2.6 $GM4^+$
0.786	$NdVO_3$	No. 11.5.63 $P2_1'/m'$	$b,c,a;0,0,0$	No. 62 $Pnma$	$GM4^+$	L62.2.6 $GM4^+$
0.787	YVO_3	No. 62.6.507 $Pn'm'a$	$b,c,a;0,0,0$	No. 62 $Pnma$	$GM3^+$	L62.2.4 $GM3^+$
0.789	CeCuSi	No. 63.7.517 $Cmc'm'$	$a,b,c;0,0,0$	No. 194 $P6_3/mmc$	$GM1^+$	L194.1.1 $GM1^+$
0.790	Sr_2DyRuO_6	No. 14.5.90 $P2_1'/c'$	$a,b,-a+c;0,0,0$	No. 14 $P2_1/c$	$GM2^+$	L14.2.2 $GM2^+$
0.792	Sr_2HoRuO_6	No. 14.1.86 $P2_1/c$	$a,b,-a+c;0,0,0$	No. 14 $P2_1/c$	$GM2^+$	L14.2.2 $GM2^+$
0.793	Sr_2HoRuO_6	No. 14.1.86 $P2_1/c$	$a,b,-a+c;0,0,0$	No. 14 $P2_1/c$	$GM2^+$	L14.2.2 $GM2^+$
0.795	Sr_2YRuO_6	No. 14.1.86 $P2_1/c$	$a,b,-a+c;0,0,0$	No. 14 $P2_1/c$	$GM2^+$	L14.2.2 $GM2^+$
0.796	Ca_2NiOsO_6	No. 14.5.90 $P2_1'/c'$	$a,b,-a+c;0,0,0$	No. 14 $P2_1/c$	$GM1^+$	L14.1.1 $GM1^+$
0.797	$SmBaMn_2O_5$	No. 129.7.1081 $P4/nm'm'$	$a,b,c;0,0,0$	No. 129 $P4/nmm$	$GM1^+$	L129.1.1 $GM1^+$
0.798	$MnPd_2$	No. 62.5.506 $Pnma'$	$a,b,c;0,0,0$	No. 62 $Pnma$	$GM3^-$	L62.2.5 $GM3^-$
0.799	$Sr_2Co_2O_5$	No. 46.9.346 $I_Pm'a'2$	$a,b,c;0,0,0$	No. 46 $Ima2$	X1	L46.2.4 X1
0.800	MnTe	No. 63.1.511 $Cmcm$	$a,b,c;0,0,0$	No. 194 $P6_3/mmc$	$GM3^+$	L194.2.4 $GM3^+$
0.801	$Tl_3Fe_2S_4$	No. 62.5.506 $Pnma'$	$a,b,c;0,0,0$	No. 62 $Pnma$	$GM4^-$	L62.2.7 $GM4^-$
0.804	MoP_3SiO_{11}	No. 15.4.95 $C2/c'$	$a,b,c;0,0,0$	No. 167 $R\bar{3}c$	$GM2^-$	L167.2.3 $GM2^-$
0.811	Fe_2WO_6	No. 60.7.494 $Pbc'n'$	$a,b,c;0,0,0$	No. 60 $Pbcn$	$GM4^+$	L60.2.6 $GM4^+$
0.813	Fe_2WO_6	No. 60.7.494 $Pbc'n'$	$a,b,c;0,0,0$	No. 60 $Pbcn$	$GM4^+$	L60.2.6 $GM4^+$
0.814	Fe_2WO_6	No. 60.3.490 $Pb'cn$	$a,b,c;0,0,0$	No. 60 $Pbcn$	$GM4^-$	L60.2.7 $GM4^-$
0.815	$MnNb_2O_6$	No. 60.3.490 $Pb'cn$	$a,b,c;0,0,0$	No. 60 $Pbcn$	$GM1^-$	L60.2.1 $GM1^-$
0.816	$MnTa_2O_6$	No. 60.3.490 $Pb'cn$	$a,b,c;0,0,0$	No. 60 $Pbcn$	$GM1^-$	L60.2.1 $GM1^-$
0.821	$SrGd_2O_4$	No. 62.5.506 $Pnma'$	$a,-c,b;0,0,0$	No. 62 $Pnma$	$GM3^-$	L62.2.5 $GM3^-$
0.823	Sr_2MnGaO_5	No. 46.3.340 $Im'a2'$	$a,b,c;0,0,0$	No. 46 $Ima2$	GM2	L46.2.1 GM2
0.832	CeAuGe	No. 36.4.252 $Cmc'2_1'$	$-b,2a+b,c;0,0,0$	No. 36 $Cmc2_1$	GM1	L36.1.1 GM1
0.833	CeCuGe	No. 63.7.517 $Cmc'm'$	$a,b,c;0,0,0$	No. 194 $P6_3/mmc$	$GM1^+$	L194.1.1 $GM1^+$
0.834	$CrSbSe_3$	No. 62.7.508 $Pnm'a'$	$a,b,c;0,0,0$	No. 62 $Pnma$	$GM1^+$	L62.1.1 $GM1^+$
0.835	$Dy_5Pd_2In_4$	No. 55.5.445 $Pb'a'm$	$a,b,c;0,0,0$	No. 55 $Pbam$	$GM1^+$	L55.1.1 $GM1^+$
0.836	$DyFeO_3$	No. 62.8.509 $Pn'ma'$	$b,c,a;0,0,0$	No. 62 $Pnma$	$GM3^+$	L62.2.4 $GM3^+$

SSGs of collinear magnetic structures (continued).

BCSID	Chemical formula	MSG	Trans from parent structure	PSG	Rep	SSG
0.837	$DyFeO_3$	No. 62.8.509 $Pn'ma'$	$b,c,a;0,0,0$	No. 62 $Pnma$	$GM3^+$	L62.2.4 $GM3^+$
0.838	$DyFeO_3$	No. 62.8.509 $Pn'ma'$	$b,c,a;0,0,0$	No. 62 $Pnma$	$GM3^+$	L62.2.4 $GM3^+$
0.839	$DyFeO_3$	No. 62.8.509 $Pn'ma'$	$b,c,a;0,0,0$	No. 62 $Pnma$	$GM3^+$	L62.2.4 $GM3^+$
0.840	$DyFeO_3$	No. 62.1.502 $Pnma$	$b,c,a;0,0,0$	No. 62 $Pnma$	$GM3^+$	L62.2.4 $GM3^+$
0.841	$DyFeO_3$	No. 62.1.502 $Pnma$	$b,c,a;0,0,0$	No. 62 $Pnma$	$GM3^+$	L62.2.4 $GM3^+$
0.855	Mn_2Sb	No. 129.7.1081 $P4/nm'm'$	$a,b,c;1/4,-1/4,0$	No. 129 $P4/nmm$	$GM1^+$	L129.1.1 $GM1^+$
0.856	Tm_2Fe_{17}	No. 194.8.1501 $P6_3/mm'c'$	$a,b,c;0,0,0$	No. 194 $P6_3/mmc$	$GM1^+$	L194.1.1 $GM1^+$
0.857	Tm_2Fe_{17}	No. 194.8.1501 $P6_3/mm'c'$	$a,b,c;0,0,0$	No. 194 $P6_3/mmc$	$GM1^+$	L194.1.1 $GM1^+$
0.858	Tm_2Fe_{17}	No. 194.8.1501 $P6_3/mm'c'$	$a,b,c;0,0,0$	No. 194 $P6_3/mmc$	$GM1^+$	L194.1.1 $GM1^+$
0.859	YCo_3	No. 166.5.1331 $R\bar{3}m'$	$a,b,c;0,0,0$	No. 166 $R\bar{3}m$	$GM1^+$	L166.1.1 $GM1^+$
0.860	$Co_3Sn_2S_2$	No. 166.5.1331 $R\bar{3}m'$	$a,b,c;0,0,0$	No. 166 $R\bar{3}m$	$GM1^+$	L166.1.1 $GM1^+$
0.861	$Co_3Sn_2S_2$	No. 166.5.1331 $R\bar{3}m'$	$a,b,c;0,0,0$	No. 166 $R\bar{3}m$	$GM1^+$	L166.1.1 $GM1^+$
0.863	$EuCd_2As_2$	No. 12.5.70 $C2'/m'$	$a,b,c;0,0,0$	No. 164 $P\bar{3}m1$	$GM1^+$	L164.1.1 $GM1^+$
0.867	Nd_2NiIrO_6	No. 14.1.86 $P2_1/c$	$a,b,-a+c;0,0,0$	No. 14 $P2_1/c$	$GM1^+$	L14.1.1 $GM1^+$
0.897	$TbMn_2Ge_2$	No. 139.7.1185 $I4/mm'm'$	$a,b,c;0,0,0$	No. 139 $I4/mmm$	$GM1^+$	L139.1.1 $GM1^+$
0.902	$DyMn_2Ge_2$	No. 139.7.1185 $I4/mm'm'$	$a,b,c;0,0,0$	No. 139 $I4/mmm$	$GM1^+$	L139.1.1 $GM1^+$
0.904	Nd_2PdGe_6	No. 64.6.533 $Cm'c'a$	$a,b,c;0,0,0$	No. 64 $Cmce$	$GM3^+$	L64.2.4 $GM3^+$
0.909	Er_2PtGe_6	No. 64.4.531 $Cmc'a$	$a,b,c;0,0,0$	No. 64 $Cmce$	$GM2^-$	L64.2.3 $GM2^-$
0.910	$TbNiSi_2$	No. 63.3.513 $Cm'cm$	$a,b,c;0,0,0$	No. 63 $Cmcm$	$GM4^-$	L63.2.7 $GM4^-$
0.911	$Tb_5Pd_2In_4$	No. 55.5.445 $Pb'a'm$	$a,b,c;0,0,0$	No. 55 $Pbam$	$GM1^+$	L55.1.1 $GM1^+$
0.914	$Tb_5Ni_2In_4$	No. 55.5.445 $Pb'a'm$	$a,b,c;0,0,0$	No. 55 $Pbam$	$GM1^+$	L55.1.1 $GM1^+$
0.917	Sr_2ScOsO_6	No. 14.1.86 $P2_1/c$	$a,b,-a+c;0,0,0$	No. 14 $P2_1/c$	$GM2^+$	L14.2.2 $GM2^+$
0.919	$EuMnBi_2$	No. 139.6.1184 $I4'/m'm'm$	$a,b,c;0,0,0$	No. 139 $I4/mmm$	$GM4^-$	L139.2.7 $GM4^-$
0.920	ThMnPN	No. 129.6.1080 $P4'/n'm'm$	$a,b,c;0,0,0$	No. 129 $P4/nmm$	$GM4^-$	L129.2.7 $GM4^-$
0.921	ThMnPN	No. 129.6.1080 $P4'/n'm'm$	$a,b,c;0,0,0$	No. 129 $P4/nmm$	$GM4^-$	L129.2.7 $GM4^-$
0.922	ThMnAsN	No. 129.6.1080 $P4'/n'm'm$	$a,b,c;0,0,0$	No. 129 $P4/nmm$	$GM4^-$	L129.2.7 $GM4^-$
0.923	ThMnAsN	No. 129.6.1080 $P4'/n'm'm$	$a,b,c;0,0,0$	No. 129 $P4/nmm$	$GM4^-$	L129.2.7 $GM4^-$
0.927	Nd_2PdGe_6	No. 64.6.533 $Cm'c'a$	$a,b,c;0,0,0$	No. 64 $Cmce$	$GM3^+$	L64.2.4 $GM3^+$
0.932	Er_2PtGe_6	No. 64.4.531 $Cmc'a$	$a,b,c;0,0,0$	No. 64 $Cmce$	$GM2^-$	L64.2.3 $GM2^-$

SSGs of collinear magnetic structures (continued).

BCSID	Chemical formula	MSG	Trans from parent structure	PSG	Rep	SSG
0.933	Na_2RuO_4	No. 14.4.89 $P2_1/c'$	$a, b, c; 0, 0, 0$	No. 14 $P2_1/c$	$GM2^-$	L14.2.3 $GM2^-$
0.934	Sr_2NiTeO_6	No. 14.1.86 $P2_1/c$	$a, b, -a+c; 0, 0, 0$	No. 14 $P2_1/c$	$GM2^+$	L14.2.2 $GM2^+$
0.936	Sr_2MnTeO_6	No. 14.1.86 $P2_1/c$	$a, b, -a+c; 0, 0, 0$	No. 14 $P2_1/c$	$GM2^+$	L14.2.2 $GM2^+$
0.937	Sr_2CoTeO_6	No. 14.1.86 $P2_1/c$	$a, b, -a+c; 0, 0, 0$	No. 14 $P2_1/c$	$GM2^+$	L14.2.2 $GM2^+$
0.947	$YCrO_3$	No. 62.8.509 $Pn'ma'$	$a, b, c; 0, 0, 0$	No. 62 $Pnma$	$GM3^+$	L62.2.4 $GM3^+$
0.959	Cr_2TeO_6	No. 58.3.473 $Pn'nm$	$a, b, c; 0, 0, 0$	No. 136 $P4_2/mnm$	$GM3^-$	L136.2.5 $GM3^-$
0.960	Fe_2TeO_6	No. 136.9.1160 $P4_2/m'n'm'$	$a, b, c; 0, 0, 0$	No. 136 $P4_2/mnm$	$GM3^-$	L136.2.5 $GM3^-$
0.965	$LuFe_2O_4$	No. 1.3.3 $P_{2s}1$	$a, b, c; 0, 0, 0$	No. 1 $P1$	T1	L1.2.1 R1
0.966	V_2WO_6	No. 58.3.473 $Pn'nm$	$a, b, c; 0, 0, 0$	No. 136 $P4_2/mnm$	$GM2^-$	L136.2.3 $GM2^-$
0.967	$BaMn_2V_2O_8$	No. 45.3.333 $Ib'a2'$	$a, b, c; 0, 0, 0$	No. 110 $I4_1cd$	GM2	L110.2.1 GM2
0.970	$PrRu_2Si_2$	No. 139.7.1185 $I4/mm'm'$	$a, b, c; 0, 0, 0$	No. 139 $I4/mmm$	$GM1^+$	L139.1.1 $GM1^+$
0.971	HoP	No. 139.7.1185 $I4/mm'm'$	$a, b, c; 0, 0, 0$	No. 225 $Fm\bar{3}m$	$GM1^+$	L225.1.1 $GM1^+$
0.972	HoPdIn	No. 189.5.1455 $P\bar{6}2'm'$	$a, b, c; 0, 0, 0$	No. 189 $P\bar{6}2m$	GM1	L189.1.1 GM1
0.973	HoPdIn	No. 189.5.1455 $P\bar{6}2'm'$	$a, b, c; 0, 0, 0$	No. 189 $P\bar{6}2m$	GM1	L189.1.1 GM1
0.974	ErPdIn	No. 189.5.1455 $P\bar{6}2'm'$	$a, b, c; 0, 0, 0$	No. 189 $P\bar{6}2m$	GM1	L189.1.1 GM1
0.975	ErPdIn	No. 189.5.1455 $P\bar{6}2'm'$	$a, b, c; 0, 0, 0$	No. 189 $P\bar{6}2m$	GM1	L189.1.1 GM1
0.976	NdPdIn	No. 38.5.269 $Am'm'2$	$a, b, c; 0, 0, 0$	No. 189 $P\bar{6}2m$	GM1	L189.1.1 GM1
0.977	NdPdIn	No. 8.3.40 Cm'	$a, b, c; 0, 0, 0$	No. 189 $P\bar{6}2m$	GM1	L189.1.1 GM1
0.978	ErNiIn	No. 189.5.1455 $P\bar{6}2'm'$	$a, b, c; 0, 0, 0$	No. 189 $P\bar{6}2m$	GM1	L189.1.1 GM1
0.979	$TmVO_3$	No. 62.6.507 $Pn'm'a$	$a, b, c; 0, 0, 0$	No. 62 $Pnma$	$GM3^+$	L62.2.4 $GM3^+$
0.980	$TmVO_3$	No. 62.6.507 $Pn'm'a$	$a, b, c; 0, 0, 0$	No. 62 $Pnma$	$GM3^+$	L62.2.4 $GM3^+$
0.982	$TmVO_3$	No. 14.1.86 $P2_1/c$	$b, c, a; 0, 0, 0$	No. 14 $P2_1/c$	$GM2^+$	L14.2.2 $GM2^+$
0.983	$TmVO_3$	No. 14.1.86 $P2_1/c$	$b, c, a; 0, 0, 0$	No. 14 $P2_1/c$	$GM2^+$	L14.2.2 $GM2^+$
0.984	$LuVO_3$	No. 62.6.507 $Pn'm'a$	$b, c, a; 0, 0, 0$	No. 62 $Pnma$	$GM3^+$	L62.2.4 $GM3^+$
1.0.1	Ag_2CrO_2	No. 12.3.68 $C2'/m$	$a-b, -5a-5b, -c; 0, 0, 0$	No. 12 $C2/m$	$GM1^-$	L12.2.1 $GM1^-$
1.0.5	Sr_3CoIrO_6	No. 165.5.1326 $P\bar{3}c'1$	$a, b, c; 0, 0, 0$	No. 165 $P\bar{3}c1$	$GM1^+$	L165.1.1 $GM1^+$
1.0.7	$LuFe_2O_4$	No. 12.5.70 $C2'/m'$	$a-b, 3a+3b, -a/3+b/3+c/3; 0, 0, 0$	No. 12 $C2/m$	$GM1^+$	L12.1.1 $GM1^+$
1.0.9	$CsCoCl_3$	No. 193.7.1491 $P6_3'/m'cm'$	$a-b, a+2b, c; 0, 0, 0$	No. 193 $P6_3/mcm$	$GM4^+$	L193.2.6 $GM4^+$
1.0.10	Sr_3NiIrO_6	No. 165.5.1326 $P\bar{3}c'1$	$a, b, c; 0, 0, 0$	No. 165 $P\bar{3}c1$	$GM1^+$	L165.1.1 $GM1^+$

SSGs of collinear magnetic structures (continued).

BCSID	Chemical formula	MSG	Trans from parent structure	PSG	Rep	SSG
1.0.11	$CeCoGe_3$	No. 107.5.887 $I4m'm'$	$a, b, 3c; 0, 0, 0$	No. 107 $I4mm$	GM1	L107.1.1 GM1
1.0.12	UAu_2Si_2	No. 71.4.624 $Im'm'm$	$3a, b, c; 0, 0, 0$	No. 71 $Immm$	$GM1^+$	L71.1.1 $GM1^+$
1.0.13	FeI_2	No. 12.5.70 $C2'/m'$	$5b, -2a + b, c; 0, 0, 0$	No. 12 $C2/m$	$GM1^+$	L12.1.1 $GM1^+$
1.0.18	$Cs_2MnU_3F_{16}$	No. 193.8.1492 $P6_3/mc'm'$	$2a + b, -a + b, c; 0, 0, 0$	No. 193 $P6_3/mcm$	$GM1^+$	L193.1.1 $GM1^+$
1.0.19	$Cs_2CoU_3F_{16}$	No. 193.8.1492 $P6_3/mc'm'$	$2a + b, -a + b, c; 0, 0, 0$	No. 193 $P6_3/mcm$	$GM1^+$	L193.1.1 $GM1^+$
1.0.26	$RbCoBr_3$	No. 193.7.1491 $P6'_3/m'cm'$	$a - b, a + 2b, c; 0, 0, 0$	No. 193 $P6_3/mcm$	$GM4^+$	L193.2.6 $GM4^+$
1.0.28	$Tb(DCO_2)_3$	No. 156.3.1281 $P3m'1$	$a, b, c; 0, 0, 0$	No. 156 $P3m1$	GM1	L156.1.1 GM1
1.0.29	$CeIrGe_3$	No. 107.5.887 $I4m'm'$	$a, b, 3c; 0, 0, 0$	No. 107 $I4mm$	GM1	L107.1.1 GM1
1.0.38	$CsCoCl_3$	No. 193.7.1491 $P6'_3/m'cm'$	$-a - 2b, 2a + b, c; 0, 0, 0$	No. 193 $P6_3/mcm$	$GM4^+$	L193.2.6 $GM4^+$
1.0.39	$BaMnO_3$	No. 193.7.1491 $P6'_3/m'cm'$	$2a + b, -a + b, c; 0, 0, 0$	No. 193 $P6_3/mcm$	$GM4^+$	L193.2.6 $GM4^+$
1.0.43	UPd_2Si_2	No. 139.7.1185 $I4/mm'm'$	$a, b, 3c; 0, 0, 0$	No. 139 $I4/mmm$	$GM1^+$	L139.1.1 $GM1^+$
1.0.53	Ho_2Ni_2Pb	No. 65.5.549 $Cm'm'm$	$5a, b, c; 1/2, 0, 0$	No. 65 $Cmmm$	$GM1^+$	L65.1.1 $GM1^+$
1.0.54	Ho_2Ni_2Pb	No. 65.5.549 $Cm'm'm$	$5a, b, c; 1/2, 0, 0$	No. 65 $Cmmm$	$GM1^+$	L65.1.1 $GM1^+$
1.3	Sr_2IrO_4	No. 73.7.649 $I_Pb'ca$	$a, b, c; 0, 0, 0$	No. 73 $Ibca$	$X1^+$	L73.2.4 $X1^+$
1.7	$NdFe_3B_4O_{12}$	No. 5.4.22 $C_{2c}2$	$a, b, c; 0, 0, 0$	No. 155 $R32$	T1	L155.2.2 T1
1.8	$CeRu_2Al_{10}$	No. 63.11.521 $C_Pm'cm$	$a, b, c; 0, 0, 0$	No. 63 $Cmcm$	$Y4^-$	L63.2.15 $Y4^-$
1.16	$BaFe_2As_2$	No. 69.10.614 $F_Cmm'm'$	$c, a - b, a + b; 0, 0, 0$	No. 69 $Fmmm$	$Z2^+$	L69.2.8 $T3^+$
1.20	$HoMnO_3$	No. 31.6.217 $P_{2b}mn2_1$	$b, -a, c; 1/4, 1/4, 0$	No. 31 $Pmn2_1$	Y4	L31.2.5 Y2
1.21	$DyCo_2Si_2$	No. 139.15.1193 $I_P4/mm'm'$	$a, b, c; 0, 0, 0$	No. 139 $I4/mmm$	$M1^+$	L139.2.8 $M1^+$
1.22	$DyCu_2Si_2$	No. 12.6.71 $C_{2c}2/m$	$a + c, b, c; 0, 0, 0$	No. 12 $C2/m$	$M1^+$	L12.2.4 $A1^+$
1.23	La_2CuO_4	No. 64.14.541 $C_Pm'c'a$	$a, b, c; 0, 0, 0$	No. 64 $Cmce$	$Y3^+$	L64.2.12 $Y3^+$
1.26	$CsFe_2Se_3$	No. 11.7.65 $P_{2c}2_1/m'$	$a/2 + b/2, -c, -a/2 + b/2; 0, 0, 0$	No. 11 $P2_1/m$	$B2^+$	L11.2.5 $B1^-$
1.30	$BaCo_2V_2O_8$	No. 73.7.649 $I_Pb'ca$	$a, b, c; 0, 0, 0$	No. 73 $Ibca$	$X4^+$	L73.2.5 $X4^+$
1.32	Lu_2MnCoO_6	No. 4.4.18 $P_{2a}2_1$	$a, b, c; 1/4, 0, 1/4$	No. 4 $P2_1$	B1	L4.2.2 B1
1.33	ErAuGe	No. 36.9.257 $C_Pm'c'2_1$	$2a - b, a, c; 0, 0, 0$	No. 26 $Pmc2_1$	Y1	L26.2.7 Y1
1.35	$LiErF_4$	No. 15.7.98 C_P2'/c	$a + b, c, -b; 0, 0, 0$	No. 15 $C2/c$	$Y1^+$	L15.2.4 $Y1^+$
1.42	La_2NiO_4	No. 64.15.542 $C_Pmc'a'$	$a, c, -b; 0, 0, 0$	No. 64 $Cmce$	$Y3^+$	L64.2.12 $Y3^+$
1.43	$PrNiO_3$	No. 26.8.175 P_Cmc2_1	$-c, a, -b; 1/4, 0, 1/4$	No. 26 $Pmc2_1$	S1	L26.2.4 S1
1.45	$NdNiO_3$	No. 26.8.175 P_Cmc2_1	$-c, a, -b; 1/4, 0, 1/4$	No. 26 $Pmc2_1$	S1	L26.2.4 S1

SSGs of collinear magnetic structures (continued).

BCSID	Chemical formula	MSG	Trans from parent structure	PSG	Rep	SSG
1.46	Sr_2FeOsO_6	No. 85.6.725 $P_{2c}4/n$	$a,b,c;1/4,1/4,1/4$	No. 85 $P4/n$	$Z1^+$	L85.2.4 $Z1^+$
1.47	Sr_2FeOsO_6	No. 87.6.738 I_P4/m	$a,b,c;0,0,0$	No. 87 $I4/m$	$M1^+$	L87.2.4 $M1^+$
1.49	Ag_2NiO_2	No. 12.8.73 $C_{2c}2/m'$	$a,3b,c;0,0,0$	No. 12 $C2/m$	$A1^+$	L12.2.4 $A1^+$
1.50	$AgNiO_2$	No. 20.7.128 $C_P22'2'_1$	$2a+b,b,c;0,0,1/4$	No. 20 $C222_1$	Y3	L20.2.5 Y3
1.58	$La_2O_2Fe_2OSe_2$	No. 8.6.43 $C_{2c}m'$	$a+c,b,c;0,0,0$	No. 8 Cm	M1	L8.2.2 A1
1.59	KTb_3F_{12}	No. 87.7.739 I_P4'/m	$a,b,c;0,0,0$	No. 87 $I4/m$	$M2^+$	L87.2.6 $M2^+$
1.61	$MnWO_4$	No. 13.8.84 P_C2/c	$2a,b,-2a+c;1/2,0,0$	No. 13 $P2/c$	$C1^-$	L13.2.4 $C1^+$
1.63	$MnPb_4Sb_6S_{14}$	No. 14.6.91 $P_{2a}2_1/c$	$a,b,c;0,0,0$	No. 14 $P2_1/c$	$Y2^-$	L14.2.4 $Y1^+$
1.64	$BaNiF_4$	No. 4.4.18 $P_{2a}2_1$	$a/2+b/2,-c,-a/2+b/2;0,0,0$	No. 4 $P2_1$	Y1	L4.2.2 B1
1.65	$SrFeO_2$	No. 47.8.354 P_Fmmm	$a,b,c;0,0,0$	No. 123 $P4/mmm$	$A1^+$	L123.2.8 $A1^+$
1.71	$SrCo_2V_2O_8$	No. 45.6.336 $I_Pba'2'$	$a,b,c;0,0,0$	No. 45 $Iba2$	X4	L45.2.5 X3
1.80	Dy_2CoGa_8	No. 123.19.1017 $P_I4/mm'm'$	$a,b,c;0,0,0$	No. 123 $P4/mmm$	$A3^-$	L123.2.8 $A1^+$
1.81	$GdIn_3$	No. 123.17.1015 P_P4'/mmm'	$a,b,c;0,0,0$	No. 123 $P4/mmm$	$M1^+$	L123.2.10 $M1^+$
1.82	Nd_2RhIn_8	No. 123.19.1017 $P_I4/mm'm'$	$a,b,c;0,0,0$	No. 123 $P4/mmm$	$A3^-$	L123.2.8 $A1^+$
1.87	Tb_2CoGa_8	No. 123.19.1017 $P_I4/mm'm'$	$a,b,c;0,0,0$	No. 123 $P4/mmm$	$A3^-$	L123.2.8 $A1^+$
1.90	$YFe_3(BO_3)_4$	No. 5.4.22 $C_{2c}2$	$a,b,c;0,0,0$	No. 152 $P3_121$	A1	L152.2.2 A1
1.91	$TbFe_3(BO_3)_4$	No. 152.4.1266 $P_{2c}3_221$	$a,b,c;0,0,0$	No. 152 $P3_121$	A1	L152.2.2 A1
1.94	$Ba_3LaRu_2O_9$	No. 15.7.98 C_P2'/c	$a,a+2b,c;0,0,0$	No. 63 $Cmcm$	$Y1^+$	L63.2.8 $Y1^+$
1.100	Cu_2MnSnS_4	No. 5.4.22 $C_{2c}2$	$a-c,b,2a;1/2,0,0$	No. 5 $C2$	GM2	L5.2.1 GM2
1.101	$LuMnO_3$	No. 31.6.217 $P_{2b}mn2_1$	$-c,b,a;0,1/4,1/4$	No. 31 $Pmn2_1$	Y4	L31.2.5 Y2
1.103	U_2Rh_2Sn	No. 127.12.1064 $P_{2c}4'/mbm'$	$a,b,c;0,0,0$	No. 127 $P4/mbm$	$Z2^-$	L127.2.11 $Z2^-$
1.103	U_2Rh_2Sn	No. 127.12.1064 $P_{2c}4'/mbm'$	$a,b,c;0,0,0$	No. 127 $P4/mbm$	$Z2^-$	L127.2.11 $Z2^-$
1.104	Gd_2CuO_4	No. 69.9.613 $F_Cm'm'm$	$a-b,a+b,c;0,0,0$	No. 69 $Fmmm$	$Y1^+$	L69.2.4 $T1^+$
1.106	Pr_2CuO_4	No. 69.9.613 $F_Cm'm'm$	$a-b,a+b,c;0,0,0$	No. 69 $Fmmm$	$Y1^+$	L69.2.4 $T1^+$
1.107	Sm_2CuO_4	No. 69.10.614 $F_Cmm'm'$	$a-b,a+b,c;0,0,0$	No. 69 $Fmmm$	$Y1^+$	L69.2.4 $T1^+$
1.111	GdBiPt	No. 8.6.43 $C_{2c}m'$	$a/2-c/2,-a/2+b/2,a+b+c;0,0,0$	No. 160 $R3m$	T1	L160.2.2 T1
1.113	$NiSb_2O_6$	No. 2.4.7 $P_{2s}\bar{1}$	$a,b,-a+c;0,0,0$	No. 14 $P2_1/c$	$Y1^+$	L14.2.4 $Y1^+$
1.120	$BaFe_2Se_3$	No. 7.6.37 P_Cc	$-c,a,-b+c;1/4,0,0$	No. 7 Pc	C1	L7.2.2 C1

SSGs of collinear magnetic structures (continued).

BCSID	Chemical formula	MSG	Trans from parent structure	PSG	Rep	SSG
1.125	LaFeAsO	No. 67.17.593 $C_Im'ma'$	$a,b,c;0,0,0$	No. 67 $Cmme$	$T2^+$	L67.2.6 $T1^+$
1.136	$AgCrS_2$	No. 8.4.41 $C_{2c}m$	$-a/3+b/3-2c/3,-a-b,-2a/3+2b/3+2c/3;0,0,0$	No. 8 Cm	M1	L8.2.2 A1
1.139	Ho_2RhIn_8	No. 47.10.356 $P_{2c}m'm'm$	$a,b,c;0,0,0$	No. 47 $Pmmm$	$X2^-$	L47.2.9 $X2^+$
1.140	PrMgPb	No. 12.10.75 C_P2/m'	$a,b,c;0,0,0$	No. 139 $I4/mmm$	$M3^-$	L139.2.13 $M3^-$
1.141	NdMgPb	No. 12.10.75 C_P2/m'	$a,b,c;0,0,0$	No. 139 $I4/mmm$	$M3^-$	L139.2.13 $M3^-$
1.142	CeMgPb	No. 69.8.612 F_Cmmm'	$a-b,a+b,c;0,0,0$	No. 69 $Fmmm$	$Y2^-$	L69.2.7 $T2^-$
1.143	Mn_3Pt	No. 123.13.1011 $P_{2c}4'/mm'm$	$a,b,c;0,0,0$	No. 123 $P4/mmm$	$Z4^-$	L123.2.16 $Z2^+$
1.146	LaCrAsO	No. 129.11.1085 $P_{2c}4'/nm'm$	$a,b,c;0,0,0$	No. 129 $P4/nmm$	$Z2^+$	L129.2.10 $Z2^+$
1.150	PrAg	No. 65.16.560 $C_Pmm'm'$	$a,b,c;0,0,0$	No. 123 $P4/mmm$	$M4^+$	L123.2.10 $M1^+$
1.156	$LaMn_3Cr_4O_{12}$	No. 146.3.1242 R_R3	$a,b,c;0,0,0$	No. 197 $I23$	H1	L197.2.1 H1
1.158	$YMn_3Al_4O_{12}$	No. 71.8.628 $I_Pm'm'm$	$a,b,c;0,0,0$	No. 204 $Im\bar{3}$	$H1^+$	L204.2.2 $H1^+$
1.159	$Li_2Ni(WO_4)_2$	No. 2.4.7 $P_{2s}\bar{1}$	$a,b,c;0,0,0$	No. 2 $P\bar{1}$	$U1^-$	L2.2.2 $R1^+$
1.160	UP	No. 139.15.1193 $I_P4/mm'm'$	$a/2+b/2,-a/2+b/2,c;0,0,0$	No. 139 $I4/mmm$	$M1^+$	L139.2.8 $M1^+$
1.162	NdMg	No. 123.15.1013 $P_{2c}4/mm'm'$	$a,b,c;0,0,0$	No. 123 $P4/mmm$	$Z1^+$	L123.2.14 $Z1^+$
1.165	Ni_3TeO_6	No. 146.3.1242 R_R3	$a,b,c;0,0,0$	No. 146 $R3$	T1	L146.2.1 T1
1.166	La_2LiOsO_6	No. 2.4.7 $P_{2s}\bar{1}$	$a,b,c;0,0,0$	No. 2 $P\bar{1}$	$V1^+$	L2.2.2 $R1^+$
1.168	Sr_2CuTeO_6	No. 12.8.73 $C_{2c}2/m'$	$a+b,c,-b;0,0,0$	No. 12 $C2/m$	$M1^+$	L12.2.4 $A1^+$
1.171	$Tb_2Fe_2Si_2C$	No. 12.6.71 $C_{2c}2/m$	$a,b,c;0,0,0$	No. 12 $C2/m$	$A2^-$	L12.2.4 $A1^+$
1.172	$NiTa_2O_6$	No. 28.13.197 $P_Am'a'2$	$a-b,a+b,c;1/2,0,0$	No. 28 $Pma2$	T3	L28.2.4 T1
1.176	$YbCo_2Si_2$	No. 67.17.593 $C_Im'ma'$	$c,-a+b,-a-b;1/2,0,0$	No. 67 $Cmme$	$T4^-$	L67.2.7 $T3^+$
1.177	Sr_2CuWO_6	No. 2.4.7 $P_{2s}\bar{1}$	$a/2-b/2-c/2,b,c;0,0,0$	No. 2 $P\bar{1}$	$R1^-$	L2.2.2 $R1^+$
1.179	NdCoAsO	No. 59.9.486 $P_{2c}m'mn$	$a,b,c;0,0,0$	No. 129 $P4/nmm$	$Z3^-$	L129.2.8 $Z1^+$
1.180	$Na_3Co_2SbO_6$	No. 2.4.7 $P_{2s}\bar{1}$	$a/2+b/2,-a/2+b/2,c;0,0,0$	No. 2 $P\bar{1}$	$X1^-$	L2.2.2 $R1^+$
1.181	$Ba_3Fe_3O_7F$	No. 11.6.64 $P_{2a}2_1/m$	$a,b,c;0,0,0$	No. 11 $P2_1/m$	$B2^-$	L11.2.4 $B1^+$
1.182	$TlMnO_3$	No. 2.4.7 $P_{2s}\bar{1}$	$a,-b,-c;0,0,0$	No. 123 $P4/mmm$	$Z1^+$	L123.2.14 $Z1^+$
1.184	$Na_2Co_2TeO_6$	No. 20.6.127 $C_P2'2'2_1$	$2a+b,b,c;0,0,1/4$	No. 20 $C222_1$	Y3	L20.2.5 Y3
1.186	$SrRu_2O_6$	No. 162.6.1308 $P_{2c}\bar{3}1m$	$a,b,c;0,0,0$	No. 162 $P\bar{3}1m$	$A2^+$	L162.2.5 $A1^-$

SSGs of collinear magnetic structures (continued).

BCSID	Chemical formula	MSG	Trans from parent structure	PSG	Rep	SSG
1.187	$TbRh_2Si_2$	No. 139.15.1193 $I_P4/mm'm'$	$a,b,c;0,0,0$	No. 139 $I4/mmm$	$M1^+$	L139.2.8 $M1^+$
1.188	$CeRh_2Si_2$	No. 69.10.614 $F_Cmm'm'$	$a-b,a+b,c;0,0,0$	No. 69 $Fmmm$	$Y1^+$	L69.2.4 $T1^+$
1.189	$TbMg_3$	No. 166.7.1333 $R_R\bar{3}m'$	$a/2-c/2,-a/2+b/2,a+b+c;0,0,0$	No. 166 $R\bar{3}m$	$T1^+$	L166.2.4 $T1^+$
1.190	$YCr(BO_3)_2$	No. 2.4.7 $P_{2s}\bar{1}$	$a,b,c;0,0,0$	No. 148 $R\bar{3}$	$T1^-$	L148.2.2 $T1^+$
1.191	$HoCr(BO_3)_2$	No. 2.4.7 $P_{2s}\bar{1}$	$a,b,c;0,0,0$	No. 148 $R\bar{3}$	$T1^-$	L148.2.2 $T1^+$
1.192	$SmMn_2O_5$	No. 26.7.174 $P_{2b}mc2_1$	$-c,a,-b;1/4,0,0$	No. 26 $Pmc2_1$	$Y1$	L26.2.7 $Y1$
1.193	$CrTe_3$	No. 2.4.7 $P_{2s}\bar{1}$	$a,b,c;0,0,0$	No. 2 $P\bar{1}$	$R1^-$	L2.2.2 $R1^+$
1.194	$NiWO_4$	No. 13.6.82 $P_{2a}2/c$	$a,b,c;0,0,0$	No. 13 $P2/c$	$Y2^-$	L13.2.5 $Y1^+$
1.195	Er_2Ni_2In	No. 51.12.398 P_Ammma	$b,c,a;1/4,1/4,0$	No. 51 $Pmma$	$T4^-$	L51.2.8 $T1^+$
1.200	U_2Ni_2Sn	No. 65.12.556 $C_{2c}mm'm'$	$a,b,c;0,0,0$	No. 127 $P4/mbm$	$Z2^-$	L127.2.11 $Z2^-$
1.205	$Dy_2Fe_2Si_2C$	No. 12.6.71 $C_{2c}2/m$	$a,b,c;0,0,0$	No. 12 $C2/m$	$A2^-$	L12.2.4 $A1^+$
1.206	$Dy_2Fe_2Si_2C$	No. 2.4.7 $P_{2s}\bar{1}$	$a,b,c;0,0,0$	No. 12 $C2/m$	$A2^-$	L12.2.4 $A1^+$
1.208	UAs	No. 139.15.1193 $I_P4/mm'm'$	$a/2+b/2,-a/2+b/2,c;0,0,0$	No. 139 $I4/mmm$	$M1^+$	L139.2.8 $M1^+$
1.209	FeI_2	No. 12.8.73 $C_{2c}2/m'$	$-2a-b+2c,-b,2c;0,0,1/2$	No. 12 $C2/m$	$A2^-$	L12.2.4 $A1^+$
1.211	Dy_2O_2S	No. 12.8.73 $C_{2c}2/m'$	$a-b,a+b,c;0,0,0$	No. 12 $C2/m$	$M2^-$	L12.2.4 $A1^+$
1.212	Dy_2O_2Se	No. 12.8.73 $C_{2c}2/m'$	$a-b,a+b,c;0,0,0$	No. 12 $C2/m$	$M2^-$	L12.2.4 $A1^+$
1.213	Ho_2O_2Se	No. 12.10.75 C_P2/m'	$-a+b,-a-b,c;0,0,0$	No. 12 $C2/m$	$Y2^-$	L12.2.9 $Y2^-$
1.214	Yb_2O_2Se	No. 12.8.73 $C_{2c}2/m'$	$a,b,c;0,0,0$	No. 164 $P\bar{3}m1$	$A2^-$	L164.2.4 $A1^+$
1.215	UP_2	No. 129.13.1087 $P_{2c}4/nm'm'$	$a,b,c;0,0,0$	No. 129 $P4/nmm$	$Z1^+$	L129.2.8 $Z1^+$
1.222	Er_2CoGa_8	No. 47.9.355 $P_{2a}mmm'$	$a,b,c;0,0,0$	No. 47 $Pmmm$	$Y2^-$	L47.2.9 $X2^+$
1.223	Tm_2CoGa_8	No. 47.7.353 P_Cmmm	$a,b,c;0,0,0$	No. 47 $Pmmm$	$U2^-$	L47.2.5 $S1^+$
1.228	$RuCl_3$	No. 12.7.72 C_P2/m	$a,b,3c;0,0,0$	No. 12 $C2/m$	$Y2^+$	L12.2.8 $Y2^+$
1.229	$BaMoP_2O_8$	No. 2.4.7 $P_{2s}\bar{1}$	$a/2+b/2,-a/2+b/2,c;0,0,0$	No. 2 $P\bar{1}$	$T1^-$	L2.2.2 $R1^+$
1.232	$CuMnSb$	No. 8.6.43 $C_{2c}m'$	$a/2-c/2,-a/2+b/2,a+b+c;0,0,0$	No. 160 $R3m$	$T1$	L160.2.2 $T1$
1.233	$CuMnSb$	No. 160.5.1299 R_R3m'	$a/2-c/2,-a/2+b/2,a+b+c;0,0,0$	No. 160 $R3m$	$T1$	L160.2.2 $T1$
1.240	FeI_2	No. 2.4.7 $P_{2s}\bar{1}$	$-a-b,a-c,2c;0,0,1/2$	No. 2 $P\bar{1}$	$U1^-$	L2.2.2 $R1^+$
1.243	Sr_2CoOsO_6	No. 2.4.7 $P_{2s}\bar{1}$	$a,b,-a/2-b/2+c/2;0,0,0$	No. 2 $P\bar{1}$	$R1^+$	L2.2.2 $R1^+$

SSGs of collinear magnetic structures (continued).

BCSID	Chemical formula	MSG	Trans from parent structure	PSG	Rep	SSG
1.251	$NdCo_2P_2$	No. 123.15.1013 $P_{2c}4/mm'm'$	$a,b,c;0,0,0$	No. 123 $P4/mmm$	$Z3^-$	L123.2.14 $Z1^+$
1.253	$CeCo_2P_2$	No. 139.17.1195 $I_P4/m'm'm'$	$a,b,c;0,0,0$	No. 139 $I4/mmm$	$M3^-$	L139.2.13 $M3^-$
1.254	$UNiGa_5$	No. 123.19.1017 $P_I4/mm'm'$	$a,b,c;0,0,0$	No. 123 $P4/mmm$	$A1^+$	L123.2.8 $A1^+$
1.255	$UPtGa_5$	No. 123.15.1013 $P_{2c}4/mm'm'$	$a,b,c;0,0,0$	No. 123 $P4/mmm$	$Z1^+$	L123.2.14 $Z1^+$
1.256	$BaNi_2V_2O_8$	No. 2.4.7 $P_{2s}\bar{1}$	$a,b,c;0,0,0$	No. 148 $R\bar{3}$	$T1^+$	L148.2.2 $T1^+$
1.257	$BaNi_2As_2O_8$	No. 2.4.7 $P_{2s}\bar{1}$	$a,-a/3+b/3+c/3,c;0,0,0$	No. 2 $P\bar{1}$	$U1^+$	L2.2.2 $R1^+$
1.261	$NpRhGa_5$	No. 123.15.1013 $P_{2c}4/mm'm'$	$a,b,c;0,0,0$	No. 123 $P4/mmm$	$Z1^+$	L123.2.14 $Z1^+$
1.262	$NpRhGa_5$	No. 65.12.556 $C_{2c}mm'm'$	$a,b,c;0,0,0$	No. 123 $P4/mmm$	$Z1^+$	L123.2.14 $Z1^+$
1.263	$Ca_3Ru_2O_7$	No. 36.9.257 $C_Pm'c'2_1$	$-c,-a,b;0,0,0$	No. 36 $Cmc2_1$	Y1	L36.2.4 Y1
1.265	CuMnSb	No. 160.5.1299 R_R3m'	$a/2-c/2,-a/2+b/2,a+b+c;0,0,0$	No. 160 $R3m$	T1	L160.2.2 T1
1.271	CeSbTe	No. 129.13.1087 $P_{2c}4/nm'm'$	$a,b,c;0,0,0$	No. 129 $P4/nmm$	$Z1^+$	L129.2.8 $Z1^+$
1.281	$YBaCuFeO_5$	No. 25.9.163 P_Fmm2	$a,b,c;0,0,0$	No. 99 $P4mm$	A3	L99.2.4 A1
1.282	$YBaCuFeO_5$	No. 10.8.56 P_C2/m	$a,b,c;0,0,0$	No. 123 $P4/mmm$	$A4^+$	L123.2.8 $A1^+$
1.285	$YBaCuFeO_5$	No. 47.8.354 P_Fmmm	$a,b,c;0,0,0$	No. 123 $P4/mmm$	$A4^+$	L123.2.8 $A1^+$
1.288	$CePd_2Si_2$	No. 69.9.613 $F_Cm'm'm$	$a-b,a+b,c;0,0,0$	No. 69 $Fmmm$	$Y1^+$	L69.2.4 $T1^+$
1.289	$CePd_2Ge_2$	No. 69.9.613 $F_Cm'm'm$	$a-b,a+b,c;0,0,0$	No. 69 $Fmmm$	$Y1^+$	L69.2.4 $T1^+$
1.290	$CeRh_2Si_2$	No. 69.10.614 $F_Cmm'm'$	$a-b,a+b,c;0,0,0$	No. 69 $Fmmm$	$Y1^+$	L69.2.4 $T1^+$
1.291	$CeAu_2Si_2$	No. 139.15.1193 $I_P4/mm'm'$	$a,b,c;0,0,0$	No. 139 $I4/mmm$	$M1^+$	L139.2.8 $M1^+$
1.292	$HoNi_2B_2C$	No. 69.10.614 $F_Cmm'm'$	$a,b,c;0,0,0$	No. 139 $I4/mmm$	$M1^+$	L139.2.8 $M1^+$
1.293	$NdNi_2B_2C$	No. 12.8.73 $C_{2c}2/m'$	$a+c,b,c;0,0,0$	No. 12 $C2/m$	$M1^+$	L12.2.4 $A1^+$
1.294	$HoNi_2B_2C$	No. 69.10.614 $F_Cmm'm'$	$a,b,c;0,0,0$	No. 139 $I4/mmm$	$M1^+$	L139.2.8 $M1^+$
1.295	$DyNi_2B_2C$	No. 69.10.614 $F_Cmm'm'$	$a,b,c;0,0,0$	No. 139 $I4/mmm$	$M1^+$	L139.2.8 $M1^+$
1.296	$PrNi_2B_2C$	No. 69.10.614 $F_Cmm'm'$	$a,b,c;0,0,0$	No. 139 $I4/mmm$	$M1^+$	L139.2.8 $M1^+$
1.298	$BaCdVO(PO_4)_2$	No. 29.7.204 $P_{2b}c'a'2_1$	$-c,b,a;0,1/4,0$	No. 29 $Pca2_1$	Y1	L29.2.4 Y1
1.308	$MnBi_2Te_4$	No. 166.7.1333 $R_R\bar{3}m'$	$a,b,c;0,0,0$	No. 166 $R\bar{3}m$	$T1^+$	L166.2.4 $T1^+$
1.311	$BaMo(PO_4)_2$	No. 2.4.7 $P_{2s}\bar{1}$	$a/2+b/2,-a/2+b/2,c;0,0,0$	No. 2 $P\bar{1}$	$U1^-$	L2.2.2 $R1^+$
1.312	$HoNi_2B_2C$	No. 69.10.614 $F_Cmm'm'$	$a,b,c;0,0,0$	No. 139 $I4/mmm$	$M1^+$	L139.2.8 $M1^+$
1.320	Sr_2FeWO_6	No. 2.4.7 $P_{2s}\bar{1}$	$a,b,c;0,0,0$	No. 2 $P\bar{1}$	$T1^-$	L2.2.2 $R1^+$

SSGs of collinear magnetic structures (continued).

BCSID	Chemical formula	MSG	Trans from parent structure	PSG	Rep	SSG
1.321	Ba_2FeWO_6	No. 2.4.7 $P_{2s}\bar{1}$	$a/2-b/2-c/2,b,c;0,0,0$	No. 2 $P\bar{1}$	R1$^-$	L2.2.2 R1$^+$
1.325	$PrMn_2O_5$	No. 6.7.31 $P_{2c}m'$	$a,-c,b;0,0,0$	No. 6 Pm	Y1	L6.2.2 B1
1.334	Pr_2Pd_2In	No. 55.9.449 $P_{2c}b'am$	$a,b,c;0,0,0$	No. 55 $Pbam$	Z4$^+$	L55.2.8 Z3$^+$
1.335	Nd_2Pd_2In	No. 25.10.164 $P_{2c}mm'2'$	$c,-a+b,-a-b;-1/4,1/4,0$	No. 25 $Pmm2$	Z1	L25.2.9 Z1
1.339	$EuAs_3$	No. 12.6.71 $C_{2c}2/m$	$a,b,c;0,0,0$	No. 12 $C2/m$	M1$^+$	L12.2.4 A1$^+$
1.341	$TmMnO_3$	No. 31.6.217 $P_{2b}mn2_1$	$b,-a,c;1/4,1/4,0$	No. 31 $Pmn2_1$	Y4	L31.2.5 Y2
1.344	$Ba_2Co_9O_{14}$	No. 12.6.71 $C_{2c}2/m$	$a,b,c;0,0,0$	No. 166 $R\bar{3}m$	T1$^+$	L166.2.4 T1$^+$
1.346	$TlMnF_4$	No. 15.6.97 C_P2/c	$a+c,b,c;1/4,1/4,1/4$	No. 15 $C2/c$	Y1$^+$	L15.2.4 Y1$^+$
1.349	$CoNb_3S_6$	No. 20.7.128 $C_P22'2'_1$	$2a+b,b,c;0,0,1/4$	No. 20 $C222_1$	Y1	L20.2.3 Y1
1.351	$Ba_2Co_2F_7Cl$	No. 11.6.64 $P_{2a}2_1/m$	$a,b,c;0,0,0$	No. 11 $P2_1/m$	Y1$^+$	L11.2.4 B1$^+$
1.353	$SmNiO_3$	No. 26.8.175 P_Cmc2_1	$-c,a,-b;1/4,0,1/4$	No. 26 $Pmc2_1$	S1	L26.2.4 S1
1.354	$EuNiO_3$	No. 26.8.175 P_Cmc2_1	$-c,a,-b;1/4,0,1/4$	No. 26 $Pmc2_1$	S1	L26.2.4 S1
1.355	$DyGe_3$	No. 11.6.64 $P_{2a}2_1/m$	$a,-3c,a/2+b/2;0,0,0$	No. 11 $P2_1/m$	Y2$^-$	L11.2.4 B1$^+$
1.356	Ho_3Ge_4	No. 63.17.527 $C_Pm'c'm'$	$a,b,c;0,0,0$	No. 63 $Cmcm$	Y2$^-$	L63.2.11 Y2$^-$
1.361	DyGe	No. 12.8.73 $C_{2c}2/m'$	$b,-a,c;0,0,0$	No. 12 $C2/m$	A2$^-$	L12.2.4 A1$^+$
1.363	$TbCu_2Si_2$	No. 2.4.7 $P_{2s}\bar{1}$	$a+c,b,c;0,0,0$	No. 12 $C2/m$	M1$^+$	L12.2.4 A1$^+$
1.364	$HoCu_2Si_2$	No. 2.4.7 $P_{2s}\bar{1}$	$a+c,b,c;0,0,0$	No. 12 $C2/m$	M1$^+$	L12.2.4 A1$^+$
1.365	$TbCu_2Si_2$	No. 2.4.7 $P_{2s}\bar{1}$	$a+c,b,c;0,0,0$	No. 12 $C2/m$	M1$^+$	L12.2.4 A1$^+$
1.366	$HoCu_2Si_2$	No. 12.6.71 $C_{2c}2/m$	$a+c,b,c;0,0,0$	No. 12 $C2/m$	M1$^+$	L12.2.4 A1$^+$
1.367	Pu_2O_3	No. 12.8.73 $C_{2c}2/m'$	$2a+b,b,c;0,0,0$	No. 12 $C2/m$	M1$^+$	L12.2.4 A1$^+$
1.368	$Tb_2Ni_3Si_5$	No. 72.11.640 $I_Pb'a'm$	$a,b,c;0,0,0$	No. 72 $Ibam$	X1$^+$	L72.2.6 X1$^+$
1.371	Nd_2NiO_4	No. 64.15.542 $C_Pmc'a'$	$a,-c,b;0,0,0$	No. 64 $Cmce$	Y3$^+$	L64.2.12 Y3$^+$
1.374	HoNiGe	No. 6.7.31 $P_{2c}m'$	$a,b,c;0,1/4,0$	No. 6 Pm	A1	L6.2.2 B1
1.375	CeScGe	No. 2.4.7 $P_{2s}\bar{1}$	$a/2+b/2+c/2,-a/2+b/2-c/2,-a/2-b/2+c/2;0,0,0$	No. 2 $P\bar{1}$	R1$^-$	L2.2.2 R1$^+$
1.376	CeScGe	No. 69.7.611 $F_Cm'mm$	$a,b,c;0,0,0$	No. 139 $I4/mmm$	M3$^-$	L139.2.13 M3$^-$
1.377	CeScSi	No. 2.4.7 $P_{2s}\bar{1}$	$a/2+b/2+c/2,-a/2+b/2-c/2,-a/2-b/2+c/2;0,0,0$	No. 2 $P\bar{1}$	R1$^-$	L2.2.2 R1$^+$
1.378	CeScSi	No. 69.7.611 $F_Cm'mm$	$a,b,c;0,0,0$	No. 139 $I4/mmm$	M3$^-$	L139.2.13 M3$^-$

SSGs of collinear magnetic structures (continued).

BCSID	Chemical formula	MSG	Trans from parent structure	PSG	Rep	SSG
1.379	ErNiGe	No. 14.6.91 $P_{2a}2_1/c$	$-b, c, -a; 0, 0, 0$	No. 14 $P2_1/c$	$Y1^+$	L14.2.4 $Y1^+$
1.384	USb_2	No. 129.13.1087 $P_{2c}4/nm'm'$	$a, b, c; 0, 0, 0$	No. 129 $P4/nmm$	$Z1^+$	L129.2.8 $Z1^+$
1.388	$La_2NiO_3F_2$	No. 66.9.572 $C_Pc'cm$	$a, b, c; 0, 0, 0$	No. 66 $Cccm$	$Y4^-$	L66.2.11 $Y3^-$
1.389	Sr_2CoO_3Cl	No. 67.9.585 C_Pmma	$a-b, a+b, c; 1/2, 1/2, 0$	No. 67 $Cmme$	$Y3^+$	L67.2.11 $Y3^+$
1.398	Pr_2CuO_4	No. 69.9.613 $F_Cm'm'm$	$a+b, -a+b, c; 0, 0, 0$	No. 69 $Fmmm$	$T1^+$	L69.2.4 $T1^+$
1.399	Pr_2CuO_4	No. 69.9.613 $F_Cm'm'm$	$a-b, a+b, c; 0, 0, 0$	No. 69 $Fmmm$	$T1^+$	L69.2.4 $T1^+$
1.400	$TbAg_2$	No. 69.10.614 $F_Cmm'm'$	$a-b, a+b, c; 0, 0, 0$	No. 69 $Fmmm$	$T1^+$	L69.2.4 $T1^+$
1.401	Nd_5Pb_3	No. 63.14.524 $C_Pm'c'm$	$2a+b, b, c; 0, 0, 0$	No. 63 $Cmcm$	$Y1^+$	L63.2.8 $Y1^+$
1.402	Nd_5Pb_3	No. 63.14.524 $C_Pm'c'm$	$2a+b, b, c; 0, 0, 0$	No. 63 $Cmcm$	$Y1^+$	L63.2.8 $Y1^+$
1.403	La_2CoO_4	No. 64.15.542 $C_Pmc'a'$	$a, b, c; 0, 0, 0$	No. 64 $Cmce$	$Y3^+$	L64.2.12 $Y3^+$
1.404	$Sr_2CuO_2Cl_2$	No. 69.10.614 $F_Cmm'm'$	$a-b, a+b, c; 0, 0, 0$	No. 69 $Fmmm$	$Y1^+$	L69.2.4 $T1^+$
1.406	Nd_2CuO_4	No. 69.9.613 $F_Cm'm'm$	$a-b, a+b, c; 0, 0, 0$	No. 69 $Fmmm$	$Y1^+$	L69.2.4 $T1^+$
1.407	Nd_2CuO_4	No. 69.10.614 $F_Cmm'm'$	$a-b, a+b, c; 0, 0, 0$	No. 69 $Fmmm$	$Y1^+$	L69.2.4 $T1^+$
1.408	Nd_2CuO_4	No. 69.9.613 $F_Cm'm'm$	$a-b, a+b, c; 0, 0, 0$	No. 69 $Fmmm$	$Y1^+$	L69.2.4 $T1^+$
1.411	$EuMn_2P_2$	No. 12.6.71 $C_{2c}2/m$	$a, b, c; 0, 0, 0$	No. 164 $P\bar{3}m1$	$A1^+$	L164.2.4 $A1^+$
1.413	$Ce_3Ni_2Ge_7$	No. 65.14.558 C_Pmmm'	$a, b, c; 0, 0, 0$	No. 65 $Cmmm$	$Y4^-$	L65.2.14 $Y3^-$
1.414	$CeNiGe_3$	No. 65.14.558 C_Pmmm'	$a, b, c; 0, 0, 0$	No. 65 $Cmmm$	$Y3^-$	L65.2.14 $Y3^-$
1.415	Tb_2Pd_2In	No. 51.19.405 $P_Am'ma$	$a-b, c, -a-b; 0, 0, 0$	No. 51 $Pmma$	$T4^-$	L51.2.8 $T1^+$
1.416	Tb_2O_2S	No. 12.8.73 $C_{2c}2/m'$	$a+2b, -a, c; 0, 0, 0$	No. 12 $C2/m$	$M2^-$	L12.2.4 $A1^+$
1.417	Tb_2O_2Se	No. 12.8.73 $C_{2c}2/m'$	$a+2b, -a, c; 0, 0, 0$	No. 12 $C2/m$	$M2^-$	L12.2.4 $A1^+$
1.419	$GdIn_3$	No. 123.17.1015 P_P4'/mmm'	$a, b, c; 0, 0, 0$	No. 123 $P4/mmm$	$M1^+$	L123.2.10 $M1^+$
1.420	$YBa_2Cu_3O_6$	No. 47.7.353 P_Cmmm	$a, b, c; 0, 0, 0$	No. 123 $P4/mmm$	$M3^-$	L123.2.13 $M2^-$
1.421	$NdRh_2Si_2$	No. 139.15.1193 $I_P4/mm'm'$	$a, b, c; 0, 0, 0$	No. 139 $I4/mmm$	$M1^+$	L139.2.8 $M1^+$
1.422	$ErRh_2Si_2$	No. 71.8.628 $I_Pm'm'm$	$a, b, c; 0, 0, 0$	No. 139 $I4/mmm$	$M1^+$	L139.2.8 $M1^+$
1.423	UPb_3	No. 123.15.1013 $P_{2c}4/mm'm'$	$a, b, c; 0, 0, 0$	No. 123 $P4/mmm$	$Z1^+$	L123.2.14 $Z1^+$
1.424	UCu_5	No. 160.5.1299 R_R3m'	$a/2-c/2, -a/2+b/2, a+b+c; 0, 0, 0$	No. 160 $R3m$	T1	L160.2.2 T1
1.425	UGeTe	No. 139.17.1195 $I_P4/m'm'm'$	$a, b, c; 0, 0, 0$	No. 139 $I4/mmm$	$M3^-$	L139.2.13 $M3^-$
1.426	UGeS	No. 129.13.1087 $P_{2c}4/nm'm'$	$a, b, c; 0, 0, 0$	No. 129 $P4/nmm$	$Z3^-$	L129.2.8 $Z1^+$
1.427	$HoCo_2Ge_2$	No. 139.15.1193 $I_P4/mm'm'$	$a, b, c; 0, 0, 0$	No. 139 $I4/mmm$	$M1^+$	L139.2.8 $M1^+$

SSGs of collinear magnetic structures (continued).

BCSID	Chemical formula	MSG	Trans from parent structure	PSG	Rep	SSG
1.428	UN	No. 139.15.1193 $I_P4/mm'm'$	$a/2+b/2,-a/2+b/2,c;0,0,0$	No. 139 $I4/mmm$	$M1^+$	L139.2.8 $M1^+$
1.429	$BaFe_2Se_3$	No. 6.6.30 P_Cm	$a,b,c;0,1/4,0$	No. 6 Pm	E2	L6.2.4 C1
1.432	Ba_2LuRuO_6	No. 69.10.614 $F_Cmm'm'$	$a/2+b/2,-a/2+b/2,c;0,0,0$	No. 139 $I4/mmm$	$M1^+$	L139.2.8 $M1^+$
1.433	Ba_2YRuO_6	No. 69.10.614 $F_Cmm'm'$	$a/2+b/2,-a/2+b/2,c;0,0,0$	No. 139 $I4/mmm$	$M1^+$	L139.2.8 $M1^+$
1.438	$BaCoF_4$	No. 4.4.18 $P_{2a}2_1$	$-b/2+c/2,a,b/2+c/2;0,0,0$	No. 4 $P2_1$	Y1	L4.2.2 B1
1.439	$BaCoF_4$	No. 29.6.203 $P_{2b}ca2_1$	$-b,-c,a;0,1/4,1/4$	No. 29 $Pca2_1$	Y2	L29.2.5 Y2
1.442	URu_2Si_2	No. 139.15.1193 $I_P4/mm'm'$	$a,b,c;0,0,0$	No. 139 $I4/mmm$	$M1^+$	L139.2.8 $M1^+$
1.445	Y_2BaCuO_5	No. 14.6.91 $P_{2a}2_1/c$	$-c,a,-b+c;0,0,0$	No. 14 $P2_1/c$	$Y2^+$	L14.2.4 $Y1^+$
1.446	$CeCoAl_4$	No. 51.19.405 $P_Am'ma$	$a,b,c;0,0,0$	No. 51 $Pmma$	$T2^-$	L51.2.8 $T1^+$
1.447	$Ce_3Ni_2Sn_7$	No. 65.14.558 C_Pmmm'	$a,b,c;0,0,0$	No. 65 $Cmmm$	$Y4^-$	L65.2.14 $Y3^-$
1.448	HoSi	No. 13.8.84 P_C2/c	$-c,-a,b;1/4,1/4,0$	No. 13 $P2/c$	$C2^+$	L13.2.4 $C1^+$
1.449	$Li_2CuW_2O_8$	No. 2.4.7 $P_{2s}\bar{1}$	$a,b,c;0,0,0$	No. 2 $P\bar{1}$	$Y1^-$	L2.2.2 $R1^+$
1.451	$Nd_6Fe_{13}Sn$	No. 140.10.1205 I_P4/mcm	$a,b,c;0,0,0$	No. 140 $I4/mcm$	$M3^+$	L140.2.12 $M3^+$
1.452	FeSn	No. 65.12.556 $C_{2c}mm'm'$	$a,b,c;0,0,0$	No. 191 $P6/mmm$	$A1^+$	L191.2.8 $A1^+$
1.453	$EuMn_2Si_2$	No. 139.17.1195 $I_P4/m'm'm'$	$a,b,c;0,0,0$	No. 139 $I4/mmm$	$M3^-$	L139.2.13 $M3^-$
1.457	$NdNiMg_{15}$	No. 67.13.589 $C_Pm'ma$	$a-b,a+b,c;0,0,0$	No. 67 $Cmme$	$Y4^-$	L67.2.11 $Y3^+$
1.458	$CsCo_2Se_2$	No. 69.7.611 $F_Cm'mm$	$a,b,c;0,0,0$	No. 139 $I4/mmm$	$M3^-$	L139.2.13 $M3^-$
1.459	$CeFe_3(BO_3)_4$	No. 5.4.22 $C_{2c}2$	$a,b,c;0,0,0$	No. 155 $R32$	T1	L155.2.2 T1
1.460	PrCuSi	No. 63.16.526 $C_Pm'cm'$	$a+b,-a+b,c;0,0,0$	No. 63 $Cmcm$	$Y1^+$	L63.2.8 $Y1^+$
1.461	$Sr_2Cr_3As_2O_2$	No. 139.12.1190 $I_P4'/mm'm$	$a,b,c;0,0,0$	No. 139 $I4/mmm$	$M2^+$	L139.2.10 $M2^+$
1.462	La_2CoPtO_6	No. 14.6.91 $P_{2a}2_1/c$	$a,b,-a+c;0,0,0$	No. 14 $P2_1/c$	$Y1^+$	L14.2.4 $Y1^+$
1.463	$Sr_2Fe_3Se_2O_3$	No. 26.8.175 P_Cmc2_1	$-c,a,-b;1/4,0,1/2$	No. 26 $Pmc2_1$	S1	L26.2.4 S1
1.464	U_2N_2P	No. 164.7.1321 $P_{2c}\bar{3}m'1$	$a,b,c;0,0,0$	No. 164 $P\bar{3}m1$	$A1^+$	L164.2.4 $A1^+$
1.465	U_2N_2As	No. 164.7.1321 $P_{2c}\bar{3}m'1$	$a,b,c;0,0,0$	No. 164 $P\bar{3}m1$	$A1^+$	L164.2.4 $A1^+$
1.468	$TbMn_2Si_2$	No. 139.17.1195 $I_P4/m'm'm'$	$a,b,c;0,0,0$	No. 139 $I4/mmm$	$M3^-$	L139.2.13 $M3^-$
1.469	YMn_2Si_2	No. 139.17.1195 $I_P4/m'm'm'$	$a,b,c;0,0,0$	No. 139 $I4/mmm$	$M3^-$	L139.2.13 $M3^-$
1.470	UCr_2Si_2	No. 12.8.73 $C_{2c}2/m'$	$a,b,c;0,0,0$	No. 12 $C2/m$	$M1^+$	L12.2.4 $A1^+$
1.475	$DyNiAl_4$	No. 63.13.523 C_Pmcm'	$a,b,c;0,0,0$	No. 63 $Cmcm$	$Y4^-$	L63.2.15 $Y4^-$

SSGs of collinear magnetic structures (continued).

BCSID	Chemical formula	MSG	Trans from parent structure	PSG	Rep	SSG
1.479	U_2Ni_2Sn	No. 127.12.1064 $P_{2c}4'/mbm'$	$a,b,c;0,0,0$	No. 127 $P4/mbm$	Z2$^-$	L127.2.11 Z2$^-$
1.482	$Er_2Fe_2Si_2C$	No. 2.4.7 $P_{2s}\bar{1}$	$a/2+b/2,-a/2+b/2,c;0,0,0$	No. 2 $P\bar{1}$	X1$^-$	L2.2.2 R1$^+$
1.485	Mn_3TeO_6	No. 14.6.91 $P_{2a}2_1/c$	$a,b,-a+c;0,0,0$	No. 14 $P2_1/c$	Y2$^-$	L14.2.4 Y1$^+$
1.486	$CeRhAl_4Si_2$	No. 123.15.1013 $P_{2c}4/mm'm'$	$a,b,c;0,0,0$	No. 123 $P4/mmm$	Z3$^-$	L123.2.14 Z1$^+$
1.487	$CeIrAl_4Si_2$	No. 123.15.1013 $P_{2c}4/mm'm'$	$a,b,c;0,0,0$	No. 123 $P4/mmm$	Z3$^-$	L123.2.14 Z1$^+$
1.488	$CeMn_2Si_2$	No. 139.17.1195 $I_P4/m'm'm'$	$a,b,c;0,0,0$	No. 139 $I4/mmm$	M3$^-$	L139.2.13 M3$^-$
1.489	$CeMn_2Si_2$	No. 139.17.1195 $I_P4/m'm'm'$	$a,b,c;0,0,0$	No. 139 $I4/mmm$	M3$^-$	L139.2.13 M3$^-$
1.490	$CeMn_2Si_2$	No. 139.17.1195 $I_P4/m'm'm'$	$a,b,c;0,0,0$	No. 139 $I4/mmm$	M3$^-$	L139.2.13 M3$^-$
1.491	$PrMn_2Si_2$	No. 139.17.1195 $I_P4/m'm'm'$	$a,b,c;0,0,0$	No. 139 $I4/mmm$	M3$^-$	L139.2.13 M3$^-$
1.492	$PrMn_2Si_2$	No. 139.17.1195 $I_P4/m'm'm'$	$a,b,c;0,0,0$	No. 139 $I4/mmm$	M3$^-$	L139.2.13 M3$^-$
1.493	$NdMn_2Si_2$	No. 139.17.1195 $I_P4/m'm'm'$	$a,b,c;0,0,0$	No. 139 $I4/mmm$	M3$^-$	L139.2.13 M3$^-$
1.494	$NdMn_2Si_2$	No. 139.17.1195 $I_P4/m'm'm'$	$a,b,c;0,0,0$	No. 139 $I4/mmm$	M3$^-$	L139.2.13 M3$^-$
1.495	YMn_2Si_2	No. 139.17.1195 $I_P4/m'm'm'$	$a,b,c;0,0,0$	No. 139 $I4/mmm$	M3$^-$	L139.2.13 M3$^-$
1.496	YMn_2Ge_2	No. 139.17.1195 $I_P4/m'm'm'$	$a,b,c;0,0,0$	No. 139 $I4/mmm$	M3$^-$	L139.2.13 M3$^-$
1.497	$EuMg_2Bi_2$	No. 12.6.71 $C_{2c}2/m$	$a,b,c;0,0,0$	No. 164 $P\bar{3}m1$	A1$^+$	L164.2.4 A1$^+$
1.500	$Sr_2CoO_2Cu_2S_2$	No. 2.4.7 $P_{2s}\bar{1}$	$a-b,a+b,c;0,0,0$	No. 69 $Fmmm$	Y1$^+$	L69.2.4 T1$^+$
1.501	$Ba_2CoO_2Cu_2S_2$	No. 2.4.7 $P_{2s}\bar{1}$	$a-b,a+b,c;0,0,0$	No. 69 $Fmmm$	Y1$^+$	L69.2.4 T1$^+$
1.504	GdCuSn	No. 36.9.257 $C_Pm'c'2_1$	$2a-b,a,c;0,0,0$	No. 26 $Pmc2_1$	Y1	L26.2.7 Y1
1.505	GdAgSn	No. 36.9.257 $C_Pm'c'2_1$	$2a-b,a,c;0,0,0$	No. 26 $Pmc2_1$	Y1	L26.2.7 Y1
1.506	GdAuSn	No. 36.9.257 $C_Pm'c'2_1$	$2a-b,a,c;0,0,0$	No. 26 $Pmc2_1$	Y1	L26.2.7 Y1
1.507	$NdPd_5Al_2$	No. 59.9.486 $P_{2c}m'mn$	$c,b,-a;1/4,1/4,1/4$	No. 59 $Pmmn$	Z1$^+$	L59.2.6 Z1$^+$
1.510	$TbNi_2Ge_2$	No. 123.15.1013 $P_{2c}4/mm'm'$	$a,b,2c;0,0,0$	No. 123 $P4/mmm$	Z3$^-$	L123.2.14 Z1$^+$
1.511	$TbNi_2Si_2$	No. 69.10.614 $F_Cmm'm'$	$a-b,a+b,c;0,0,0$	No. 69 $Fmmm$	Y1$^+$	L69.2.4 T1$^+$
1.512	$TbCo_2Si_2$	No. 139.15.1193 $I_P4/mm'm'$	$a,b,c;0,0,0$	No. 139 $I4/mmm$	M1$^+$	L139.2.8 M1$^+$
1.513	$HoCo_2Si_2$	No. 139.15.1193 $I_P4/mm'm'$	$a,b,c;0,0,0$	No. 139 $I4/mmm$	M1$^+$	L139.2.8 M1$^+$
1.514	$HoCo_2Si_2$	No. 139.15.1193 $I_P4/mm'm'$	$a,b,c;0,0,0$	No. 139 $I4/mmm$	M1$^+$	L139.2.8 M1$^+$
1.515	$ErCo_2Si_2$	No. 12.11.76 C_P2'/m'	$a,b,c;0,0,0$	No. 139 $I4/mmm$	M1$^+$	L139.2.8 M1$^+$
1.516	$ErCo_2Si_2$	No. 71.8.628 $I_Pm'm'm$	$a,b,c;0,0,0$	No. 139 $I4/mmm$	M1$^+$	L139.2.8 M1$^+$
1.527	$CsNiF_3$	No. 63.15.525 $C_Pmc'm'$	$-c,-2a+b,a;0,0,0$	No. 51 $Pmma$	Z1$^+$	L51.2.14 Z1$^+$

SSGs of collinear magnetic structures (continued).

BCSID	Chemical formula	MSG	Trans from parent structure	PSG	Rep	SSG
1.530	CeC_2	No. 139.15.1193 $I_P4/mm'm'$	$a,b,c;0,0,0$	No. 139 $I4/mmm$	$M1^+$	L139.2.8 $M1^+$
1.531	PrC_2	No. 139.15.1193 $I_P4/mm'm'$	$a,b,c;0,0,0$	No. 139 $I4/mmm$	$M1^+$	L139.2.8 $M1^+$
1.532	NdC_2	No. 139.15.1193 $I_P4/mm'm'$	$a,b,c;0,0,0$	No. 139 $I4/mmm$	$M1^+$	L139.2.8 $M1^+$
1.534	HoC_2	No. 47.9.355 $P_{2a}mmm'$	$2a,b,c;0,0,0$	No. 47 $Pmmm$	$X1^+$	L47.2.7 $X1^+$
1.535	UPd_2Ge_2	No. 129.13.1087 $P_{2c}4/nm'm'$	$a,b,2c;1/4,1/4,-1/4$	No. 129 $P4/nmm$	$Z3^-$	L129.2.8 $Z1^+$
1.536	UPd_2Si_2	No. 139.15.1193 $I_P4/mm'm'$	$a,b,c;0,0,0$	No. 139 $I4/mmm$	$M1^+$	L139.2.8 $M1^+$
1.537	URh_2Si_2	No. 139.15.1193 $I_P4/mm'm'$	$a,b,c;0,0,0$	No. 139 $I4/mmm$	$M1^+$	L139.2.8 $M1^+$
1.538	Ba_2MnTeO_6	No. 12.11.76 C_P2'/m'	$a-b,a+b,-a/3+b/3+c/3;0,0,0$	No. 12 $C2/m$	$Y1^+$	L12.2.6 $Y1^+$
1.541	RbMnP	No. 129.11.1085 $P_{2c}4'/nm'm$	$a,b,c;1/4,-1/4,0$	No. 129 $P4/nmm$	$Z4^-$	L129.2.10 $Z2^+$
1.542	RbMnP	No. 129.11.1085 $P_{2c}4'/nm'm$	$a,b,c;1/4,-1/4,0$	No. 129 $P4/nmm$	$Z4^-$	L129.2.10 $Z2^+$
1.543	RbMnAs	No. 129.11.1085 $P_{2c}4'/nm'm$	$a,b,c;1/4,-1/4,0$	No. 129 $P4/nmm$	$Z4^-$	L129.2.10 $Z2^+$
1.544	RbMnAs	No. 129.11.1085 $P_{2c}4'/nm'm$	$a,b,c;1/4,-1/4,0$	No. 129 $P4/nmm$	$Z4^-$	L129.2.10 $Z2^+$
1.545	RbMnBi	No. 129.11.1085 $P_{2c}4'/nm'm$	$a,b,c;1/4,-1/4,0$	No. 129 $P4/nmm$	$Z4^-$	L129.2.10 $Z2^+$
1.546	CsMnBi	No. 129.11.1085 $P_{2c}4'/nm'm$	$a,b,c;1/4,-1/4,0$	No. 129 $P4/nmm$	$Z4^-$	L129.2.10 $Z2^+$
1.547	CsMnP	No. 129.11.1085 $P_{2c}4'/nm'm$	$a,b,c;1/4,-1/4,0$	No. 129 $P4/nmm$	$Z4^-$	L129.2.10 $Z2^+$
1.548	CsMnP	No. 129.11.1085 $P_{2c}4'/nm'm$	$a,b,c;1/4,-1/4,0$	No. 129 $P4/nmm$	$Z4^-$	L129.2.10 $Z2^+$
1.556	$FeSn_2$	No. 72.12.641 $I_Pb'am'$	$a,b,c;0,0,0$	No. 140 $I4/mcm$	$M1^+$	L140.2.8 $M1^+$
1.558	$MnSn_2$	No. 69.11.615 $F_Cm'm'm'$	$a-b,a+b,c;1/2,0,0$	No. 69 $Fmmm$	$Y4^-$	L69.2.9 $T3^-$
1.559	$MnSn_2$	No. 65.11.555 $C_{2c}m'm'm$	$c,-a+b,-a-b;1/2,0,0$	No. 65 $Cmmm$	$Z1^+$	L65.2.15 $Z1^+$
1.565	Pb_2CoOsO_6	No. 7.4.35 $P_{2a}c$	$a,b,-a+c;0,1/4,0$	No. 7 Pc	Y2	L7.2.3 Y1
1.566	Ba_2YbRuO_6	No. 139.15.1193 $I_P4/mm'm'$	$a/2+b/2,-a/2+b/2,c;0,0,0$	No. 139 $I4/mmm$	$M1^+$	L139.2.8 $M1^+$
1.567	Ba_2TmRuO_6	No. 139.15.1193 $I_P4/mm'm'$	$a/2+b/2,-a/2+b/2,c;0,0,0$	No. 139 $I4/mmm$	$M1^+$	L139.2.8 $M1^+$
1.568	$GdCu_2Si_2$	No. 12.6.71 $C_{2c}2/m$	$a+c,b,c;0,0,0$	No. 12 $C2/m$	$M1^+$	L12.2.4 $A1^+$
1.569	$SrRu_2O_6$	No. 162.6.1308 $P_{2c}\bar{3}1m$	$a,b,c;0,0,0$	No. 162 $P\bar{3}1m$	$A2^+$	L162.2.5 $A1^-$
1.570	La_3OsO_7	No. 11.6.64 $P_{2a}2_1/m$	$a/2+b/2,-c,-a/2+b/2;0,0,0$	No. 11 $P2_1/m$	$Y2^+$	L11.2.5 $B1^-$
1.571	La_3OsO_7	No. 11.6.64 $P_{2a}2_1/m$	$a/2+b/2,-c,-a/2+b/2;0,0,0$	No. 11 $P2_1/m$	$Y2^+$	L11.2.5 $B1^-$
1.574	NdBiPt	No. 119.7.977 $I_P\bar{4}'m'2$	$a/2-b/2,a/2+b/2,c;0,0,0$	No. 119 $I\bar{4}m2$	M2	L119.2.4 M1

SSGs of collinear magnetic structures (continued).

BCSID	Chemical formula	MSG	Trans from parent structure	PSG	Rep	SSG
1.575	ErRh	No. 47.9.355 $P_{2a}mmm'$	$a,b,c;0,0,0$	No. 123 $P4/mmm$	$Z1^+$	L123.2.14 $Z1^+$
1.576	Yb_2O_2S	No. 12.6.71 $C_{2c}2/m$	$a,b,c;0,0,0$	No. 164 $P\bar{3}m1$	$A2^-$	L164.2.4 $A1^+$
1.578	$KErSe_2$	No. 12.6.71 $C_{2c}2/m$	$2a/3+b/3+4c/3,b,c;0,0,0$	No. 12 $C2/m$	$M2^-$	L12.2.4 $A1^+$
1.585	PrFeAsO	No. 67.13.589 $C_Pm'ma$	$a,b,c;0,0,0$	No. 67 $Cmme$	$Y1^-$	L67.2.9 $Y1^+$
1.586	PrFeAsO	No. 39.12.289 $A_Pb'm'2$	$c,b,-a;0,0,0$	No. 39 $Aem2$	Y2	L39.2.7 Y2
1.588	NdFeAsO	No. 67.17.593 $C_Im'ma'$	$a,b,c;0,0,0$	No. 67 $Cmme$	$T2^+$	L67.2.6 $T1^+$
1.593	BaCoSO	No. 57.10.467 $P_{2a}bcm$	$a,b,c;1/4,1/4,0$	No. 57 $Pbcm$	$X2^+$	L57.2.10 $X2^+$
1.594	BaCoSO	No. 57.10.467 $P_{2a}bcm$	$a,b,c;1/4,1/4,0$	No. 57 $Pbcm$	$X4^-$	L57.2.10 $X2^+$
1.596	$TbCuSb_2$	No. 2.4.7 $P_{2s}\bar{1}$	$a,b,c;0,0,0$	No. 11 $P2_1/m$	$Y2^-$	L11.2.4 $B1^+$
1.597	$TbCuSb_2$	No. 11.6.64 $P_{2a}2_1/m$	$2b,-a,c;0,1/2,0$	No. 11 $P2_1/m$	$A2^-$	L11.2.4 $B1^+$
1.617	$LiFe(MoO_4)_2$	No. 2.4.7 $P_{2s}\bar{1}$	$a,b,c;0,0,0$	No. 2 $P\bar{1}$	$Y1^-$	L2.2.2 $R1^+$
1.620	$NdCu_2$	No. 74.11.660 $I_Pm'ma'$	$5a,b,c;0,0,0$	No. 74 $Imma$	$X1^+$	L74.2.6 $X1^+$
1.623	$EuMg_2Bi_2$	No. 12.6.71 $C_{2c}2/m$	$a,b,c;0,0,0$	No. 164 $P\bar{3}m1$	$A1^+$	L164.2.4 $A1^+$
1.624	$EuSn_2P_2$	No. 12.6.71 $C_{2c}2/m$	$a,b,c;0,0,0$	No. 166 $R\bar{3}m$	$T1^+$	L166.2.4 $T1^+$
1.625	$Sr_2Fe_3S_2O_3$	No. 55.9.449 $P_{2c}b'am$	$a,b,c;0,0,0$	No. 55 $Pbam$	$Z4^+$	L55.2.8 $Z3^+$
1.626	$Sr_2Fe_3Se_2O_3$	No. 26.8.175 P_Cmc2_1	$-c,a,-b;1/4,0,0$	No. 26 $Pmc2_1$	S4	L26.2.4 S1
1.627	$KCeS_2$	No. 12.8.73 $C_{2c}2/m'$	$a/3+2b/3+2c/3,-a,c;0,0,0$	No. 12 $C2/m$	$A1^+$	L12.2.4 $A1^+$
1.628	$PrMnSi_2$	No. 63.17.527 $C_Pm'c'm'$	$a,b,c;0,0,0$	No. 63 $Cmcm$	$Y4^-$	L63.2.15 $Y4^-$
1.630	$LuMn_6Sn_6$	No. 65.12.556 $C_{2c}mm'm'$	$a,b,c;0,0,0$	No. 191 $P6/mmm$	$A1^+$	L191.2.8 $A1^+$
1.631	YMn_6Ge_6	No. 191.13.1475 $P_{2c}6/mm'm'$	$a,b,c;0,0,0$	No. 191 $P6/mmm$	$A1^+$	L191.2.8 $A1^+$
1.632	$ErFe_6Ge_6$	No. 71.9.629 $I_Pm'm'm'$	$a,b,c;0,0,0$	No. 71 $Immm$	$X3^-$	L71.2.7 $X2^-$
1.633	YFe_6Sn_6	No. 71.9.629 $I_Pm'm'm'$	$a,b,c;0,0,0$	No. 71 $Immm$	$X3^-$	L71.2.7 $X2^-$
1.634	YFe_6Ge_6	No. 63.17.527 $C_Pm'c'm'$	$a,b,c;0,0,0$	No. 63 $Cmcm$	$Y3^-$	L63.2.13 $Y3^-$
1.635	$ErFe_2Si_2$	No. 59.9.486 $P_{2c}m'mn$	$a,b,c;1/4,1/4,1/4$	No. 129 $P4/nmm$	$Z3^-$	L129.2.8 $Z1^+$
1.636	$ErMn_2Si_2$	No. 139.17.1195 $I_P4/m'm'm'$	$a,b,c;0,0,0$	No. 139 $I4/mmm$	$M3^-$	L139.2.13 $M3^-$
1.637	$ErMn_2Si_2$	No. 139.17.1195 $I_P4/m'm'm'$	$a,b,c;0,0,0$	No. 139 $I4/mmm$	$M3^-$	L139.2.13 $M3^-$
1.638	$ErMn_2Ge_2$	No. 139.17.1195 $I_P4/m'm'm'$	$a,b,c;0,0,0$	No. 139 $I4/mmm$	$M3^-$	L139.2.13 $M3^-$
1.639	$ErMn_2Ge_2$	No. 139.17.1195 $I_P4/m'm'm'$	$a,b,c;0,0,0$	No. 139 $I4/mmm$	$M3^-$	L139.2.13 $M3^-$

SSGs of collinear magnetic structures (continued).

BCSID	Chemical formula	MSG	Trans from parent structure	PSG	Rep	SSG
1.640	$ErMn_2Ge_2$	No. 139.17.1195 $I_P4/m'm'm'$	$a,b,c;0,0,0$	No. 139 $I4/mmm$	$M3^-$	L139.2.13 $M3^-$
1.641	$Ba_2FeSi_2O_7$	No. 35.8.243 $C_{2c}m'm2'$	$a,b,c;0,0,0$	No. 113 $P\bar{4}2_1m$	Z4	L113.2.5 Z2
1.642	$TlFeS_2$	No. 12.6.71 $C_{2c}2/m$	$c,-b,a;0,0,0$	No. 10 $P2/m$	$A1^-$	L10.2.5 $B1^-$
1.643	DyOCl	No. 59.9.486 $P_{2c}m'mn$	$a,b,c;0,0,0$	No. 129 $P4/nmm$	$Z3^-$	L129.2.8 $Z1^+$
1.644	$EuSn_2As_2$	No. 12.6.71 $C_{2c}2/m$	$a,b,c;0,0,0$	No. 166 $R\bar{3}m$	$T1^+$	L166.2.4 $T1^+$
1.646	$Na_2Ni_2TeO_6$	No. 38.8.272 A_Imm2	$-c,2a+b,-b;0,0,1/4$	No. 38 $Amm2$	T4	L38.2.5 T2
1.648	Nd_2O_3	No. 12.6.71 $C_{2c}2/m$	$2a+b,b,c;0,0,0$	No. 12 $C2/m$	$M1^+$	L12.2.4 $A1^+$
1.653	$FeWO_4$	No. 13.6.82 $P_{2a}2/c$	$a,b,c;0,0,0$	No. 13 $P2/c$	$Y2^-$	L13.2.5 $Y1^+$
1.654	$NiNb_2O_6$	No. 13.9.85 $P_{2b}2'/c$	$a,b,c;0,0,0$	No. 13 $P2/c$	$Z1^-$	L13.2.6 $Z1^+$
1.655	$FeNb_2O_6$	No. 18.6.118 $P_{2c}2_12'_12'$	$a,-c,b;0,1/4,1/4$	No. 18 $P2_12_12$	Z1	L18.2.3 Z1
1.656	$CoNb_2O_6$	No. 14.6.91 $P_{2a}2_1/c$	$-c,a,-b;0,0,0$	No. 14 $P2_1/c$	$Y2^-$	L14.2.4 $Y1^+$
1.658	$DyGa_3$	No. 12.8.73 $C_{2c}2/m'$	$2a/3+b/3+4c/3,b,c;0,0,0$	No. 12 $C2/m$	$M1^+$	L12.2.4 $A1^+$
1.663	Tb_2Ni_2In	No. 10.8.56 P_C2/m	$a/2+b/2,-c,-a/2+b/2;0,0,0$	No. 10 $P2/m$	$C2^+$	L10.2.6 $C1^+$
1.664	$DyVO_4$	No. 74.11.660 $I_Pm'ma'$	$a,b,c;0,1/4,1/8$	No. 74 $Imma$	$X1^+$	L74.2.6 $X1^+$
1.667	$UPtGa_5$	No. 47.11.357 P_Cmmm'	$a,b,c;0,0,0$	No. 47 $Pmmm$	$U1^+$	L47.2.5 $S1^+$
1.668	$HoCoGa_5$	No. 47.11.357 P_Cmmm'	$a,b,c;0,0,0$	No. 47 $Pmmm$	$U1^+$	L47.2.5 $S1^+$
1.670	$NpFeGa_5$	No. 47.11.357 P_Cmmm'	$a,b,c;0,0,0$	No. 123 $P4/mmm$	$M1^+$	L123.2.10 $M1^+$
1.671	$NpCoGa_5$	No. 123.15.1013 $P_{2c}4/mm'm'$	$a,b,c;0,0,0$	No. 123 $P4/mmm$	$Z1^+$	L123.2.14 $Z1^+$
1.672	$EuZn_2As_2$	No. 12.6.71 $C_{2c}2/m$	$a,b,c;0,0,0$	No. 164 $P\bar{3}m1$	$A1^+$	L164.2.4 $A1^+$
1.673	$EuCd_2Sb_2$	No. 12.6.71 $C_{2c}2/m$	$a,b,c;0,0,0$	No. 164 $P\bar{3}m1$	$A1^+$	L164.2.4 $A1^+$
1.679	Nd_2NiIrO_6	No. 2.4.7 $P_{2s}\bar{1}$	$a,b,c;0,0,0$	No. 2 $P\bar{1}$	$V1^+$	L2.2.2 $R1^+$
1.681	$PrFe_2Al_8$	No. 10.8.56 P_C2/m	$a,-c,b;0,0,0$	No. 10 $P2/m$	$C1^+$	L10.2.6 $C1^+$
1.683	$UPdGa_5$	No. 123.19.1017 $P_I4/mm'm'$	$a,b,c;0,0,0$	No. 123 $P4/mmm$	$A1^+$	L123.2.8 $A1^+$
1.686	Er_2Ni_2Pb	No. 10.8.56 P_C2/m	$a/2+b/2,-c,-a/2+b/2;0,0,0$	No. 10 $P2/m$	$C1^-$	L10.2.6 $C1^+$
1.687	Er_2Ni_2Pb	No. 65.12.556 $C_{2c}mm'm'$	$a,b,c;0,0,0$	No. 65 $Cmmm$	$Z2^-$	L65.2.15 $Z1^+$
1.689	$LuMn_2Ge_2$	No. 139.17.1195 $I_P4/m'm'm'$	$a,b,c;0,0,0$	No. 139 $I4/mmm$	$M3^-$	L139.2.13 $M3^-$
1.690	$TmMn_2Ge_2$	No. 139.17.1195 $I_P4/m'm'm'$	$a,b,c;0,0,0$	No. 139 $I4/mmm$	$M3^-$	L139.2.13 $M3^-$
1.691	YMn_2Ge_2	No. 139.17.1195 $I_P4/m'm'm'$	$a,b,c;0,0,0$	No. 139 $I4/mmm$	$M3^-$	L139.2.13 $M3^-$

SSGs of collinear magnetic structures (continued).

BCSID	Chemical formula	MSG	Trans from parent structure	PSG	Rep	SSG
1.692	YMn_2Ge_2	No. 139.17.1195 $I_P4/m'm'm'$	$a,b,c;0,0,0$	No. 139 $I4/mmm$	$M3^-$	L139.2.13 $M3^-$
1.694	$TbMn_2Ge_2$	No. 139.17.1195 $I_P4/m'm'm'$	$a,b,c;0,0,0$	No. 139 $I4/mmm$	$M3^-$	L139.2.13 $M3^-$
1.696	$HoNiSi_2$	No. 63.11.521 $C_Pm'cm$	$a,b,c;0,0,0$	No. 63 $Cmcm$	$Y4^-$	L63.2.15 $Y4^-$
1.697	$Tb_5Pd_2In_4$	No. 26.7.174 $P_{2b}mc2_1$	$-c,b,a;0,1/4,0$	No. 26 $Pmc2_1$	Y1	L26.2.7 Y1
1.699	$GdInCu_4$	No. 115.8.948 $P_I\bar{4}m2$	$a/2-c/2,-a/2-c/2,b;0,0,0$	No. 115 $P\bar{4}m2$	A1	L115.2.4 A1
1.700	$HoInCu_4$	No. 21.11.139 $C_I2'22'$	$a/2-c/2,-a/2-c/2,b;0,0,0$	No. 115 $P\bar{4}m2$	A1	L115.2.4 A1
1.701	$HoCdCu_4$	No. 8.4.41 $C_{2c}m$	$a/2-c/2,-a/2+b/2,a+b+c;0,0,0$	No. 160 $R3m$	T1	L160.2.2 T1
1.702	$YBaCo_2O_5$	No. 47.7.353 P_Cmmm	$a,b,c;0,0,0$	No. 123 $P4/mmm$	$M2^-$	L123.2.13 $M2^-$
1.703	$YBaCo_2O_5$	No. 51.15.401 $P_{2b}m'ma'$	$2a,b,c;0,0,0$	No. 51 $Pmma$	$Y4^-$	L51.2.10 $Y1^+$
1.704	$TaBaFe_2O_5$	No. 51.15.401 $P_{2b}m'ma'$	$2a,b,c;0,0,0$	No. 51 $Pmma$	$Y4^-$	L51.2.10 $Y1^+$
1.706	Ba_2MnTeO_6	No. 69.10.614 $F_Cmm'm'$	$a/2+b/2,-a/2+b/2,c;0,0,0$	No. 139 $I4/mmm$	$M1^+$	L139.2.8 $M1^+$
1.707	Ba_2MnWO_6	No. 12.8.73 $C_{2c}2/m'$	$a/2-c/2,-a/2+b/2,a+b+c;0,0,0$	No. 166 $R\bar{3}m$	$T1^+$	L166.2.4 $T1^+$
1.714	$CeAuBi_2$	No. 129.13.1087 $P_{2c}4/nm'm'$	$a,b,c;0,0,0$	No. 129 $P4/nmm$	$Z3^-$	L129.2.8 $Z1^+$
1.715	Sr_2CoWO_6	No. 2.4.7 $P_{2s}\bar{1}$	$a,b,-a+c;0,0,0$	No. 14 $P2_1/c$	$Y1^+$	L14.2.4 $Y1^+$
1.719	Ca_2MnWO_6	No. 2.4.7 $P_{2s}\bar{1}$	$a,b,c;0,0,0$	No. 2 $P\bar{1}$	$T1^-$	L2.2.2 $R1^+$
1.721	UCu_5	No. 160.5.1299 R_R3m'	$a/2-c/2,-a/2+b/2,a+b+c;0,0,0$	No. 160 $R3m$	T1	L160.2.2 T1
1.722	$Ba_3LaRu_2O_9$	No. 15.7.98 C_P2'/c	$-b,2a+b,c;0,0,0$	No. 63 $Cmcm$	$Y1^+$	L63.2.8 $Y1^+$
1.724	Ba_2NiTeO_6	No. 12.11.76 C_P2'/m'	$a/3+2b/3+2c/3,-a,-a/3-2b/3+c/3;0,0,0$	No. 12 $C2/m$	$Y1^+$	L12.2.6 $Y1^+$
1.726	$RuCl_3$	No. 5.4.22 $C_{2c}2$	$-b,2a+b,c;0,0,0$	No. 5 $C2$	M1	L5.2.2 A1
1.727	$Tm_3Cu_4Ge_4$	No. 59.9.486 $P_{2c}m'mn$	$a,-c,b;1/4,1/4,1/4$	No. 59 $Pmmn$	$Z1^+$	L59.2.6 $Z1^+$
1.728	$Tm_3Cu_4Sn_4$	No. 12.6.71 $C_{2c}2/m$	$a,b,c;0,0,0$	No. 12 $C2/m$	$A2^-$	L12.2.4 $A1^+$
1.729	$Gd_2Fe_2Si_2C$	No. 12.6.71 $C_{2c}2/m$	$a,b,c;0,0,0$	No. 12 $C2/m$	$A2^-$	L12.2.4 $A1^+$
1.732	Cu_2MnSnS_4	No. 5.4.22 $C_{2c}2$	$a+c,b,c;0,0,0$	No. 5 $C2$	M1	L5.2.2 A1
1.738	TbNiAl	No. 38.13.277 $A_Im'm'2$	$-c,2a+b,-b;0,0,0$	No. 38 $Amm2$	T3	L38.2.4 T1
1.740	$CeAuSb_2$	No. 25.13.167 $P_Am'm'2$	$a,2b,c;0,0,0$	No. 25 $Pmm2$	T3	L25.2.5 T1
1.743	$CeRhGe_3$	No. 99.11.833 $P_{2c}4m'm'$	$a,b,2c;0,0,0$	No. 99 $P4mm$	Z1	L99.2.8 Z1

SSGs of collinear magnetic structures (continued).

BCSID	Chemical formula	MSG	Trans from parent structure	PSG	Rep	SSG
1.744	PrPdSn	No. 14.6.91 $P_{2a}2_1/c$	$-c, a, -b+c; 0, 0, 0$	No. 14 $P2_1/c$	$Y2^+$	L14.2.4 $Y1^+$
1.746	YMn_2	No. 5.6.24 C_P2'	$a/2+c/2, -a/2+c/2, -b; 0, 0, 0$	No. 98 $I4_122$	M2	L98.2.5 M2
1.749	HoSbTe	No. 11.6.64 $P_{2a}2_1/m$	$a, b, c; 0, 0, 0$	No. 11 $P2_1/m$	$Y1^+$	L11.2.4 $B1^+$
1.750	HoSbTe	No. 11.6.64 $P_{2a}2_1/m$	$a, b, -a+2c; 0, 0, 0$	No. 11 $P2_1/m$	$Y1^+$	L11.2.4 $B1^+$
2.1	$EuFe_2As_2$	No. 64.16.543 $C_Pm'ca'$	$a-b, -c, a+b; 0, 0, 0$	No. 64 $Cmce$	$Y1^+$	L64.2.8 $Y1^+$
2.26	$PrCo_2P_2$	No. 123.7.1005 $P4/mm'm'$	$a, b, 2c; 0, 0, 1/2$	No. 123 $P4/mmm$	$GM1^+$	L123.1.1 $GM1^+$
2.30	$CeRh_2Si_2$	No. 67.13.589 $C_Pm'ma$	$a-b, a+b, 2c; 1/4, 1/4, 1/4$	No. 67 $Cmme$	$Y3^+$	L67.2.11 $Y3^+$
2.36	$TbGe_3$	No. 57.11.468 $P_{2a}bc'm$	$a, b, 3c; 1/4, 1/4, 0$	No. 57 $Pbcm$	$X3^-$	L57.2.8 $X1^+$
2.50	$EuMnBi_2$	No. 131.6.1102 $P4_2'/m'm'c$	$a, b, c; 0, 1/2, 0$	No. 131 $P4_2/mmc$	$GM4^-$	L131.2.7 $GM4^-$
2.65	UPd_2Si_2	No. 123.7.1005 $P4/mm'm'$	$a, b, 3c; 0, 0, 0$	No. 123 $P4/mmm$	$GM1^+$	L123.1.1 $GM1^+$
2.74	$BaDy_2O_4$	No. 4.3.17 $P2_1'$	$3b, -a, c; 0, 1/4, 1/4$	No. 4 $P2_1$	GM1	L4.1.1 GM1
2.80	$ErFe_6Ge_6$	No. 59.5.482 $Pm'm'n$	$-c, b, a; 1/4, 1/4, 1/4$	No. 59 $Pmmn$	$GM1^+$	L59.1.1 $GM1^+$
2.88	UNiGa	No. 189.4.1454 $P\bar{6}'2m'$	$a, b, 6c; 0, 0, 0$	No. 189 $P\bar{6}2m$	GM3	L189.2.2 GM3
2.92	Er_2Ni_2Pb	No. 10.9.57 $P_{2b}2'/m$	$a+b, c, a/2-b/2; 0, 0, 0$	No. 10 $P2/m$	$Z1^-$	L10.2.7 $Z1^+$
2.95	$TbMn_2Ge_2$	No. 129.7.1081 $P4/nm'm'$	$a, b, c; 1/4, 1/4, 1/4$	No. 129 $P4/nmm$	$GM1^+$	L129.1.1 $GM1^+$
2.98	$EuMnBi_2$	No. 131.6.1102 $P4_2'/m'm'c$	$a, b, c; 0, 1/2, 0$	No. 131 $P4_2/mmc$	$GM4^-$	L131.2.7 $GM4^-$
2.99	TbNiAl	No. 6.6.30 P_Cm	$a-b, c, -a-b; 0, 0, 0$	No. 6 Pm	E2	L6.2.4 C1
2.103	Eu_3PbO	No. 47.4.350 $Pm'm'm$	$-c, b, 2a; 1/2, 0, 0$	No. 123 $P4/mmm$	$GM1^+$	L123.1.1 $GM1^+$
3.3	Ho_2RhIn_8	No. 63.8.518 $Cm'cm'$	$-2b, -2c, 2a; 1/2, 0, 0$	No. 63 $Cmcm$	$GM1^+$	L63.1.1 $GM1^+$
3.14	FeI_2	No. 12.5.70 $C2'/m'$	$2a-2b, 6a+6b, c; 1/2, -1/2, 0$	No. 12 $C2/m$	$GM1^+$	L12.1.1 $GM1^+$
3.15	FeI_2	No. 164.5.1319 $P\bar{3}m'1$	$5a, 5b, c; 0, 0, 0$	No. 164 $P\bar{3}m1$	$GM1^+$	L164.1.1 $GM1^+$
3.23	Eu_3PbO	No. 123.7.1005 $P4/mm'm'$	$2a, 2b, c; 1/2, 1/2, 0$	No. 123 $P4/mmm$	$GM1^+$	L123.1.1 $GM1^+$

TABLE S692: SSGs of coplanar magnetic structures.

BCSID	Chemical formula	MSG	Trans from parent structure	PSG	Rep	SSG
light-element materials						
0.7	$ScMnO_3$	No. 185.5.1433 $P6_3c'm'$	$a, b, c; 0, 0, 0$	No. 185 $P6_3cm$	GM6	P185.6.2 GM6
0.8	$ScMnO_3$	No. 173.1.1360 $P6_3$	$a, b, c; 0, 0, 0$	No. 185 $P6_3cm$	GM6	P185.6.2 GM6
0.17	$FePO_4$	No. 19.1.119 $P2_12_12_1$	$a, b, c; 0, 0, 0$	No. 62 $Pnma$	$GM3^- \oplus GM4^+$	P62.3.24 $GM3^- \oplus GM4^+$

SSGs of coplanar magnetic structures (continued).

BCSID	Chemical formula	MSG	Trans from parent structure	PSG	Rep	SSG
0.28	$LiFeSi_2O_6$	No. 14.4.89 $P2_1/c'$	$a,b,c;0,0,0$	No. 14 $P2_1/c$	$GM1^- \oplus GM2^-$	P14.3.3 $GM1^- \oplus GM2^-$
0.36	NiF_2	No. 58.6.476 $Pnn'm'$	$a,b,c;0,0,0$	No. 136 $P4_2/mnm$	$GM4^+$	P136.2.6 $GM4^+$
0.40	Mn_2O_3-alpha	No. 61.1.497 $Pbca$	$a,b,c;0,0,0$	No. 61 $Pbca$	$GM2^+ \oplus GM3^+$	P61.3.5 $GM2^+ \oplus GM3^+$
0.41	Mn_2O_3-alpha	No. 61.1.497 $Pbca$	$a,b,c;0,0,0$	No. 61 $Pbca$	$GM2^+ \oplus GM3^+$	P61.3.5 $GM2^+ \oplus GM3^+$
0.69	$Co_4(OH)_2(C_{10}H_{16}O_4)_3$	No. 14.5.90 $P2_1'/c'$	$a,b,c;0,0,0$	No. 14 $P2_1/c$	$GM2^+$	P14.2.2 $GM2^+$
0.85	$KCo_4(PO_4)_3$	No. 58.6.476 $Pnn'm'$	$a,b,c;0,0,0$	No. 58 $Pnnm$	$GM2^+$	P58.2.2 $GM2^+$
0.88	$LiNiPO_4$	No. 62.4.505 $Pnm'a$	$a,b,c;0,0,0$	No. 62 $Pnma$	$GM2^- \oplus GM3^-$	P62.3.16 $GM2^- \oplus GM3^-$
0.101	Mn_2GeO_4	No. 62.6.507 $Pn'm'a$	$a,b,c;0,0,0$	No. 62 $Pnma$	$GM3^+ \oplus GM4^+$	P62.3.21 $GM3^+ \oplus GM4^+$
0.119	$CoSe_2O_5$	No. 60.3.490 $Pb'cn$	$a,b,c;0,0,0$	No. 60 $Pbcn$	$GM1^- \oplus GM4^-$	P60.3.7 $GM1^- \oplus GM4^-$
0.120	$LiFe(SO_4)_2$	No. 14.1.86 $P2_1/c$	$a,b,c;0,0,0$	No. 14 $P2_1/c$	$GM2^+$	P14.2.2 $GM2^+$
0.121	$Li_2Co(SO_4)_2$	No. 14.5.90 $P2_1'/c'$	$a,b,c;0,0,0$	No. 14 $P2_1/c$	$GM2^+$	P14.2.2 $GM2^+$
0.122	$Li_2Mn(SO_4)_2$	No. 14.1.86 $P2_1/c$	$a,b,c;0,0,0$	No. 14 $P2_1/c$	$GM2^+$	P14.2.2 $GM2^+$
0.123	Mn_3NiN	No. 148.1.1247 $R\bar{3}$	$a-b,b-c,a+b+c;0,0,0$	No. 166 $R\bar{3}m$	$GM3^+$	P166.6.1 $GM3^+$
0.124	Mn_3NiN	No. 148.1.1247 $R\bar{3}$	$a-b,b-c,a+b+c;0,0,0$	No. 166 $R\bar{3}m$	$GM3^+$	P166.6.1 $GM3^+$
0.132	$Fe(N(CN_2))_2$	No. 58.6.476 $Pnn'm'$	$a,b,c;0,0,0$	No. 58 $Pnnm$	$GM2^+$	P58.2.2 $GM2^+$
0.133	$Ni_3B_7O_{13}Cl$	No. 29.3.200 $Pc'a2_1'$	$a,b,c;0,0,0$	No. 29 $Pca2_1$	$GM2$	P29.2.1 $GM2$
0.152	$LiFePO_4$	No. 14.4.89 $P2_1/c'$	$a,b,c;0,0,0$	No. 62 $Pnma$	$GM2^- \oplus GM3^-$	P62.3.16 $GM2^- \oplus GM3^-$
0.175	$Ca_2CoSi_2O_7$	No. 18.4.116 $P2_12_1'2'$	$3a,3b,c;0,0,0$	No. 18 $P2_12_12$	$GM2$	P18.2.1 $GM2$
0.177	Mn_3GaN	No. 166.1.1327 $R\bar{3}m$	$a,b,c;0,0,0$	No. 221 $Pm\bar{3}m$	$GM3^+$	P221.6.1 $GM3^+$
0.179	$FeCl_5D_2O(ND_4)_2$	No. 4.3.17 $P2_1'$	$b,c,a;0,0,0$	No. 14 $P2_1/c$	$GM2^-$	P14.2.3 $GM2^-$
0.182	$KCrF_4$	No. 62.3.504 $Pn'ma$	$a,b,c;0,0,0$	No. 62 $Pnma$	$GM1^- \oplus GM4^-$	P62.3.7 $GM1^- \oplus GM4^-$
0.262	$CoFePO_5$	No. 62.7.508 $Pnm'a'$	$a,b,c;0,0,0$	No. 62 $Pnma$	$GM2^+ \oplus GM4^+$	P62.3.12 $GM2^+ \oplus GM4^+$
0.273	Mn_3ZnN	No. 166.1.1327 $R\bar{3}m$	$a,b,c;0,0,0$	No. 221 $Pm\bar{3}m$	$GM3^+$	P221.6.1 $GM3^+$
0.279	Mn_3As	No. 63.7.517 $Cmc'm'$	$a,b,c;0,0,0$	No. 194 $P6_3/mmc$	$GM5^+$	P194.6.1 $GM5^+$
0.280	Mn_3As	No. 63.8.518 $Cm'cm'$	$a,b,c;0,0,0$	No. 194 $P6_3/mmc$	$GM5^+$	P194.6.1 $GM5^+$
0.295	$Cu_2(OD)_3Cl$	No. 14.1.86 $P2_1/c$	$a,b,-a+c;0,0,0$	No. 14 $P2_1/c$	$GM2^+ \oplus GM2^+$	P14.3.5 $GM2^+ \oplus GM2^+$
0.296	$Cu_2(OD)_3Cl$	No. 14.1.86 $P2_1/c$	$a,b,-a+c;0,0,0$	No. 14 $P2_1/c$	$GM2^+$	P14.2.2 $GM2^+$
0.313	$MnGeO_3$	No. 61.3.499 $Pb'ca$	$a,b,c;0,0,0$	No. 61 $Pbca$	$GM1^- \oplus GM4^-$	P61.3.3 $GM1^- \oplus GM2^-$

SSGs of coplanar magnetic structures (continued).

BCSID	Chemical formula	MSG	Trans from parent structure	PSG	Rep	SSG
0.328	$KMnF_4$	No. 14.5.90 $P2_1'/c'$	$-c, b, a; 0, 0, 0$	No. 14 $P2_1/c$	$GM2^+$	P14.2.2 $GM2^+$
0.377	Mn_3Ge	No. 63.8.518 $Cm'cm'$	$a, b, c; 0, 0, 0$	No. 194 $P6_3/mmc$	$GM5^+$	P194.6.1 $GM5^+$
0.385	$LiCoPO_4$	No. 14.4.89 $P2_1/c'$	$a, b, c; 0, 0, 0$	No. 62 $Pnma$	$GM2^- \oplus GM3^-$	P62.3.16 $GM2^- \oplus GM3^-$
0.387	Fe_3BO_5	No. 26.3.170 $Pm'c2_1'$	$b, c, a; 0, 0, 0$	No. 62 $Pnma$	$GM2^-$	P62.2.3 $GM2^-$
0.425	$Na_2CoP_2O_7$	No. 33.3.228 $Pn'a2_1'$	$a, b, c; 0, 0, 0$	No. 33 $Pna2_1$	$GM2 \oplus GM3$	P33.3.2 $GM2 \oplus GM3$
0.579	Na_2NiFeF_7	No. 74.6.655 $Imm'a'$	$a, b, c; 0, 0, 0$	No. 74 $Imma$	$GM4^+$	P74.2.4 $GM3^+$
0.580	Na_2NiFeF_7	No. 74.6.655 $Imm'a'$	$a, b, c; 0, 0, 0$	No. 74 $Imma$	$GM4^+$	P74.2.4 $GM3^+$
0.583	$Fe_2F_5(H_2O)_2$	No. 74.6.655 $Imm'a'$	$a, b, c; 0, 0, 0$	No. 74 $Imma$	$GM3^+$	P74.2.4 $GM3^+$
0.612	Cu_2OSO_4	No. 12.1.66 $C2/m$	$a, b, c; 0, 0, 0$	No. 12 $C2/m$	$GM2^+$	P12.2.2 $GM2^+$
0.641	Mn_3Ga	No. 12.5.70 $C2'/m'$	$a, b, c; 0, 0, 0$	No. 139 $I4/mmm$	$GM1^+$	P139.1.1 $GM1^+$
0.891	$CuCr_2O_4$	No. 15.5.96 $C2'/c'$	$a, b, c; 0, 0, 0$	No. 141 $I4_1/amd$	$GM2^+$	P141.2.2 $GM2^+$
1.0.22	$K_2Mn_3(VO_4)_2CO_3$	No. 4.3.17 $P2_1'$	$a+2b, -2a-b, c; 0, 0, 0$	No. 176 $P6_3/m$	$GM2^-$	P176.2.3 $GM2^-$
1.0.33	FeF_3	No. 176.1.1374 $P6_3/m$	$a, b, c; 0, 0, 0$	No. 191 $P6/mmm$	$A5^+$	P191.6.5 $A5^+$
1.0.50	$CoGeO_3$	No. 15.5.96 $C2'/c'$	$a, 3b, c; 0, 0, 0$	No. 15 $C2/c$	$GM1^+$	P15.1.1 $GM1^+$
1.2	$CuSe_2O_5$	No. 15.7.98 C_P2'/c	$a, b, c; 0, 0, 0$	No. 15 $C2/c$	$Y1^+ \oplus Y2^+$	P15.3.15 $Y1^+ \oplus Y2^+$
1.25	$KFe_3(OH)_6(SO_4)_2$	No. 166.7.1333 $R_R\bar{3}m'$	$a, b, c; 0, 0, 0$	No. 166 $R\bar{3}m$	$T3^-$	P166.6.3 $T3^+$
1.39	$LiFeGe_2O_6$	No. 14.6.91 $P_{2a}2_1/c$	$a, b, c; 0, 0, 0$	No. 14 $P2_1/c$	$Y1^+ \oplus Y2^+$	P14.3.12 $Y1^+ \oplus Y2^+$
1.88	Mn_5Si_3	No. 63.16.526 $C_Pm'cm'$	$a+2b, -a, c; 0, 0, 0$	No. 63 $Cmcm$	$Y1^+ \oplus Y2^+$	P63.3.87 $Y1^+ \oplus Y2^+$
1.117	$NaFePO_4$	No. 11.7.65 $P_{2c}2_1/m'$	$a, b, c; 0, 0, 0$	No. 11 $P2_1/m$	$A1^+ \oplus A1^+$	P11.3.13 $B1^+ \oplus B1^+$
1.126	$NaCoSO_4F$	No. 15.6.97 C_P2/c	$a, b, c; 0, 0, 0$	No. 15 $C2/c$	$Y1^+ \oplus Y2^+$	P15.3.15 $Y1^+ \oplus Y2^+$
1.147	$Li_2Fe(SO_4)_2$	No. 14.6.91 $P_{2a}2_1/c$	$a, b, c; 0, 0, 0$	No. 14 $P2_1/c$	$Y1^+ \oplus Y2^+$	P14.3.12 $Y1^+ \oplus Y2^+$
1.185	$GeCu_2O_4$	No. 118.6.970 $P_I\bar{4}n2$	$a, b, c; 0, 1/4, -1/8$	No. 119 $I\bar{4}m2$	P3	P119.7.3 P1
1.196	MnV_2O_6	No. 14.6.91 $P_{2a}2_1/c$	$-c, -a, b; 0, 0, 0$	No. 14 $P2_1/c$	$Y1^+ \oplus Y2^+$	P14.3.12 $Y1^+ \oplus Y2^+$
1.203	Ni_2SiO_4	No. 11.7.65 $P_{2c}2_1/m'$	$a, b, c; 0, 0, 0$	No. 62 $Pnma$	$U1^+U4^+$	P62.4.1 $U1^+U4^+$
1.204	Ni_2SiO_4	No. 11.7.65 $P_{2c}2_1/m'$	$a, b, c; 0, 0, 0$	No. 11 $P2_1/m$	$A1^+ \oplus A1^+$	P11.3.13 $B1^+ \oplus B1^+$
1.227	$Ca_2Cr_2O_5$	No. 5.6.24 C_P2'	$b, c, a; 0, 0, 0$	No. 46 $Ima2$	$X1 \oplus X1$	P46.3.19 $X1 \oplus X1$
1.231	$NiPS_3$	No. 1.3.3 $P_{2s}1$	$a, b, c; 0, 0, 0$	No. 5 $C2$	$Y1 \oplus Y1$	P5.3.11 $Y1 \oplus Y1$
1.237	VCl_2	No. 157.5.1288 $P_{2c}31m'$	$a, b, c; 0, 0, 0$	No. 164 $P\bar{3}m1$	H1	P164.7.3 H1
1.238	VBr_2	No. 157.5.1288 $P_{2c}31m'$	$a, b, c; 0, 0, 0$	No. 164 $P\bar{3}m1$	H1	P164.7.3 H1

SSGs of coplanar magnetic structures (continued).

BCSID	Chemical formula	MSG	Trans from parent structure	PSG	Rep	SSG
1.323	$CoGeO_3$	No. 15.7.98 C_P2'/c	$a,b,c;0,0,0$	No. 15 $C2/c$	$Y1^+\oplus Y1^+$	P15.3.13 $Y1^+\oplus Y1^+$
1.345	$NaMnF_4$	No. 14.6.91 $P_{2a}2_1/c$	$a,b,c;0,0,0$	No. 14 $P2_1/c$	$Y1^+\oplus Y2^+$	P14.3.12 $Y1^+\oplus Y2^+$
1.382	Ca_2FeO_3Cl	No. 115.10.950 $P_P\bar{4}'m2'$	$a,b,c;0,0,0$	No. 129 $P4/nmm$	M3	P129.6.8 M3
1.383	Ca_2FeO_3Br	No. 115.10.950 $P_P\bar{4}'m2'$	$a,b,c;0,0,0$	No. 129 $P4/nmm$	M3	P129.6.8 M3
1.418	Cu_4O_3	No. 115.8.948 $P_I\bar{4}m2$	$a,b,c;0,1/4,-1/8$	No. 119 $I\bar{4}m2$	P3	P119.7.3 P1
1.431	$Ca_2Mn_3O_8$	No. 2.4.7 $P_{2s}\bar{1}$	$a/2-b/2,a/2+b/2,c;0,0,0$	No. 2 $P\bar{1}$	$Y1^+\oplus Y1^+$	P2.3.3 $R1^+\oplus R1^+$
1.441	$NaFe_3(SO_4)_2(OH)_6$	No. 166.7.1333 $R_R\bar{3}m'$	$a,b,c;0,0,0$	No. 166 $R\bar{3}m$	$T3^-$	P166.6.3 $T3^+$
1.455	$Mn_6Ni_{16}Si_7$	No. 12.11.76 C_P2'/m'	$a,b,c;0,0,0$	No. 69 $Fmmm$	$Z1^+\oplus Z1^+$	P69.3.44 $T1^+\oplus T1^+$
1.484	Li_2MnGeO_4	No. 7.6.37 P_Cc	$a,b,a+c;0,0,0$	No. 7 Pc	$C1\oplus C2$	P7.3.6 $C1\oplus C2$
1.519	$CoSO_4$	No. 63.16.526 $C_Pm'cm'$	$a,b,c;0,0,0$	No. 63 $Cmcm$	$Y1^+\oplus Y3^+$	P63.3.89 $Y1^+\oplus Y3^+$
1.562	$GeNi_2O_4$	No. 5.4.22 $C_{2c}2$	$a-b,b-c,a+b+c;0,0,0$	No. 166 $R\bar{3}m$	$T1^+\oplus T2^-$	P166.3.14 $T1^+\oplus T2^-$
1.564	$GeCo_2O_4$	No. 5.4.22 $C_{2c}2$	$a-b,b-c,a+b+c;0,0,0$	No. 166 $R\bar{3}m$	$T1^+\oplus T2^-$	P166.3.14 $T1^+\oplus T2^-$
1.622	$CoGeO_3$	No. 15.7.98 C_P2'/c	$a,b,c;0,0,0$	No. 15 $C2/c$	$Y1^+\oplus Y1^+$	P15.3.13 $Y1^+\oplus Y1^+$
1.669	$KFe(PO_3F)_2$	No. 143.3.1233 $P_{2c}3$	$a,b,c;0,0,0$	No. 147 $P\bar{3}$	P1	P147.8.2 P1
1.688	$NiCr_2O_4$	No. 24.4.153 $I_P2_12_12_1$	$a+b,-c,-a;0,0,0$	No. 5 $C2$	$Y1\oplus Y2$	P5.3.12 $Y1\oplus Y2$
1.730	Cu_2MnSiS_4	No. 7.4.35 $P_{2a}c$	$a,b,-a+c;0,0,0$	No. 7 Pc	$Y1\oplus Y2$	P7.3.10 $Y1\oplus Y2$
1.731	Cu_2FeSiS_4	No. 7.6.37 P_Cc	$a,b,-a+c;0,0,0$	No. 7 Pc	$C1\oplus C2$	P7.3.6 $C1\oplus C2$
1.733	Cu_2MnGeS_4	No. 7.4.35 $P_{2a}c$	$a,b,-a+c;0,0,0$	No. 7 Pc	$Y1\oplus Y2$	P7.3.10 $Y1\oplus Y2$
1.739	$Cu_9O_2(SeO_3)_4Cl_6$	No. 2.4.7 $P_{2s}\bar{1}$	$a/2+b/2,-a/2+b/2,c;0,0,0$	No. 2 $P\bar{1}$	$X1^+\oplus X1^+$	P2.3.3 $R1^+\oplus R1^+$
2.29	Mn_3O_4	No. 60.6.493 $Pb'c'n$	$-c,-a,2b;0,1/2,0$	No. 60 $Pbcn$	$GM4^+$	P60.2.6 $GM4^+$
2.31	Mn_3ZnN	No. 72.12.641 $I_Pb'am'$	$a,b,c;0,0,0$	No. 123 $P4/mmm$	$M4^+\oplus Z3^-$	P123.3.151 $M1^+\oplus Z1^+$
2.68	$FeGe_2$	No. 56.3.453 $Pc'cn$	$a,b,c;0,0,0$	No. 140 $I4/mcm$	$GM1^-\oplus M1^+$	P140.3.8 $GM1^-\oplus M1^+$
2.90	Mn_3O_4	No. 60.6.493 $Pb'c'n$	$-c,-a,2b;0,1/4,1/8$	No. 60 $Pbcn$	$GM4^+$	P60.2.6 $GM4^+$
2.93	$CoCrO_4$	No. 60.1.488 $Pbcn$	$a,b,c;0,0,0$	No. 63 $Cmcm$	$GM3^+\oplus Y3^+$	P63.3.51 $GM3^+\oplus Y3^+$
heavy-element materials						
0.6	$YMnO_3$	No. 185.1.1429 $P6_3cm$	$a,b,c;0,0,0$	No. 185 $P6_3cm$	GM6	P185.6.2 GM6
0.9	GdB_4	No. 127.9.1061 $P4/m'b'm'$	$a,b,c;0,0,0$	No. 127 $P4/mbm$	$GM5^-$	P127.6.2 $GM5^-$
0.10	$DyFeO_3$	No. 19.1.119 $P2_12_12_1$	$a,b,c;0,0,1/4$	No. 19 $P2_12_12_1$	$GM3\oplus GM4$	P19.3.2 $GM2\oplus GM3$

SSGs of coplanar magnetic structures (continued).

BCSID	Chemical formula	MSG	Trans from parent structure	PSG	Rep	SSG
0.11	$DyFeO_3$	No. 33.5.230 $Pn'a'2_1$	$a,-c,b;0,0,0$	No. 33 $Pna2_1$	GM4	P33.2.3 GM4
0.12	$U_3Ru_4Al_{12}$	No. 63.5.515 $Cmcm'$	$-b,2a+b,c;0,0,0$	No. 63 $Cmcm$	$GM3^- \oplus GM4^-$	P63.3.57 $GM3^- \oplus GM4^-$
0.26	TmAgGe	No. 38.5.269 $Am'm'2$	$-c,-a+b,a+b;0,0,0$	No. 38 $Amm2$	GM4	P38.2.3 GM4
0.27	YFe_4Ge_2	No. 58.7.477 $Pn'n'm'$	$a,b,c;0,0,0$	No. 58 $Pnnm$	$GM3^- \oplus GM4^-$	P58.3.18 $GM3^- \oplus GM4^-$
0.30	$YbMnO_3$	No. 185.3.1431 $P6_3'c'm$	$a,b,c;0,0,0$	No. 185 $P6_3cm$	GM5	P185.6.1 GM5
0.31	$HoMnO_3$	No. 185.5.1433 $P6_3c'm'$	$a,b,c;0,0,0$	No. 185 $P6_3cm$	GM6	P185.6.2 GM6
0.32	$HoMnO_3$	No. 185.1.1429 $P6_3cm$	$a,b,c;0,0,0$	No. 185 $P6_3cm$	GM6	P185.6.2 GM6
0.37	$U_3Al_2Si_3$	No. 5.3.21 $C2'$	$a+b,-c,-a;0,0,0$	No. 5 $C2$	GM1	P5.1.1 GM1
0.44	$YMnO_3$	No. 173.3.1362 $P6_3'$	$a,b,c;0,0,0$	No. 185 $P6_3cm$	GM5	P185.6.1 GM5
0.46	$CaBaCo_4O_7$	No. 33.4.229 $Pna'2_1'$	$-b,a,c;0,0,0$	No. 33 $Pna2_1$	GM2	P33.2.1 GM2
0.47	$Gd_2Sn_2O_7$	No. 141.5.1217 $I4_1'/amd'$	$a/2-b/2,a/2+b/2,c;1/4,1/4,0$	No. 141 $I4_1/amd$	$GM5^+$	P141.6.1 $GM5^+$
0.80	U_2Pd_2In	No. 127.8.1060 $P4'/m'bm'$	$a,b,c;0,0,0$	No. 127 $P4/mbm$	$GM5^-$	P127.6.2 $GM5^-$
0.81	U_2Pd_2Sn	No. 127.8.1060 $P4'/m'bm'$	$a,b,c;0,0,0$	No. 127 $P4/mbm$	$GM5^-$	P127.6.2 $GM5^-$
0.82	Gd_2CuO_4	No. 64.8.535 $Cm'ca'$	$c,b,-a;0,0,0$	No. 64 $Cmce$	$GM3^+$	P64.2.4 $GM3^+$
0.104	$ErVO_3$	No. 11.5.63 $P2_1'/m'$	$b,c,a;0,0,0$	No. 62 $Pnma$	$GM3^+ \oplus GM4^+$	P62.3.21 $GM3^+ \oplus GM4^+$
0.107	$Ho_2Ge_2O_7$	No. 92.1.771 $P4_12_12$	$a,b,c;0,0,0$	No. 92 $P4_12_12$	GM5	P92.6.1 GM5
0.108	Mn_3Ir	No. 166.5.1331 $R\bar{3}m'$	$a,b,c;0,0,0$	No. 221 $Pm\bar{3}m$	$GM3^+$	P221.6.1 $GM3^+$
0.109	Mn_3Pt	No. 166.5.1331 $R\bar{3}m'$	$a,b,c;0,0,0$	No. 221 $Pm\bar{3}m$	$GM3^+$	P221.6.1 $GM3^+$
0.117	$LuFeO_3$	No. 185.5.1433 $P6_3c'm'$	$a,b,c;0,0,0$	No. 185 $P6_3cm$	GM6	P185.6.2 GM6
0.129	$Cu_3Mo_2O_9$	No. 19.3.121 $P2_1'2_1'2_1$	$a,b,c;0,0,1/4$	No. 19 $P2_12_12_1$	GM2 ⊕ GM3	P19.3.2 GM2 ⊕ GM3
0.130	$Cu_3Mo_2O_9$	No. 26.3.170 $Pm'c2_1'$	$-b,-c,a;0,1/4,1/4$	No. 26 $Pmc2_1$	GM3	P26.2.2 GM3
0.134	$Mn_3B_7O_{13}I$	No. 29.3.200 $Pc'a2_1'$	$a,b,c;0,0,0$	No. 29 $Pca2_1$	GM2 ⊕ GM3	P29.3.2 GM2 ⊕ GM3
0.140	$LuFe_4Ge_2$	No. 58.7.477 $Pn'n'm'$	$a,b,c;0,0,0$	No. 58 $Pnnm$	$GM3^- \oplus GM4^-$	P58.3.18 $GM3^- \oplus GM4^-$
0.159	$DyCoO_3$	No. 62.9.510 $Pn'm'a'$	$-b,c,-a;0,0,0$	No. 62 $Pnma$	$GM2^- \oplus GM3^-$	P62.3.16 $GM2^- \oplus GM3^-$
0.160	$TbCoO_3$	No. 62.4.505 $Pnm'a$	$-b,c,-a;0,0,0$	No. 62 $Pnma$	$GM2^- \oplus GM3^-$	P62.3.16 $GM2^- \oplus GM3^-$
0.164	Y_2MnCoO_6	No. 14.5.90 $P2_1'/c'$	$a,b,a+c;0,0,0$	No. 14 $P2_1/c$	$GM2^+$	P14.2.2 $GM2^+$
0.165	$SrMn(VO_4)(OH)$	No. 4.1.15 $P2_1$	$b,-a,c;0,1/4,0$	No. 4 $P2_1$	GM2	P4.2.1 GM2
0.171	$DyScO_3$	No. 62.9.510 $Pn'm'a'$	$a,b,c;0,0,0$	No. 62 $Pnma$	$GM2^- \oplus GM3^-$	P62.3.16 $GM2^- \oplus GM3^-$
0.174	$Pr_3Ru_4Al_{12}$	No. 15.5.96 $C2'/c'$	$a+b,-a+b,c;0,0,0$	No. 63 $Cmcm$	$GM1^+$	P63.1.1 $GM1^+$

SSGs of coplanar magnetic structures (continued).

BCSID	Chemical formula	MSG	Trans from parent structure	PSG	Rep	SSG
0.188	CeMnAsO	No. 13.3.79 $P2'/c$	$a,b,c;0,0,0$	No. 59 $Pmmn$	$\mathrm{GM2}^-\oplus\mathrm{GM2}^-$	P59.3.16 $\mathrm{GM2}^-\oplus\mathrm{GM2}^-$
0.191	$BaCuF_4$	No. 36.5.253 $Cm'c'2_1$	$a,b,c;0,0,0$	No. 36 $Cmc2_1$	GM3	P36.2.2 GM3
0.192	$RbFe_2F_6$	No. 62.1.502 $Pnma$	$a,b,c;0,0,0$	No. 62 $Pnma$	$\mathrm{GM3}^+\oplus\mathrm{GM4}^+$	P62.3.21 $\mathrm{GM3}^+\oplus\mathrm{GM4}^+$
0.196	$Co_4Nb_2O_9$	No. 15.4.95 $C2/c'$	$a,b,c;0,0,0$	No. 165 $P\bar{3}c1$	$\mathrm{GM2}^-\oplus\mathrm{GM2}^-$	P165.3.6 $\mathrm{GM2}^-\oplus\mathrm{GM2}^-$
0.197	$Co_4Nb_2O_9$	No. 15.4.95 $C2/c'$	$a,b,c;0,0,0$	No. 165 $P\bar{3}c1$	$\mathrm{GM1}^-\oplus\mathrm{GM2}^-$	P165.3.3 $\mathrm{GM1}^-\oplus\mathrm{GM2}^-$
0.199	Mn_3Sn	No. 63.7.517 $Cmc'm'$	$a,b,c;0,0,0$	No. 194 $P6_3/mmc$	$\mathrm{GM5}^+$	P194.6.1 $\mathrm{GM5}^+$
0.200	Mn_3Sn	No. 63.8.518 $Cm'cm'$	$a,b,c;0,0,0$	No. 194 $P6_3/mmc$	$\mathrm{GM5}^+$	P194.6.1 $\mathrm{GM5}^+$
0.210	Sr_2CoOsO_6	No. 15.1.92 $C2/c$	$a,c,-b;1/4,0,1/4$	No. 15 $C2/c$	$\mathrm{GM2}^+\oplus\mathrm{GM2}^+$	P15.3.6 $\mathrm{GM2}^+\oplus\mathrm{GM2}^+$
0.237	$Er_2Sn_2O_7$	No. 141.5.1217 $I4_1'/amd'$	$a/2-b/2,a/2+b/2,c;1/4,1/4,0$	No. 141 $I4_1/amd$	$\mathrm{GM5}^+$	P141.6.1 $\mathrm{GM5}^+$
0.238	$Er_2Pt_2O_7$	No. 141.5.1217 $I4_1'/amd'$	$a/2-b/2,a/2+b/2,c;1/4,1/4,0$	No. 141 $I4_1/amd$	$\mathrm{GM5}^+$	P141.6.1 $\mathrm{GM5}^+$
0.242	$Tm_2Cu_2O_5$	No. 33.5.230 $Pn'a'2_1$	$a,b,c;0,0,0$	No. 33 $Pna2_1$	GM4	P33.2.3 GM4
0.253	$Cs_2FeCl_5.D_2O$	No. 5.1.19 $C2$	$a+c,b,c;0,0,0$	No. 15 $C2/c$	$\mathrm{GM2}^-$	P15.2.3 $\mathrm{GM2}^-$
0.270	Tb_2MnNiO_6	No. 14.5.90 $P2_1'/c'$	$a,b,-a+c;0,0,0$	No. 14 $P2_1/c$	$\mathrm{GM1}^+$	P14.1.1 $\mathrm{GM1}^+$
0.271	Tb_2MnNiO_6	No. 14.5.90 $P2_1'/c'$	$a,b,-a+c;0,0,0$	No. 14 $P2_1/c$	$\mathrm{GM1}^+$	P14.1.1 $\mathrm{GM1}^+$
0.283	$U_{14}Au_{51}$	No. 175.4.1370 $P6/m'$	$a,b,c;0,0,0$	No. 175 $P6/m$	$\mathrm{GM4}^-\mathrm{GM6}^-$	P175.4.4 $\mathrm{GM4}^-\mathrm{GM6}^-$
0.288	$NdMnO_3$	No. 62.8.509 $Pn'ma'$	$a,b,c;0,0,0$	No. 62 $Pnma$	$\mathrm{GM2}^+$	P62.2.2 $\mathrm{GM2}^+$
0.289	$NdMnO_3$	No. 62.8.509 $Pn'ma'$	$a,b,c;0,0,0$	No. 62 $Pnma$	$\mathrm{GM2}^+$	P62.2.2 $\mathrm{GM2}^+$
0.298	$Na_2BaFe(VO_4)_2$	No. 15.5.96 $C2'/c'$	$a,b,c;0,0,0$	No. 15 $C2/c$	$\mathrm{GM2}^+$	P15.2.2 $\mathrm{GM2}^+$
0.314	$ZrCo_2Ge_4O_{12}$	No. 50.6.382 $Pb'an'$	$a,b,c;0,0,0$	No. 125 $P4/nbm$	$\mathrm{GM4}^+$	P125.2.6 $\mathrm{GM4}^+$
0.319	Tm_2CoMnO_6	No. 14.5.90 $P2_1'/c'$	$a,b,a+c;0,0,0$	No. 14 $P2_1/c$	$\mathrm{GM1}^+$	P14.1.1 $\mathrm{GM1}^+$
0.320	U_2Pd_2In	No. 127.8.1060 $P4'/m'bm'$	$a,b,c;0,0,0$	No. 127 $P4/mbm$	$\mathrm{GM5}^-$	P127.6.2 $\mathrm{GM5}^-$
0.321	U_2Pd_2Sn	No. 127.8.1060 $P4'/m'bm'$	$a,b,c;0,0,0$	No. 127 $P4/mbm$	$\mathrm{GM5}^-$	P127.6.2 $\mathrm{GM5}^-$
0.324	$CdYb_2S_4$	No. 141.1.1213 $I4_1/amd$	$a/2+b/2,-a/2+b/2,c;1/4,0,1/4$	No. 141 $I4_1/amd$	$\mathrm{GM5}^+$	P141.6.1 $\mathrm{GM5}^+$
0.325	$CdYb_2Se_4$	No. 141.1.1213 $I4_1/amd$	$a/2+b/2,-a/2+b/2,c;1/4,0,1/4$	No. 141 $I4_1/amd$	$\mathrm{GM5}^+$	P141.6.1 $\mathrm{GM5}^+$
0.337	$NdFeO_3$	No. 14.5.90 $P2_1'/c'$	$b,c,a;0,0,0$	No. 62 $Pnma$	$\mathrm{GM3}^+\oplus\mathrm{GM4}^+$	P62.3.21 $\mathrm{GM3}^+\oplus\mathrm{GM4}^+$
0.350	$TbAlO_3$	No. 62.9.510 $Pn'm'a'$	$-b,-c,a;0,0,0$	No. 62 $Pnma$	$\mathrm{GM2}^-\oplus\mathrm{GM3}^-$	P62.3.16 $\mathrm{GM2}^-\oplus\mathrm{GM3}^-$
0.353	$TbFeO_3$	No. 19.3.121 $P2_1'2_1'2_1$	$a,b,c;1/4,0,0$	No. 19 $P2_12_12_1$	$\mathrm{GM3}\oplus\mathrm{GM4}$	P19.3.2 $\mathrm{GM2}\oplus\mathrm{GM3}$
0.370	$NdMnO_3$	No. 62.8.509 $Pn'ma'$	$a,b,c;0,0,0$	No. 62 $Pnma$	$\mathrm{GM2}^+$	P62.2.2 $\mathrm{GM2}^+$

SSGs of coplanar magnetic structures (continued).

BCSID	Chemical formula	MSG	Trans from parent structure	PSG	Rep	SSG
0.371	$NdMnO_3$	No. 62.8.509 $Pn'ma'$	$a,b,c;0,0,0$	No. 62 $Pnma$	$GM2^+$	P62.2.2 $GM2^+$
0.375	La_2CoIrO_6	No. 14.1.86 $P2_1/c$	$a,b,-a+c;0,0,0$	No. 14 $P2_1/c$	$GM2^+$	P14.2.2 $GM2^+$
0.396	MnPtGa	No. 63.6.516 $Cm'c'm$	$a,a+2b,c;0,0,0$	No. 63 $Cmcm$	$GM3^+$	P63.2.4 $GM3^+$
0.398	Ca_2RuO_4	No. 61.1.497 $Pbca$	$a,b,c;0,0,0$	No. 61 $Pbca$	$GM2^+ \oplus GM4^+$	P61.3.5 $GM2^+ \oplus GM3^+$
0.407	NdSi	No. 62.6.507 $Pn'm'a$	$a,b,c;0,0,0$	No. 62 $Pnma$	$GM4^+$	P62.2.6 $GM4^+$
0.408	PrSi	No. 62.7.508 $Pnm'a'$	$a,b,c;0,0,0$	No. 62 $Pnma$	$GM4^+$	P62.2.6 $GM4^+$
0.409	TmNi	No. 62.6.507 $Pn'm'a$	$a,b,c;0,0,0$	No. 62 $Pnma$	$GM4^+$	P62.2.6 $GM4^+$
0.422	$EuMnSb_2$	No. 11.4.62 $P2_1/m'$	$a,b,c;0,0,0$	No. 62 $Pnma$	$GM3^- \oplus GM3^-$	P62.3.23 $GM3^- \oplus GM3^-$
0.424	$EuMnSb_2$	No. 62.9.510 $Pn'm'a'$	$a,b,c;0,0,0$	No. 62 $Pnma$	$GM2^- \oplus GM3^-$	P62.3.16 $GM2^- \oplus GM3^-$
0.438	Pr_3CoGe_2	No. 62.7.508 $Pnm'a'$	$a,b,c;0,0,0$	No. 62 $Pnma$	$GM4^+$	P62.2.6 $GM4^+$
0.441	$Fe_4Nb_2O_9$	No. 15.4.95 $C2/c'$	$a,b,c;0,0,0$	No. 165 $P\bar{3}c1$	$GM1^- \oplus GM2^-$	P165.3.3 $GM1^- \oplus GM2^-$
0.449	Tb_2Pt	No. 11.5.63 $P2_1'/m'$	$a,b,c;0,0,0$	No. 11 $P2_1/m$	$GM1^+$	P11.1.1 $GM1^+$
0.473	$LaMn_2Si_2$	No. 44.3.326 $Im'm2'$	$a,b,c;0,0,0$	No. 139 $I4/mmm$	$GM4^-$	P139.2.7 $GM4^-$
0.480	HoNi	No. 62.7.508 $Pnm'a'$	$a,b,c;0,0,0$	No. 62 $Pnma$	$GM4^+$	P62.2.6 $GM4^+$
0.481	HoNi	No. 14.5.90 $P2_1'/c'$	$a,b,c;0,0,0$	No. 62 $Pnma$	$GM4^+$	P62.2.6 $GM4^+$
0.487	$ErCr_2Si_2$	No. 44.4.327 $Im'm'2$	$a,b,c;0,0,0$	No. 139 $I4/mmm$	$GM4^-$	P139.2.7 $GM4^-$
0.491	NdB_4	No. 83.4.706 $P4/m'$	$a,b,c;0,0,0$	No. 127 $P4/mbm$	$GM5^-$	P127.6.2 $GM5^-$
0.492	NdB_4	No. 14.3.88 $P2_1'/c$	$a,b,c;0,0,0$	No. 55 $Pbam$	$GM3^- \oplus GM4^-$	P55.3.31 $GM3^- \oplus GM4^-$
0.495	$LaMn_2Si_2$	No. 44.3.326 $Im'm2'$	$a,b,c;0,0,0$	No. 139 $I4/mmm$	$GM4^-$	P139.2.7 $GM4^-$
0.496	$LaMn_2Si_2$	No. 44.3.326 $Im'm2'$	$a,b,c;0,0,0$	No. 139 $I4/mmm$	$GM4^-$	P139.2.7 $GM4^-$
0.497	$LaMn_2Si_2$	No. 44.3.326 $Im'm2'$	$a,b,c;0,0,0$	No. 139 $I4/mmm$	$GM4^-$	P139.2.7 $GM4^-$
0.506	$Cs_2Cu_3SnF_{12}$	No. 14.5.90 $P2_1'/c'$	$a,b,-a+c;0,0,0$	No. 14 $P2_1/c$	$GM2^+$	P14.2.2 $GM2^+$
0.511	$Co_4Ta_2O_9$	No. 15.3.94 $C2'/c$	$a,b,c;0,0,0$	No. 165 $P\bar{3}c1$	$GM1^- \oplus GM2^-$	P165.3.3 $GM1^- \oplus GM2^-$
0.520	$TbCoO_3$	No. 62.4.505 $Pnm'a$	$b,c,a;0,0,0$	No. 62 $Pnma$	$GM2^- \oplus GM3^-$	P62.3.16 $GM2^- \oplus GM3^-$
0.521	$DyCoO_3$	No. 62.9.510 $Pn'm'a'$	$b,c,a;0,0,0$	No. 62 $Pnma$	$GM2^- \oplus GM3^-$	P62.3.16 $GM2^- \oplus GM3^-$
0.529	$Co_4Nb_2O_9$	No. 15.4.95 $C2/c'$	$a,b,c;0,0,0$	No. 165 $P\bar{3}c1$	$GM1^- \oplus GM2^-$	P165.3.3 $GM1^- \oplus GM2^-$
0.550	Mn_3ReO_6	No. 2.4.7 $P_{2s}\bar{1}$	$a,b,c;0,0,0$	No. 2 $P\bar{1}$	$V1^- \oplus V1^-$	P2.3.3 $R1^+ \oplus R1^+$
0.551	Mn_3ReO_6	No. 2.4.7 $P_{2s}\bar{1}$	$a,b,c;0,0,0$	No. 2 $P\bar{1}$	$V1^- \oplus V1^-$	P2.3.3 $R1^+ \oplus R1^+$
0.552	Pb_2MnO_4	No. 114.4.939 $P\bar{4}'2_1c'$	$a,b,c;0,0,0$	No. 114 $P\bar{4}2_1c$	$GM5$	P114.6.1 $GM5$

SSGs of coplanar magnetic structures (continued).

BCSID	Chemical formula	MSG	Trans from parent structure	PSG	Rep	SSG
0.564	$U_2Rh_3Si_5$	No. 15.6.97 C_P2/c	$a+c, b, c; 0, 0, 0$	No. 15 $C2/c$	$Y1^- \oplus Y2^-$	P15.3.15 $Y1^+ \oplus Y2^+$
0.565	$Ce_2Ni_3Ge_5$	No. 72.12.641 $I_Pb'am'$	$a, b, c; 0, 0, 0$	No. 72 $Ibam$	$X1^+ \oplus X2^+$	P72.3.55 $X1^+ \oplus X2^+$
0.577	$BaMnFeF_7$	No. 14.5.90 $P2_1'/c'$	$a, b, c; 0, 0, 0$	No. 14 $P2_1/c$	$GM1^+$	P14.1.1 $GM1^+$
0.588	$PrCrO_3$	No. 62.8.509 $Pn'ma'$	$b, c, a; 0, 0, 0$	No. 62 $Pnma$	$GM3^+$	P62.2.4 $GM3^+$
0.589	$NdCrO_3$	No. 11.1.59 $P2_1/m$	$b, c, a; 0, 0, 0$	No. 62 $Pnma$	$GM3^+ \oplus GM4^+$	P62.3.21 $GM3^+ \oplus GM4^+$
0.590	$ErCrO_3$	No. 11.1.59 $P2_1/m$	$b, c, a; 0, 0, 0$	No. 62 $Pnma$	$GM3^+ \oplus GM4^+$	P62.3.21 $GM3^+ \oplus GM4^+$
0.625	U_2Pd_2In	No. 127.8.1060 $P4'/m'bm'$	$a, b, c; 0, 0, 0$	No. 127 $P4/mbm$	$GM5^-$	P127.6.2 $GM5^-$
0.656	$NdMn_2Ge_2$	No. 44.3.326 $Im'm2'$	$a, b, c; 0, 0, 0$	No. 139 $I4/mmm$	$GM4^-$	P139.2.7 $GM4^-$
0.657	$PrMn_2Ge_2$	No. 44.3.326 $Im'm2'$	$a, b, c; 0, 0, 0$	No. 139 $I4/mmm$	$GM4^-$	P139.2.7 $GM4^-$
0.663	Mn_3Sn_2	No. 62.8.509 $Pn'ma'$	$a, b, c; 0, 0, 0$	No. 62 $Pnma$	$GM2^+$	P62.2.2 $GM2^+$
0.664	Mn_3Sn_2	No. 14.5.90 $P2_1'/c'$	$a, b, c; 0, 0, 0$	No. 62 $Pnma$	$GM2^+$	P62.2.2 $GM2^+$
0.669	Sr_2YbRuO_6	No. 14.1.86 $P2_1/c$	$a, -c, -a+b; 0, 0, 0$	No. 14 $P2_1/c$	$GM2^+ \oplus GM2^+$	P14.3.5 $GM2^+ \oplus GM2^+$
0.670	Sr_2YbRuO_6	No. 14.1.86 $P2_1/c$	$a, b, -a+c; 0, 0, 0$	No. 14 $P2_1/c$	$GM2^+ \oplus GM2^+$	P14.3.5 $GM2^+ \oplus GM2^+$
0.684	TbPt	No. 62.6.507 $Pn'm'a$	$a, b, c; 0, 0, 0$	No. 62 $Pnma$	$GM4^+$	P62.2.6 $GM4^+$
0.685	ErPt	No. 62.7.508 $Pnm'a'$	$a, b, c; 0, 0, 0$	No. 62 $Pnma$	$GM4^+$	P62.2.6 $GM4^+$
0.686	HoPt	No. 62.7.508 $Pnm'a'$	$a, b, c; 0, 0, 0$	No. 62 $Pnma$	$GM4^+$	P62.2.6 $GM4^+$
0.687	DyPt	No. 62.6.507 $Pn'm'a$	$a, b, c; 0, 0, 0$	No. 62 $Pnma$	$GM4^+$	P62.2.6 $GM4^+$
0.688	TmPt	No. 62.7.508 $Pnm'a'$	$a, b, c; 0, 0, 0$	No. 62 $Pnma$	$GM4^+$	P62.2.6 $GM4^+$
0.698	$SmCrO_3$	No. 62.6.507 $Pn'm'a$	$b, c, a; 0, 0, 0$	No. 62 $Pnma$	$GM3^+ \oplus GM4^+$	P62.3.21 $GM3^+ \oplus GM4^+$
0.702	$TbMn_6Sn_6$	No. 12.5.70 $C2'/m'$	$a, b, c; 0, 0, 0$	No. 191 $P6/mmm$	$GM1^+$	P191.1.1 $GM1^+$
0.703	$HoMn_6Sn_6$	No. 12.5.70 $C2'/m'$	$a, b, c; 0, 0, 0$	No. 191 $P6/mmm$	$GM1^+$	P191.1.1 $GM1^+$
0.704	$HoMn_6Sn_6$	No. 12.5.70 $C2'/m'$	$a, b, c; 0, 0, 0$	No. 191 $P6/mmm$	$GM1^+$	P191.1.1 $GM1^+$
0.707	$Tb_2Ir_3Ga_9$	No. 63.8.518 $Cm'cm'$	$a, b, c; 0, 0, 0$	No. 63 $Cmcm$	$GM2^+$	P63.2.2 $GM2^+$
0.716	$HoCrWO_6$	No. 33.1.226 $Pna2_1$	$a, b, c; 0, 0, 0$	No. 33 $Pna2_1$	$GM2 \oplus GM4$	P33.3.3 $GM2 \oplus GM4$
0.724	$BaCoSiO_4$	No. 173.1.1360 $P6_3$	$a, b, c; 0, 0, 0$	No. 173 $P6_3$	GM4GM6	P173.4.2 GM4GM6
0.759	$CeFeO_3$	No. 62.1.502 $Pnma$	$b, c, a; 0, 0, 0$	No. 62 $Pnma$	$GM3^+ \oplus GM4^+$	P62.3.21 $GM3^+ \oplus GM4^+$
0.761	$SrFe_2Se_2O$	No. 59.7.484 $Pm'm'n'$	$a, b, c; 0, 0, 0$	No. 59 $Pmmn$	$GM2^- \oplus GM4^-$	P59.3.18 $GM2^- \oplus GM3^-$
0.762	$SrFe_2S_2O$	No. 59.7.484 $Pm'm'n'$	$a, b, c; 0, 0, 0$	No. 59 $Pmmn$	$GM2^- \oplus GM4^-$	P59.3.18 $GM2^- \oplus GM3^-$
0.768	$SrMnSb_2$	No. 33.5.230 $Pn'a'2_1$	$a, b, c; 0, 0, 0$	No. 62 $Pnma$	$GM3^-$	P62.2.5 $GM3^-$

SSGs of coplanar magnetic structures (continued).

BCSID	Chemical formula	MSG	Trans from parent structure	PSG	Rep	SSG
0.773	$NdMnSi_2$	No. 12.5.70 $C2'/m'$	$a,b,c;0,0,0$	No. 63 $Cmcm$	$GM1^+$	P63.1.1 $GM1^+$
0.782	$NdScO_3$	No. 62.4.505 $Pnm'a$	$b,c,a;0,0,0$	No. 62 $Pnma$	$GM2^- \oplus GM3^-$	P62.3.16 $GM2^- \oplus GM3^-$
0.783	$NdInO_3$	No. 62.4.505 $Pnm'a$	$b,c,a;0,0,0$	No. 62 $Pnma$	$GM2^- \oplus GM3^-$	P62.3.16 $GM2^- \oplus GM3^-$
0.785	$NdVO_3$	No. 11.5.63 $P2_1'/m'$	$b,c,a;0,0,0$	No. 62 $Pnma$	$GM4^+ \oplus GM4^+$	P62.3.26 $GM4^+ \oplus GM4^+$
0.788	YVO_3	No. 2.1.4 $P\bar{1}$	$c,a,b;0,0,0$	No. 14 $P2_1/c$	$GM2^+ \oplus GM2^+$	P14.3.5 $GM2^+ \oplus GM2^+$
0.791	Sr_2TbRuO_6	No. 14.1.86 $P2_1/c$	$a,b,-a+c;0,0,0$	No. 14 $P2_1/c$	$GM2^+ \oplus GM2^+$	P14.3.5 $GM2^+ \oplus GM2^+$
0.794	Sr_2HoRuO_6	No. 14.1.86 $P2_1/c$	$a,b,-a+c;0,0,0$	No. 14 $P2_1/c$	$GM2^+ \oplus GM2^+$	P14.3.5 $GM2^+ \oplus GM2^+$
0.803	NbMnP	No. 31.3.214 $Pm'n2_1'$	$a,b,c;0,0,0$	No. 62 $Pnma$	$GM2^- \oplus GM4^+$	P62.3.17 $GM2^- \oplus GM4^+$
0.805	$DyBaCuO_5$	No. 62.4.505 $Pnm'a$	$a,b,c;0,0,0$	No. 62 $Pnma$	$GM2^- \oplus GM3^-$	P62.3.16 $GM2^- \oplus GM3^-$
0.810	Fe_2WO_6	No. 60.7.494 $Pbc'n'$	$a,b,c;0,0,0$	No. 60 $Pbcn$	$GM4^+$	P60.2.6 $GM4^+$
0.812	Fe_2WO_6	No. 30.3.207 $Pn'c2'$	$a,b,c;0,0,0$	No. 60 $Pbcn$	$GM4^+ \oplus GM4^-$	P60.3.27 $GM4^+ \oplus GM4^-$
0.818	$MnTa_2O_6$	No. 60.3.490 $Pb'cn$	$a,b,c;0,0,0$	No. 60 $Pbcn$	$GM1^- \oplus GM4^-$	P60.3.7 $GM1^- \oplus GM4^-$
0.819	$MnNb_2O_6$	No. 60.3.490 $Pb'cn$	$a,b,c;0,0,0$	No. 60 $Pbcn$	$GM1^- \oplus GM4^-$	P60.3.7 $GM1^- \oplus GM4^-$
0.831	$BaCaFe_4O_7$	No. 33.5.230 $Pn'a'2_1$	$-b,a,c;0,0,0$	No. 33 $Pna2_1$	$GM4$	P33.2.3 $GM4$
0.842	$DyAlO_3$	No. 62.9.510 $Pn'm'a'$	$b,c,a;0,0,0$	No. 62 $Pnma$	$GM2^- \oplus GM3^-$	P62.3.16 $GM2^- \oplus GM3^-$
0.847	$Er_5Pd_2In_4$	No. 10.5.53 $P2'/m'$	$a,c,-b;0,0,0$	No. 10 $P2/m$	$GM1^+$	P10.1.1 $GM1^+$
0.848	$Er_5Pd_2In_4$	No. 10.5.53 $P2'/m'$	$a,c,-b;0,0,0$	No. 10 $P2/m$	$GM1^+$	P10.1.1 $GM1^+$
0.849	$Er_5Pd_2In_4$	No. 55.6.446 $Pb'am'$	$a,b,c;0,0,0$	No. 55 $Pbam$	$GM2^+$	P55.2.2 $GM2^+$
0.850	$Er_5Pd_2In_4$	No. 55.6.446 $Pb'am'$	$a,b,c;0,0,0$	No. 55 $Pbam$	$GM2^+$	P55.2.2 $GM2^+$
0.854	$Gd_2Pt_2O_7$	No. 141.5.1217 $I4_1'/amd'$	$a/2-b/2,a/2+b/2,c;1/4,1/4,1/2$	No. 141 $I4_1/amd$	$GM5^+$	P141.6.1 $GM5^+$
0.868	Pr_2NiIrO_6	No. 14.1.86 $P2_1/c$	$a,b,-a+c;0,0,0$	No. 14 $P2_1/c$	$GM2^+$	P14.2.2 $GM2^+$
0.869	Pr_2NiIrO_6	No. 14.1.86 $P2_1/c$	$a,b,-a+c;0,0,0$	No. 14 $P2_1/c$	$GM2^+$	P14.2.2 $GM2^+$
0.871	Pr_2NiIrO_6	No. 14.1.86 $P2_1/c$	$a,b,-a+c;0,0,0$	No. 14 $P2_1/c$	$GM2^+$	P14.2.2 $GM2^+$
0.872	Pr_2NiIrO_6	No. 14.1.86 $P2_1/c$	$a,b,-a+c;0,0,0$	No. 14 $P2_1/c$	$GM2^+$	P14.2.2 $GM2^+$
0.873	Pr_2NiIrO_6	No. 14.1.86 $P2_1/c$	$a,b,-a+c;0,0,0$	No. 14 $P2_1/c$	$GM2^+$	P14.2.2 $GM2^+$
0.903	Pr_2PdGe_6	No. 64.6.533 $Cm'c'a$	$a,b,c;0,0,0$	No. 64 $Cmce$	$GM3^+ \oplus GM4^+$	P64.3.45 $GM3^+ \oplus GM4^+$
0.905	Tb_2PdGe_6	No. 64.3.530 $Cm'ca$	$a,b,c;0,0,0$	No. 64 $Cmce$	$GM1^- \oplus GM2^-$	P64.3.3 $GM1^- \oplus GM2^-$
0.906	Dy_2PdGe_6	No. 64.3.530 $Cm'ca$	$a,b,c;0,0,0$	No. 64 $Cmce$	$GM1^- \oplus GM2^-$	P64.3.3 $GM1^- \oplus GM2^-$
0.907	Ho_2PdGe_6	No. 64.3.530 $Cm'ca$	$a,b,c;0,0,0$	No. 64 $Cmce$	$GM1^- \oplus GM2^-$	P64.3.3 $GM1^- \oplus GM2^-$

SSGs of coplanar magnetic structures (continued).

BCSID	Chemical formula	MSG	Trans from parent structure	PSG	Rep	SSG
0.908	Tb_2PtGe_6	No. 64.3.530 $Cm'ca$	$a,b,c;0,0,0$	No. 64 $Cmce$	$GM1^- \oplus GM2^-$	P64.3.3 $GM1^- \oplus GM2^-$
0.912	$Ho_5Ni_2In_4$	No. 14.1.86 $P2_1/c$	$a,b,c;0,0,0$	No. 55 $Pbam$	$GM2^+ \oplus GM2^+$	P55.3.9 $GM2^+ \oplus GM2^+$
0.913	$Ho_5Ni_2In_4$	No. 14.5.90 $P2_1'/c'$	$a,b,c;0,0,0$	No. 55 $Pbam$	$GM1^+$	P55.1.1 $GM1^+$
0.915	$Tb_5Ni_2In_4$	No. 14.5.90 $P2_1'/c'$	$a,b,c;0,0,0$	No. 55 $Pbam$	$GM1^+$	P55.1.1 $GM1^+$
0.918	Ag_2RuO_4	No. 62.4.505 $Pnm'a$	$a,b,c;0,0,0$	No. 62 $Pnma$	$GM2^- \oplus GM3^-$	P62.3.16 $GM2^- \oplus GM3^-$
0.924	$RbRuO_4$	No. 62.9.510 $Pn'm'a'$	$a,b,c;0,0,0$	No. 62 $Pnma$	$GM2^- \oplus GM3^-$	P62.3.16 $GM2^- \oplus GM3^-$
0.926	Pr_2PdGe_6	No. 64.6.533 $Cm'c'a$	$a,b,c;0,0,0$	No. 64 $Cmce$	$GM3^+ \oplus GM4^+$	P64.3.45 $GM3^+ \oplus GM4^+$
0.928	Dy_2PdGe_6	No. 64.3.530 $Cm'ca$	$a,b,c;0,0,0$	No. 64 $Cmce$	$GM1^- \oplus GM2^-$	P64.3.3 $GM1^- \oplus GM2^-$
0.929	Tb_2PdGe_6	No. 64.3.530 $Cm'ca$	$a,b,c;0,0,0$	No. 64 $Cmce$	$GM1^- \oplus GM2^-$	P64.3.3 $GM1^- \oplus GM2^-$
0.930	Ho_2PdGe_6	No. 64.3.530 $Cm'ca$	$a,b,c;0,0,0$	No. 64 $Cmce$	$GM1^- \oplus GM2^-$	P64.3.3 $GM1^- \oplus GM2^-$
0.931	Tb_2PtGe_6	No. 64.3.530 $Cm'ca$	$a,b,c;0,0,0$	No. 64 $Cmce$	$GM1^- \oplus GM2^-$	P64.3.3 $GM1^- \oplus GM2^-$
0.951	$LaYbO_3$	No. 62.8.509 $Pn'ma'$	$a,b,c;0,0,0$	No. 62 $Pnma$	$GM3^+$	P62.2.4 $GM3^+$
0.952	YbPdSi	No. 59.5.482 $Pm'm'n$	$a,b,c;0,0,0$	No. 59 $Pmmn$	$GM3^+$	P59.2.4 $GM3^+$
0.981	$TmVO_3$	No. 62.1.502 $Pnma$	$a,b,c;0,0,0$	No. 62 $Pnma$	$GM3^+ \oplus GM4^+$	P62.3.21 $GM3^+ \oplus GM4^+$
1.0.3	$CsCoBr_3$	No. 36.3.251 $Cm'c2_1'$	$2a+b,-a+b,c;0,0,0$	No. 193 $P6_3/mcm$	$GM1^- \oplus GM4^+$	P193.3.6 $GM1^- \oplus GM4^+$
1.0.4	$CsNiCl_3$	No. 20.4.125 $C22'2_1'$	$-3a,-a-2b,c;0,0,0$	No. 63 $Cmcm$	$GM1^- \oplus GM3^+$	P63.3.4 $GM1^- \oplus GM3^+$
1.0.8	$Ba_3MnNb_2O_9$	No. 157.1.1284 $P31m$	$a,b,c;0,0,0$	No. 164 $P\bar{3}m1$	K1	P164.7.1 K1
1.0.14	$CsFeCl_3$	No. 189.3.1453 $P\bar{6}'2'm$	$a,b,c;0,0,0$	No. 194 $P6_3/mmc$	K1	P194.7.1 K1
1.0.24	$ThMn_2$	No. 189.3.1453 $P\bar{6}'2'm$	$a,b,c;0,0,0$	No. 194 $P6_3/mmc$	K4	P194.7.4 K4
1.0.27	Li_2MnTeO_6	No. 165.1.1322 $P\bar{3}c1$	$2a+b,-a+b,c;0,-1,0$	No. 165 $P\bar{3}c1$	$GM3^+$	P165.6.1 $GM3^+$
1.0.31	$EuIn_2As_2$	No. 20.3.124 $C2'2'2_1$	$-a,b,-3c;0,0,-1/2$	No. 193 $P6_3/mcm$	$GM3^- \oplus GM4^+$	P193.3.24 $GM3^- \oplus GM4^+$
1.0.32	$EuIn_2As_2$	No. 178.5.1390 $P6_12'2'$	$a,b,c;0,0,0$	No. 194 $P6_3/mmc$	DT1	P194.8.1 DT1
1.0.34	$RbNiCl_3$	No. 36.3.251 $Cm'c2_1'$	$2a+b,-a+b,c;0,0,0$	No. 193 $P6_3/mcm$	$GM1^- \oplus GM4^+$	P193.3.6 $GM1^- \oplus GM4^+$
1.0.35	$CsMnBr_3$	No. 189.5.1455 $P\bar{6}2'm'$	$a,b,c;0,0,0$	No. 194 $P6_3/mmc$	K2	P194.7.2 K2
1.0.36	$CsMnI_3$	No. 36.3.251 $Cm'c2_1'$	$2a+b,-a+b,c;0,0,0$	No. 193 $P6_3/mcm$	$GM1^- \oplus GM4^+$	P193.3.6 $GM1^- \oplus GM4^+$
1.0.37	$CsMnI_3$	No. 36.3.251 $Cm'c2_1'$	$2a+b,-a+b,c;0,0,0$	No. 193 $P6_3/mcm$	$GM1^- \oplus GM4^+$	P193.3.6 $GM1^- \oplus GM4^+$
1.0.40	$RbFeCl_3$	No. 189.4.1454 $P\bar{6}'2m'$	$a,b,c;0,0,0$	No. 194 $P6_3/mmc$	K1	P194.7.1 K1
1.0.41	$RbNiCl_3$	No. 20.4.125 $C22'2_1'$	$a,b,c;0,0,0$	No. 194 $P6_3/mmc$	K2	P194.7.2 K2
1.0.42	$CsNiCl_3$	No. 20.4.125 $C22'2_1'$	$a,b,c;0,0,0$	No. 194 $P6_3/mmc$	K2	P194.7.2 K2

SSGs of coplanar magnetic structures (continued).

BCSID	Chemical formula	MSG	Trans from parent structure	PSG	Rep	SSG
1.0.44	$Ba_3CoSb_2O_9$	No. 36.3.251 $Cm'c2_1'$	$a,b,c;0,0,0$	No. 194 $P6_3/mmc$	K2	P194.7.2 K2
1.0.45	$Ba_3CoSb_2O_9$	No. 189.1.1451 $P\bar{6}2m$	$a,b,c;0,0,0$	No. 194 $P6_3/mmc$	K2	P194.7.2 K2
1.0.46	$Ba_3MnSb_2O_9$	No. 5.1.19 $C2$	$3a,b,c;0,0,0$	No. 15 $C2/c$	$GM1^- \oplus GM2^+$	P15.3.2 $GM1^- \oplus GM2^+$
1.0.49	$BaCoSiO_4$	No. 173.1.1360 $P6_3$	$-a-2b,2a+b,c;0,0,0$	No. 173 $P6_3$	GM4GM6	P173.4.2 GM4GM6
1.11	$Bi_4Fe_5O_{13}F$	No. 84.7.719 P_P4_2/m'	$a,b,c;0,0,0$	No. 84 $P4_2/m$	$M3^-M4^-$	P84.4.4 $M3^-M4^-$
1.13	$Ba_3Nb_2NiO_9$	No. 157.5.1288 $P_{2c}31m'$	$a,b,c;0,0,0$	No. 164 $P\bar{3}m1$	H2	P164.7.3 H1
1.14	Ho_2BaNiO_5	No. 12.8.73 $C_{2c}2/m'$	$a+c,b,c;0,0,0$	No. 12 $C2/m$	$M1^+ \oplus M1^+$	P12.3.25 $A1^+ \oplus A1^+$
1.15	Er_2BaNiO_5	No. 12.8.73 $C_{2c}2/m'$	$a+c,b,c;0,0,0$	No. 12 $C2/m$	$M1^+ \oplus M1^+$	P12.3.25 $A1^+ \oplus A1^+$
1.19	$PrMn_2O_5$	No. 26.10.177 $P_{2b}m'c'2_1$	$-c,a,-b;1/4,0,0$	No. 26 $Pmc2_1$	$Y1 \oplus Y3$	P26.3.45 $Y1 \oplus Y3$
1.34	HoAuGe	No. 36.9.257 $C_Pm'c'2_1$	$-b,2a+b,c;0,0,0$	No. 36 $Cmc2_1$	$Y1 \oplus Y3$	P36.3.21 $Y1 \oplus Y3$
1.36	Dy_2BaNiO_5	No. 12.8.73 $C_{2c}2/m'$	$a+c,b,c;0,0,0$	No. 12 $C2/m$	$M1^+ \oplus M1^+$	P12.3.25 $A1^+ \oplus A1^+$
1.38	Nd_2NaOsO_6	No. 2.4.7 $P_{2s}\bar{1}$	$a,b,c;0,0,0$	No. 2 $P\bar{1}$	$V1^+ \oplus V1^+$	P2.3.3 $R1^+ \oplus R1^+$
1.44	$NdNiO_3$	No. 26.8.175 P_Cmc2_1	$-c,a,-b;1/4,0,1/4$	No. 26 $Pmc2_1$	$S1 \oplus S2$	P26.3.23 $S1 \oplus S2$
1.48	$HoNiO_3$	No. 4.4.18 $P_{2a}2_1$	$a,b,c;1/4,0,1/4$	No. 4 $P2_1$	$A1 \oplus A1$	P4.3.3 $B1 \oplus B1$
1.51	Cs_2CoCl_4	No. 4.4.18 $P_{2a}2_1$	$-c,a,-b+c;0,0,0$	No. 14 $P2_1/c$	$Y1^+ \oplus Y1^-$	P14.3.11 $Y1^+ \oplus Y1^-$
1.53	Er_2BaNiO_5	No. 12.8.73 $C_{2c}2/m'$	$a+c,b,c;0,0,0$	No. 12 $C2/m$	$M1^+ \oplus M1^+$	P12.3.25 $A1^+ \oplus A1^+$
1.54	$GdMn_2O_5$	No. 26.10.177 $P_{2b}m'c'2_1$	$-c,a,-b;1/4,0,0$	No. 26 $Pmc2_1$	$Y1 \oplus Y3$	P26.3.45 $Y1 \oplus Y3$
1.56	$Gd_2Ti_2O_7$	No. 166.6.1332 $R_R\bar{3}m$	$-a/2+b/2,-b/2+c/2,a+b+c;0,1/2,0$	No. 166 $R\bar{3}m$	$T3^+$	P166.6.3 $T3^+$
1.67	TmPtIn	No. 25.13.167 $P_Am'm'2$	$c,-a+b,-a-b;0,0,0$	No. 25 $Pmm2$	$U2 \oplus U4$	P25.3.63 $T1 \oplus T4$
1.68	$NaNdFeWO_6$	No. 1.3.3 $P_{2s}1$	$a,b,c;0,0,0$	No. 1 $P1$	$U1 \oplus U1$	P1.3.1 $R1 \oplus R1$
1.72	Sr_2CoOsO_6	No. 12.8.73 $C_{2c}2/m'$	$a-b,c,-a;0,0,0$	No. 12 $C2/m$	$A1^+ \oplus A1^+$	P12.3.25 $A1^+ \oplus A1^+$
1.74	$BiMn_2O_5$	No. 26.8.175 P_Cmc2_1	$-c,a,-b;1/4,0,0$	No. 26 $Pmc2_1$	$S2 \oplus S4$	P26.3.24 $S1 \oplus S3$
1.76	$DyMn_2O_5$	No. 26.10.177 $P_{2b}m'c'2_1$	$-c,a,-b;1/4,0,0$	No. 26 $Pmc2_1$	$Y1 \oplus Y3$	P26.3.45 $Y1 \oplus Y3$
1.77	Sr_2IrO_4	No. 73.7.649 $I_Pb'ca$	$a,b,c;0,0,0$	No. 73 $Ibca$	$X1^+ \oplus X2^+$	P73.3.22 $X1^+ \oplus X2^+$
1.93	$HoFe_3(BO_3)_4$	No. 1.3.3 $P_{2s}1$	$a,b,c;0,0,0$	No. 152 $P3_121$	$A1 \oplus A1$	P152.3.3 $A1 \oplus A1$
1.95	$BaNd_2O_4$	No. 14.6.91 $P_{2a}2_1/c$	$-c,a,-b+c;0,0,0$	No. 14 $P2_1/c$	$Y1^+ \oplus Y2^+$	P14.3.12 $Y1^+ \oplus Y2^+$
1.96	$BaNd_2O_4$	No. 14.6.91 $P_{2a}2_1/c$	$-c,a,-b+c;0,0,0$	No. 14 $P2_1/c$	$Y1^+ \oplus Y2^+$	P14.3.12 $Y1^+ \oplus Y2^+$
1.98	$DyFe_4Ge_2$	No. 25.11.165 $P_{2c}m'm'2$	$a-b,-c,a+b;0,0,0$	No. 25 $Pmm2$	$Z1 \oplus Z4$	P25.3.107 $Z1 \oplus Z3$
1.99	$CsCoCl_3(D_2O)_2$	No. 54.12.439 $P_{2b}cca'$	$a,b,c;0,0,0$	No. 54 $Pcca$	$Y1^- \oplus Y4^-$	P54.3.60 $Y1^+ \oplus Y4^+$

SSGs of coplanar magnetic structures (continued).

BCSID	Chemical formula	MSG	Trans from parent structure	PSG	Rep	SSG
1.105	Gd_2CuO_4	No. 64.14.541 $C_Pm'c'a$	$c, b, -a; 0, 0, 0$	No. 64 $Cmce$	$Y1^+ \oplus Y3^+$	P64.3.89 $Y1^+ \oplus Y3^+$
1.108	$TbMn_2O_5$	No. 6.6.30 P_Cm	$a, -2c, b; 0, 0, 0$	No. 6 Pm	$C1 \oplus C1$	P6.3.18 $C1 \oplus C1$
1.109	$HoMn_2O_5$	No. 6.6.30 P_Cm	$a, -2c, b; 0, 0, 0$	No. 6 Pm	$C1 \oplus C1$	P6.3.18 $C1 \oplus C1$
1.114	Ca_4IrO_6	No. 15.6.97 C_P2/c	$a-b, a+b, -a/3+b/3+c/3; 1/2, 0, 0$	No. 15 $C2/c$	$Y1^- \oplus Y2^-$	P15.3.15 $Y1^+ \oplus Y2^+$
1.116	$AgMnVO_4$	No. 11.6.64 $P_{2a}2_1/m$	$a, b, c; 0, 0, 0$	No. 11 $P2_1/m$	$A2^+ \oplus A2^+$	P11.3.19 $B1^- \oplus B1^-$
1.118	$GdPO_4$	No. 14.6.91 $P_{2a}2_1/c$	$a, b, a+c; 0, 0, 0$	No. 14 $P2_1/c$	$Y1^- \oplus Y2^-$	P14.3.12 $Y1^+ \oplus Y2^+$
1.122	$Cu_3Bi(SeO_3)_2O_2Br$	No. 59.10.487 $P_{2c}m'm'n$	$a, b, c; 0, 0, 0$	No. 59 $Pmmn$	$Z1^+ \oplus Z3^+$	P59.3.40 $Z1^+ \oplus Z3^+$
1.123	$Cu_3Y(SeO_3)_2O_2Cl$	No. 59.10.487 $P_{2c}m'm'n$	$a, b, c; 0, 0, 0$	No. 59 $Pmmn$	$Z1^+ \oplus Z3^+$	P59.3.40 $Z1^+ \oplus Z3^+$
1.124	$YBaFe_4O_7$	No. 4.4.18 $P_{2a}2_1$	$a, b, c; 0, 0, 0$	No. 4 $P2_1$	$B1 \oplus B2$	P4.3.4 $B1 \oplus B2$
1.127	$BiNiO(PO_4)$	No. 14.6.91 $P_{2a}2_1/c$	$a, b, a+c; 0, 0, 0$	No. 14 $P2_1/c$	$Y1^- \oplus Y2^-$	P14.3.12 $Y1^+ \oplus Y2^+$
1.128	$BiCoO(PO_4)$	No. 14.6.91 $P_{2a}2_1/c$	$a, b, a+c; 0, 0, 0$	No. 14 $P2_1/c$	$Y1^- \oplus Y2^-$	P14.3.12 $Y1^+ \oplus Y2^+$
1.129	$AgFe_3(SO_4)_2(OD)_6$	No. 166.7.1333 $R_R\bar{3}m'$	$a, b, c; 0, 0, 0$	No. 166 $R\bar{3}m$	$T3^+$	P166.6.3 $T3^+$
1.133	$CuSb_2O_6$	No. 14.6.91 $P_{2a}2_1/c$	$a, b, a+c; 0, 0, 0$	No. 14 $P2_1/c$	$Y1^+ \oplus Y2^+$	P14.3.12 $Y1^+ \oplus Y2^+$
1.163	TmPdIn	No. 174.4.1366 $P_{2c}\bar{6}$	$2a+b, -a+b, c; 1/3, -1/3, 0$	No. 174 $P\bar{6}$	A4A6	P174.4.3 A3A5
1.164	Co_3TeO_6	No. 2.4.7 $P_{2s}\bar{1}$	$a/2-b/2-c, b, 2c; 0, 0, 1/2$	No. 2 $P\bar{1}$	$R1^+ \oplus R1^+$	P2.3.3 $R1^+ \oplus R1^+$
1.170	$Tm_5Ni_2In_4$	No. 6.6.30 P_Cm	$a, c, -b; 0, 0, 0$	No. 6 Pm	$D1 \oplus D1$	P6.3.18 $C1 \oplus C1$
1.197	$Fe_4Si_2Sn_7O_{16}$	No. 12.6.71 $C_{2c}2/m$	$a+2b, -a, c; 0, 0, 0$	No. 12 $C2/m$	$M1^+ \oplus M2^+$	P12.3.30 $A1^+ \oplus A2^+$
1.202	$CrReO_4$	No. 12.8.73 $C_{2c}2/m'$	$a, b, c; 0, 0, 0$	No. 12 $C2/m$	$M1^- \oplus M2^-$	P12.3.30 $A1^+ \oplus A2^+$
1.216	Nd_2BaNiO_5	No. 12.8.73 $C_{2c}2/m'$	$a+c, b, c; 0, 0, 0$	No. 12 $C2/m$	$M1^+ \oplus M1^+$	P12.3.25 $A1^+ \oplus A1^+$
1.217	Tb_2BaNiO_5	No. 12.8.73 $C_{2c}2/m'$	$a+c, b, c; 0, 0, 0$	No. 12 $C2/m$	$M1^+ \oplus M1^+$	P12.3.25 $A1^+ \oplus A1^+$
1.218	Tm_2BaNiO_5	No. 2.4.7 $P_{2s}\bar{1}$	$a+c, b, c; 0, 0, 0$	No. 12 $C2/m$	$M1^+ \oplus M1^+$	P12.3.25 $A1^+ \oplus A1^+$
1.224	$CoNb_2O_6$	No. 18.6.118 $P_{2c}2_12'_12'$	$a, -c, b; 0, 1/4, 1/4$	No. 18 $P2_12_12$	$Z1 \oplus Z2$	P18.3.10 $Z1 \oplus Z2$
1.226	$CeCo_2Ge_4O_{12}$	No. 50.9.385 $P_{2c}b'an$	$a, b, c; 0, 0, 0$	No. 125 $P4/nbm$	$Z2^- \oplus Z3^-$	P125.3.64 $Z1^+ \oplus Z4^+$
1.266	$SmFe_3(BO_3)_4$	No. 1.3.3 $P_{2s}1$	$a, b, c; 0, 0, 0$	No. 155 $R32$	$T1 \oplus T1$	P155.3.3 $T1 \oplus T1$
1.272	CeNiAsO	No. 4.4.18 $P_{2a}2_1$	$a, b, c; 0, 0, 0$	No. 11 $P2_1/m$	$Y1^+ \oplus Y2^-$	P11.3.14 $B1^+ \oplus B2^-$
1.280	$Yb_2Cu_2O_5$	No. 7.4.35 $P_{2a}c$	$-c, a, -b+c; 1/4, 0, 0$	No. 7 Pc	$Y1 \oplus Y2$	P7.3.10 $Y1 \oplus Y2$
1.301	$BiMnTeO_6$	No. 14.6.91 $P_{2a}2_1/c$	$a, b, c; 0, 0, 0$	No. 14 $P2_1/c$	$Y1^- \oplus Y2^-$	P14.3.12 $Y1^+ \oplus Y2^+$
1.302	Ba_2CoO_4	No. 14.6.91 $P_{2a}2_1/c$	$a, b, -a+c; 0, 0, 0$	No. 14 $P2_1/c$	$Y1^+ \oplus Y2^+$	P14.3.12 $Y1^+ \oplus Y2^+$

SSGs of coplanar magnetic structures (continued).

BCSID	Chemical formula	MSG	Trans from parent structure	PSG	Rep	SSG
1.306	$Na_2BaMn(VO_4)_2$	No. 15.7.98 C_P2'/c	$a,b,c;0,0,0$	No. 15 $C2/c$	$Y1^+ \oplus Y2^+$	P15.3.15 $Y1^+ \oplus Y2^+$
1.324	$DyMn_2O_5$	No. 26.10.177 $P_{2b}m'c'2_1$	$-c,a,-b;1/4,0,0$	No. 26 $Pmc2_1$	$Y1 \oplus Y3$	P26.3.45 $Y1 \oplus Y3$
1.328	Yb_2CoMnO_6	No. 4.4.18 $P_{2a}2_1$	$a,b,c;1/4,0,1/4$	No. 4 $P2_1$	$B1 \oplus B1$	P4.3.3 $B1 \oplus B1$
1.330	Lu_2CoMnO_6	No. 4.4.18 $P_{2a}2_1$	$a,b,c;1/4,0,1/4$	No. 4 $P2_1$	$B1 \oplus B1$	P4.3.3 $B1 \oplus B1$
1.338	U_2Ni_2In	No. 127.13.1065 $P_{2c}4/mb'm'$	$a,b,c;0,0,0$	No. 127 $P4/mbm$	$Z5^+$	P127.6.6 $Z5^+$
1.340	$LuMnO_3$	No. 31.6.217 $P_{2b}mn2_1$	$-c,b,a;0,1/4,1/4$	No. 31 $Pmn2_1$	$Y3 \oplus Y4$	P31.3.15 $Y1 \oplus Y2$
1.343	$Ba_2Co_9O_{14}$	No. 12.8.73 $C_{2c}2/m'$	$a,b,c;0,0,0$	No. 166 $R\bar{3}m$	$T1^+ \oplus T1^+$	P166.3.13 $T1^+ \oplus T1^+$
1.350	Nd_2BaCoO_5	No. 12.8.73 $C_{2c}2/m'$	$a+c,b,c;0,0,0$	No. 12 $C2/m$	$M1^+ \oplus M1^+$	P12.3.25 $A1^+ \oplus A1^+$
1.352	$Ba_2Ni_2F_7Cl$	No. 11.7.65 $P_{2c}2_1/m'$	$a,b,c;0,0,0$	No. 11 $P2_1/m$	$Y1^+ \oplus Y1^+$	P11.3.13 $B1^+ \oplus B1^+$
1.357	Ho_3Ge_4	No. 11.7.65 $P_{2c}2_1/m'$	$a,b,c;0,0,0$	No. 63 $Cmcm$	$Y2^- \oplus Y4^-$	P63.3.110 $Y2^- \oplus Y4^-$
1.359	Dy_3Ge_4	No. 11.6.64 $P_{2a}2_1/m$	$a,b,c;0,0,0$	No. 63 $Cmcm$	$Y2^- \oplus Y4^-$	P63.3.110 $Y2^- \oplus Y4^-$
1.362	Er_3Ge_4	No. 63.11.521 $C_Pm'cm$	$a,b,c;0,0,0$	No. 63 $Cmcm$	$Y2^- \oplus Y4^-$	P63.3.110 $Y2^- \oplus Y4^-$
1.380	Sr_2FeO_3Cl	No. 115.10.950 $P_P\bar{4}'m2'$	$a,b,c;0,0,0$	No. 129 $P4/nmm$	M3	P129.6.8 M3
1.381	Sr_2FeO_3Br	No. 115.10.950 $P_P\bar{4}'m2'$	$a,b,c;0,0,0$	No. 129 $P4/nmm$	M3	P129.6.8 M3
1.385	Sr_2FeO_3F	No. 115.10.950 $P_P\bar{4}'m2'$	$a,b,c;0,0,0$	No. 129 $P4/nmm$	M3	P129.6.8 M3
1.386	Sr_2FeO_3F	No. 115.8.948 $P_I\bar{4}m2$	$a,b,c;0,0,0$	No. 129 $P4/nmm$	A3	P129.6.4 A3
1.387	Sr_2FeO_3F	No. 115.7.947 $P_P\bar{4}m2$	$a,b,c;0,0,0$	No. 129 $P4/nmm$	M3	P129.6.8 M3
1.443	Gd_2BaCuO_5	No. 26.10.177 $P_{2b}m'c'2_1$	$-b,-c,a;0,1/4,1/4$	No. 26 $Pmc2_1$	$Y1 \oplus Y3$	P26.3.45 $Y1 \oplus Y3$
1.444	Er_2Pt	No. 31.7.218 $P_{2b}m'n2_1'$	$b,-a,c;1/4,1/4,0$	No. 31 $Pmn2_1$	$Y1 \oplus Y3$	P31.3.14 $Y1 \oplus Y3$
1.456	$Sr_2CuO_2Cu_2S_2$	No. 118.6.970 $P_I\bar{4}n2$	$a,b,c;0,0,0$	No. 139 $I4/mmm$	P1	P139.7.9 P1
1.476	Ba_2CoO_4	No. 14.6.91 $P_{2a}2_1/c$	$a,b,-a+c;0,0,0$	No. 14 $P2_1/c$	$Y1^- \oplus Y2^-$	P14.3.12 $Y1^+ \oplus Y2^+$
1.477	Ba_2CoO_4	No. 14.6.91 $P_{2a}2_1/c$	$a,b,-a+c;0,0,0$	No. 14 $P2_1/c$	$Y1^- \oplus Y2^-$	P14.3.12 $Y1^+ \oplus Y2^+$
1.499	$CsFe(MoO_4)_2$	No. 143.3.1233 $P_{2c}3$	$a,b,c;0,0,0$	No. 147 $P\bar{3}$	P1	P147.8.2 P1
1.517	$DyBe_{13}$	No. 22.5.144 $F_C22'2'$	$a/2+b/2,-a/2+b/2,3c;1/4,1/4,-1/2$	No. 140 $I4/mcm$	$M1^- \oplus M3^+$	P140.3.96 $M1^- \oplus M3^+$
1.518	$TbBe_{13}$	No. 22.5.144 $F_C22'2'$	$a/2+b/2,-a/2+b/2,3c;1/4,1/4,-1/2$	No. 140 $I4/mcm$	$M1^- \oplus M3^+$	P140.3.96 $M1^- \oplus M3^+$
1.524	$InMnO_3$	No. 157.5.1288 $P_{2c}31m'$	$a,b,c;0,0,0$	No. 157 $P31m$	A3	P157.6.2 A3
1.525	$InMnO_3$	No. 157.4.1287 $P_{2c}31m$	$a,b,c;0,0,0$	No. 157 $P31m$	A3	P157.6.2 A3
1.528	$Bi_2Fe_4O_9$	No. 10.8.56 P_C2/m	$a,b,c;0,0,0$	No. 55 $Pbam$	$R3^+R4^+$	P55.4.3 $R1^+R2^+$
1.533	TbC_2	No. 16.7.105 $P_{2c}22'2'$	$2a,b,c;0,0,0$	No. 47 $Pmmm$	$X1^+ \oplus X3^-$	P47.3.94 $X1^+ \oplus X3^-$

SSGs of coplanar magnetic structures (continued).

BCSID	Chemical formula	MSG	Trans from parent structure	PSG	Rep	SSG
1.549	U_2Ni_2In	No. 127.13.1065 $P_{2c}4/mb'm'$	$a,b,c;0,0,0$	No. 127 $P4/mbm$	$Z5^+$	P127.6.6 $Z5^+$
1.577	$SrNd_2O_4$	No. 14.6.91 $P_{2a}2_1/c$	$-c,a,-b+c;0,0,0$	No. 14 $P2_1/c$	$Y1^- \oplus Y2^-$	P14.3.12 $Y1^+ \oplus Y2^+$
1.584	PrFeAsO	No. 67.13.589 $C_Pm'ma$	$a,b,c;0,0,0$	No. 67 $Cmme$	$Y1^- \oplus Y4^-$	P67.3.131 $Y1^+ \oplus Y3^+$
1.587	NdFeAsO	No. 12.10.75 C_P2/m'	$a,b,c;0,0,0$	No. 67 $Cmme$	$Y1^- \oplus Y4^-$	P67.3.131 $Y1^+ \oplus Y3^+$
1.599	$DyMn_2O_5$	No. 6.7.31 $P_{2c}m'$	$a,-c,b;0,0,0$	No. 6 Pm	$Y1 \oplus Y1$	P6.3.6 $B1 \oplus B1$
1.600	$Bi_4Fe_5O_{13}F$	No. 84.7.719 P_P4_2/m'	$a,b,c;0,0,0$	No. 135 $P4_2/mbc$	$M2^-M3^-$	P135.4.4 $M2^-M3^-$
1.601	$Bi_4Fe_5O_{13}F$	No. 84.7.719 P_P4_2/m'	$a,b,c;0,0,0$	No. 135 $P4_2/mbc$	$M2^-M3^-$	P135.4.4 $M2^-M3^-$
1.602	$Bi_4Fe_5O_{13}F$	No. 84.7.719 P_P4_2/m'	$a,b,c;0,0,0$	No. 135 $P4_2/mbc$	$M2^-M3^-$	P135.4.4 $M2^-M3^-$
1.603	$Bi_4Fe_5O_{13}F$	No. 84.7.719 P_P4_2/m'	$a,b,c;0,0,0$	No. 135 $P4_2/mbc$	$M2^-M3^-$	P135.4.4 $M2^-M3^-$
1.604	$Bi_4Fe_5O_{13}F$	No. 84.7.719 P_P4_2/m'	$a,b,c;0,0,0$	No. 84 $P4_2/m$	$M3^-M4^-$	P84.4.4 $M3^-M4^-$
1.605	$Bi_4Fe_5O_{13}F$	No. 84.7.719 P_P4_2/m'	$a,b,c;0,0,0$	No. 84 $P4_2/m$	$M3^-M4^-$	P84.4.4 $M3^-M4^-$
1.606	$Bi_4Fe_5O_{13}F$	No. 84.7.719 P_P4_2/m'	$a,b,c;0,0,0$	No. 84 $P4_2/m$	$M3^-M4^-$	P84.4.4 $M3^-M4^-$
1.607	$Bi_4Fe_5O_{13}F$	No. 84.7.719 P_P4_2/m'	$a,b,c;0,0,0$	No. 84 $P4_2/m$	$M3^-M4^-$	P84.4.4 $M3^-M4^-$
1.608	$Bi_4Fe_5O_{13}F$	No. 84.7.719 P_P4_2/m'	$a,b,c;0,0,0$	No. 84 $P4_2/m$	$M3^-M4^-$	P84.4.4 $M3^-M4^-$
1.609	$Bi_4Fe_5O_{13}F$	No. 84.7.719 P_P4_2/m'	$a,b,c;0,0,0$	No. 84 $P4_2/m$	$M3^-M4^-$	P84.4.4 $M3^-M4^-$
1.610	$Bi_4Fe_5O_{13}F$	No. 84.7.719 P_P4_2/m'	$a,b,c;0,0,0$	No. 84 $P4_2/m$	$M3^-M4^-$	P84.4.4 $M3^-M4^-$
1.611	$Bi_4Fe_5O_{13}F$	No. 84.7.719 P_P4_2/m'	$a,b,c;0,0,0$	No. 84 $P4_2/m$	$M3^-M4^-$	P84.4.4 $M3^-M4^-$
1.612	$Bi_4Fe_5O_{13}F$	No. 84.7.719 P_P4_2/m'	$a,b,c;0,0,0$	No. 84 $P4_2/m$	$M3^-M4^-$	P84.4.4 $M3^-M4^-$
1.613	$Bi_4Fe_5O_{13}F$	No. 84.7.719 P_P4_2/m'	$a,b,c;0,0,0$	No. 84 $P4_2/m$	$M3^-M4^-$	P84.4.4 $M3^-M4^-$
1.614	$Bi_4Fe_5O_{13}F$	No. 84.7.719 P_P4_2/m'	$a,b,c;0,0,0$	No. 84 $P4_2/m$	$M3^-M4^-$	P84.4.4 $M3^-M4^-$
1.615	$Bi_4Fe_5O_{13}F$	No. 84.7.719 P_P4_2/m'	$a,b,c;0,0,0$	No. 84 $P4_2/m$	$M3^-M4^-$	P84.4.4 $M3^-M4^-$
1.616	$Bi_4Fe_5O_{13}F$	No. 84.7.719 P_P4_2/m'	$a,b,c;0,0,0$	No. 84 $P4_2/m$	$M3^-M4^-$	P84.4.4 $M3^-M4^-$
1.649	Sr_3ZnIrO_6	No. 15.6.97 C_P2/c	$a/3+2b/3+2c/3,-a,-a/3-2b/3+c/3;0,1/2,0$	No. 15 $C2/c$	$Y1^- \oplus Y2^-$	P15.3.15 $Y1^+ \oplus Y2^+$
1.650	$DyBaCuO_5$	No. 14.6.91 $P_{2a}2_1/c$	$-b,c,-a;0,0,0$	No. 14 $P2_1/c$	$Y1^+ \oplus Y2^+$	P14.3.12 $Y1^+ \oplus Y2^+$
1.651	$HoBaCuO_5$	No. 14.6.91 $P_{2a}2_1/c$	$-b,c,-a;0,0,0$	No. 14 $P2_1/c$	$Y1^+ \oplus Y2^+$	P14.3.12 $Y1^+ \oplus Y2^+$
1.657	$LuNiO_3$	No. 4.4.18 $P_{2a}2_1$	$a,b,c;1/4,0,1/4$	No. 4 $P2_1$	$A1 \oplus A1$	P4.3.3 $B1 \oplus B1$
1.660	$FePb_4Sb_6S_{14}$	No. 14.6.91 $P_{2a}2_1/c$	$a,b,c;0,0,0$	No. 14 $P2_1/c$	$Y1^- \oplus Y2^-$	P14.3.12 $Y1^+ \oplus Y2^+$
1.661	La_2NiIrO_6	No. 2.4.7 $P_{2s}\bar{1}$	$a,b,-a+c;0,0,0$	No. 2 $P\bar{1}$	$R1^+ \oplus R1^+$	P2.3.3 $R1^+ \oplus R1^+$

SSGs of coplanar magnetic structures (continued).

BCSID	Chemical formula	MSG	Trans from parent structure	PSG	Rep	SSG
1.662	La_2NiIrO_6	No. 2.4.7 $P_{2s}\bar{1}$	$a,b,c;0,0,0$	No. 2 $P\bar{1}$	$V1^- \oplus V1^-$	P2.3.3 $R1^+ \oplus R1^+$
1.665	$Ba_3CoNb_2O_9$	No. 157.5.1288 $P_{2c}31m'$	$a,b,c;0,0,0$	No. 164 $P\bar{3}m1$	H2	P164.7.3 H1
1.698	Dy_2TiO_5	No. 14.6.91 $P_{2a}2_1/c$	$-b,c,-a;0,0,0$	No. 14 $P2_1/c$	$Y1^- \oplus Y2^-$	P14.3.12 $Y1^+ \oplus Y2^+$
1.709	$CsCrF_4$	No. 38.13.277 $A_Im'm'2$	$-c,2a+b,-b;0,0,0$	No. 38 $Amm2$	$T1 \oplus T4$	P38.3.34 $T1 \oplus T4$
1.716	Sr_2MnMoO_6	No. 14.6.91 $P_{2a}2_1/c$	$a,b,-a+c;0,0,0$	No. 14 $P2_1/c$	$Y1^- \oplus Y2^-$	P14.3.12 $Y1^+ \oplus Y2^+$
1.717	Sr_2MnWO_6	No. 14.6.91 $P_{2a}2_1/c$	$a,b,-a+c;0,0,0$	No. 14 $P2_1/c$	$Y1^- \oplus Y2^-$	P14.3.12 $Y1^+ \oplus Y2^+$
1.718	Ca_2MnWO_6	No. 2.4.7 $P_{2s}\bar{1}$	$a,b,c;0,0,0$	No. 2 $P\bar{1}$	$T1^+ \oplus T1^+$	P2.3.3 $R1^+ \oplus R1^+$
1.725	$Ba_3NiTa_2O_9$	No. 157.4.1287 $P_{2c}31m$	$a,b,c;0,0,0$	No. 164 $P\bar{3}m1$	H2	P164.7.3 H1
1.726	$RuCl_3$	No. 5.4.22 $C_{2c}2$	$a,b,c;0,0,0$	No. 1 $P1$	$U1 \oplus U1$	P1.3.1 $R1 \oplus R1$
1.745	La_2Co_3	No. 64.16.543 $C_Pm'ca'$	$a,b,c;0,0,0$	No. 64 $Cmce$	$Y1^+ \oplus Y4^+$	P64.3.91 $Y1^+ \oplus Y4^+$
1.747	ErAuIn	No. 174.4.1366 $P_{2c}\bar{6}$	$a,b,c;0,0,0$	No. 189 $P\bar{6}2m$	A6	P189.6.3 A5
1.748	TbAuIn	No. 174.4.1366 $P_{2c}\bar{6}$	$a,b,c;0,0,0$	No. 189 $P\bar{6}2m$	A6	P189.6.3 A5
1.752	$CsCo_2(MoO_4)_2(OH)$	No. 11.6.64 $P_{2a}2_1/m$	$a,b,c;0,0,0$	No. 11 $P2_1/m$	$Y1^+ \oplus Y2^+$	P11.3.17 $B1^+ \oplus B2^+$
2.2	$Sr_2F_2Fe_2OS_2$	No. 10.8.56 P_C2/m	$c,a+b,-a/2+b/2+c/2;0,0,0$	No. 12 $C2/m$	$L1^+$	P12.7.1 $V1^+$
2.6	Nd_2CuO_4	No. 131.13.1109 $P_P4_2'/m'mc'$	$a,b,c;0,0,0$	No. 139 $I4/mmm$	$X1^+$	P139.7.1 $X1^+$
2.7	Sm_2CuO_4	No. 131.11.1107 $P_P4_2/m'mc$	$a,b,c;0,0,0$	No. 139 $I4/mmm$	$X1^+$	P139.7.1 $X1^+$
2.8	$SrHo_2O_4$	No. 14.4.89 $P2_1/c'$	$-c,b,a;0,0,0$	No. 14 $P2_1/c$	$GM2^- \oplus Y1^-$	P14.3.9 $GM2^- \oplus Y1^+$
2.10	HoP	No. 15.5.96 $C2'/c'$	$a/2-c/2,-a/2+b/2,a+b+c;0,0,0$	No. 166 $R\bar{3}m$	$T1^+$	P166.2.4 $T1^+$
2.11	TbMg	No. 51.7.393 $Pmm'a'$	$a,b,c;0,0,0$	No. 123 $P4/mmm$	$Z1^+$	P123.2.14 $Z1^+$
2.12	TbMg	No. 49.6.369 $Pc'cm'$	$a,b,c;0,0,0$	No. 123 $P4/mmm$	$Z1^+$	P123.2.14 $Z1^+$
2.13	UP	No. 131.13.1109 $P_P4_2'/m'mc'$	$a/2+b/2,-a/2+b/2,c;0,0,0$	No. 139 $I4/mmm$	$X1^+$	P139.7.1 $X1^+$
2.14	NdMg	No. 123.18.1016 $P_P4'/m'mm'$	$a,b,c;0,0,0$	No. 123 $P4/mmm$	$X1^+$	P123.7.3 $X1^+$
2.20	UAs	No. 131.13.1109 $P_P4_2'/m'mc'$	$a,b,c;1/4,1/4,0$	No. 132 $P4_2/mcm$	$X1^+$	P132.7.1 $X1^+$
2.21	TbOOH	No. 14.4.89 $P2_1/c'$	$a,b,c;0,0,0$	No. 11 $P2_1/m$	$GM2^- \oplus Y2^-$	P11.3.11 $GM2^- \oplus B1^+$
2.22	$FeTa_2O_6$	No. 86.6.732 P_I4_2/n	$a,b,c;1/2,0,0$	No. 84 $P4_2/m$	$R1^+$	P84.7.3 $R1^+$
2.23	$Sr_2CoO_2Ag_2Se_2$	No. 84.7.719 P_P4_2/m'	$a,b,c;0,0,0$	No. 139 $I4/mmm$	$X1^+$	P139.7.1 $X1^+$
2.24	$Ba_2CoO_2Ag_2Se_2$	No. 84.7.719 P_P4_2/m'	$a,b,c;0,0,0$	No. 139 $I4/mmm$	$X1^+$	P139.7.1 $X1^+$

SSGs of coplanar magnetic structures (continued).

BCSID	Chemical formula	MSG	Trans from parent structure	PSG	Rep	SSG
2.25	Sr_2CoOsO_6	No. 2.4.7 $P_{2s}\bar{1}$	$a/2+b/2+c/2, -a/2+b/2+c/2, -b+c; 0,0,1/2$	No. 2 $P\bar{1}$	$U1^+ \oplus U1^+$	P2.3.3 $R1^+ \oplus R1^+$
2.27	$Sr_2Mn_3Sb_2O_2$	No. 63.3.513 $Cm'cm$	$a+b, -a+b, c; 0,0,0$	No. 69 $Fmmm$	$GM1^- \oplus T1^+$	P69.3.4 $GM1^- \oplus T1^+$
2.28	$NpNiGa_5$	No. 74.6.655 $Imm'a'$	$a, b, c; 0,0,0$	No. 123 $P4/mmm$	$A1^+$	P123.2.8 $A1^+$
2.48	Pr_2CuO_4	No. 131.13.1109 $P_P4'_2/m'mc'$	$a, b, c; 0,0,0$	No. 139 $I4/mmm$	$X1^+$	P139.7.1 $X1^+$
2.49	$La_2O_2Fe_2OSe_2$	No. 10.8.56 P_C2/m	$c, a+b, -a/2+b/2+c/2; 0,0,0$	No. 12 $C2/m$	$L1^+$	P12.7.1 $V1^+$
2.51	$EuMnBi_2$	No. 31.5.216 $Pm'n'2_1$	$a, b, c; 0,0,0$	No. 119 $I\bar{4}m2$	M2	P119.2.4 M1
2.53	$Ba_2Mn_3Sb_2O_2$	No. 67.3.579 $Cm'ma$	$a-b, a+b, c; 0,0,0$	No. 69 $Fmmm$	$GM1^- \oplus Y1^+$	P69.3.4 $GM1^- \oplus T1^+$
2.54	$Sr_2Cr_3As_2O_2$	No. 15.7.98 C_P2'/c	$a-b, a+b, c; 0,1,0$	No. 69 $Fmmm$	$Y1^+ \oplus Z2^+$	P69.3.55 $T1^+ \oplus Y4^+$
2.56	$La_2O_2Fe_2OS_2$	No. 10.8.56 P_C2/m	$c, a+b, -a/2+b/2+c/2; 0,0,0$	No. 12 $C2/m$	$V1^+$	P12.7.1 $V1^+$
2.57	$TbMn_2Si_2$	No. 59.6.483 $Pmm'n'$	$a, b, c; 0,0,0$	No. 139 $I4/mmm$	$M3^-$	P139.2.13 $M3^-$
2.60	$NdMn_2Si_2$	No. 59.6.483 $Pmm'n'$	$a, b, c; 0,0,0$	No. 139 $I4/mmm$	$M3^-$	P139.2.13 $M3^-$
2.66	$FeSn_2$	No. 68.3.596 $Cc'ca$	$a, b, c; 0,0,0$	No. 140 $I4/mcm$	$GM1^- \oplus M1^+$	P140.3.8 $GM1^- \oplus M1^+$
2.67	$FeSn_2$	No. 63.16.526 $C_Pm'cm'$	$a+b, -a+b, c; 0,1/2,0$	No. 69 $Fmmm$	$Y4^- \oplus Z2^+$	P69.3.101 $T3^+ \oplus Y4^-$
2.70	GdMg	No. 15.5.96 $C2'/c'$	$a, b, c; 0,0,0$	No. 123 $P4/mmm$	$Z1^+$	P123.2.14 $Z1^+$
2.71	HoRh	No. 12.9.74 C_P2'/m	$a, b, c; 0,0,0$	No. 47 $Pmmm$	$X1^+ \oplus Y1^+$	P47.3.95 $X1^+ \oplus Y1^+$
2.72	VNb_3S_6	No. 20.3.124 $C2'2'2_1$	$a, b, 3c; 0,0,-1/2$	No. 182 $P6_322$	GM4	P182.2.3 GM4
2.73	$BaNd_2ZnO_5$	No. 124.11.1028 $P_P4/m'cc$	$a, b, c; 0,0,0$	No. 140 $I4/mcm$	$X4^-$	P140.7.8 $X4^-$
2.77	Eu_2CuO_4	No. 131.11.1107 $P_P4_2/m'mc$	$a, b, c; 0,0,0$	No. 139 $I4/mmm$	$X1^+$	P139.7.1 $X1^+$
2.78	Nd_2CuO_4	No. 131.13.1109 $P_P4'_2/m'mc'$	$a, b, c; 0,0,0$	No. 139 $I4/mmm$	$X1^+$	P139.7.1 $X1^+$
2.79	Pr_2CuO_4	No. 131.13.1109 $P_P4'_2/m'mc'$	$a, b, c; 0,0,0$	No. 139 $I4/mmm$	$X1^+$	P139.7.1 $X1^+$
2.81	$ErMn_2Si_2$	No. 59.5.482 $Pm'm'n$	$a, b, c; 0,0,0$	No. 139 $I4/mmm$	$M3^-$	P139.2.13 $M3^-$
2.82	$ErMn_2Si_2$	No. 59.5.482 $Pm'm'n$	$a, b, c; 0,0,0$	No. 139 $I4/mmm$	$M3^-$	P139.2.13 $M3^-$
2.83	$ErMn_2Ge_2$	No. 59.5.482 $Pm'm'n$	$a, b, c; 0,0,0$	No. 139 $I4/mmm$	$M3^-$	P139.2.13 $M3^-$
2.84	$ErMn_2Ge_2$	No. 59.5.482 $Pm'm'n$	$a, b, c; 0,0,0$	No. 139 $I4/mmm$	$M3^-$	P139.2.13 $M3^-$
2.85	$HoBaCuO_5$	No. 14.3.88 $P2'_1/c$	$a, -c, -a+2b; 0,1/2,0$	No. 14 $P2_1/c$	$GM1^- \oplus GM2^-$	P14.3.3 $GM1^- \oplus GM2^-$
2.86	$FeTa_2O_6$	No. 86.6.732 P_I4_2/n	$a, b, c; 1/2,0,0$	No. 84 $P4_2/m$	$R2^+$	P84.7.3 $R1^+$
2.87	$TbCoGa_5$	No. 67.10.586 C_Imma	$a, b, c; 0,0,0$	No. 47 $Pmmm$	$T1^+ \oplus U1^+$	P47.3.59 $S1^+ \oplus T1^+$
2.94	$TmMn_2Ge_2$	No. 26.5.172 $Pm'c'2_1$	$a, b, c; 0,0,0$	No. 99 $P4mm$	Z1	P99.2.8 Z1

SSGs of coplanar magnetic structures (continued).

BCSID	Chemical formula	MSG	Trans from parent structure	PSG	Rep	SSG
2.96	$GdMn_2Si_2$	No. 58.4.474 $Pnnm'$	$a,b,c;0,0,0$	No. 139 $I4/mmm$	$GM4^- \oplus M3^-$	P139.3.82 $GM4^- \oplus M3^-$
2.97	$GdMn_2Si_2$	No. 59.5.482 $Pm'm'n$	$a,b,c;0,0,0$	No. 139 $I4/mmm$	$M3^-$	P139.2.13 $M3^-$
2.100	HoP	No. 15.5.96 $C2'/c'$	$a/2-c/2,-a/2+b/2,a+b+c;0,0,0$	No. 166 $R\bar{3}m$	$T1^+$	P166.2.4 $T1^+$
3.1	TmAgGe	No. 189.4.1454 $P\bar{6}'2m'$	$2a,2b,c;1,1,0$	No. 189 $P\bar{6}2m$	GM5	P189.6.1 GM5
3.13	CeB_6	No. 51.19.405 $P_Am'ma$	$2b,-2a,2c;0,1/2,1/2$	No. 63 $Cmcm$	$S1^+$	P63.7.1 $S1^+$
3.17	$BaCu_3V_2O_8(OD)_2$	No. 152.3.1265 $P3_12'1$	$2a,2b,c;1,1,0$	No. 152 $P3_121$	GM3	P152.6.1 GM3
3.20	$TbMn_2Ge_2$	No. 2.1.4 $P\bar{1}$	$b,-a,c;1/4,1/4,1/4$	No. 11 $P2_1/m$	$Y1^+$	P11.2.4 $B1^+$

TABLE S693: SSGs of non-coplanar magnetic structures.

BCSID	Chemical formula	MSG	Trans from parent structure	PSG	Rep	SSG
light-element materials						
0.60	$[NH_2(CH_3)_2]_n$ $[Fe^{III}Fe^{II}(HCOO)_6]_n$	No. 167.5.1338 $R\bar{3}c'$	$a,b,c;0,0,0$	No. 167 $R\bar{3}c$	$GM3^+$	N167.6.1 $GM3^+$
0.64	MnV_2O_4	No. 88.1.742 $I4_1/a$	$a,b,c;0,0,0$	No. 88 $I4_1/a$	$GM3^+GM4^+$	N88.4.1 $GM3^+GM4^+$
0.70	$Na_3Co(CO_3)_2Cl$	No. 203.1.1527 $Fd\bar{3}$	$a,b,c;0,0,0$	No. 203 $Fd\bar{3}$	$GM4^+$	N203.15.1 $GM4^+$
0.78	NiN_2O_6	No. 148.1.1247 $R\bar{3}$	$a,b,c;0,0,0$	No. 148 $R\bar{3}$	$T1^+ \oplus T2^+T3^+$	N148.10.6 $T1^+ \oplus T2^+T3^+$
0.96	$CoSO_4$	No. 62.1.502 $Pnma$	$a,b,c;0,0,0$	No. 62 $Pnma$	$GM2^+ \oplus GM3^+ \oplus GM4^+$	N62.9.42 $GM2^+ \oplus GM3^+ \oplus GM4^+$
0.102	Mn_2GeO_4	No. 62.1.502 $Pnma$	$a,b,c;0,0,0$	No. 62 $Pnma$	$GM2^+ \oplus GM3^+ \oplus GM4^+$	N62.9.42 $GM2^+ \oplus GM3^+ \oplus GM4^+$
0.103	Mn_2GeO_4	No. 14.1.86 $P2_1/c$	$-b,-c,a;0,0,0$	No. 14 $P2_1/c$	$GM2^+ \oplus GM2^+$	N14.3.5 $GM2^+ \oplus GM2^+$
0.135	$Ni_3B_7O_{13}Br$	No. 29.3.200 $Pc'a2_1'$	$a,b,c;0,0,0$	No. 29 $Pca2_1$	$GM2 \oplus GM3$	N29.3.2 $GM2 \oplus GM3$
0.136	$Co_3B_7O_{13}Br$	No. 29.3.200 $Pc'a2_1'$	$a,b,c;0,0,0$	No. 29 $Pca2_1$	$GM2 \oplus GM3$	N29.3.2 $GM2 \oplus GM3$
0.150	NiS_2	No. 205.1.1535 $Pa\bar{3}$	$a,b,c;0,0,0$	No. 205 $Pa\bar{3}$	$GM4^+$	N205.15.1 $GM4^+$
0.168	$NH_4Fe_2F_6$	No. 62.1.502 $Pnma$	$a,b,c;0,0,0$	No. 62 $Pnma$	$GM2^+ \oplus GM3^+ \oplus GM4^+$	N62.9.42 $GM2^+ \oplus GM3^+ \oplus GM4^+$
0.203	Mn_3Ge	No. 12.5.70 $C2'/m'$	$a,b,c;0,0,0$	No. 194 $P6_3/mmc$	$GM5^+$	N194.6.1 $GM5^+$
0.218	Co_2SiO_4	No. 62.1.502 $Pnma$	$a,b,c;0,0,0$	No. 62 $Pnma$	$GM2^+ \oplus GM3^+ \oplus GM4^+$	N62.9.42 $GM2^+ \oplus GM3^+ \oplus GM4^+$
0.219	Co_2SiO_4	No. 62.1.502 $Pnma$	$a,b,c;0,0,0$	No. 62 $Pnma$	$GM2^+ \oplus GM3^+ \oplus GM4^+$	N62.9.42 $GM2^+ \oplus GM3^+ \oplus GM4^+$
0.220	Mn_2SiO_4	No. 62.6.507 $Pn'm'a$	$a,b,c;0,0,0$	No. 62 $Pnma$	$GM3^+ \oplus GM4^+$	N62.3.21 $GM3^+ \oplus GM4^+$
0.221	Fe_2SiO_4	No. 62.1.502 $Pnma$	$a,b,c;0,0,0$	No. 62 $Pnma$	$GM2^+ \oplus GM3^+ \oplus GM4^+$	N62.9.42 $GM2^+ \oplus GM3^+ \oplus GM4^+$
0.236	$CaFe_4Al_8$	No. 139.5.1183 $I4'/mmm'$	$a,b,c;0,0,0$	No. 139 $I4/mmm$	$M4^+ \oplus M5^+$	N139.12.55 $M4^+ \oplus M5^+$
0.281	$Co_2V_2O_7$	No. 14.4.89 $P2_1/c'$	$a,b,c;0,0,0$	No. 14 $P2_1/c$	$GM1^- \oplus GM2^- \oplus GM2^-$	N14.9.8 $GM1^- \oplus GM2^- \oplus GM2^-$

SSGs of non-coplanar magnetic structures (continued).

BCSID	Chemical formula	MSG	Trans from parent structure	PSG	Rep	SSG
0.294	$Cu_4(OD)_6FBr$	No. 62.6.507 $Pn'm'a$	$a,b,c;0,0,0$	No. 62 $Pnma$	$GM3^+ \oplus GM4^+$	N62.3.21 $GM3^+ \oplus GM4^+$
0.311	$CoGeO_3$	No. 61.3.499 $Pb'ca$	$a,b,c;0,0,0$	No. 61 $Pbca$	$GM1^- \oplus GM2^- \oplus GM3^-$	N61.9.10 $GM1^- \oplus GM2^- \oplus GM3^-$
0.357	$CaFe_5O_7$	No. 11.1.59 $P2_1/m$	$a,b,c;0,0,0$	No. 11 $P2_1/m$	$GM2^+ \oplus GM2^+$	N11.3.6 $GM2^+ \oplus GM2^+$
0.368	$(CH_3NH_3)(Co(COOH)_3$	No. 62.8.509 $Pn'ma'$	$a,b,c;0,0,0$	No. 62 $Pnma$	$GM2^+ \oplus GM3^+$	N62.3.10 $GM2^+ \oplus GM3^+$
0.369	$(CH_3NH_3)(Co(COOH)_3$	No. 14.5.90 $P2_1'/c'$	$a,b,a+c;0,0,0$	No. 14 $P2_1/c$	$GM2^+$	N14.2.2 $GM2^+$
0.388	$Co_3Al_2Si_3O_{12}$	No. 142.3.1224 $I4_1/a'cd$	$c,b,-a;1/4,1/4,3/4$	No. 142 $I4_1/acd$	$GM1^- \oplus GM5^-$	N142.12.2 $GM1^- \oplus GM5^-$
0.393	$Cu_4(OH)_6FBr$	No. 11.5.63 $P2_1'/m'$	$b,c,a;0,0,0$	No. 11 $P2_1/m$	$GM2^+$	N11.2.2 $GM2^+$
0.431	CuB_2O_4	No. 1.1.1 $P1$	$a+b,-a+b,-a/2-b/2+c/2;1/8,-1/8,0$	No. 9 Cc	$GM2 \oplus GM2 \oplus GM2$	N9.9.1 $GM2 \oplus GM2 \oplus GM2$
0.571	$CoSO_4$	No. 62.1.502 $Pnma$	$b,c,a;0,0,0$	No. 62 $Pnma$	$GM2^+ \oplus GM3^+ \oplus GM4^+$	N62.9.42 $GM2^+ \oplus GM3^+ \oplus GM4^+$
0.572	Na_2NiCrF_7	No. 74.5.654 $Im'm'a$	$a,b,c;0,0,0$	No. 74 $Imma$	$X1^+ \oplus X3^+ \oplus X4^+$	N74.9.320 $X1^+ \oplus X3^+ \oplus X4^+$
0.573	Na_2NiCrF_7	No. 74.5.654 $Im'm'a$	$a,b,c;0,0,0$	No. 74 $Imma$	$X1^+ \oplus X3^+ \oplus X4^+$	N74.9.320 $X1^+ \oplus X3^+ \oplus X4^+$
0.574	$MnFeF_5(H_2O)_2$	No. 5.3.21 $C2'$	$a+b,c,a;0,0,0$	No. 5 $C2$	GM2	N5.2.1 GM2
0.576	Cr_2F_5	No. 15.1.92 $C2/c$	$a,b,c;0,0,0$	No. 15 $C2/c$	$GM2^+ \oplus GM2^+$	N15.3.6 $GM2^+ \oplus GM2^+$
0.584	$Fe_2F_5(H_2O)_2$	No. 15.5.96 $C2'/c'$	$a+b,c,-b;0,0,0$	No. 15 $C2/c$	$Y1^+ \oplus Y1^+ \oplus Y2^+$	N15.9.43 $Y1^+ \oplus Y1^+ \oplus Y2^+$
0.756	GaV_4S_8	No. 160.3.1297 $R3m'$	$a,b,c;0,0,0$	No. 160 $R3m$	GM3	N160.6.1 GM3
0.763	$Mn_5(PO_4)_2$ $(PO_3(OH))_2(HOH)_4$	No. 15.5.96 $C2'/c'$	$a,b,c;0,0,0$	No. 15 $C2/c$	$GM2^+$	N15.2.2 $GM2^+$
0.764	$Mn_5(PO_4)_2$ $(PO_3(OH))_2(HOH)_4$	No. 15.5.96 $C2'/c'$	$a,b,c;0,0,0$	No. 15 $C2/c$	$GM2^+$	N15.2.2 $GM2^+$
0.765	$Mn_5(PO_4)_2$ $(PO_3(OH))_2(HOH)_4$	No. 15.5.96 $C2'/c'$	$a,b,c;0,0,0$	No. 15 $C2/c$	$GM2^+$	N15.2.2 $GM2^+$
0.806	$Fe_2Se_2O_7$	No. 56.3.453 $Pc'cn$	$a,b,c;0,0,0$	No. 56 $Pccn$	$GM1^- \oplus GM2^- \oplus GM4^-$	N56.9.12 $GM1^- \oplus GM2^- \oplus GM3^-$
0.807	$Fe_2Se_2O_7$	No. 56.3.453 $Pc'cn$	$a,b,c;0,0,0$	No. 56 $Pccn$	$GM1^- \oplus GM2^- \oplus GM4^-$	N56.9.12 $GM1^- \oplus GM2^- \oplus GM3^-$
0.808	$Fe_2Se_2O_7$	No. 56.3.453 $Pc'cn$	$a,b,c;0,0,0$	No. 56 $Pccn$	$GM1^- \oplus GM2^- \oplus GM4^-$	N56.9.12 $GM1^- \oplus GM2^- \oplus GM3^-$
0.851	$C_7H_{14}NFeCl_4$	No. 19.3.121 $P2_1'2_1'2_1$	$a,b,c;0,0,0$	No. 19 $P2_12_12_1$	$GM3 \oplus GM4$	N19.3.2 $GM2 \oplus GM3$
0.883	$NaCo_2(SeO_3)_2(OH)$	No. 62.8.509 $Pn'ma'$	$a,b,c;0,0,0$	No. 62 $Pnma$	$GM2^+ \oplus GM3^+$	N62.3.10 $GM2^+ \oplus GM3^+$
0.900	Mn_3CoGe	No. 198.1.1511 $P2_13$	$a,b,c;0,0,0$	No. 198 $P2_13$	GM4	N198.15.1 GM4
0.948	$CaNi_3P_4O_{14}$	No. 14.1.86 $P2_1/c$	$a,b,c;0,0,0$	No. 14 $P2_1/c$	$GM2^+ \oplus GM2^+$	N14.3.5 $GM2^+ \oplus GM2^+$
1.73	CaV_2O_4	No. 14.6.91 $P_{2a}2_1/c$	$b,a,-b-c;0,0,0$	No. 14 $P2_1/c$	$Y1^+ \oplus Y1^+ \oplus Y2^+$	N14.9.31 $Y1^+ \oplus Y1^+ \oplus Y2^+$
1.85	alpha-Mn	No. 121.9.993 $I_P\bar{4}2'm'$	$a,b,c;0,0,0$	No. 121 $I\bar{4}2m$	$M1 \oplus M5$	N121.12.8 $M1 \oplus M5$

SSGs of non-coplanar magnetic structures (continued).

BCSID	Chemical formula	MSG	Trans from parent structure	PSG	Rep	SSG
1.135	$C_8H_{10}Co_2O_{11}$	No. 2.4.7 $P_{2s}\bar{1}$	$a,b,c;0,0,0$	No. 2 $P\bar{1}$	$X1^- \oplus X1^- \oplus X1^-$	N2.9.6 $R1^+ \oplus R1^+ \oplus R1^+$
1.138	MgV_2O_4	No. 22.5.144 $F_C22'2'$	$a-b,a+b,c;0,0,0$	No. 22 $F222$	$Z1 \oplus Z2 \oplus Z3$	N22.9.47 $T1 \oplus T3 \oplus T2$
1.167	NiS_2	No. 2.4.7 $P_{2s}\bar{1}$	$a,b,c;0,0,0$	No. 2 $P\bar{1}$	$R1^+ \oplus R1^+ \oplus R1^+$	N2.9.6 $R1^+ \oplus R1^+ \oplus R1^+$
1.307	Mn_5Si_3	No. 1.3.3 $P_{2s}1$	$c,a+2b,-a;0,0,1/4$	No. 38 $Amm2$	$Y4$	N38.2.9 $Y4$
1.342	$Co_3(PO_4)_2$	No. 14.6.91 $P_{2a}2_1/c$	$a,b,c;0,0,0$	No. 14 $P2_1/c$	$Y1^+ \oplus Y1^+ \oplus Y2^+$	N14.9.31 $Y1^+ \oplus Y1^+ \oplus Y2^+$
1.498	$Cu_6(SiO_3)_6(H_2O)_6$	No. 148.4.1250 $R_R\bar{3}$	$a,b,c;0,0,0$	No. 148 $R\bar{3}$	$T1^+ \oplus T2^+T3^+$	N148.10.6 $T1^+ \oplus T2^+T3^+$
1.595	CaCoSO	No. 8.6.43 $C_{2c}m'$	$-2a-b,-3b,c;2/3,1/3,0$	No. 8 Cm	$A1 \oplus A1 \oplus A2$	N8.9.21 $A1 \oplus A1 \oplus A2$
1.751	$CaCo_3Ti_4O_{12}$	No. 201.4.1523 $P_Fn\bar{3}$	$a,b,c;1/4,1/4,1/4$	No. 201 $Pn\bar{3}$	$R4^+$	N201.15.3 $R4^+$
2.5	Mn_3CuN	No. 85.1.720 $P4/n$	$a,b,c;0,0,0$	No. 123 $P4/mmm$	$A1^+ \oplus A5^-$	N123.12.46 $A1^+ \oplus A5^-$
2.9	$Ca_3CuNi_2(PO_4)_4$	No. 13.8.84 P_C2/c	$a,b,c;0,0,0$	No. 13 $P2/c$	$C1^- \oplus C2^- \oplus C2^-$	N13.9.97 $C1^+ \oplus C1^+ \oplus C2^+$
2.18	Sc_2NiMnO_6	No. 2.4.7 $P_{2s}\bar{1}$	$a+b-c,-a+b+c,c;0,0,0$	No. 2 $P\bar{1}$	$Z1^+ \oplus Z1^+ \oplus Z1^+$	N2.9.6 $R1^+ \oplus R1^+ \oplus R1^+$
2.19	Mn_3ZnC	No. 139.7.1185 $I4/mm'm'$	$a+b,-a+b,2c;0,0,0$	No. 139 $I4/mmm$	$M1^+ \oplus M5^+$	N139.12.31 $M1^+ \oplus M5^+$
2.33	$Na_2Mn_3Se_4$	No. 2.4.7 $P_{2s}\bar{1}$	$b+c,a+c,a+b;0,0,1/2$	No. 2 $P\bar{1}$	$R1^+ \oplus R1^+ \oplus R1^+$	N2.9.6 $R1^+ \oplus R1^+ \oplus R1^+$
2.35	CrSe	No. 157.3.1286 $P31m'$	$a,b,c;0,0,0$	No. 194 $P6_3/mmc$	$GM3^+ \oplus K2$	N194.13.14 $GM3^+ \oplus K2$
2.52	Mn_3O_4	No. 7.3.34 Pc'	$-c,-a,2b;0,0,0$	No. 7 Pc	$GM2$	N7.2.1 $GM2$
2.59	Mn_3As_2	No. 15.1.92 $C2/c$	$a,b,c;0,0,0$	No. 12 $C2/m$	$A1^+ \oplus A1^+$	N12.3.25 $A1^+ \oplus A1^+$
2.61	$Fe_3F_8(H_2O)_2$	No. 12.5.70 $C2'/m'$	$a,b,c;0,0,0$	No. 12 $C2/m$	$GM2^+ \oplus M1^+ \oplus M1^+$	N12.9.70 $GM2^+ \oplus A1^+ \oplus A1^+$
2.91	$NaCo_2(SeO_3)_2(OH)$	No. 33.3.228 $Pn'a2'_1$	$b,-a,c;1/4,1/4,0$	No. 31 $Pmn2_1$	$Y1 \oplus Y3$	N31.3.14 $Y1 \oplus Y3$
3.4	$MgCr_2O_4$	No. 111.5.915 $P\bar{4}2'm'$	$a/2+b/2,-a/2+b/2,c;1/8,1/8,1/8$	No. 119 $I\bar{4}m2$	$M2 \oplus X2$	N111.13.28 $M2 \oplus X2$
3.19	CoO	No. 134.11.1142 $P_I4_2/nn'm'$	$a,b,c;0,1/2,0$	No. 134 $P4_2/nnm$	$A4^+ \oplus A5^+$	N134.12.73 $A1^+ \oplus A5^+$
3.24	$CaFe_3Ti_4O_{12}$	No. 148.1.1247 $R\bar{3}$	$a-c,-a+b,a/2+b/2+c/2;0,0,0$	No. 148 $R\bar{3}$	$F1^+$	N148.16.2 $F1^+$
heavy-element materials						
0.2	$Cd_2Os_2O_7$	No. 227.4.1631 $Fd\bar{3}m'$	$a,b,c;0,0,0$	No. 227 $Fd\bar{3}m$	$GM5^+$	N227.15.3 $GM5^+$
0.20	$MnTe_2$	No. 205.1.1535 $Pa\bar{3}$	$a,b,c;0,0,0$	No. 205 $Pa\bar{3}$	$GM4^+$	N205.15.1 $GM4^+$
0.29	$Er_2Ti_2O_7$	No. 141.4.1216 $I4'_1/am'd$	$a/2+b/2,-a/2+b/2,c;1/4,0,1/4$	No. 141 $I4_1/amd$	$GM2^+ \oplus GM5^+$	N141.12.7 $GM2^+ \oplus GM5^+$
0.33	$HoMnO_3$	No. 185.1.1429 $P6_3cm$	$a,b,c;0,0,0$	No. 185 $P6_3cm$	$GM2 \oplus GM6$	N185.12.2 $GM2 \oplus GM6$
0.39	Nd_2NaRuO_6	No. 14.1.86 $P2_1/c$	$a,b,a+c;0,0,0$	No. 14 $P2_1/c$	$GM2^+ \oplus GM2^+$	N14.3.5 $GM2^+ \oplus GM2^+$

SSGs of non-coplanar magnetic structures (continued).

BCSID	Chemical formula	MSG	Trans from parent structure	PSG	Rep	SSG
0.42	$HoMnO_3$	No. 185.3.1431 $P6_3'c'm$	$a,b,c;0,0,0$	No. 185 $P6_3cm$	$GM4 \oplus GM5$	N185.12.5 $GM4 \oplus GM5$
0.43	$HoMnO_3$	No. 185.4.1432 $P6_3'cm'$	$a,b,c;0,0,0$	No. 185 $P6_3cm$	$GM3 \oplus GM5$	N185.12.3 $GM3 \oplus GM5$
0.48	$Tb_2Sn_2O_7$	No. 141.7.1219 $I4_1/am'd'$	$a/2+b/2,-a/2+b/2,c;1/4,0,1/4$	No. 141 $I4_1/amd$	$GM5^+$	N141.6.1 $GM5^+$
0.49	$Ho_2Ru_2O_7$	No. 141.7.1219 $I4_1/am'd'$	$a/2+b/2,-a/2+b/2,c;1/4,0,1/4$	No. 141 $I4_1/amd$	$GM5^+$	N141.6.1 $GM5^+$
0.51	$Ho_2Ru_2O_7$	No. 141.7.1219 $I4_1/am'd'$	$a/2+b/2,-a/2+b/2,c;1/4,0,1/4$	No. 141 $I4_1/amd$	$GM5^+$	N141.6.1 $GM5^+$
0.77	$Tb_2Ti_2O_7$	No. 166.5.1331 $R\bar{3}m'$	$a/2-c/2,-a/2+b/2,a+b+c;0,0,0$	No. 166 $R\bar{3}m$	$GM3^+$	N166.6.1 $GM3^+$
0.90	$Rb_2Fe_2O(AsO_4)_2$	No. 62.1.502 $Pnma$	$a,b,c;0,0,0$	No. 62 $Pnma$	$GM2^+ \oplus GM3^+ \oplus GM4^+$	N62.9.42 $GM2^+ \oplus GM3^+ \oplus GM4^+$
0.97	$FeSb_2O_4$	No. 26.1.168 $Pmc2_1$	$a,b,c;0,0,0$	No. 135 $P4_2/mbc$	$GM1^- \oplus GM4^+ \oplus GM4^-$	N135.9.27 $GM1^- \oplus GM4^+ \oplus GM4^-$
0.106	$DyVO_3$	No. 11.5.63 $P2_1'/m'$	$b,c,a;0,0,0$	No. 62 $Pnma$	$GM3^+ \oplus GM4^+$	N62.3.21 $GM3^+ \oplus GM4^+$
0.127	$Dy_3Al_5O_{12}$	No. 230.4.1650 $Ia\bar{3}d'$	$a,b,c;0,0,0$	No. 230 $Ia\bar{3}d$	$GM5^+$	N230.15.3 $GM5^+$
0.141	Tb_5Ge_4	No. 62.4.505 $Pnm'a$	$a,b,c;0,0,0$	No. 62 $Pnma$	$GM1^- \oplus GM2^- \oplus GM3^-$	N62.9.16 $GM1^- \oplus GM2^- \oplus GM3^-$
0.145	Co_3TeO_6	No. 15.3.94 $C2'/c$	$a,b,c;0,0,0$	No. 15 $C2/c$	$GM1^- \oplus GM1^- \oplus GM2^-$	N15.9.3 $GM1^- \oplus GM1^- \oplus GM2^-$
0.151	$Tm_2Mn_2O_7$	No. 141.7.1219 $I4_1/am'd'$	$b/2-c/2,b/2+c/2,a;0,1/4,-1/4$	No. 141 $I4_1/amd$	$GM5^+$	N141.6.1 $GM5^+$
0.157	$Yb_2Sn_2O_7$	No. 141.7.1219 $I4_1/am'd'$	$a/2+b/2,-a/2+b/2,c;1/4,0,1/4$	No. 141 $I4_1/amd$	$GM5^+$	N141.6.1 $GM5^+$
0.158	$Yb_2Ti_2O_7$	No. 141.7.1219 $I4_1/am'd'$	$a/2+b/2,-a/2+b/2,c;1/4,0,1/4$	No. 141 $I4_1/amd$	$GM5^+$	N141.6.1 $GM5^+$
0.167	$Nd_3Sb_3Mg_2O_{14}$	No. 166.5.1331 $R\bar{3}m'$	$a,b,c;0,0,0$	No. 166 $R\bar{3}m$	$GM3^+$	N166.6.1 $GM3^+$
0.169	U_3As_4	No. 161.3.1302 $R3c'$	$a,b,c;0,0,0$	No. 220 $I\bar{4}3d$	GM3	N220.6.1 GM3
0.170	U_3P_4	No. 161.3.1302 $R3c'$	$a,b,c;0,0,0$	No. 220 $I\bar{4}3d$	GM3	N220.6.1 GM3
0.184	Nd_5Si_4	No. 92.4.774 $P4_12_1'2'$	$a,b,c;0,0,0$	No. 92 $P4_12_12$	GM5	N92.6.1 GM5
0.185	Nd_5Ge_4	No. 62.7.508 $Pnm'a'$	$a,b,c;0,0,0$	No. 62 $Pnma$	$GM2^+ \oplus GM4^+$	N62.3.12 $GM2^+ \oplus GM4^+$
0.204	Ca_2MnReO_6	No. 14.1.86 $P2_1/c$	$a,b,a+c;0,0,0$	No. 14 $P2_1/c$	$GM2^+ \oplus GM2^+$	N14.3.5 $GM2^+ \oplus GM2^+$
0.205	Sr_2MnReO_6	No. 14.5.90 $P2_1'/c'$	$a,b,a+c;0,0,0$	No. 14 $P2_1/c$	$GM2^+$	N14.2.2 $GM2^+$
0.240	$Er_2Cu_2O_5$	No. 33.1.226 $Pna2_1$	$a,b,c;0,0,0$	No. 33 $Pna2_1$	$GM2 \oplus GM3 \oplus GM4$	N33.9.5 $GM2 \oplus GM3 \oplus GM4$
0.268	Tb_2MnNiO_6	No. 4.3.17 $P2_1'$	$a,b,c;1/4,0,1/4$	No. 4 $P2_1$	GM2	N4.2.1 GM2
0.269	Tb_2MnNiO_6	No. 14.5.90 $P2_1'/c'$	$a,b,-a+c;0,0,0$	No. 14 $P2_1/c$	$GM2^+$	N14.2.2 $GM2^+$
0.287	$SrCo(VO_4)(OH)$	No. 19.1.119 $P2_12_12_1$	$a,b,c;0,0,1$	No. 19 $P2_12_12_1$	$GM2 \oplus GM3 \oplus GM4$	N19.9.3 $GM2 \oplus GM3 \oplus GM4$
0.292	$NiTe_2O_5$	No. 62.1.502 $Pnma$	$a,b,c;0,0,0$	No. 62 $Pnma$	$GM2^+ \oplus GM3^+ \oplus GM4^+$	N62.9.42 $GM2^+ \oplus GM3^+ \oplus GM4^+$

SSGs of non-coplanar magnetic structures (continued).

BCSID	Chemical formula	MSG	Trans from parent structure	PSG	Rep	SSG
0.316	$DyCrWO_6$	No. 4.1.15 $P2_1$	$a,b,c;0,0,0$	No. 33 $Pna2_1$	GM2 ⊕ GM4 ⊕ GM4	N33.9.6 GM2 ⊕ GM4 ⊕ GM4
0.318	Tm_2CoMnO_6	No. 14.5.90 $P2_1'/c'$	$a,b,a+c;0,0,0$	No. 14 $P2_1/c$	$GM2^+$	N14.2.2 $GM2^+$
0.326	$Nd_2Sn_2O_7$	No. 227.4.1631 $Fd\bar{3}m'$	$a,b,c;0,0,0$	No. 227 $Fd\bar{3}m$	$GM5^+$	N227.15.3 $GM5^+$
0.339	$Nd_2Hf_2O_7$	No. 227.4.1631 $Fd\bar{3}m'$	$a,b,c;0,0,0$	No. 227 $Fd\bar{3}m$	$GM5^+$	N227.15.3 $GM5^+$
0.340	$Nd_2Zr_2O_7$	No. 227.4.1631 $Fd\bar{3}m'$	$a,b,c;0,0,0$	No. 227 $Fd\bar{3}m$	$GM5^+$	N227.15.3 $GM5^+$
0.342	Tb_3Ge_5	No. 43.1.320 $Fdd2$	$a,b,c;0,0,0$	No. 43 $Fdd2$	GM2 ⊕ GM3 ⊕ GM4	N43.9.4 GM2 ⊕ GM3 ⊕ GM4
0.347	Er_2ReC_2	No. 14.3.88 $P2_1'/c$	$a,b,c;0,0,0$	No. 62 $Pnma$	$GM2^- \oplus GM3^- \oplus GM3^-$	N62.9.59 $GM2^- \oplus GM3^- \oplus GM3^-$
0.349	Nd_2NiO_4	No. 138.7.1176 $P4_2/nc'm'$	$a,b,c;0,0,0$	No. 138 $P4_2/ncm$	$GM5^+$	N138.6.1 $GM5^+$
0.352	$TbFeO_3$	No. 62.6.507 $Pn'm'a$	$-b,-c,a;0,0,0$	No. 62 $Pnma$	$GM3^+ \oplus GM4^+$	N62.3.21 $GM3^+ \oplus GM4^+$
0.394	$Cu_2CdB_2O_6$	No. 14.4.89 $P2_1/c'$	$a,b,c;0,0,0$	No. 14 $P2_1/c$	$GM1^- \oplus GM2^- \oplus GM2^-$	N14.9.8 $GM1^- \oplus GM2^- \oplus GM2^-$
0.411	Tb_5Ge_4	No. 62.4.505 $Pnm'a$	$a,b,c;0,0,0$	No. 62 $Pnma$	$GM1^- \oplus GM2^- \oplus GM3^-$	N62.9.16 $GM1^- \oplus GM2^- \oplus GM3^-$
0.412	Tb_5Ge_4	No. 62.4.505 $Pnm'a$	$a,b,c;0,0,0$	No. 62 $Pnma$	$GM1^- \oplus GM2^- \oplus GM3^-$	N62.9.16 $GM1^- \oplus GM2^- \oplus GM3^-$
0.419	$Er_2Ge_2O_7$	No. 92.3.773 $P4_1'2_12'$	$a,b,c;0,0,0$	No. 92 $P4_12_12$	GM4 ⊕ GM5	N92.12.9 GM4 ⊕ GM5
0.427	$Sm_2Ti_2O_7$	No. 227.4.1631 $Fd\bar{3}m'$	$a,b,c;0,0,0$	No. 227 $Fd\bar{3}m$	$GM5^+$	N227.15.3 $GM5^+$
0.430	Yb_3Pt_4	No. 148.3.1249 $R\bar{3}'$	$a,b,c;0,0,0$	No. 148 $R\bar{3}$	$GM1^- \oplus GM2^-GM3^-$	N148.10.2 $GM1^- \oplus GM2^-GM3^-$
0.440	$SrCuTe_2O_6$	No. 213.1.1564 $P4_132$	$a,b,c;0,0,0$	No. 213 $P4_132$	GM4	N213.15.1 GM4
0.450	Nd_5Ge_4	No. 62.7.508 $Pnm'a'$	$a,b,c;0,0,0$	No. 62 $Pnma$	$GM2^+ \oplus GM4^+$	N62.3.12 $GM2^+ \oplus GM4^+$
0.478	$SmCrO_3$	No. 62.1.502 $Pnma$	$b,c,a;0,0,0$	No. 62 $Pnma$	$GM2^+ \oplus GM3^+ \oplus GM4^+$	N62.9.42 $GM2^+ \oplus GM3^+ \oplus GM4^+$
0.479	$SmCrO_3$	No. 62.8.509 $Pn'ma'$	$b,c,a;0,0,0$	No. 62 $Pnma$	$GM2^+ \oplus GM3^+$	N62.3.10 $GM2^+ \oplus GM3^+$
0.488	$YbMnO_3$	No. 185.3.1431 $P6_3'c'm$	$a,b,c;0,0,0$	No. 185 $P6_3cm$	GM4 ⊕ GM5	N185.12.5 GM4 ⊕ GM5
0.489	$YbMnO_3$	No. 185.3.1431 $P6_3'c'm$	$a,b,c;0,0,0$	No. 185 $P6_3cm$	GM4 ⊕ GM5	N185.12.5 GM4 ⊕ GM5
0.490	$YbMnO_3$	No. 185.5.1433 $P6_3c'm'$	$a,b,c;0,0,0$	No. 185 $P6_3cm$	GM6	N185.6.2 GM6
0.530	$SrCuTe_2O_6$	No. 213.1.1564 $P4_132$	$a,b,c;0,0,0$	No. 213 $P4_132$	GM4	N213.15.1 GM4
0.544	Mn_2FeReO_6	No. 2.1.4 $P\bar{1}$	$a,b,c;0,0,0$	No. 2 $P\bar{1}$	$GM1^+$	N2.1.1 $GM1^+$
0.545	Mn_2FeReO_6	No. 2.1.4 $P\bar{1}$	$a,b,c;0,0,0$	No. 2 $P\bar{1}$	$GM1^+$	N2.1.1 $GM1^+$
0.578	$NaBaFe_2F_9$	No. 14.1.86 $P2_1/c$	$a,b,-a+c;0,0,0$	No. 14 $P2_1/c$	$GM2^+ \oplus GM2^+$	N14.3.5 $GM2^+ \oplus GM2^+$
0.652	$HoMnO_3$	No. 185.4.1432 $P6_3'cm'$	$a,b,c;0,0,0$	No. 185 $P6_3cm$	GM3 ⊕ GM5	N185.12.3 GM3 ⊕ GM5
0.658	$BaCuTe_2O_6$	No. 213.3.1566 $P4_1'32'$	$a,b,c;0,0,0$	No. 213 $P4_132$	GM5	N213.15.2 GM5
0.696	$SmCrO_3$	No. 62.8.509 $Pn'ma'$	$b,c,a;0,0,0$	No. 62 $Pnma$	$GM2^+ \oplus GM3^+$	N62.3.10 $GM2^+ \oplus GM3^+$

SSGs of non-coplanar magnetic structures (continued).

BCSID	Chemical formula	MSG	Trans from parent structure	PSG	Rep	SSG
0.697	$SmCrO_3$	No. 62.6.507 $Pn'm'a$	$b,c,a;0,0,0$	No. 62 $Pnma$	$GM3^+ \oplus GM4^+$	N62.3.21 $GM3^+ \oplus GM4^+$
0.715	$HoCrWO_6$	No. 33.1.226 $Pna2_1$	$a,b,c;0,0,0$	No. 33 $Pna2_1$	$GM2 \oplus GM3 \oplus GM4$	N33.9.5 $GM2 \oplus GM3 \oplus GM4$
0.726	$CsMn_2F_6$	No. 62.7.508 $Pnm'a'$	$a,b,c;0,0,0$	No. 62 $Pnma$	$GM2^+ \oplus GM4^+$	N62.3.12 $GM2^+ \oplus GM4^+$
0.727	$CsMn_2F_6$	No. 14.1.86 $P2_1/c$	$-c,a,-b+c;0,0,0$	No. 14 $P2_1/c$	$GM2^+ \oplus GM2^+$	N14.3.5 $GM2^+ \oplus GM2^+$
0.740	$Dy_3Ga_5O_{12}$	No. 230.4.1650 $Ia\bar{3}d'$	$a,b,c;0,0,0$	No. 230 $Ia\bar{3}d$	$GM5^+$	N230.15.3 $GM5^+$
0.741	$Er_3Ga_5O_{12}$	No. 230.4.1650 $Ia\bar{3}d'$	$a,b,c;0,0,0$	No. 230 $Ia\bar{3}d$	$GM5^+$	N230.15.3 $GM5^+$
0.743	$Ho_3Al_5O_{12}$	No. 230.4.1650 $Ia\bar{3}d'$	$a,b,c;0,0,0$	No. 230 $Ia\bar{3}d$	$GM5^+$	N230.15.3 $GM5^+$
0.744	$Tb_3Al_5O_{12}$	No. 230.4.1650 $Ia\bar{3}d'$	$a,b,c;0,0,0$	No. 230 $Ia\bar{3}d$	$GM5^+$	N230.15.3 $GM5^+$
0.745	$Ho_3Ga_5O_{12}$	No. 230.4.1650 $Ia\bar{3}d'$	$a,b,c;0,0,0$	No. 230 $Ia\bar{3}d$	$GM5^+$	N230.15.3 $GM5^+$
0.746	$Tb_3Ga_5O_{12}$	No. 230.4.1650 $Ia\bar{3}d'$	$a,b,c;0,0,0$	No. 230 $Ia\bar{3}d$	$GM5^+$	N230.15.3 $GM5^+$
0.809	Fe_2WO_6	No. 14.4.89 $P2_1/c'$	$a,b,c;0,0,0$	No. 14 $P2_1/c$	$GM1^- \oplus GM2^- \oplus GM2^-$	N14.9.8 $GM1^- \oplus GM2^- \oplus GM2^-$
0.853	$HoVO_3$	No. 33.3.228 $Pn'a2_1'$	$-b,a,c;0,0,0$	No. 33 $Pna2_1$	$GM2 \oplus GM3$	N33.3.2 $GM2 \oplus GM3$
0.862	$Eu_2Ir_2O_7$	No. 227.4.1631 $Fd\bar{3}m'$	$a,b,c;0,0,0$	No. 227 $Fd\bar{3}m$	$GM5^+$	N227.15.3 $GM5^+$
0.870	Pr_2NiIrO_6	No. 14.1.86 $P2_1/c$	$a,b,-a+c;0,0,0$	No. 14 $P2_1/c$	$GM2^+ \oplus GM2^+$	N14.3.5 $GM2^+ \oplus GM2^+$
0.874	Nd_2NiIrO_6	No. 14.1.86 $P2_1/c$	$a,b,-a+c;0,0,0$	No. 14 $P2_1/c$	$GM2^+ \oplus GM2^+$	N14.3.5 $GM2^+ \oplus GM2^+$
0.875	Nd_2NiIrO_6	No. 14.1.86 $P2_1/c$	$a,b,-a+c;0,0,0$	No. 14 $P2_1/c$	$GM2^+ \oplus GM2^+$	N14.3.5 $GM2^+ \oplus GM2^+$
0.877	Nd_2ZnIrO_6	No. 2.4.7 $P_{2s}\bar{1}$	$a,b,c;0,0,0$	No. 2 $P\bar{1}$	$V1^- \oplus V1^- \oplus V1^-$	N2.9.6 $R1^+ \oplus R1^+ \oplus R1^+$
0.878	Nd_2ZnIrO_6	No. 2.4.7 $P_{2s}\bar{1}$	$a,b,c;0,0,0$	No. 2 $P\bar{1}$	$V1^- \oplus V1^- \oplus V1^-$	N2.9.6 $R1^+ \oplus R1^+ \oplus R1^+$
0.879	Nd_2ZnIrO_6	No. 2.4.7 $P_{2s}\bar{1}$	$a,b,c;0,0,0$	No. 2 $P\bar{1}$	$V1^- \oplus V1^- \oplus V1^-$	N2.9.6 $R1^+ \oplus R1^+ \oplus R1^+$
0.898	Mn_3IrSi	No. 198.1.1511 $P2_13$	$a,b,c;0,0,0$	No. 198 $P2_13$	$GM4$	N198.15.1 $GM4$
0.899	Mn_3IrGe	No. 198.1.1511 $P2_13$	$a,b,c;0,0,0$	No. 198 $P2_13$	$GM4$	N198.15.1 $GM4$
0.916	$Cd_2Os_2O_7$	No. 227.4.1631 $Fd\bar{3}m'$	$a,b,c;0,0,0$	No. 227 $Fd\bar{3}m$	$GM5^+$	N227.15.3 $GM5^+$
0.941	Er_2O_3	No. 206.1.1538 $Ia\bar{3}$	$a,b,c;0,0,0$	No. 206 $Ia\bar{3}$	$GM4^+$	N206.15.1 $GM4^+$
0.942	$Er_2Ge_2O_7$	No. 92.3.773 $P4_12_12'$	$a,b,c;0,0,0$	No. 92 $P4_12_12$	$GM4 \oplus GM5$	N92.12.9 $GM4 \oplus GM5$
0.943	$Yb_2Ge_2O_7$	No. 92.4.774 $P4_12_12'$	$a,b,c;0,0,0$	No. 92 $P4_12_12$	$GM5$	N92.6.1 $GM5$
0.944	$Yb_2Ir_2O_7$	No. 166.5.1331 $R\bar{3}m'$	$a/2-c/2,-a/2+b/2,a+b+c;0,0,0$	No. 166 $R\bar{3}m$	$GM3^+$	N166.6.1 $GM3^+$
0.945	$Yb_2Ir_2O_7$	No. 227.4.1631 $Fd\bar{3}m'$	$a,b,c;0,0,0$	No. 227 $Fd\bar{3}m$	$GM5^+$	N227.15.3 $GM5^+$
0.950	$LaErO_3$	No. 62.1.502 $Pnma$	$a,b,c;0,0,0$	No. 62 $Pnma$	$GM2^+ \oplus GM3^+ \oplus GM4^+$	N62.9.42 $GM2^+ \oplus GM3^+ \oplus GM4^+$
0.954	$Nd_2Ir_2O_7$	No. 227.4.1631 $Fd\bar{3}m'$	$a,b,c;0,0,0$	No. 227 $Fd\bar{3}m$	$GM5^+$	N227.15.3 $GM5^+$

SSGs of non-coplanar magnetic structures (continued).

BCSID	Chemical formula	MSG	Trans from parent structure	PSG	Rep	SSG
0.958	$Mn_3Si_2Te_6$	No. 15.5.96 $C2'/c'$	$-a, a+2b, -c; 0, 0, 0$	No. 15 $C2/c$	$GM2^+$	N15.2.2 $GM2^+$
1.0.17	$CaBaCo_2Fe_2O_7$	No. 157.3.1286 $P31m'$	$a-b, a+2b, c; -1/3, -2/3, 0$	No. 157 $P31m$	GM3	N157.6.1 GM3
1.0.23	$Dy_3Ru_4Al_{12}$	No. 12.5.70 $C2'/m'$	$3a+3b, -a+b, c; 0, 0, 0$	No. 63 $Cmcm$	$GM2^+$	N63.2.2 $GM2^+$
1.0.52	$Tb_{14}Ag_{51}$	No. 174.3.1365 $P\bar{6}'$	$a-b, a+2b, c; 1/3, -1/3, 0$	No. 174 $P\bar{6}$	GM2 ⊕ GM3GM5	N174.10.1 GM2 ⊕ GM3GM5
1.75	$BiMn_2O_5$	No. 6.6.30 P_Cm	$a, -c, b; 0, 0, 0$	No. 6 Pm	C1 ⊕ C2 ⊕ C2	N6.9.88 C1 ⊕ C1 ⊕ C2
1.89	$DyFe_3(BO_3)_4$	No. 152.4.1266 $P_{2c}3_221$	$a, b, c; 0, 0, 0$	No. 152 $P3_121$	A1 ⊕ A3	N152.12.4 A1 ⊕ A3
1.92	$HoFe_3(BO_3)_4$	No. 152.4.1266 $P_{2c}3_221$	$a, b, c; 0, 0, 0$	No. 152 $P3_121$	A1 ⊕ A3	N152.12.4 A1 ⊕ A3
1.102	U_2Ni_2In	No. 127.13.1065 $P_{2c}4/mb'm'$	$a, b, c; 0, 0, 0$	No. 127 $P4/mbm$	$Z1^+ ⊕ Z5^+$	N127.12.49 $Z1^+ ⊕ Z5^+$
1.115	$Dy_3Ru_4Al_{12}$	No. 12.8.73 $C_{2c}2/m'$	$2a+b, b, c; 0, 0, 0$	No. 12 $C2/m$	$M1^+ ⊕ M1^+ ⊕ M2^+$	N12.9.143 $A1^+ ⊕ A1^+ ⊕ A2^+$
1.152	Ce_3NIn	No. 111.10.920 $P_P\bar{4}'2m'$	$-c, b, a; 0, 0, 0$	No. 123 $P4/mmm$	$M4^+ ⊕ M5^-$	N123.12.63 $M1^+ ⊕ M5^-$
1.161	$PrFe_3(BO_3)_4$	No. 155.4.1278 R_R32	$a, b, c; 0, 0, 0$	No. 155 $R32$	T1 ⊕ T3	N155.12.4 T1 ⊕ T3
1.201	Cr_2ReO_6	No. 14.6.91 $P_{2a}2_1/c$	$a, b, -a+c; 0, 0, 0$	No. 14 $P2_1/c$	$Y1^+ ⊕ Y2^+ ⊕ Y2^+$	N14.9.31 $Y1^+ ⊕ Y1^+ ⊕ Y2^+$
1.207	U_2Rh_2Sn	No. 127.12.1064 $P_{2c}4'/mbm'$	$a, b, c; 0, 0, 0$	No. 127 $P4/mbm$	$Z2^- ⊕ Z5^-$	N127.12.74 $Z2^- ⊕ Z5^-$
1.235	$Ba(TiO)Cu_4(PO_4)_4$	No. 90.7.763 $P_{2c}4'2'_12$	$a, b, c; 0, 0, 0$	No. 90 $P42_12$	Z2 ⊕ Z5	N90.12.20 Z2 ⊕ Z5
1.267	$Dy_2Co_3Al_9$	No. 38.6.270 $A_{2a}mm2$	$-c, -a, b; 0, 0, 1/4$	No. 38 $Amm2$	Z1 ⊕ Z2 ⊕ Z4	N38.9.393 Z1 ⊕ Z2 ⊕ Z4
1.274	$DyFeWO_6$	No. 7.6.37 P_Cc	$-c, b, a; 0, 1/4, 0$	No. 7 Pc	C1 ⊕ C2 ⊕ C2	N7.9.15 C1 ⊕ C1 ⊕ C2
1.279	$Ho_2Cu_2O_5$	No. 4.4.18 $P_{2a}2_1$	$a, -c, b; 0, 0, 0$	No. 4 $P2_1$	B1 ⊕ B1 ⊕ B2	N4.9.7 B1 ⊕ B1 ⊕ B2
1.299	$GdMn_2O_5$	No. 26.10.177 $P_{2b}m'c'2_1$	$-c, a, -b; 1/4, 0, 0$	No. 26 $Pmc2_1$	Y1 ⊕ Y2 ⊕ Y3	N26.9.228 Y1 ⊕ Y3 ⊕ Y2
1.300	$GdMn_2O_5$	No. 26.10.177 $P_{2b}m'c'2_1$	$-c, a, -b; 1/4, 0, 0$	No. 26 $Pmc2_1$	Y1 ⊕ Y2 ⊕ Y3	N26.9.228 Y1 ⊕ Y3 ⊕ Y2
1.303	$Dy_3Ru_4Al_{12}$	No. 12.8.73 $C_{2c}2/m'$	$2a+b, b, c; 0, 0, 0$	No. 12 $C2/m$	$M1^+ ⊕ M1^+ ⊕ M2^+$	N12.9.143 $A1^+ ⊕ A1^+ ⊕ A2^+$
1.326	$PrMn_2O_5$	No. 55.9.449 $P_{2c}b'am$	$a, b, c; 0, 0, 0$	No. 55 $Pbam$	$Z1^+ ⊕ Z2^+ ⊕ Z4^+$	N55.9.210 $Z1^+ ⊕ Z2^+ ⊕ Z3^+$
1.327	$LaMn_2O_5$	No. 55.8.448 $P_{2c}bam$	$a, b, c; 0, 0, 0$	No. 55 $Pbam$	$Z2^+ ⊕ Z3^+ ⊕ Z4^+$	N55.9.228 $Z1^- ⊕ Z3^- ⊕ Z4^-$
1.680	Nd_2NiIrO_6	No. 2.4.7 $P_{2s}\bar{1}$	$a, b, c; 0, 0, 0$	No. 2 $P\bar{1}$	$V1^+ ⊕ V1^+ ⊕ V1^+$	N2.9.6 $R1^+ ⊕ R1^+ ⊕ R1^+$
1.710	$BaFe_2Se_3$	No. 6.6.30 P_Cm	$a, b, c; 0, 0, 0$	No. 6 Pm	E1 ⊕ E2 ⊕ E2	N6.9.88 C1 ⊕ C1 ⊕ C2
1.720	Yb_2O_3	No. 73.6.648 I_Pbca	$a, b, c; 0, 0, 0$	No. 206 $Ia\bar{3}$	$H4^-$	N206.15.3 $H4^+$
2.3	$HoNiO_3$	No. 4.1.15 $P2_1$	$a+c, b, -a+c; -1/4, 0, 1/4$	No. 4 $P2_1$	GM2 ⊕ GM2	N4.3.1 GM2 ⊕ GM2
2.32	$Dy_3Ru_4Al_{12}$	No. 165.5.1326 $P\bar{3}c'1$	$2a+b, -a+b, c; 0, -1, 0$	No. 193 $P6_3/mcm$	$GM5^+$	N193.6.1 $GM5^+$
2.37	$La_8Cu_7O_{19}$	No. 2.4.7 $P_{2s}\bar{1}$	$a, b, c; 0, 0, 0$	No. 2 $P\bar{1}$	$V1^+ ⊕ V1^+ ⊕ V1^+$	N2.9.6 $R1^+ ⊕ R1^+ ⊕ R1^+$

SSGs of non-coplanar magnetic structures (continued).

BCSID	Chemical formula	MSG	Trans from parent structure	PSG	Rep	SSG
2.38	Pb_2MnWO_6	No. 31.1.212 $Pmn2_1$	$2a, b, c; 1/8, 0, 0$	No. 7 Pc	GM2 ⊕ Y1 ⊕ Y2	N7.9.10 GM2 ⊕ Y1 ⊕ Y2
2.55	$Sr_2Fe_3Se_2O_3$	No. 8.6.43 $C_{2c}m'$	$a, -c, b; 0, 0, 0$	No. 6 Pm	C2 ⊕ A1 ⊕ A1	N6.9.33 B1 ⊕ B1 ⊕ C1
2.62	$TbCrO_3$	No. 31.5.216 $Pm'n'2_1$	$-c, b, a; 0, 1/4, 1/4$	No. 31 $Pmn2_1$	GM4 ⊕ Y1 ⊕ Y3	N31.9.36 GM4 ⊕ Y1 ⊕ Y3
2.63	$DyCrO_3$	No. 11.5.63 $P2_1'/m'$	$a, c, -b; 0, 0, 0$	No. 11 $P2_1/m$	$GM2^+ ⊕ A2^- ⊕ A2^-$	N11.9.29 $GM2^+ ⊕ B1^+ ⊕ B1^+$
2.64	$DyCrO_3$	No. 11.5.63 $P2_1'/m'$	$a, c, -b; 0, 0, 0$	No. 11 $P2_1/m$	$GM2^+ ⊕ A2^- ⊕ A2^-$	N11.9.29 $GM2^+ ⊕ B1^+ ⊕ B1^+$
2.75	$Sr_2Fe_3S_2O_3$	No. 12.11.76 C_P2'/m'	$a, c, -b; 0, 0, 0$	No. 10 $P2/m$	$A1^+ ⊕ A1^+ ⊕ Z2^+$	N10.9.173 $B1^+ ⊕ B1^+ ⊕ Z2^+$
2.76	$Sr_2Fe_3Se_2O_3$	No. 8.6.43 $C_{2c}m'$	$a, c, -b; 0, 0, 0$	No. 6 Pm	C2 ⊕ A1 ⊕ A1	N6.9.33 B1 ⊕ B1 ⊕ C1
2.101	TbSbTe	No. 3.6.13 P_C2	$a-b, a+b, c; 0, 0, 0$	No. 3 $P2$	C1 ⊕ C2 ⊕ C2	N3.9.62 C1 ⊕ C1 ⊕ C2
2.102	TbSbTe	No. 3.6.13 P_C2	$a-b, a+b, -a+b+2c; 1/4, 1/4, 1/2$	No. 3 $P2$	C1 ⊕ C2 ⊕ C2	N3.9.62 C1 ⊕ C1 ⊕ C2
3.2	UO_2	No. 224.4.1614 $Pn\bar{3}m'$	$a, b, c; 0, 0, 0$	No. 225 $Fm\bar{3}m$	$X1^+$	N225.16.1 $X1^+$
3.6	DyCu	No. 229.4.1641 $Im\bar{3}m'$	$a, b, c; 0, 0, 0$	No. 221 $Pm\bar{3}m$	$M4^+$	N221.16.1 $M1^+$
3.7	NpBi	No. 224.4.1614 $Pn\bar{3}m'$	$a, b, c; 0, 0, 0$	No. 225 $Fm\bar{3}m$	$X1^+$	N225.16.1 $X1^+$
3.8	NdZn	No. 229.9.1646 $I_Pm'\bar{3}'m'$	$a, b, c; 0, 0, 0$	No. 221 $Pm\bar{3}m$	$X1^+$	N221.16.5 $X1^+$
3.9	NpS	No. 224.7.1617 $P_Fn\bar{3}m'$	$a, b, c; 0, 0, 0$	No. 224 $Pn\bar{3}m$	$R5^+$	N224.15.6 $R4^-$
3.10	NpSe	No. 224.7.1617 $P_Fn\bar{3}m'$	$a, b, c; 0, 0, 0$	No. 224 $Pn\bar{3}m$	$R5^+$	N224.15.6 $R4^-$
3.11	NpTe	No. 224.7.1617 $P_Fn\bar{3}m'$	$a, b, c; 0, 0, 0$	No. 224 $Pn\bar{3}m$	$R5^+$	N224.15.6 $R4^-$
3.12	USb	No. 224.4.1614 $Pn\bar{3}m'$	$a, b, c; 0, 0, 0$	No. 225 $Fm\bar{3}m$	$X1^+$	N225.16.1 $X1^+$
3.16	$Gd_2Ti_2O_7$	No. 215.4.1575 $P_F\bar{4}3m$	$a, b, c; 15/8, 3/8, 15/8$	No. 215 $P\bar{4}3m$	R5	N215.15.4 R5
3.18	HoRh	No. 206.4.1541 $I_Pa\bar{3}'$	$a, b, c; 0, 0, 0$	No. 221 $Pm\bar{3}m$	$X1^+$	N221.16.5 $X1^+$
3.21	$TmGa_3$	No. 229.4.1641 $Im\bar{3}m'$	$a, b, c; 0, 0, 0$	No. 221 $Pm\bar{3}m$	$M1^+$	N221.16.1 $M1^+$
3.22	Eu_3PbO	No. 206.4.1541 $I_Pa\bar{3}'$	$a, b, c; 0, 0, 0$	No. 221 $Pm\bar{3}m$	$X3^-$	N221.16.5 $X1^+$

TABLE S694: Coplanar magnetic materials with non-commuting SBZs.

BCSID	Chemical formula	PSG	SSG
light-element materials			
2.31	Mn_3ZnN	No. 123 $P4/mmm$	P123.3.151 $M1^+ ⊕ Z1^+$
heavy-element materials			
2.2	$Sr_2F_2Fe_2OS_2$	No. 12 $C2/m$	P12.7.1 $V1^+$
2.6	Nd_2CuO_4	No. 139 $I4/mmm$	P139.7.1 $X1^+$
2.7	Sm_2CuO_4	No. 139 $I4/mmm$	P139.7.1 $X1^+$

Coplanar magnetic materials with non-commuting SBZs (continued).

BCSID	Chemical formula	PSG	SSG
2.13	UP	No. 139 $I4/mmm$	P139.7.1 $\mathrm{X1}^+$
2.14	NdMg	No. 123 $P4/mmm$	P123.7.3 $\mathrm{X1}^+$
2.20	UAs	No. 132 $P4_2/mcm$	P132.7.1 $\mathrm{X1}^+$
2.22	$FeTa_2O_6$	No. 84 $P4_2/m$	P84.7.3 $\mathrm{R1}^+$
2.23	$Sr_2CoO_2Ag_2Se_2$	No. 139 $I4/mmm$	P139.7.1 $\mathrm{X1}^+$
2.24	$Ba_2CoO_2Ag_2Se_2$	No. 139 $I4/mmm$	P139.7.1 $\mathrm{X1}^+$
2.48	Pr_2CuO_4	No. 139 $I4/mmm$	P139.7.1 $\mathrm{X1}^+$
2.49	$La_2O_2Fe_2OSe_2$	No. 12 $C2/m$	P12.7.1 $\mathrm{V1}^+$
2.54	$Sr_2Cr_3As_2O_2$	No. 69 $Fmmm$	P69.3.55 $\mathrm{T1}^+ \oplus \mathrm{Y4}^+$
2.56	$La_2O_2Fe_2OS_2$	No. 12 $C2/m$	P12.7.1 $\mathrm{V1}^+$
2.67	$FeSn_2$	No. 69 $Fmmm$	P69.3.101 $\mathrm{T3}^+ \oplus \mathrm{Y4}^-$
2.71	HoRh	No. 47 $Pmmm$	P47.3.95 $\mathrm{X1}^+ \oplus \mathrm{Y1}^+$
2.73	$BaNd_2ZnO_5$	No. 140 $I4/mcm$	P140.7.8 $\mathrm{X4}^-$
2.77	Eu_2CuO_4	No. 139 $I4/mmm$	P139.7.1 $\mathrm{X1}^+$
2.78	Nd_2CuO_4	No. 139 $I4/mmm$	P139.7.1 $\mathrm{X1}^+$
2.79	Pr_2CuO_4	No. 139 $I4/mmm$	P139.7.1 $\mathrm{X1}^+$
2.86	$FeTa_2O_6$	No. 84 $P4_2/m$	P84.7.3 $\mathrm{R1}^+$
2.87	$TbCoGa_5$	No. 47 $Pmmm$	P47.3.59 $\mathrm{S1}^+ \oplus \mathrm{T1}^+$
3.13	CeB_6	No. 63 $Cmcm$	P63.7.1 $\mathrm{S1}^+$

TABLE S695: Non-coplanar magnetic materials with non-commuting SBZs.

BCSID	Chemical formula	PSG	SSG
light-element materials			
3.4	$MgCr_2O_4$	No. 119 $I\bar{4}m2$	N111.13.28 $\mathrm{M2} \oplus \mathrm{X2}$
3.24	$CaFe_3Ti_4O_{12}$	No. 148 $R\bar{3}$	N148.16.2 $\mathrm{F1}^+$
heavy-element materials			
3.2	UO_2	No. 225 $Fm\bar{3}m$	N225.16.1 $\mathrm{X1}^+$
3.6	DyCu	No. 221 $Pm\bar{3}m$	N221.16.1 $\mathrm{M1}^+$
3.7	NpBi	No. 225 $Fm\bar{3}m$	N225.16.1 $\mathrm{X1}^+$
3.8	NdZn	No. 221 $Pm\bar{3}m$	N221.16.5 $\mathrm{X1}^+$
3.12	USb	No. 225 $Fm\bar{3}m$	N225.16.1 $\mathrm{X1}^+$

Non-coplanar magnetic materials with non-commuting SBZs (continued).

BCSID	Chemical formula	PSG	SSG
3.18	HoRh	No. 221 $Pm\bar{3}m$	N221.16.5 $\mathrm{X1}^+$
3.21	$TmGa_3$	No. 221 $Pm\bar{3}m$	N221.16.1 $\mathrm{M1}^+$
3.22	Eu_3PbO	No. 221 $Pm\bar{3}m$	N221.16.5 $\mathrm{X1}^+$

TABLE S696: Coplanar magnetic materials with non-symmorphic SBZs.

BCSID	Chemical formula	PSG	SSG
light-element materials			
1.0.33	FeF_3	No. 191 $P6/mmm$	P191.6.5 $\mathrm{A5}^+$
1.2	$CuSe_2O_5$	No. 15 $C2/c$	P15.3.15 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^+$
1.25	$KFe_3(OH)_6(SO_4)_2$	No. 166 $R\bar{3}m$	P166.6.3 $\mathrm{T3}^+$
1.39	$LiFeGe_2O_6$	No. 14 $P2_1/c$	P14.3.12 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^+$
1.88	Mn_5Si_3	No. 63 $Cmcm$	P63.3.87 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^+$
1.117	$NaFePO_4$	No. 11 $P2_1/m$	P11.3.13 $\mathrm{B1}^+ \oplus \mathrm{B1}^+$
1.126	$NaCoSO_4F$	No. 15 $C2/c$	P15.3.15 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^+$
1.147	$Li_2Fe(SO_4)_2$	No. 14 $P2_1/c$	P14.3.12 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^+$
1.185	$GeCu_2O_4$	No. 119 $I\bar{4}m2$	P119.7.3 P1
1.196	MnV_2O_6	No. 14 $P2_1/c$	P14.3.12 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^+$
1.203	Ni_2SiO_4	No. 62 $Pnma$	P62.4.1 $\mathrm{U1}^+\mathrm{U4}^+$
1.204	Ni_2SiO_4	No. 11 $P2_1/m$	P11.3.13 $\mathrm{B1}^+ \oplus \mathrm{B1}^+$
1.237	VCl_2	No. 164 $P\bar{3}m1$	P164.7.3 H1
1.238	VBr_2	No. 164 $P\bar{3}m1$	P164.7.3 H1
1.323	$CoGeO_3$	No. 15 $C2/c$	P15.3.13 $\mathrm{Y1}^+ \oplus \mathrm{Y1}^+$
1.345	$NaMnF_4$	No. 14 $P2_1/c$	P14.3.12 $\mathrm{Y1}^+ \oplus \mathrm{Y2}^+$
1.382	Ca_2FeO_3Cl	No. 129 $P4/nmm$	P129.6.8 M3
1.383	Ca_2FeO_3Br	No. 129 $P4/nmm$	P129.6.8 M3
1.418	Cu_4O_3	No. 119 $I\bar{4}m2$	P119.7.3 P1
1.431	$Ca_2Mn_3O_8$	No. 2 $P\bar{1}$	P2.3.3 $\mathrm{R1}^+ \oplus \mathrm{R1}^+$
1.441	$NaFe_3(SO_4)_2(OH)_6$	No. 166 $R\bar{3}m$	P166.6.3 $\mathrm{T3}^+$
1.455	$Mn_6Ni_{16}Si_7$	No. 69 $Fmmm$	P69.3.44 $\mathrm{T1}^+ \oplus \mathrm{T1}^+$
1.484	Li_2MnGeO_4	No. 7 Pc	P7.3.6 $\mathrm{C1} \oplus \mathrm{C2}$

Coplanar magnetic materials with non-symmorphic SBZs (continued).

BCSID	Chemical formula	PSG	SSG
1.519	$CoSO_4$	No. 63 $Cmcm$	P63.3.89 $Y1^+ \oplus Y3^+$
1.622	$CoGeO_3$	No. 15 $C2/c$	P15.3.13 $Y1^+ \oplus Y1^+$
1.730	Cu_2MnSiS_4	No. 7 Pc	P7.3.10 $Y1 \oplus Y2$
1.731	Cu_2FeSiS_4	No. 7 Pc	P7.3.6 $C1 \oplus C2$
1.733	Cu_2MnGeS_4	No. 7 Pc	P7.3.10 $Y1 \oplus Y2$
1.739	$Cu_9O_2(SeO_3)_4Cl_6$	No. 2 $P\bar{1}$	P2.3.3 $R1^+ \oplus R1^+$
2.68	$FeGe_2$	No. 140 $I4/mcm$	P140.3.8 $GM1^- \oplus M1^+$
2.93	$CoCrO_4$	No. 63 $Cmcm$	P63.3.51 $GM3^+ \oplus Y3^+$
heavy-element materials			
0.550	Mn_3ReO_6	No. 2 $P\bar{1}$	P2.3.3 $R1^+ \oplus R1^+$
0.551	Mn_3ReO_6	No. 2 $P\bar{1}$	P2.3.3 $R1^+ \oplus R1^+$
0.564	$U_2Rh_3Si_5$	No. 15 $C2/c$	P15.3.15 $Y1^+ \oplus Y2^+$
0.565	$Ce_2Ni_3Ge_5$	No. 72 $Ibam$	P72.3.55 $X1^+ \oplus X2^+$
1.11	$Bi_4Fe_5O_{13}F$	No. 84 $P4_2/m$	P84.4.4 $M3^-M4^-$
1.13	$Ba_3Nb_2NiO_9$	No. 164 $P\bar{3}m1$	P164.7.3 H1
1.14	Ho_2BaNiO_5	No. 12 $C2/m$	P12.3.25 $A1^+ \oplus A1^+$
1.15	Er_2BaNiO_5	No. 12 $C2/m$	P12.3.25 $A1^+ \oplus A1^+$
1.36	Dy_2BaNiO_5	No. 12 $C2/m$	P12.3.25 $A1^+ \oplus A1^+$
1.38	Nd_2NaOsO_6	No. 2 $P\bar{1}$	P2.3.3 $R1^+ \oplus R1^+$
1.44	$NdNiO_3$	No. 26 $Pmc2_1$	P26.3.23 $S1 \oplus S2$
1.48	$HoNiO_3$	No. 4 $P2_1$	P4.3.3 $B1 \oplus B1$
1.51	Cs_2CoCl_4	No. 14 $P2_1/c$	P14.3.11 $Y1^+ \oplus Y1^-$
1.53	Er_2BaNiO_5	No. 12 $C2/m$	P12.3.25 $A1^+ \oplus A1^+$
1.56	$Gd_2Ti_2O_7$	No. 166 $R\bar{3}m$	P166.6.3 $T3^+$
1.67	TmPtIn	No. 25 $Pmm2$	P25.3.63 $T1 \oplus T4$
1.72	Sr_2CoOsO_6	No. 12 $C2/m$	P12.3.25 $A1^+ \oplus A1^+$
1.74	$BiMn_2O_5$	No. 26 $Pmc2_1$	P26.3.24 $S1 \oplus S3$
1.77	Sr_2IrO_4	No. 73 $Ibca$	P73.3.22 $X1^+ \oplus X2^+$
1.93	$HoFe_3(BO_3)_4$	No. 152 $P3_121$	P152.3.3 $A1 \oplus A1$
1.95	$BaNd_2O_4$	No. 14 $P2_1/c$	P14.3.12 $Y1^+ \oplus Y2^+$

Coplanar magnetic materials with non-symmorphic SBZs (continued).

BCSID	Chemical formula	PSG	SSG
1.96	$BaNd_2O_4$	No. 14 $P2_1/c$	P14.3.12 $Y1^+ \oplus Y2^+$
1.98	$DyFe_4Ge_2$	No. 25 $Pmm2$	P25.3.107 $Z1 \oplus Z3$
1.99	$CsCoCl_3(D_2O)_2$	No. 54 $Pcca$	P54.3.60 $Y1^+ \oplus Y4^+$
1.105	Gd_2CuO_4	No. 64 $Cmce$	P64.3.89 $Y1^+ \oplus Y3^+$
1.108	$TbMn_2O_5$	No. 6 Pm	P6.3.18 $C1 \oplus C1$
1.109	$HoMn_2O_5$	No. 6 Pm	P6.3.18 $C1 \oplus C1$
1.114	Ca_4IrO_6	No. 15 $C2/c$	P15.3.15 $Y1^+ \oplus Y2^+$
1.116	$AgMnVO_4$	No. 11 $P2_1/m$	P11.3.19 $B1^- \oplus B1^-$
1.118	$GdPO_4$	No. 14 $P2_1/c$	P14.3.12 $Y1^+ \oplus Y2^+$
1.122	$Cu_3Bi(SeO_3)_2O_2Br$	No. 59 $Pmmn$	P59.3.40 $Z1^+ \oplus Z3^+$
1.123	$Cu_3Y(SeO_3)_2O_2Cl$	No. 59 $Pmmn$	P59.3.40 $Z1^+ \oplus Z3^+$
1.127	$BiNiO(PO_4)$	No. 14 $P2_1/c$	P14.3.12 $Y1^+ \oplus Y2^+$
1.128	$BiCoO(PO_4)$	No. 14 $P2_1/c$	P14.3.12 $Y1^+ \oplus Y2^+$
1.129	$AgFe_3(SO_4)_2(OD)_6$	No. 166 $R\bar{3}m$	P166.6.3 $T3^+$
1.133	$CuSb_2O_6$	No. 14 $P2_1/c$	P14.3.12 $Y1^+ \oplus Y2^+$
1.163	TmPdIn	No. 174 $P\bar{6}$	P174.4.3 A3A5
1.164	Co_3TeO_6	No. 2 $P\bar{1}$	P2.3.3 $R1^+ \oplus R1^+$
1.170	$Tm_5Ni_2In_4$	No. 6 Pm	P6.3.18 $C1 \oplus C1$
1.197	$Fe_4Si_2Sn_7O_{16}$	No. 12 $C2/m$	P12.3.30 $A1^+ \oplus A2^+$
1.202	$CrReO_4$	No. 12 $C2/m$	P12.3.30 $A1^+ \oplus A2^+$
1.216	Nd_2BaNiO_5	No. 12 $C2/m$	P12.3.25 $A1^+ \oplus A1^+$
1.217	Tb_2BaNiO_5	No. 12 $C2/m$	P12.3.25 $A1^+ \oplus A1^+$
1.218	Tm_2BaNiO_5	No. 12 $C2/m$	P12.3.25 $A1^+ \oplus A1^+$
1.226	$CeCo_2Ge_4O_{12}$	No. 125 $P4/nbm$	P125.3.64 $Z1^+ \oplus Z4^+$
1.266	$SmFe_3(BO_3)_4$	No. 155 $R32$	P155.3.3 $T1 \oplus T1$
1.280	$Yb_2Cu_2O_5$	No. 7 Pc	P7.3.10 $Y1 \oplus Y2$
1.301	$BiMnTeO_6$	No. 14 $P2_1/c$	P14.3.12 $Y1^+ \oplus Y2^+$
1.302	Ba_2CoO_4	No. 14 $P2_1/c$	P14.3.12 $Y1^+ \oplus Y2^+$
1.306	$Na_2BaMn(VO_4)_2$	No. 15 $C2/c$	P15.3.15 $Y1^+ \oplus Y2^+$

Coplanar magnetic materials with non-symmorphic SBZs (continued).

BCSID	Chemical formula	PSG	SSG
1.328	Yb_2CoMnO_6	No. 4 $P2_1$	P4.3.3 $\mathrm{B1}\oplus\mathrm{B1}$
1.330	Lu_2CoMnO_6	No. 4 $P2_1$	P4.3.3 $\mathrm{B1}\oplus\mathrm{B1}$
1.338	U_2Ni_2In	No. 127 $P4/mbm$	P127.6.6 $\mathrm{Z5}^+$
1.340	$LuMnO_3$	No. 31 $Pmn2_1$	P31.3.15 $\mathrm{Y1}\oplus\mathrm{Y2}$
1.343	$Ba_2Co_9O_{14}$	No. 166 $R\bar{3}m$	P166.3.13 $\mathrm{T1}^+\oplus\mathrm{T1}^+$
1.350	Nd_2BaCoO_5	No. 12 $C2/m$	P12.3.25 $\mathrm{A1}^+\oplus\mathrm{A1}^+$
1.352	$Ba_2Ni_2F_7Cl$	No. 11 $P2_1/m$	P11.3.13 $\mathrm{B1}^+\oplus\mathrm{B1}^+$
1.357	Ho_3Ge_4	No. 63 $Cmcm$	P63.3.110 $\mathrm{Y2}^-\oplus\mathrm{Y4}^-$
1.359	Dy_3Ge_4	No. 63 $Cmcm$	P63.3.110 $\mathrm{Y2}^-\oplus\mathrm{Y4}^-$
1.362	Er_3Ge_4	No. 63 $Cmcm$	P63.3.110 $\mathrm{Y2}^-\oplus\mathrm{Y4}^-$
1.380	Sr_2FeO_3Cl	No. 129 $P4/nmm$	P129.6.8 M3
1.381	Sr_2FeO_3Br	No. 129 $P4/nmm$	P129.6.8 M3
1.385	Sr_2FeO_3F	No. 129 $P4/nmm$	P129.6.8 M3
1.386	Sr_2FeO_3F	No. 129 $P4/nmm$	P129.6.4 A3
1.387	Sr_2FeO_3F	No. 129 $P4/nmm$	P129.6.8 M3
1.456	$Sr_2CuO_2Cu_2S_2$	No. 139 $I4/mmm$	P139.7.9 P1
1.476	Ba_2CoO_4	No. 14 $P2_1/c$	P14.3.12 $\mathrm{Y1}^+\oplus\mathrm{Y2}^+$
1.477	Ba_2CoO_4	No. 14 $P2_1/c$	P14.3.12 $\mathrm{Y1}^+\oplus\mathrm{Y2}^+$
1.524	$InMnO_3$	No. 157 $P31m$	P157.6.2 A3
1.525	$InMnO_3$	No. 157 $P31m$	P157.6.2 A3
1.528	$Bi_2Fe_4O_9$	No. 55 $Pbam$	P55.4.3 $\mathrm{R1}^+\mathrm{R2}^+$
1.549	U_2Ni_2In	No. 127 $P4/mbm$	P127.6.6 $\mathrm{Z5}^+$
1.577	$SrNd_2O_4$	No. 14 $P2_1/c$	P14.3.12 $\mathrm{Y1}^+\oplus\mathrm{Y2}^+$
1.584	PrFeAsO	No. 67 $Cmme$	P67.3.131 $\mathrm{Y1}^+\oplus\mathrm{Y3}^+$
1.587	NdFeAsO	No. 67 $Cmme$	P67.3.131 $\mathrm{Y1}^+\oplus\mathrm{Y3}^+$
1.600	$Bi_4Fe_5O_{13}F$	No. 135 $P4_2/mbc$	P135.4.4 $\mathrm{M2}^-\mathrm{M3}^-$
1.601	$Bi_4Fe_5O_{13}F$	No. 135 $P4_2/mbc$	P135.4.4 $\mathrm{M2}^-\mathrm{M3}^-$
1.602	$Bi_4Fe_5O_{13}F$	No. 135 $P4_2/mbc$	P135.4.4 $\mathrm{M2}^-\mathrm{M3}^-$
1.603	$Bi_4Fe_5O_{13}F$	No. 135 $P4_2/mbc$	P135.4.4 $\mathrm{M2}^-\mathrm{M3}^-$

Coplanar magnetic materials with non-symmorphic SBZs (continued).

BCSID	Chemical formula	PSG	SSG
1.604	$Bi_4Fe_5O_{13}F$	No. 84 $P4_2/m$	P84.4.4 $M3^-M4^-$
1.605	$Bi_4Fe_5O_{13}F$	No. 84 $P4_2/m$	P84.4.4 $M3^-M4^-$
1.606	$Bi_4Fe_5O_{13}F$	No. 84 $P4_2/m$	P84.4.4 $M3^-M4^-$
1.607	$Bi_4Fe_5O_{13}F$	No. 84 $P4_2/m$	P84.4.4 $M3^-M4^-$
1.608	$Bi_4Fe_5O_{13}F$	No. 84 $P4_2/m$	P84.4.4 $M3^-M4^-$
1.609	$Bi_4Fe_5O_{13}F$	No. 84 $P4_2/m$	P84.4.4 $M3^-M4^-$
1.610	$Bi_4Fe_5O_{13}F$	No. 84 $P4_2/m$	P84.4.4 $M3^-M4^-$
1.611	$Bi_4Fe_5O_{13}F$	No. 84 $P4_2/m$	P84.4.4 $M3^-M4^-$
1.612	$Bi_4Fe_5O_{13}F$	No. 84 $P4_2/m$	P84.4.4 $M3^-M4^-$
1.613	$Bi_4Fe_5O_{13}F$	No. 84 $P4_2/m$	P84.4.4 $M3^-M4^-$
1.614	$Bi_4Fe_5O_{13}F$	No. 84 $P4_2/m$	P84.4.4 $M3^-M4^-$
1.615	$Bi_4Fe_5O_{13}F$	No. 84 $P4_2/m$	P84.4.4 $M3^-M4^-$
1.616	$Bi_4Fe_5O_{13}F$	No. 84 $P4_2/m$	P84.4.4 $M3^-M4^-$
1.649	Sr_3ZnIrO_6	No. 15 $C2/c$	P15.3.15 $Y1^+ \oplus Y2^+$
1.650	$DyBaCuO_5$	No. 14 $P2_1/c$	P14.3.12 $Y1^+ \oplus Y2^+$
1.651	$HoBaCuO_5$	No. 14 $P2_1/c$	P14.3.12 $Y1^+ \oplus Y2^+$
1.657	$LuNiO_3$	No. 4 $P2_1$	P4.3.3 $B1 \oplus B1$
1.660	$FePb_4Sb_6S_{14}$	No. 14 $P2_1/c$	P14.3.12 $Y1^+ \oplus Y2^+$
1.661	La_2NiIrO_6	No. 2 $P\bar{1}$	P2.3.3 $R1^+ \oplus R1^+$
1.662	La_2NiIrO_6	No. 2 $P\bar{1}$	P2.3.3 $R1^+ \oplus R1^+$
1.665	$Ba_3CoNb_2O_9$	No. 164 $P\bar{3}m1$	P164.7.3 H1
1.698	Dy_2TiO_5	No. 14 $P2_1/c$	P14.3.12 $Y1^+ \oplus Y2^+$
1.709	$CsCrF_4$	No. 38 $Amm2$	P38.3.34 $T1 \oplus T4$
1.716	Sr_2MnMoO_6	No. 14 $P2_1/c$	P14.3.12 $Y1^+ \oplus Y2^+$
1.717	Sr_2MnWO_6	No. 14 $P2_1/c$	P14.3.12 $Y1^+ \oplus Y2^+$
1.718	Ca_2MnWO_6	No. 2 $P\bar{1}$	P2.3.3 $R1^+ \oplus R1^+$
1.725	$Ba_3NiTa_2O_9$	No. 164 $P\bar{3}m1$	P164.7.3 H1
1.745	La_2Co_3	No. 64 $Cmce$	P64.3.91 $Y1^+ \oplus Y4^+$
1.747	ErAuIn	No. 189 $P\bar{6}2m$	P189.6.3 A5

Coplanar magnetic materials with non-symmorphic SBZs (continued).

BCSID	Chemical formula	PSG	SSG
1.748	TbAuIn	No. 189 $P\bar{6}2m$	P189.6.3 A5
1.752	$CsCo_2(MoO_4)_2(OH)$	No. 11 $P2_1/m$	P11.3.17 $B1^+ \oplus B2^+$
2.8	$SrHo_2O_4$	No. 14 $P2_1/c$	P14.3.9 $GM2^- \oplus Y1^+$
2.21	TbOOH	No. 11 $P2_1/m$	P11.3.11 $GM2^- \oplus B1^+$
2.25	Sr_2CoOsO_6	No. 2 $P\bar{1}$	P2.3.3 $R1^+ \oplus R1^+$
2.27	$Sr_2Mn_3Sb_2O_2$	No. 69 $Fmmm$	P69.3.4 $GM1^- \oplus T1^+$
2.53	$Ba_2Mn_3Sb_2O_2$	No. 69 $Fmmm$	P69.3.4 $GM1^- \oplus T1^+$
2.66	$FeSn_2$	No. 140 $I4/mcm$	P140.3.8 $GM1^- \oplus M1^+$
2.96	$GdMn_2Si_2$	No. 139 $I4/mmm$	P139.3.82 $GM4^- \oplus M3^-$

TABLE S697: Non-coplanar magnetic materials with non-symmorphic SBZs.

BCSID	Chemical formula	PSG	SSG
light-element materials			
2.61	$Fe_3F_8(H_2O)_2$	No. 12 $C2/m$	N12.9.70 $GM2^+ \oplus A1^+ \oplus A1^+$
heavy-element materials			
2.38	Pb_2MnWO_6	No. 7 Pc	N7.9.10 $GM2 \oplus Y1 \oplus Y2$
2.63	$DyCrO_3$	No. 11 $P2_1/m$	N11.9.29 $GM2^+ \oplus B1^+ \oplus B1^+$
2.64	$DyCrO_3$	No. 11 $P2_1/m$	N11.9.29 $GM2^+ \oplus B1^+ \oplus B1^+$
2.75	$Sr_2Fe_3S_2O_3$	No. 10 $P2/m$	N10.9.173 $B1^+ \oplus B1^+ \oplus Z2^+$

TABLE S698: Collinear magnetic materials with non-zero spin texture $\vec{S}(\boldsymbol{k})$.

BCSID	Chemical formula	PSG	SSG	d_M	Sym of $\vec{S}(\boldsymbol{k})$	Representation
light-element materials						
0.4	$NiCr_2O_4$	$I4_1/amd$	L141.1.1 $GM1^+$	1	$4/mmm$	$A1_g$
0.5	Cr_2S_3	$R\bar{3}$	L148.1.1 $GM1^+$	1	$\bar{3}$	A_g
0.15	MnF_2	$P4_2/mnm$	L136.2.6 $GM4^+$	1	$4/mmm$	$B2_g$
0.23	$Ca_3Mn_2O_7$	$Cmc2_1$	L36.2.1 GM2	1	mmm	$B1_g$
0.35	Cu_2OSeO_3	$P2_13$	L198.1.1 GM1	1	$m\bar{3}$	A_g
0.38	$GaFeO_3$	$Pna2_1$	L33.1.1 GM1	1	mmm	A_g
0.50	$MnTiO_3$	$R3c$	L161.2.1 GM2	1	$\bar{3}m$	$A2_g$
0.65	Fe_2O_3-alpha	$R\bar{3}c$	L167.2.2 $GM2^+$	1	$\bar{3}m$	$A2_g$
0.66	Fe_2O_3-alpha	$R\bar{3}c$	L167.2.2 $GM2^+$	1	$\bar{3}m$	$A2_g$
0.83	$LiFeP_2O_7$	$P2_1$	L4.2.1 GM2	1	$2/m$	B_g
0.112	$FeBO_3$	$R\bar{3}c$	L167.2.2 $GM2^+$	1	$\bar{3}m$	$A2_g$
0.113	$NiCO_3$	$R\bar{3}c$	L167.2.2 $GM2^+$	1	$\bar{3}m$	$A2_g$
0.114	$CoCO_3$	$R\bar{3}c$	L167.2.2 $GM2^+$	1	$\bar{3}m$	$A2_g$

Collinear magnetic materials with non-zero spin texture $\vec{S}(\boldsymbol{k})$ (continued).

BCSID	Chemical formula	PSG	SSG	d_M	Sym of $\vec{S}(\boldsymbol{k})$	Representation
0.115	$MnCO_3$	$R\bar{3}c$	L167.2.2 GM2$^+$	1	$\bar{3}m$	$A2_g$
0.116	$FeCO_3$	$R\bar{3}c$	L167.2.2 GM2$^+$	1	$\bar{3}m$	$A2_g$
0.128	$FeSO_4F$	$C2/c$	L15.2.2 GM2$^+$	1	$2/m$	B_g
0.131	$Mn(N(CN_2))_2$	$Pnnm$	L58.2.2 GM2$^+$	1	mmm	$B1_g$
0.137	$Cu_2V_2O_7$	$Fdd2$	L43.2.2 GM3	1	mmm	$B3_g$
0.178	CoF_2	$P4_2/mnm$	L136.2.6 GM4$^+$	1	$4/mmm$	$B2_g$
0.254	$[C(ND_2)_3]$ $Cu(DCOO)_3$	$Pna2_1$	L33.2.3 GM4	1	mmm	$B2_g$
0.255	$[C(ND_2)_3]$ $Cu(DCOO)_3$	$Pna2_1$	L33.2.3 GM4	1	mmm	$B2_g$
0.258	$Li_3Fe_2(PO_4)_3$	$P2_1/c$	L14.1.1 GM1$^+$	1	$2/m$	A_g
0.259	$Li_3Fe_2(PO_4)_3$	$R\bar{3}$	L148.1.1 GM1$^+$	1	$\bar{3}$	A_g
0.260	$CuFePO_5$	$Pnma$	L62.2.6 GM4$^+$	1	mmm	$B2_g$
0.261	$NiFePO_5$	$Pnma$	L62.2.6 GM4$^+$	1	mmm	$B2_g$
0.263	Fe_2PO_5	$Pnma$	L62.2.6 GM4$^+$	1	mmm	$B2_g$
0.274	Mn_4N	$Pm\bar{3}m$	L221.1.1 GM1$^+$	1	$m\bar{3}m$	$A1_g$
0.275	Mn_3AlN	$Pm\bar{3}m$	L221.1.1 GM1$^+$	1	$m\bar{3}m$	$A1_g$
0.276	Mn_3AlN	$P4/mmm$	L123.1.1 GM1$^+$	1	$4/mmm$	$A1_g$
0.286	Mn_5Ge_3	$P6_3/mcm$	L193.1.1 GM1$^+$	1	$6/mmm$	$A1_g$
0.297	$NaCrGe_2O_6$	$C2/c$	L15.1.1 GM1$^+$	1	$2/m$	A_g
0.299	Fe_2O_3	$Pna2_1$	L33.1.1 GM1	1	mmm	A_g
0.300	Fe_2O_3	$Pna2_1$	L33.1.1 GM1	1	mmm	A_g
0.307	$ScCrO_3$	$Pnma$	L62.2.6 GM4$^+$	1	mmm	$B2_g$
0.310	$NaMnFeF_6$	$P321$	L150.1.1 GM1	1	$\bar{3}m$	$A1_g$
0.334	CoF_3	$R\bar{3}c$	L167.2.2 GM2$^+$	1	$\bar{3}m$	$A2_g$
0.335	FeF_3	$R\bar{3}c$	L167.2.2 GM2$^+$	1	$\bar{3}m$	$A2_g$
0.358	$CaFe_5O_7$	$P2_1/m$	L11.2.2 GM2$^+$	1	$2/m$	B_g
0.392	$Fe_3(PO_4)_2(OH)_2$	$P2_1/c$	L14.2.2 GM2$^+$	1	$2/m$	B_g
0.414	$AlFe_2B_2$	$Cmmm$	L65.1.1 GM1$^+$	1	mmm	A_g
0.432	$KMnF_3$	$Pnma$	L62.2.4 GM3$^+$	1	mmm	$B3_g$
0.433	$KMnF_3$	$I4/mcm$	L140.2.4 GM3$^+$	1	$4/mmm$	$A2_g$
0.445	MnCoGe	$Pnma$	L62.1.1 GM1$^+$	1	mmm	A_g
0.501	$LiFe_2F_6$	$P4_2/mnm$	L136.2.6 GM4$^+$	1	$4/mmm$	$B2_g$
0.512	Mn_3As_2	$C2/m$	L12.1.1 GM1$^+$	1	$2/m$	A_g
0.575	$ZnFeF_5(H_2O)_2$	$Imm2$	L44.2.2 GM3	1	mmm	$B3_g$
0.581	FeF_3	$R\bar{3}c$	L167.2.2 GM2$^+$	1	$\bar{3}m$	$A2_g$
0.582	$Fe_3F_8(H_2O)_2$	$C2/m$	L12.2.2 GM2$^+$	1	$2/m$	B_g
0.613	$FeCr_2S_4$	$I4_1/amd$	L141.1.1 GM1$^+$	1	$4/mmm$	$A1_g$
0.614	$FeCr_2S_4$	$Fd\bar{3}m$	L227.1.1 GM1$^+$	1	$m\bar{3}m$	$A1_g$
0.615	$FeCr_2S_4$	$Fd\bar{3}m$	L227.1.1 GM1$^+$	1	$m\bar{3}m$	$A1_g$
0.714	$Li_2Ni(SO_4)_2$	$P2_1/c$	L14.2.2 GM2$^+$	1	$2/m$	B_g
0.755	$Mn_2SeO_3F_2$	$Pnma$	L62.2.4 GM3$^+$	1	mmm	$B3_g$
0.760	$FeOHSO_4$	$C2/c$	L15.2.2 GM2$^+$	1	$2/m$	B_g
0.802	$CuFeS_2$	$I\bar{4}2d$	L122.2.3 GM4	1	$4/mmm$	$A2_g$
0.825	Ca_2MnGaO_5	$Pnma$	L62.2.2 GM2$^+$	1	mmm	$B1_g$
0.892	$NiCr_2O_4$	$I4_1/amd$	L141.1.1 GM1$^+$	1	$4/mmm$	$A1_g$

Collinear magnetic materials with non-zero spin texture $\vec{S}(\boldsymbol{k})$ (continued).

BCSID	Chemical formula	PSG	SSG	d_M	Sym of $\vec{S}(\boldsymbol{k})$	Representation
0.893	$NiCr_2O_4$	$I4_1/amd$	L141.1.1 GM1$^+$	1	$4/mmm$	$A1_g$
0.895	$NiCr_2O_4$	$I\bar{4}m2$	L119.1.1 GM1	1	$4/mmm$	$A1_g$
0.896	$NiCrO_4$	$Cmcm$	L63.2.4 GM3$^+$	1	mmm	$B3_g$
0.955	$Na_2Mn(H_2C_3O_4)_2(H_2O)_2$	$Pbca$	L61.2.2 GM2$^+$	1	mmm	$B1_g$
0.968	$CaFe_2O_4$	$Pnma$	L62.1.1 GM1$^+$	1	mmm	A_g
1.0.47	$MnSe_2$	$Pbca$	L61.2.2 GM2$^+$	1	mmm	$B1_g$
1.0.48	$MnSe_2$	$Pca2_1$	L29.2.1 GM2	1	mmm	$B1_g$
1.145	$Mn_3Ni_{20}P_6$	$P4/mmm$	L123.1.1 GM1$^+$	1	$4/mmm$	$A1_g$
1.277	$LiFeCr_4O_8$	$F\bar{4}3m$	L216.1.1 GM1	1	$m\bar{3}m$	$A1_g$
1.522	$CrVO_4$	$Cmcm$	L63.2.4 GM3$^+$	1	mmm	$B3_g$
2.15	$Mn_3Ni_{20}P_6$	$P4/mmm$	L123.1.1 GM1$^+$	1	$4/mmm$	$A1_g$
heavy-element materials						
0.1	$LaMnO_3$	$Pnma$	L62.2.2 GM2$^+$	1	mmm	$B1_g$
0.3	Ca_3LiOsO_6	$R\bar{3}c$	L167.2.2 GM2$^+$	1	$\bar{3}m$	$A2_g$
0.21	$PbNiO_3$	$R3c$	L161.2.1 GM2	1	$\bar{3}m$	$A2_g$
0.25	$NaOsO_3$	$Pnma$	L62.2.4 GM3$^+$	1	mmm	$B3_g$
0.45	La_2NiO_4	$Pccn$	L56.2.4 GM3$^+$	1	mmm	$B3_g$
0.56	$Ba_2CoGe_2O_7$	$P\bar{4}2_1m$	L113.2.3 GM4	1	$4/mmm$	$A2_g$
0.62	$SrMn_2V_2O_8$	$I4_1cd$	L110.2.1 GM2	1	$4/mmm$	$B1_g$
0.79	$CaIrO_3$	$Cmcm$	L63.2.4 GM3$^+$	1	mmm	$B3_g$
0.105	$ErVO_3$	$P2_1/c$	L14.2.2 GM2$^+$	1	$2/m$	B_g
0.118	$Ba_5Co_5ClO_{13}$	$P6_3/mmc$	L194.2.4 GM3$^+$	1	$6/mmm$	$B2_g$
0.138	$BiCrO_3$	$C2/c$	L15.1.1 GM1$^+$	1	$2/m$	A_g
0.139	$BiCrO_3$	$C2/c$	L15.1.1 GM1$^+$	1	$2/m$	A_g
0.148	La_2LiRuO_6	$P2_1/c$	L14.2.2 GM2$^+$	1	$2/m$	B_g
0.149	$Nd_3Ru_4Al_{12}$	$Cmcm$	L63.1.1 GM1$^+$	1	mmm	A_g
0.154	$Er_2Ru_2O_7$	$I4_1/amd$	L141.2.2 GM2$^+$	1	$4/mmm$	$B1_g$
0.173	$Pr_3Ru_4Al_{12}$	$Cmcm$	L63.1.1 GM1$^+$	1	mmm	A_g
0.176	$Mn_3Ti_2Te_6$	$P\bar{3}1c$	L163.1.1 GM1$^+$	1	$\bar{3}m$	$A1_g$
0.189	$CeMn_2Ge_4O_{12}$	$P4/nbm$	L125.2.6 GM4$^+$	1	$4/mmm$	$B2_g$
0.226	$NdCo_2$	$Fd\bar{3}m$	L227.1.1 GM1$^+$	1	$m\bar{3}m$	$A1_g$
0.227	$NdCo_2$	$I4_1/amd$	L141.1.1 GM1$^+$	1	$4/mmm$	$A1_g$
0.228	$TbCo_2$	$R\bar{3}m$	L166.1.1 GM1$^+$	1	$\bar{3}m$	$A1_g$
0.229	$Ba_2MnSi_2O_7$	$P\bar{4}2_1m$	L113.2.3 GM4	1	$4/mmm$	$A2_g$
0.231	$TmMn_3O_6$	$Pmmn$	L59.1.1 GM1$^+$	1	mmm	A_g
0.232	$TmMn_3O_6$	$Pmmn$	L59.1.1 GM1$^+$	1	mmm	A_g
0.234	$MnLaMnSbO_6$	$P4_2/n$	L86.1.1 GM1$^+$	1	$4/m$	A_g
0.235	$MnPrMnSbO_6$	$P4_2/n$	L86.1.1 GM1$^+$	1	$4/m$	A_g
0.239	Ca_3LiRuO_6	$R\bar{3}c$	L167.2.2 GM2$^+$	1	$\bar{3}m$	$A2_g$
0.266	$Na_2BaCo(VO_4)_2$	$P\bar{3}m1$	L164.1.1 GM1$^+$	1	$\bar{3}m$	$A1_g$
0.301	Sr_2CoTeO_6	$P2_1/c$	L14.2.2 GM2$^+$	1	$2/m$	B_g
0.303	$BaCrF_5$	$P2_12_12_1$	L19.2.1 GM2	1	mmm	$B1_g$
0.308	$InCrO_3$	$Pnma$	L62.2.6 GM4$^+$	1	mmm	$B2_g$
0.309	$TlCrO_3$	$Pnma$	L62.2.6 GM4$^+$	1	mmm	$B2_g$
0.315	$ZrMn_2Ge_4O_{12}$	$P4/nbm$	L125.2.6 GM4$^+$	1	$4/mmm$	$B2_g$

Collinear magnetic materials with non-zero spin texture $\vec{S}(\boldsymbol{k})$ (continued).

BCSID	Chemical formula	PSG	SSG	d_M	Sym of $\vec{S}(\boldsymbol{k})$	Representation
0.317	Ho_2CoMnO_6	$P2_1/c$	L14.1.1 GM1$^+$	1	$2/m$	A_g
0.323	$LaCrO_3$	$Pnma$	L62.2.4 GM3$^+$	1	mmm	$B3_g$
0.327	$CsMnF_4$	$P4/nmm$	L129.1.1 GM1$^+$	1	$4/mmm$	$A1_g$
0.329	$RbMnF_4$	$P2_1/c$	L14.2.2 GM2$^+$	1	$2/m$	B_g
0.331	$Fe_2Mo_3O_8$	$P6_3mc$	L186.2.3 GM4	1	$6/mmm$	$B2_g$
0.332	$Co_2Mo_3O_8$	$P6_3mc$	L186.2.3 GM4	1	$6/mmm$	$B2_g$
0.333	$Mn_2Mo_3O_8$	$P6_3mc$	L186.1.1 GM1	1	$6/mmm$	$A1_g$
0.336	$NdFeO_3$	$Pnma$	L62.2.4 GM3$^+$	1	mmm	$B3_g$
0.338	$Co_2Mo_3O_8$	$P6_3mc$	L186.2.3 GM4	1	$6/mmm$	$B2_g$
0.345	Tb_2C_3	$Fdd2$	L43.2.1 GM2	1	mmm	$B1_g$
0.351	$TbFeO_3$	$Pnma$	L62.2.4 GM3$^+$	1	mmm	$B3_g$
0.354	$TbCrO_3$	$Pnma$	L62.2.4 GM3$^+$	1	mmm	$B3_g$
0.361	Sr_3LiRuO_6	$R\bar{3}c$	L167.2.2 GM2$^+$	1	$\bar{3}m$	$A2_g$
0.367	$EuCr_2As_2$	$I\bar{4}m2$	L119.1.1 GM1	1	$4/mmm$	$A1_g$
0.374	YNi_4Si	$Cmmm$	L65.1.1 GM1$^+$	1	mmm	A_g
0.379	$SmFeO_3$	$Pnma$	L62.2.4 GM3$^+$	1	mmm	$B3_g$
0.380	$SmFeO_3$	$Pnma$	L62.2.4 GM3$^+$	1	mmm	$B3_g$
0.395	MnPtGa	$Cmcm$	L63.1.1 GM1$^+$	1	mmm	A_g
0.397	$Mn_3Si_2Te_6$	$P\bar{3}1c$	L163.1.1 GM1$^+$	1	$\bar{3}m$	$A1_g$
0.402	$Sr_4Fe_4O_{11}$	$Cmmm$	L65.2.2 GM2$^+$	1	mmm	$B1_g$
0.403	$NdCo_2$	$Imma$	L74.1.1 GM1$^+$	1	mmm	A_g
0.404	Sr_3NaRuO_6	$R\bar{3}c$	L167.2.2 GM2$^+$	1	$\bar{3}m$	$A2_g$
0.405	$CsCoF_4$	$I\bar{4}$	L82.2.1 GM2	1	$4/m$	B_g
0.415	$EuFe_2P_2$	$I4/mmm$	L139.1.1 GM1$^+$	1	$4/mmm$	$A1_g$
0.416	$LaCrO_3$	$R\bar{3}c$	L167.2.2 GM2$^+$	1	$\bar{3}m$	$A2_g$
0.417	$LaCrO_3$	$Pnma$	L62.2.4 GM3$^+$	1	mmm	$B3_g$
0.420	Sr_2LuRuO_6	$P2_1/c$	L14.2.2 GM2$^+$	1	$2/m$	B_g
0.428	$BaMn_2Si_2O_7$	$C2/c$	L15.1.1 GM1$^+$	1	$2/m$	A_g
0.434	K_2ReI_6	$P2_1/c$	L14.2.2 GM2$^+$	1	$2/m$	B_g
0.436	$TbNi_4Si$	$Cmmm$	L65.1.1 GM1$^+$	1	mmm	A_g
0.439	Tb_3NiGe_2	$Pnma$	L62.1.1 GM1$^+$	1	mmm	A_g
0.448	Ce_4Ge_3	$I\bar{4}2d$	L122.2.3 GM4	1	$4/mmm$	$A2_g$
0.475	Sr_2TbIrO_6	$P2_1/c$	L14.2.2 GM2$^+$	1	$2/m$	B_g
0.499	UCr_2Si_2C	$P4/mmm$	L123.2.2 GM2$^+$	1	$4/mmm$	$B1_g$
0.509	$BaFe_{12}O_{19}$	$P6_3/mmc$	L194.1.1 GM1$^+$	1	$6/mmm$	$A1_g$
0.513	$YRuO_3$	$Pnma$	L62.2.4 GM3$^+$	1	mmm	$B3_g$
0.528	CrSb	$P6_3/mmc$	L194.2.4 GM3$^+$	1	$6/mmm$	$B2_g$
0.541	Mn_2FeReO_6	$P2_1/c$	L14.1.1 GM1$^+$	1	$2/m$	A_g
0.542	Mn_2FeReO_6	$P\bar{1}$	L2.1.1 GM1$^+$	1	$\bar{1}$	A_g
0.543	Mn_2FeReO_6	$P\bar{1}$	L2.1.1 GM1$^+$	1	$\bar{1}$	A_g
0.553	K_2ReI_6	$P2_1/c$	L14.2.2 GM2$^+$	1	$2/m$	B_g
0.561	$NdNiGe_2$	$Cmcm$	L63.1.1 GM1$^+$	1	mmm	A_g
0.586	$YCrO_3$	$Pnma$	L62.2.4 GM3$^+$	1	mmm	$B3_g$
0.587	$TmCrO_3$	$Pnma$	L62.2.4 GM3$^+$	1	mmm	$B3_g$
0.591	$ErCrO_3$	$Pnma$	L62.2.4 GM3$^+$	1	mmm	$B3_g$

Collinear magnetic materials with non-zero spin texture $\vec{S}(\boldsymbol{k})$ (continued).

BCSID	Chemical formula	PSG	SSG	d_M	Sym of $\vec{S}(\boldsymbol{k})$	Representation
0.592	$DyCrO_3$	$Pnma$	L62.2.4 GM3$^+$	1	mmm	$B3_g$
0.593	UPSe	$P4/nmm$	L129.1.1 GM1$^+$	1	$4/mmm$	$A1_g$
0.594	UAsS	$P4/nmm$	L129.1.1 GM1$^+$	1	$4/mmm$	$A1_g$
0.595	UPTe	$I4/mmm$	L139.1.1 GM1$^+$	1	$4/mmm$	$A1_g$
0.596	UAsTe	$I4/mmm$	L139.1.1 GM1$^+$	1	$4/mmm$	$A1_g$
0.607	RuO_2	$P4_2/mnm$	L136.2.6 GM4$^+$	1	$4/mmm$	$B2_g$
0.608	$PrMnO_3$	$Pnma$	L62.2.2 GM2$^+$	1	mmm	$B1_g$
0.609	$NdMnO_3$	$Pnma$	L62.2.2 GM2$^+$	1	mmm	$B1_g$
0.616	HoB_2	$P6/mmm$	L191.1.1 GM1$^+$	1	$6/mmm$	$A1_g$
0.642	$LaMnO_3$	$Pnma$	L62.2.2 GM2$^+$	1	mmm	$B1_g$
0.662	Mn_3Sn_2	$Pnma$	L62.1.1 GM1$^+$	1	mmm	A_g
0.671	Sr_2TmRuO_6	$P2_1/c$	L14.2.2 GM2$^+$	1	$2/m$	B_g
0.672	$CaCu_3Fe_2Sb_2O_{12}$	$Pn\bar{3}$	L201.1.1 GM1$^+$	1	$m\bar{3}$	A_g
0.681	Ce_4Sb_3	$I\bar{4}2d$	L122.2.2 GM3	1	$4/mmm$	$B2_g$
0.682	Ca_2FeOsO_6	$P2_1/c$	L14.1.1 GM1$^+$	1	$2/m$	A_g
0.689	PrPt	$Cmcm$	L63.1.1 GM1$^+$	1	mmm	A_g
0.690	NdPt	$Cmcm$	L63.1.1 GM1$^+$	1	mmm	A_g
0.699	$LiMn_6Sn_6$	$P6/mmm$	L191.1.1 GM1$^+$	1	$6/mmm$	$A1_g$
0.700	$TbMn_6Sn_6$	$P6/mmm$	L191.1.1 GM1$^+$	1	$6/mmm$	$A1_g$
0.701	$TbMn_6Sn_6$	$P6/mmm$	L191.1.1 GM1$^+$	1	$6/mmm$	$A1_g$
0.705	$HoMn_6Sn_6$	$P6/mmm$	L191.1.1 GM1$^+$	1	$6/mmm$	$A1_g$
0.706	$Tb_2Ir_3Ga_9$	$Cmcm$	L63.2.2 GM2$^+$	1	mmm	$B1_g$
0.708	$CrNb_4S_8$	$P6_3/mmc$	L194.2.4 GM3$^+$	1	$6/mmm$	$B2_g$
0.709	$MnNb_4S_8$	$P6_3/mmc$	L194.1.1 GM1$^+$	1	$6/mmm$	$A1_g$
0.710	$MnNb_3S_6$	$P6_322$	L182.1.1 GM1	1	$6/mmm$	$A1_g$
0.711	$MnTa_4S_8$	$P6_3/mmc$	L194.1.1 GM1$^+$	1	$6/mmm$	$A1_g$
0.712	VNb_3S_6	$P6_322$	L182.2.3 GM4	1	$6/mmm$	$B1_g$
0.722	$Mn_4Nb_2O_9$	Cc	L9.2.1 GM2	1	$2/m$	B_g
0.729	$ErNi_4B$	$P6/mmm$	L191.1.1 GM1$^+$	1	$6/mmm$	$A1_g$
0.730	$TbNi_4B$	$P6/mmm$	L191.1.1 GM1$^+$	1	$6/mmm$	$A1_g$
0.731	$HoNi_4B$	$P6/mmm$	L191.1.1 GM1$^+$	1	$6/mmm$	$A1_g$
0.732	$SrRuO_3$	$Pnma$	L62.1.1 GM1$^+$	1	mmm	A_g
0.735	$LaBaMn_2O_5$	$P4/nmm$	L129.1.1 GM1$^+$	1	$4/mmm$	$A1_g$
0.737	$LaBaMn_2O_6$	$P4/mmm$	L123.1.1 GM1$^+$	1	$4/mmm$	$A1_g$
0.738	$LaBaMn_2O_6$	$P4/mmm$	L123.1.1 GM1$^+$	1	$4/mmm$	$A1_g$
0.739	$YBaMn_2O_5$	$P4/nmm$	L129.1.1 GM1$^+$	1	$4/mmm$	$A1_g$
0.747	$Ba_3CoIr_2O_9$	$C2/c$	L15.2.2 GM2$^+$	1	$2/m$	B_g
0.748	$Ba_3NiRu_2O_9$	$P6_3/mmc$	L194.2.4 GM3$^+$	1	$6/mmm$	$B2_g$
0.757	$CeFeO_3$	$Pnma$	L62.2.4 GM3$^+$	1	mmm	$B3_g$
0.758	$CeFeO_3$	$Pnma$	L62.2.4 GM3$^+$	1	mmm	$B3_g$
0.767	$SrMnSb_2$	$Pnma$	L62.1.1 GM1$^+$	1	mmm	A_g
0.771	$PrMnSi_2$	$Cmcm$	L63.1.1 GM1$^+$	1	mmm	A_g
0.772	$PrMnSi_2$	$Cmcm$	L63.1.1 GM1$^+$	1	mmm	A_g
0.774	$NdMnSi_2$	$Cmcm$	L63.1.1 GM1$^+$	1	mmm	A_g
0.775	$NdMnSi_2$	$Cmcm$	L63.1.1 GM1$^+$	1	mmm	A_g

Collinear magnetic materials with non-zero spin texture $\vec{S}(\boldsymbol{k})$ (continued).

BCSID	Chemical formula	PSG	SSG	d_M	Sym of $\vec{S}(\boldsymbol{k})$	Representation
0.776	$CeMnSi_2$	$Cmcm$	L63.1.1 GM1$^+$	1	mmm	A_g
0.777	$CeMnSi_2$	$Cmcm$	L63.1.1 GM1$^+$	1	mmm	A_g
0.778	$LaMnSi_2$	$Cmcm$	L63.1.1 GM1$^+$	1	mmm	A_g
0.779	$LaMnSi_2$	$Cmcm$	L63.1.1 GM1$^+$	1	mmm	A_g
0.780	$LaMnSi_2$	$Cmcm$	L63.1.1 GM1$^+$	1	mmm	A_g
0.781	$CeMnSi_2$	$Cmcm$	L63.1.1 GM1$^+$	1	mmm	A_g
0.784	$NdCoO_3$	$Pnma$	L62.2.6 GM4$^+$	1	mmm	$B2_g$
0.786	$NdVO_3$	$Pnma$	L62.2.6 GM4$^+$	1	mmm	$B2_g$
0.787	YVO_3	$Pnma$	L62.2.4 GM3$^+$	1	mmm	$B3_g$
0.789	CeCuSi	$P6_3/mmc$	L194.1.1 GM1$^+$	1	$6/mmm$	$A1_g$
0.790	Sr_2DyRuO_6	$P2_1/c$	L14.2.2 GM2$^+$	1	$2/m$	B_g
0.792	Sr_2HoRuO_6	$P2_1/c$	L14.2.2 GM2$^+$	1	$2/m$	B_g
0.793	Sr_2HoRuO_6	$P2_1/c$	L14.2.2 GM2$^+$	1	$2/m$	B_g
0.795	Sr_2YRuO_6	$P2_1/c$	L14.2.2 GM2$^+$	1	$2/m$	B_g
0.796	Ca_2NiOsO_6	$P2_1/c$	L14.1.1 GM1$^+$	1	$2/m$	A_g
0.797	$SmBaMn_2O_5$	$P4/nmm$	L129.1.1 GM1$^+$	1	$4/mmm$	$A1_g$
0.800	MnTe	$P6_3/mmc$	L194.2.4 GM3$^+$	1	$6/mmm$	$B2_g$
0.811	Fe_2WO_6	$Pbcn$	L60.2.6 GM4$^+$	1	mmm	$B2_g$
0.813	Fe_2WO_6	$Pbcn$	L60.2.6 GM4$^+$	1	mmm	$B2_g$
0.823	Sr_2MnGaO_5	$Ima2$	L46.2.1 GM2	1	mmm	$B1_g$
0.832	CeAuGe	$Cmc2_1$	L36.1.1 GM1	1	mmm	A_g
0.833	CeCuGe	$P6_3/mmc$	L194.1.1 GM1$^+$	1	$6/mmm$	$A1_g$
0.834	$CrSbSe_3$	$Pnma$	L62.1.1 GM1$^+$	1	mmm	A_g
0.835	$Dy_5Pd_2In_4$	$Pbam$	L55.1.1 GM1$^+$	1	mmm	A_g
0.836	$DyFeO_3$	$Pnma$	L62.2.4 GM3$^+$	1	mmm	$B3_g$
0.837	$DyFeO_3$	$Pnma$	L62.2.4 GM3$^+$	1	mmm	$B3_g$
0.838	$DyFeO_3$	$Pnma$	L62.2.4 GM3$^+$	1	mmm	$B3_g$
0.839	$DyFeO_3$	$Pnma$	L62.2.4 GM3$^+$	1	mmm	$B3_g$
0.840	$DyFeO_3$	$Pnma$	L62.2.4 GM3$^+$	1	mmm	$B3_g$
0.841	$DyFeO_3$	$Pnma$	L62.2.4 GM3$^+$	1	mmm	$B3_g$
0.855	Mn_2Sb	$P4/nmm$	L129.1.1 GM1$^+$	1	$4/mmm$	$A1_g$
0.856	Tm_2Fe_{17}	$P6_3/mmc$	L194.1.1 GM1$^+$	1	$6/mmm$	$A1_g$
0.857	Tm_2Fe_{17}	$P6_3/mmc$	L194.1.1 GM1$^+$	1	$6/mmm$	$A1_g$
0.858	Tm_2Fe_{17}	$P6_3/mmc$	L194.1.1 GM1$^+$	1	$6/mmm$	$A1_g$
0.859	YCo_3	$R\bar{3}m$	L166.1.1 GM1$^+$	1	$\bar{3}m$	$A1_g$
0.860	$Co_3Sn_2S_2$	$R\bar{3}m$	L166.1.1 GM1$^+$	1	$\bar{3}m$	$A1_g$
0.861	$Co_3Sn_2S_2$	$R\bar{3}m$	L166.1.1 GM1$^+$	1	$\bar{3}m$	$A1_g$
0.863	$EuCd_2As_2$	$P\bar{3}m1$	L164.1.1 GM1$^+$	1	$\bar{3}m$	$A1_g$
0.867	Nd_2NiIrO_6	$P2_1/c$	L14.1.1 GM1$^+$	1	$2/m$	A_g
0.897	$TbMn_2Ge_2$	$I4/mmm$	L139.1.1 GM1$^+$	1	$4/mmm$	$A1_g$
0.902	$DyMn_2Ge_2$	$I4/mmm$	L139.1.1 GM1$^+$	1	$4/mmm$	$A1_g$
0.904	Nd_2PdGe_6	$Cmce$	L64.2.4 GM3$^+$	1	mmm	$B3_g$
0.911	$Tb_5Pd_2In_4$	$Pbam$	L55.1.1 GM1$^+$	1	mmm	A_g
0.914	$Tb_5Ni_2In_4$	$Pbam$	L55.1.1 GM1$^+$	1	mmm	A_g
0.917	Sr_2ScOsO_6	$P2_1/c$	L14.2.2 GM2$^+$	1	$2/m$	B_g

Collinear magnetic materials with non-zero spin texture $\vec{S}(\boldsymbol{k})$ (continued).

BCSID	Chemical formula	PSG	SSG	d_M	Sym of $\vec{S}(\boldsymbol{k})$	Representation
0.927	Nd_2PdGe_6	$Cmce$	L64.2.4 GM3$^+$	1	mmm	B3$_g$
0.934	Sr_2NiTeO_6	$P2_1/c$	L14.2.2 GM2$^+$	1	$2/m$	B$_g$
0.936	Sr_2MnTeO_6	$P2_1/c$	L14.2.2 GM2$^+$	1	$2/m$	B$_g$
0.937	Sr_2CoTeO_6	$P2_1/c$	L14.2.2 GM2$^+$	1	$2/m$	B$_g$
0.947	$YCrO_3$	$Pnma$	L62.2.4 GM3$^+$	1	mmm	B3$_g$
0.967	$BaMn_2V_2O_8$	$I4_1cd$	L110.2.1 GM2	1	$4/mmm$	B1$_g$
0.970	$PrRu_2Si_2$	$I4/mmm$	L139.1.1 GM1$^+$	1	$4/mmm$	A1$_g$
0.971	HoP	$Fm\bar{3}m$	L225.1.1 GM1$^+$	1	$m\bar{3}m$	A1$_g$
0.972	HoPdIn	$P\bar{6}2m$	L189.1.1 GM1	1	$6/mmm$	A1$_g$
0.973	HoPdIn	$P\bar{6}2m$	L189.1.1 GM1	1	$6/mmm$	A1$_g$
0.974	ErPdIn	$P\bar{6}2m$	L189.1.1 GM1	1	$6/mmm$	A1$_g$
0.975	ErPdIn	$P\bar{6}2m$	L189.1.1 GM1	1	$6/mmm$	A1$_g$
0.976	NdPdIn	$P\bar{6}2m$	L189.1.1 GM1	1	$6/mmm$	A1$_g$
0.977	NdPdIn	$P\bar{6}2m$	L189.1.1 GM1	1	$6/mmm$	A1$_g$
0.978	ErNiIn	$P\bar{6}2m$	L189.1.1 GM1	1	$6/mmm$	A1$_g$
0.979	$TmVO_3$	$Pnma$	L62.2.4 GM3$^+$	1	mmm	B3$_g$
0.980	$TmVO_3$	$Pnma$	L62.2.4 GM3$^+$	1	mmm	B3$_g$
0.982	$TmVO_3$	$P2_1/c$	L14.2.2 GM2$^+$	1	$2/m$	B$_g$
0.983	$TmVO_3$	$P2_1/c$	L14.2.2 GM2$^+$	1	$2/m$	B$_g$
0.984	$LuVO_3$	$Pnma$	L62.2.4 GM3$^+$	1	mmm	B3$_g$
1.0.5	Sr_3CoIrO_6	$P\bar{3}c1$	L165.1.1 GM1$^+$	1	$\bar{3}m$	A1$_g$
1.0.7	$LuFe_2O_4$	$C2/m$	L12.1.1 GM1$^+$	1	$2/m$	A$_g$
1.0.9	$CsCoCl_3$	$P6_3/mcm$	L193.2.6 GM4$^+$	1	$6/mmm$	B1$_g$
1.0.10	Sr_3NiIrO_6	$P\bar{3}c1$	L165.1.1 GM1$^+$	1	$\bar{3}m$	A1$_g$
1.0.11	$CeCoGe_3$	$I4mm$	L107.1.1 GM1	1	$4/mmm$	A1$_g$
1.0.12	UAu_2Si_2	$Immm$	L71.1.1 GM1$^+$	1	mmm	A$_g$
1.0.13	FeI_2	$C2/m$	L12.1.1 GM1$^+$	1	$2/m$	A$_g$
1.0.18	$Cs_2MnU_3F_{16}$	$P6_3/mcm$	L193.1.1 GM1$^+$	1	$6/mmm$	A1$_g$
1.0.19	$Cs_2CoU_3F_{16}$	$P6_3/mcm$	L193.1.1 GM1$^+$	1	$6/mmm$	A1$_g$
1.0.26	$RbCoBr_3$	$P6_3/mcm$	L193.2.6 GM4$^+$	1	$6/mmm$	B1$_g$
1.0.28	$Tb(DCO_2)_3$	$P3m1$	L156.1.1 GM1	1	$\bar{3}m$	A1$_g$
1.0.29	$CeIrGe_3$	$I4mm$	L107.1.1 GM1	1	$4/mmm$	A1$_g$
1.0.38	$CsCoCl_3$	$P6_3/mcm$	L193.2.6 GM4$^+$	1	$6/mmm$	B1$_g$
1.0.39	$BaMnO_3$	$P6_3/mcm$	L193.2.6 GM4$^+$	1	$6/mmm$	B1$_g$
1.0.43	UPd_2Si_2	$I4/mmm$	L139.1.1 GM1$^+$	1	$4/mmm$	A1$_g$
1.0.53	Ho_2Ni_2Pb	$Cmmm$	L65.1.1 GM1$^+$	1	mmm	A$_g$
1.0.54	Ho_2Ni_2Pb	$Cmmm$	L65.1.1 GM1$^+$	1	mmm	A$_g$
1.100	Cu_2MnSnS_4	$C2$	L5.2.1 GM2	1	$2/m$	B$_g$
2.26	$PrCo_2P_2$	$P4/mmm$	L123.1.1 GM1$^+$	1	$4/mmm$	A1$_g$
2.65	UPd_2Si_2	$P4/mmm$	L123.1.1 GM1$^+$	1	$4/mmm$	A1$_g$
2.74	$BaDy_2O_4$	$P2_1$	L4.1.1 GM1	1	$2/m$	A$_g$
2.80	$ErFe_6Ge_6$	$Pmmn$	L59.1.1 GM1$^+$	1	mmm	A$_g$
2.88	UNiGa	$P\bar{6}2m$	L189.2.2 GM3	1	$6/mmm$	B1$_g$
2.95	$TbMn_2Ge_2$	$P4/nmm$	L129.1.1 GM1$^+$	1	$4/mmm$	A1$_g$
2.103	Eu_3PbO	$P4/mmm$	L123.1.1 GM1$^+$	1	$4/mmm$	A1$_g$

Collinear magnetic materials with non-zero spin texture $\vec{S}(\boldsymbol{k})$ (continued).

BCSID	Chemical formula	PSG	SSG	d_M	Sym of $\vec{S}(\boldsymbol{k})$	Representation
3.3	Ho_2RhIn_8	$Cmcm$	L63.1.1 GM1$^+$	1	mmm	A_g
3.14	FeI_2	$C2/m$	L12.1.1 GM1$^+$	1	$2/m$	A_g
3.15	FeI_2	$P\bar{3}m1$	L164.1.1 GM1$^+$	1	$\bar{3}m$	$A1_g$
3.23	Eu_3PbO	$P4/mmm$	L123.1.1 GM1$^+$	1	$4/mmm$	$A1_g$

TABLE S699: Coplanar magnetic materials with non-zero spin texture $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$.

BCSID	Chemical formula	PSG	SSG	d_M	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
light-element materials						
0.7	$ScMnO_3$	$P6_3cm$	P185.6.2 GM6	3	$6/mmm$	$A1_u \oplus E1_g$
0.8	$ScMnO_3$	$P6_3cm$	P185.6.2 GM6	3	$6/mmm$	$A1_u \oplus E1_g$
0.17	$FePO_4$	$Pnma$	P62.3.24 GM3$^-$ $\oplus$ GM4$^+$	2	mmm	$B1_u \oplus B2_g$
0.36	NiF_2	$P4_2/mnm$	P136.2.6 GM4$^+$	2	$4/mmm$	$A1_g \oplus B2_g$
0.40	Mn_2O_3-alpha	$Pbca$	P61.3.5 GM2$^+$ $\oplus$ GM3$^+$	2	mmm	$B1_g \oplus B3_g$
0.41	Mn_2O_3-alpha	$Pbca$	P61.3.5 GM2$^+$ $\oplus$ GM3$^+$	2	mmm	$B1_g \oplus B3_g$
0.69	$Co_4(OH)_2(C_{10}H_{16}O_4)_3$	$P2_1/c$	P14.2.2 GM2$^+$	2	$2/m$	$A_g \oplus B_g$
0.85	$KCo_4(PO_4)_3$	$Pnnm$	P58.2.2 GM2$^+$	2	mmm	$A_g \oplus B1_g$
0.101	Mn_2GeO_4	$Pnma$	P62.3.21 GM3$^+$ $\oplus$ GM4$^+$	2	mmm	$B3_g \oplus B2_g$
0.120	$LiFe(SO_4)_2$	$P2_1/c$	P14.2.2 GM2$^+$	2	$2/m$	$A_g \oplus B_g$
0.121	$Li_2Co(SO_4)_2$	$P2_1/c$	P14.2.2 GM2$^+$	2	$2/m$	$A_g \oplus B_g$
0.122	$Li_2Mn(SO_4)_2$	$P2_1/c$	P14.2.2 GM2$^+$	2	$2/m$	$A_g \oplus B_g$
0.123	Mn_3NiN	$R\bar{3}m$	P166.6.1 GM3$^+$	2	$\bar{3}m$	E_g
0.124	Mn_3NiN	$R\bar{3}m$	P166.6.1 GM3$^+$	2	$\bar{3}m$	E_g
0.132	$Fe(N(CN_2))_2$	$Pnnm$	P58.2.2 GM2$^+$	2	mmm	$A_g \oplus B1_g$
0.133	$Ni_3B_7O_{13}Cl$	$Pca2_1$	P29.2.1 GM2	3	mmm	$A_g \oplus A_u \oplus B1_g$
0.175	$Ca_2CoSi_2O_7$	$P2_12_12$	P18.2.1 GM2	3	mmm	$A_g \oplus B1_g \oplus B1_u$
0.177	Mn_3GaN	$Pm\bar{3}m$	P221.6.1 GM3$^+$	2	$m\bar{3}m$	E_g
0.179	$FeCl_5D_2O(ND_4)_2$	$P2_1/c$	P14.2.3 GM2$^-$	2	$2/m$	$A_g \oplus B_u$
0.262	$CoFePO_5$	$Pnma$	P62.3.12 GM2$^+$ $\oplus$ GM4$^+$	2	mmm	$B1_g \oplus B2_g$
0.273	Mn_3ZnN	$Pm\bar{3}m$	P221.6.1 GM3$^+$	2	$m\bar{3}m$	E_g
0.279	Mn_3As	$P6_3/mmc$	P194.6.1 GM5$^+$	2	$6/mmm$	$E2_g$
0.280	Mn_3As	$P6_3/mmc$	P194.6.1 GM5$^+$	2	$6/mmm$	$E2_g$
0.295	$Cu_2(OD)_3Cl$	$P2_1/c$	P14.3.5 GM2$^+$ $\oplus$ GM2$^+$	2	$2/m$	$B_g \oplus B_g$
0.296	$Cu_2(OD)_3Cl$	$P2_1/c$	P14.2.2 GM2$^+$	2	$2/m$	$A_g \oplus B_g$
0.328	$KMnF_4$	$P2_1/c$	P14.2.2 GM2$^+$	2	$2/m$	$A_g \oplus B_g$
0.377	Mn_3Ge	$P6_3/mmc$	P194.6.1 GM5$^+$	2	$6/mmm$	$E2_g$
0.387	Fe_3BO_5	$Pnma$	P62.2.3 GM2$^-$	2	mmm	$A_g \oplus B1_u$
0.425	$Na_2CoP_2O_7$	$Pna2_1$	P33.3.2 GM2 $\oplus$ GM3	3	mmm	$B1_g \oplus B3_g \oplus B3_u$
0.579	Na_2NiFeF_7	$Imma$	P74.2.4 GM3$^+$	2	mmm	$A_g \oplus B3_g$
0.580	Na_2NiFeF_7	$Imma$	P74.2.4 GM3$^+$	2	mmm	$A_g \oplus B3_g$
0.583	$Fe_2F_5(H_2O)_2$	$Imma$	P74.2.4 GM3$^+$	2	mmm	$A_g \oplus B3_g$
0.612	Cu_2OSO_4	$C2/m$	P12.2.2 GM2$^+$	2	$2/m$	$A_g \oplus B_g$
0.641	Mn_3Ga	$I4/mmm$	P139.1.1 GM1$^+$	2	$4/mmm$	$A1_g \oplus A1_g$
0.891	$CuCr_2O_4$	$I4_1/amd$	P141.2.2 GM2$^+$	2	$4/mmm$	$A1_g \oplus B1_g$
1.0.22	$K_2Mn_3(VO_4)_2CO_3$	$P6_3/m$	P176.2.3 GM2$^-$	2	$6/m$	$A_g \oplus B_u$

Coplanar magnetic materials with non-zero spin texture $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$ (continued).

BCSID	Chemical formula	PSG	SSG	d_M	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
1.0.50	$CoGeO_3$	$C2/c$	P15.1.1 GM1$^+$	2	$2/m$	$A_g \oplus A_g$
1.227	$Ca_2Cr_2O_5$	$Ima2$	P46.3.19 X1 $\oplus$ X1	1	mmm	$B1_u$
1.231	$NiPS_3$	$C2$	P5.3.11 Y1 $\oplus$ Y1	1	$2/m$	A_u
1.562	$GeNi_2O_4$	$R\bar{3}m$	P166.3.14 T1$^+$ $\oplus$ T2$^-$	1	$\bar{3}m$	$A2_u$
1.564	$GeCo_2O_4$	$R\bar{3}m$	P166.3.14 T1$^+$ $\oplus$ T2$^-$	1	$\bar{3}m$	$A2_u$
1.669	$KFe(PO_3F)_2$	$P\bar{3}$	P147.8.2 P1	1	$\bar{3}$	A_u
1.688	$NiCr_2O_4$	$C2$	P5.3.12 Y1 $\oplus$ Y2	1	$2/m$	B_u
2.29	Mn_3O_4	$Pbcn$	P60.2.6 GM4$^+$	2	mmm	$A_g \oplus B2_g$
2.90	Mn_3O_4	$Pbcn$	P60.2.6 GM4$^+$	2	mmm	$A_g \oplus B2_g$
heavy-element materials						
0.6	$YMnO_3$	$P6_3cm$	P185.6.2 GM6	3	$6/mmm$	$A1_u \oplus E1_g$
0.10	$DyFeO_3$	$P2_12_12_1$	P19.3.2 GM2 $\oplus$ GM3	3	mmm	$B1_g \oplus B3_g \oplus B2_u$
0.11	$DyFeO_3$	$Pna2_1$	P33.2.3 GM4	3	mmm	$A_g \oplus B3_u \oplus B2_g$
0.26	TmAgGe	$Amm2$	P38.2.3 GM4	3	mmm	$A_g \oplus B3_g \oplus B2_u$
0.30	$YbMnO_3$	$P6_3cm$	P185.6.1 GM5	3	$6/mmm$	$A1_u \oplus E2_g$
0.31	$HoMnO_3$	$P6_3cm$	P185.6.2 GM6	3	$6/mmm$	$A1_u \oplus E1_g$
0.32	$HoMnO_3$	$P6_3cm$	P185.6.2 GM6	3	$6/mmm$	$A1_u \oplus E1_g$
0.37	$U_3Al_2Si_3$	$C2$	P5.1.1 GM1	3	$2/m$	$A_g \oplus A_g \oplus A_u$
0.44	$YMnO_3$	$P6_3cm$	P185.6.1 GM5	3	$6/mmm$	$A1_u \oplus E2_g$
0.46	$CaBaCo_4O_7$	$Pna2_1$	P33.2.1 GM2	3	mmm	$A_g \oplus A_u \oplus B1_g$
0.47	$Gd_2Sn_2O_7$	$I4_1/amd$	P141.6.1 GM5$^+$	2	$4/mmm$	E_g
0.82	Gd_2CuO_4	$Cmce$	P64.2.4 GM3$^+$	2	mmm	$A_g \oplus B3_g$
0.104	$ErVO_3$	$Pnma$	P62.3.21 GM3$^+$ $\oplus$ GM4$^+$	2	mmm	$B3_g \oplus B2_g$
0.107	$Ho_2Ge_2O_7$	$P4_12_12$	P92.6.1 GM5	3	$4/mmm$	$A2_u \oplus E_g$
0.108	Mn_3Ir	$Pm\bar{3}m$	P221.6.1 GM3$^+$	2	$m\bar{3}m$	E_g
0.109	Mn_3Pt	$Pm\bar{3}m$	P221.6.1 GM3$^+$	2	$m\bar{3}m$	E_g
0.117	$LuFeO_3$	$P6_3cm$	P185.6.2 GM6	3	$6/mmm$	$A1_u \oplus E1_g$
0.129	$Cu_3Mo_2O_9$	$P2_12_12_1$	P19.3.2 GM2 $\oplus$ GM3	3	mmm	$B1_g \oplus B3_g \oplus B2_u$
0.130	$Cu_3Mo_2O_9$	$Pmc2_1$	P26.2.2 GM3	3	mmm	$A_g \oplus B3_g \oplus B2_u$
0.134	$Mn_3B_7O_{13}I$	$Pca2_1$	P29.3.2 GM2 $\oplus$ GM3	3	mmm	$B1_g \oplus B3_g \oplus B3_u$
0.164	Y_2MnCoO_6	$P2_1/c$	P14.2.2 GM2$^+$	2	$2/m$	$A_g \oplus B_g$
0.165	$SrMn(VO_4)(OH)$	$P2_1$	P4.2.1 GM2	3	$2/m$	$A_g \oplus B_g \oplus B_u$
0.174	$Pr_3Ru_4Al_{12}$	$Cmcm$	P63.1.1 GM1$^+$	2	mmm	$A_g \oplus A_g$
0.191	$BaCuF_4$	$Cmc2_1$	P36.2.2 GM3	3	mmm	$A_g \oplus B3_g \oplus B2_u$
0.192	$RbFe_2F_6$	$Pnma$	P62.3.21 GM3$^+$ $\oplus$ GM4$^+$	2	mmm	$B3_g \oplus B2_g$
0.199	Mn_3Sn	$P6_3/mmc$	P194.6.1 GM5$^+$	2	$6/mmm$	$E2_g$
0.200	Mn_3Sn	$P6_3/mmc$	P194.6.1 GM5$^+$	2	$6/mmm$	$E2_g$
0.210	Sr_2CoOsO_6	$C2/c$	P15.3.6 GM2$^+$ $\oplus$ GM2$^+$	2	$2/m$	$B_g \oplus B_g$
0.237	$Er_2Sn_2O_7$	$I4_1/amd$	P141.6.1 GM5$^+$	2	$4/mmm$	E_g
0.238	$Er_2Pt_2O_7$	$I4_1/amd$	P141.6.1 GM5$^+$	2	$4/mmm$	E_g
0.242	$Tm_2Cu_2O_5$	$Pna2_1$	P33.2.3 GM4	3	mmm	$A_g \oplus B3_u \oplus B2_g$
0.253	$Cs_2FeCl_5.D_2O$	$C2/c$	P15.2.3 GM2$^-$	2	$2/m$	$A_g \oplus B_u$
0.270	Tb_2MnNiO_6	$P2_1/c$	P14.1.1 GM1$^+$	2	$2/m$	$A_g \oplus A_g$
0.271	Tb_2MnNiO_6	$P2_1/c$	P14.1.1 GM1$^+$	2	$2/m$	$A_g \oplus A_g$
0.288	$NdMnO_3$	$Pnma$	P62.2.2 GM2$^+$	2	mmm	$A_g \oplus B1_g$

Coplanar magnetic materials with non-zero spin texture $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$ (continued).

BCSID	Chemical formula	PSG	SSG	d_M	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
0.289	$NdMnO_3$	$Pnma$	P62.2.2 $GM2^+$	2	mmm	$A_g \oplus B1_g$
0.298	$Na_2BaFe(VO_4)_2$	$C2/c$	P15.2.2 $GM2^+$	2	$2/m$	$A_g \oplus B_g$
0.314	$ZrCo_2Ge_4O_{12}$	$P4/nbm$	P125.2.6 $GM4^+$	2	$4/mmm$	$A1_g \oplus B2_g$
0.319	Tm_2CoMnO_6	$P2_1/c$	P14.1.1 $GM1^+$	2	$2/m$	$A_g \oplus A_g$
0.324	$CdYb_2S_4$	$I4_1/amd$	P141.6.1 $GM5^+$	2	$4/mmm$	E_g
0.325	$CdYb_2Se_4$	$I4_1/amd$	P141.6.1 $GM5^+$	2	$4/mmm$	E_g
0.337	$NdFeO_3$	$Pnma$	P62.3.21 $GM3^+ \oplus GM4^+$	2	mmm	$B3_g \oplus B2_g$
0.353	$TbFeO_3$	$P2_12_12_1$	P19.3.2 $GM2 \oplus GM3$	3	mmm	$B1_g \oplus B3_g \oplus B2_u$
0.370	$NdMnO_3$	$Pnma$	P62.2.2 $GM2^+$	2	mmm	$A_g \oplus B1_g$
0.371	$NdMnO_3$	$Pnma$	P62.2.2 $GM2^+$	2	mmm	$A_g \oplus B1_g$
0.375	La_2CoIrO_6	$P2_1/c$	P14.2.2 $GM2^+$	2	$2/m$	$A_g \oplus B_g$
0.396	MnPtGa	$Cmcm$	P63.2.4 $GM3^+$	2	mmm	$A_g \oplus B3_g$
0.398	Ca_2RuO_4	$Pbca$	P61.3.5 $GM2^+ \oplus GM3^+$	2	mmm	$B1_g \oplus B3_g$
0.407	NdSi	$Pnma$	P62.2.6 $GM4^+$	2	mmm	$A_g \oplus B2_g$
0.408	PrSi	$Pnma$	P62.2.6 $GM4^+$	2	mmm	$A_g \oplus B2_g$
0.409	TmNi	$Pnma$	P62.2.6 $GM4^+$	2	mmm	$A_g \oplus B2_g$
0.438	Pr_3CoGe_2	$Pnma$	P62.2.6 $GM4^+$	2	mmm	$A_g \oplus B2_g$
0.449	Tb_2Pt	$P2_1/m$	P11.1.1 $GM1^+$	2	$2/m$	$A_g \oplus A_g$
0.473	$LaMn_2Si_2$	$I4/mmm$	P139.2.7 $GM4^-$	2	$4/mmm$	$A1_g \oplus B2_u$
0.480	HoNi	$Pnma$	P62.2.6 $GM4^+$	2	mmm	$A_g \oplus B2_g$
0.481	HoNi	$Pnma$	P62.2.6 $GM4^+$	2	mmm	$A_g \oplus B2_g$
0.487	$ErCr_2Si_2$	$I4/mmm$	P139.2.7 $GM4^-$	2	$4/mmm$	$A1_g \oplus B2_u$
0.495	$LaMn_2Si_2$	$I4/mmm$	P139.2.7 $GM4^-$	2	$4/mmm$	$A1_g \oplus B2_u$
0.496	$LaMn_2Si_2$	$I4/mmm$	P139.2.7 $GM4^-$	2	$4/mmm$	$A1_g \oplus B2_u$
0.497	$LaMn_2Si_2$	$I4/mmm$	P139.2.7 $GM4^-$	2	$4/mmm$	$A1_g \oplus B2_u$
0.506	$Cs_2Cu_3SnF_{12}$	$P2_1/c$	P14.2.2 $GM2^+$	2	$2/m$	$A_g \oplus B_g$
0.552	Pb_2MnO_4	$P\bar{4}2_1c$	P114.6.1 GM5	3	$4/mmm$	$B2_u \oplus E_g$
0.577	$BaMnFeF_7$	$P2_1/c$	P14.1.1 $GM1^+$	2	$2/m$	$A_g \oplus A_g$
0.588	$PrCrO_3$	$Pnma$	P62.2.4 $GM3^+$	2	mmm	$A_g \oplus B3_g$
0.589	$NdCrO_3$	$Pnma$	P62.3.21 $GM3^+ \oplus GM4^+$	2	mmm	$B3_g \oplus B2_g$
0.590	$ErCrO_3$	$Pnma$	P62.3.21 $GM3^+ \oplus GM4^+$	2	mmm	$B3_g \oplus B2_g$
0.656	$NdMn_2Ge_2$	$I4/mmm$	P139.2.7 $GM4^-$	2	$4/mmm$	$A1_g \oplus B2_u$
0.657	$PrMn_2Ge_2$	$I4/mmm$	P139.2.7 $GM4^-$	2	$4/mmm$	$A1_g \oplus B2_u$
0.663	Mn_3Sn_2	$Pnma$	P62.2.2 $GM2^+$	2	mmm	$A_g \oplus B1_g$
0.664	Mn_3Sn_2	$Pnma$	P62.2.2 $GM2^+$	2	mmm	$A_g \oplus B1_g$
0.669	Sr_2YbRuO_6	$P2_1/c$	P14.3.5 $GM2^+ \oplus GM2^+$	2	$2/m$	$B_g \oplus B_g$
0.670	Sr_2YbRuO_6	$P2_1/c$	P14.3.5 $GM2^+ \oplus GM2^+$	2	$2/m$	$B_g \oplus B_g$
0.684	TbPt	$Pnma$	P62.2.6 $GM4^+$	2	mmm	$A_g \oplus B2_g$
0.685	ErPt	$Pnma$	P62.2.6 $GM4^+$	2	mmm	$A_g \oplus B2_g$
0.686	HoPt	$Pnma$	P62.2.6 $GM4^+$	2	mmm	$A_g \oplus B2_g$
0.687	DyPt	$Pnma$	P62.2.6 $GM4^+$	2	mmm	$A_g \oplus B2_g$
0.688	TmPt	$Pnma$	P62.2.6 $GM4^+$	2	mmm	$A_g \oplus B2_g$
0.698	$SmCrO_3$	$Pnma$	P62.3.21 $GM3^+ \oplus GM4^+$	2	mmm	$B3_g \oplus B2_g$
0.702	$TbMn_6Sn_6$	$P6/mmm$	P191.1.1 $GM1^+$	2	$6/mmm$	$A1_g \oplus A1_g$
0.703	$HoMn_6Sn_6$	$P6/mmm$	P191.1.1 $GM1^+$	2	$6/mmm$	$A1_g \oplus A1_g$

Coplanar magnetic materials with non-zero spin texture $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$ (continued).

BCSID	Chemical formula	PSG	SSG	d_M	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
0.704	$HoMn_6Sn_6$	$P6/mmm$	P191.1.1 $GM1^+$	2	$6/mmm$	$A1_g \oplus A1_g$
0.707	$Tb_2Ir_3Ga_9$	$Cmcm$	P63.2.2 $GM2^+$	2	mmm	$A_g \oplus B1_g$
0.716	$HoCrWO_6$	$Pna2_1$	P33.3.3 $GM2 \oplus GM4$	3	mmm	$B1_g \oplus B2_g \oplus B2_u$
0.724	$BaCoSiO_4$	$P6_3$	P173.4.2 GM4GM6	3	$6/m$	$A_u \oplus {}^2E2_g \oplus {}^1E2_g$
0.759	$CeFeO_3$	$Pnma$	P62.3.21 $GM3^+ \oplus GM4^+$	2	mmm	$B3_g \oplus B2_g$
0.768	$SrMnSb_2$	$Pnma$	P62.2.5 $GM3^-$	2	mmm	$A_g \oplus B3_u$
0.773	$NdMnSi_2$	$Cmcm$	P63.1.1 $GM1^+$	2	mmm	$A_g \oplus A_g$
0.785	$NdVO_3$	$Pnma$	P62.3.26 $GM4^+ \oplus GM4^+$	2	mmm	$B2_g \oplus B2_g$
0.788	YVO_3	$P2_1/c$	P14.3.5 $GM2^+ \oplus GM2^+$	2	$2/m$	$B_g \oplus B_g$
0.791	Sr_2TbRuO_6	$P2_1/c$	P14.3.5 $GM2^+ \oplus GM2^+$	2	$2/m$	$B_g \oplus B_g$
0.794	Sr_2HoRuO_6	$P2_1/c$	P14.3.5 $GM2^+ \oplus GM2^+$	2	$2/m$	$B_g \oplus B_g$
0.803	NbMnP	$Pnma$	P62.3.17 $GM2^- \oplus GM4^+$	2	mmm	$B3_u \oplus B2_g$
0.810	Fe_2WO_6	$Pbcn$	P60.2.6 $GM4^+$	2	mmm	$A_g \oplus B2_g$
0.812	Fe_2WO_6	$Pbcn$	P60.3.27 $GM4^+ \oplus GM4^-$	2	mmm	$A_u \oplus B2_g$
0.831	$BaCaFe_4O_7$	$Pna2_1$	P33.2.3 GM4	3	mmm	$A_g \oplus B3_u \oplus B2_g$
0.847	$Er_5Pd_2In_4$	$P2/m$	P10.1.1 $GM1^+$	2	$2/m$	$A_g \oplus A_g$
0.848	$Er_5Pd_2In_4$	$P2/m$	P10.1.1 $GM1^+$	2	$2/m$	$A_g \oplus A_g$
0.849	$Er_5Pd_2In_4$	$Pbam$	P55.2.2 $GM2^+$	2	mmm	$A_g \oplus B1_g$
0.850	$Er_5Pd_2In_4$	$Pbam$	P55.2.2 $GM2^+$	2	mmm	$A_g \oplus B1_g$
0.854	$Gd_2Pt_2O_7$	$I4_1/amd$	P141.6.1 $GM5^+$	2	$4/mmm$	E_g
0.868	Pr_2NiIrO_6	$P2_1/c$	P14.2.2 $GM2^+$	2	$2/m$	$A_g \oplus B_g$
0.869	Pr_2NiIrO_6	$P2_1/c$	P14.2.2 $GM2^+$	2	$2/m$	$A_g \oplus B_g$
0.871	Pr_2NiIrO_6	$P2_1/c$	P14.2.2 $GM2^+$	2	$2/m$	$A_g \oplus B_g$
0.872	Pr_2NiIrO_6	$P2_1/c$	P14.2.2 $GM2^+$	2	$2/m$	$A_g \oplus B_g$
0.873	Pr_2NiIrO_6	$P2_1/c$	P14.2.2 $GM2^+$	2	$2/m$	$A_g \oplus B_g$
0.903	Pr_2PdGe_6	$Cmce$	P64.3.45 $GM3^+ \oplus GM4^+$	2	mmm	$B3_g \oplus B2_g$
0.912	$Ho_5Ni_2In_4$	$Pbam$	P55.3.9 $GM2^+ \oplus GM2^+$	2	mmm	$B1_g \oplus B1_g$
0.913	$Ho_5Ni_2In_4$	$Pbam$	P55.1.1 $GM1^+$	2	mmm	$A_g \oplus A_g$
0.915	$Tb_5Ni_2In_4$	$Pbam$	P55.1.1 $GM1^+$	2	mmm	$A_g \oplus A_g$
0.926	Pr_2PdGe_6	$Cmce$	P64.3.45 $GM3^+ \oplus GM4^+$	2	mmm	$B3_g \oplus B2_g$
0.951	$LaYbO_3$	$Pnma$	P62.2.4 $GM3^+$	2	mmm	$A_g \oplus B3_g$
0.952	YbPdSi	$Pmmn$	P59.2.4 $GM3^+$	2	mmm	$A_g \oplus B3_g$
0.981	$TmVO_3$	$Pnma$	P62.3.21 $GM3^+ \oplus GM4^+$	2	mmm	$B3_g \oplus B2_g$
1.0.3	$CsCoBr_3$	$P6_3/mcm$	P193.3.6 $GM1^- \oplus GM4^+$	2	$6/mmm$	$B1_g \oplus B1_u$
1.0.4	$CsNiCl_3$	$Cmcm$	P63.3.4 $GM1^- \oplus GM3^+$	2	mmm	$B3_g \oplus B3_u$
1.0.8	$Ba_3MnNb_2O_9$	$P\bar{3}m1$	P164.7.1 K1	1	$\bar{3}m$	$A1_u$
1.0.14	$CsFeCl_3$	$P6_3/mmc$	P194.7.1 K1	1	$6/mmm$	$B2_u$
1.0.24	$ThMn_2$	$P6_3/mmc$	P194.7.4 K4	1	$6/mmm$	$B2_u$
1.0.27	Li_2MnTeO_6	$P\bar{3}c1$	P165.6.1 $GM3^+$	2	$\bar{3}m$	E_g
1.0.31	$EuIn_2As_2$	$P6_3/mcm$	P193.3.24 $GM3^- \oplus GM4^+$	2	$6/mmm$	$A2_u \oplus B1_g$
1.0.32	$EuIn_2As_2$	$P6_3/mmc$	P194.8.1 DT1	1	$6/mmm$	$A2_u$
1.0.34	$RbNiCl_3$	$P6_3/mcm$	P193.3.6 $GM1^- \oplus GM4^+$	2	$6/mmm$	$B1_g \oplus B1_u$
1.0.35	$CsMnBr_3$	$P6_3/mmc$	P194.7.2 K2	1	$6/mmm$	$B2_u$
1.0.36	$CsMnI_3$	$P6_3/mcm$	P193.3.6 $GM1^- \oplus GM4^+$	2	$6/mmm$	$B1_g \oplus B1_u$
1.0.37	$CsMnI_3$	$P6_3/mcm$	P193.3.6 $GM1^- \oplus GM4^+$	2	$6/mmm$	$B1_g \oplus B1_u$

Coplanar magnetic materials with non-zero spin texture $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$ (continued).

BCSID	Chemical formula	PSG	SSG	d_M	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
1.0.40	$RbFeCl_3$	$P6_3/mmc$	P194.7.1 K1	1	$6/mmm$	$B2_u$
1.0.41	$RbNiCl_3$	$P6_3/mmc$	P194.7.2 K2	1	$6/mmm$	$B2_u$
1.0.42	$CsNiCl_3$	$P6_3/mmc$	P194.7.2 K2	1	$6/mmm$	$B2_u$
1.0.44	$Ba_3CoSb_2O_9$	$P6_3/mmc$	P194.7.2 K2	1	$6/mmm$	$B2_u$
1.0.45	$Ba_3CoSb_2O_9$	$P6_3/mmc$	P194.7.2 K2	1	$6/mmm$	$B2_u$
1.0.46	$Ba_3MnSb_2O_9$	$C2/c$	P15.3.2 $GM1^- \oplus GM2^+$	2	$2/m$	$B_g \oplus B_u$
1.0.49	$BaCoSiO_4$	$P6_3$	P173.4.2 GM4GM6	3	$6/m$	$A_u \oplus {}^2E2_g \oplus {}^1E2_g$
1.19	$PrMn_2O_5$	$Pmc2_1$	P26.3.45 Y1 $\oplus$ Y3	1	mmm	$B2_u$
1.34	HoAuGe	$Cmc2_1$	P36.3.21 Y1 $\oplus$ Y3	1	mmm	$B2_u$
1.54	$GdMn_2O_5$	$Pmc2_1$	P26.3.45 Y1 $\oplus$ Y3	1	mmm	$B2_u$
1.68	$NaNdFeWO_6$	$P1$	P1.3.1 R1 $\oplus$ R1	1	$\bar{1}$	A_u
1.76	$DyMn_2O_5$	$Pmc2_1$	P26.3.45 Y1 $\oplus$ Y3	1	mmm	$B2_u$
1.124	$YBaFe_4O_7$	$P2_1$	P4.3.4 B1 $\oplus$ B2	1	$2/m$	B_u
1.224	$CoNb_2O_6$	$P2_12_12$	P18.3.10 Z1 $\oplus$ Z2	1	mmm	$B1_u$
1.272	CeNiAsO	$P2_1/m$	P11.3.14 $B1^+ \oplus B2^-$	1	$2/m$	B_u
1.324	$DyMn_2O_5$	$Pmc2_1$	P26.3.45 Y1 $\oplus$ Y3	1	mmm	$B2_u$
1.443	Gd_2BaCuO_5	$Pmc2_1$	P26.3.45 Y1 $\oplus$ Y3	1	mmm	$B2_u$
1.444	Er_2Pt	$Pmn2_1$	P31.3.14 Y1 $\oplus$ Y3	1	mmm	$B2_u$
1.499	$CsFe(MoO_4)_2$	$P\bar{3}$	P147.8.2 P1	1	$\bar{3}$	A_u
1.517	$DyBe_{13}$	$I4/mcm$	P140.3.96 $M1^- \oplus M3^+$	1	$4/mmm$	$A2_u$
1.518	$TbBe_{13}$	$I4/mcm$	P140.3.96 $M1^- \oplus M3^+$	1	$4/mmm$	$A2_u$
1.533	TbC_2	$Pmmm$	P47.3.94 $X1^+ \oplus X3^-$	1	mmm	$B3_u$
1.599	$DyMn_2O_5$	Pm	P6.3.6 B1 $\oplus$ B1	1	$2/m$	B_u
1.726	$RuCl_3$	$P1$	P1.3.1 R1 $\oplus$ R1	1	$\bar{1}$	A_u
2.10	HoP	$R\bar{3}m$	P166.2.4 $T1^+$	1	$\bar{3}m$	$A1_g$
2.11	TbMg	$P4/mmm$	P123.2.14 $Z1^+$	1	$4/mmm$	$A1_g$
2.12	TbMg	$P4/mmm$	P123.2.14 $Z1^+$	1	$4/mmm$	$A1_g$
2.28	$NpNiGa_5$	$P4/mmm$	P123.2.8 $A1^+$	1	$4/mmm$	$A1_g$
2.51	$EuMnBi_2$	$I\bar{4}m2$	P119.2.4 M1	1	$4/mmm$	$A1_g$
2.57	$TbMn_2Si_2$	$I4/mmm$	P139.2.13 $M3^-$	1	$4/mmm$	$A1_g$
2.60	$NdMn_2Si_2$	$I4/mmm$	P139.2.13 $M3^-$	1	$4/mmm$	$A1_g$
2.70	GdMg	$P4/mmm$	P123.2.14 $Z1^+$	1	$4/mmm$	$A1_g$
2.72	VNb_3S_6	$P6_322$	P182.2.3 GM4	3	$6/mmm$	$A1_g \oplus B1_g \oplus B1_u$
2.81	$ErMn_2Si_2$	$I4/mmm$	P139.2.13 $M3^-$	1	$4/mmm$	$A1_g$
2.82	$ErMn_2Si_2$	$I4/mmm$	P139.2.13 $M3^-$	1	$4/mmm$	$A1_g$
2.83	$ErMn_2Ge_2$	$I4/mmm$	P139.2.13 $M3^-$	1	$4/mmm$	$A1_g$
2.84	$ErMn_2Ge_2$	$I4/mmm$	P139.2.13 $M3^-$	1	$4/mmm$	$A1_g$
2.94	$TmMn_2Ge_2$	$P4mm$	P99.2.8 Z1	1	$4/mmm$	$A1_g$
2.97	$GdMn_2Si_2$	$I4/mmm$	P139.2.13 $M3^-$	1	$4/mmm$	$A1_g$
2.100	HoP	$R\bar{3}m$	P166.2.4 $T1^+$	1	$\bar{3}m$	$A1_g$
3.1	TmAgGe	$P\bar{6}2m$	P189.6.1 GM5	3	$6/mmm$	$B1_u \oplus E2_g$
3.17	$BaCu_3V_2O_8(OD)_2$	$P3_121$	P152.6.1 GM3	3	$\bar{3}m$	$A2_u \oplus E_g$
3.20	$TbMn_2Ge_2$	$P2_1/m$	P11.2.4 $B1^+$	1	$2/m$	A_g

TABLE S700: Non-coplanar magnetic materials with non-zero spin texture $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$.

BCSID	Chemical formula	PSG	SSG	d_M	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
light-element materials						
0.60	$[NH_2(CH_3)_2]_n$ $[Fe^{III}Fe^{II}(HCOO)_6]_n$	$R\bar{3}c$	N167.6.1 $GM3^+$	3	$\bar{3}m$	$A1_g \oplus E_g$
0.64	MnV_2O_4	$I4_1/a$	N88.4.1 $GM3^+GM4^+$	3	$4/m$	$A_g \oplus {}^2E_g \oplus {}^1E_g$
0.70	$Na_3Co(CO_3)_2Cl$	$Fd\bar{3}$	N203.15.1 $GM4^+$	3	$m\bar{3}$	T_g
0.96	$CoSO_4$	$Pnma$	N62.9.42 $GM2^+ \oplus GM3^+ \oplus GM4^+$	3	mmm	$B1_g \oplus B3_g \oplus B2_g$
0.102	Mn_2GeO_4	$Pnma$	N62.9.42 $GM2^+ \oplus GM3^+ \oplus GM4^+$	3	mmm	$B1_g \oplus B3_g \oplus B2_g$
0.103	Mn_2GeO_4	$P2_1/c$	N14.3.5 $GM2^+ \oplus GM2^+$	3	$2/m$	$A_g \oplus B_g \oplus B_g$
0.135	$Ni_3B_7O_{13}Br$	$Pca2_1$	N29.3.2 GM2 $\oplus$ GM3	3	$mm2$	A1 $\oplus$ A2 $\oplus$ B2
0.136	$Co_3B_7O_{13}Br$	$Pca2_1$	N29.3.2 GM2 $\oplus$ GM3	3	$mm2$	A1 $\oplus$ A2 $\oplus$ B2
0.150	NiS_2	$Pa\bar{3}$	N205.15.1 $GM4^+$	3	$m\bar{3}$	T_g
0.168	$NH_4Fe_2F_6$	$Pnma$	N62.9.42 $GM2^+ \oplus GM3^+ \oplus GM4^+$	3	mmm	$B1_g \oplus B3_g \oplus B2_g$
0.203	Mn_3Ge	$P6_3/mmc$	N194.6.1 $GM5^+$	3	$6/mmm$	$A1_g \oplus E2_g$
0.218	Co_2SiO_4	$Pnma$	N62.9.42 $GM2^+ \oplus GM3^+ \oplus GM4^+$	3	mmm	$B1_g \oplus B3_g \oplus B2_g$
0.219	Co_2SiO_4	$Pnma$	N62.9.42 $GM2^+ \oplus GM3^+ \oplus GM4^+$	3	mmm	$B1_g \oplus B3_g \oplus B2_g$
0.220	Mn_2SiO_4	$Pnma$	N62.3.21 $GM3^+ \oplus GM4^+$	3	mmm	$A_g \oplus B3_g \oplus B2_g$
0.221	Fe_2SiO_4	$Pnma$	N62.9.42 $GM2^+ \oplus GM3^+ \oplus GM4^+$	3	mmm	$B1_g \oplus B3_g \oplus B2_g$
0.294	$Cu_4(OD)_6FBr$	$Pnma$	N62.3.21 $GM3^+ \oplus GM4^+$	3	mmm	$A_g \oplus B3_g \oplus B2_g$
0.357	$CaFe_5O_7$	$P2_1/m$	N11.3.6 $GM2^+ \oplus GM2^+$	3	$2/m$	$A_g \oplus B_g \oplus B_g$
0.368	(CH_3NH_3) $(Co(COOH)_3$	$Pnma$	N62.3.10 $GM2^+ \oplus GM3^+$	3	mmm	$A_g \oplus B1_g \oplus B3_g$
0.369	(CH_3NH_3) $(Co(COOH)_3$	$P2_1/c$	N14.2.2 $GM2^+$	3	$2/m$	$A_g \oplus A_g \oplus B_g$
0.393	$Cu_4(OH)_6FBr$	$P2_1/m$	N11.2.2 $GM2^+$	3	$2/m$	$A_g \oplus A_g \oplus B_g$
0.431	CuB_2O_4	Cc	N9.9.1 GM2 $\oplus$ GM2 $\oplus$ GM2	3	2	B $\oplus$ B $\oplus$ B
0.571	$CoSO_4$	$Pnma$	N62.9.42 $GM2^+ \oplus GM3^+ \oplus GM4^+$	3	mmm	$B1_g \oplus B3_g \oplus B2_g$
0.574	$MnFeF_5(H_2O)_2$	$C2$	N5.2.1 GM2	3	m	$A' \oplus A' \oplus A''$
0.576	Cr_2F_5	$C2/c$	N15.3.6 $GM2^+ \oplus GM2^+$	3	$2/m$	$A_g \oplus B_g \oplus B_g$
0.756	GaV_4S_8	$R3m$	N160.6.1 GM3	3	32	A1 $\oplus$ E
0.763	$Mn_5(PO_4)_2$ $(PO_3(OH))_2(HOH)_4$	$C2/c$	N15.2.2 $GM2^+$	3	$2/m$	$A_g \oplus A_g \oplus B_g$
0.764	$Mn_5(PO_4)_2$ $(PO_3(OH))_2(HOH)_4$	$C2/c$	N15.2.2 $GM2^+$	3	$2/m$	$A_g \oplus A_g \oplus B_g$
0.765	$Mn_5(PO_4)_2$ $(PO_3(OH))_2(HOH)_4$	$C2/c$	N15.2.2 $GM2^+$	3	$2/m$	$A_g \oplus A_g \oplus B_g$
0.851	$C_7H_{14}NFeCl_4$	$P2_12_12_1$	N19.3.2 GM2 $\oplus$ GM3	3	$mm2$	A1 $\oplus$ B2 $\oplus$ B1
0.883	$NaCo_2(SeO_3)_2(OH)$	$Pnma$	N62.3.10 $GM2^+ \oplus GM3^+$	3	mmm	$A_g \oplus B1_g \oplus B3_g$
0.900	Mn_3CoGe	$P2_13$	N198.15.1 GM4	3	23	T
0.948	$CaNi_3P_4O_{14}$	$P2_1/c$	N14.3.5 $GM2^+ \oplus GM2^+$	3	$2/m$	$A_g \oplus B_g \oplus B_g$
1.85	alpha-Mn	$I\bar{4}2m$	N121.12.8 M1 $\oplus$ M5	3	$4/mmm$	$B2_u \oplus E_u$
1.138	MgV_2O_4	$F222$	N22.9.47 T1 $\oplus$ T3 $\oplus$ T2	3	mmm	$B1_u \oplus B3_u \oplus B2_u$
1.307	Mn_5Si_3	$Amm2$	N38.2.9 Y4	3	mmm	$A_g \oplus A_g \oplus B1_u$
1.595	CaCoSO	Cm	N8.9.21 A1 $\oplus$ A1 $\oplus$ A2	3	$2/m$	$A_u \oplus A_u \oplus B_u$
2.5	Mn_3CuN	$P4/mmm$	N123.12.46 $A1^+ \oplus A5^-$	2	$4/mmm$	E_u
2.35	CrSe	$P6_3/mmc$	N194.13.14 $GM3^+ \oplus K2$	1	622	B2
2.52	Mn_3O_4	Pc	N7.2.1 GM2	3	2	A $\oplus$ A $\oplus$ B
2.59	Mn_3As_2	$C2/m$	N12.3.25 $A1^+ \oplus A1^+$	1	$2/m$	A_g

Non-coplanar magnetic materials with non-zero spin texture $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$ (continued).

BCSID	Chemical formula	PSG	SSG	d_M	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
2.91	$NaCo_2(SeO_3)_2(OH)$	$Pmn2_1$	N31.3.14 Y1 $\oplus$ Y3	1	$mm2$	A1
heavy-element materials						
0.2	$Cd_2Os_2O_7$	$Fd\bar{3}m$	N227.15.3 $GM5^+$	3	$m\bar{3}m$	$T2_g$
0.20	$MnTe_2$	$Pa\bar{3}$	N205.15.1 $GM4^+$	3	$m\bar{3}$	T_g
0.29	$Er_2Ti_2O_7$	$I4_1/amd$	N141.12.7 $GM2^+ \oplus GM5^+$	3	$4/mmm$	$B1_g \oplus E_g$
0.33	$HoMnO_3$	$P6_3cm$	N185.12.2 GM2 $\oplus$ GM6	3	$6mm$	A2 $\oplus$ E1
0.39	Nd_2NaRuO_6	$P2_1/c$	N14.3.5 $GM2^+ \oplus GM2^+$	3	$2/m$	$A_g \oplus B_g \oplus B_g$
0.42	$HoMnO_3$	$P6_3cm$	N185.12.5 GM4 $\oplus$ GM5	3	$\bar{6}2m$	$A1'' \oplus E'$
0.43	$HoMnO_3$	$P6_3cm$	N185.12.3 GM3 $\oplus$ GM5	3	$\bar{6}m2$	$A2' \oplus E'$
0.48	$Tb_2Sn_2O_7$	$I4_1/amd$	N141.6.1 $GM5^+$	3	$4/mmm$	$A1_g \oplus E_g$
0.49	$Ho_2Ru_2O_7$	$I4_1/amd$	N141.6.1 $GM5^+$	3	$4/mmm$	$A1_g \oplus E_g$
0.51	$Ho_2Ru_2O_7$	$I4_1/amd$	N141.6.1 $GM5^+$	3	$4/mmm$	$A1_g \oplus E_g$
0.77	$Tb_2Ti_2O_7$	$R\bar{3}m$	N166.6.1 $GM3^+$	3	$\bar{3}m$	$A1_g \oplus E_g$
0.90	$Rb_2Fe_2O(AsO_4)_2$	$Pnma$	N62.9.42 $GM2^+ \oplus GM3^+ \oplus GM4^+$	3	mmm	$B1_g \oplus B3_g \oplus B2_g$
0.97	$FeSb_2O_4$	$P4_2/mbc$	N135.9.27 $GM1^- \oplus GM4^+ \oplus GM4^-$	3	$4/mmm$	$A1_u \oplus B2_g \oplus B2_u$
0.106	$DyVO_3$	$Pnma$	N62.3.21 $GM3^+ \oplus GM4^+$	3	mmm	$A_g \oplus B3_g \oplus B2_g$
0.127	$Dy_3Al_5O_{12}$	$Ia\bar{3}d$	N230.15.3 $GM5^+$	3	$m\bar{3}m$	$T2_g$
0.151	$Tm_2Mn_2O_7$	$I4_1/amd$	N141.6.1 $GM5^+$	3	$4/mmm$	$A1_g \oplus E_g$
0.157	$Yb_2Sn_2O_7$	$I4_1/amd$	N141.6.1 $GM5^+$	3	$4/mmm$	$A1_g \oplus E_g$
0.158	$Yb_2Ti_2O_7$	$I4_1/amd$	N141.6.1 $GM5^+$	3	$4/mmm$	$A1_g \oplus E_g$
0.167	$Nd_3Sb_3Mg_2O_{14}$	$R\bar{3}m$	N166.6.1 $GM3^+$	3	$\bar{3}m$	$A1_g \oplus E_g$
0.169	U_3As_4	$I\bar{4}3d$	N220.6.1 GM3	3	432	A1 $\oplus$ E
0.170	U_3P_4	$I\bar{4}3d$	N220.6.1 GM3	3	432	A1 $\oplus$ E
0.184	Nd_5Si_4	$P4_12_12$	N92.6.1 GM5	3	$4mm$	A1 $\oplus$ E
0.185	Nd_5Ge_4	$Pnma$	N62.3.12 $GM2^+ \oplus GM4^+$	3	mmm	$A_g \oplus B1_g \oplus B2_g$
0.204	Ca_2MnReO_6	$P2_1/c$	N14.3.5 $GM2^+ \oplus GM2^+$	3	$2/m$	$A_g \oplus B_g \oplus B_g$
0.205	Sr_2MnReO_6	$P2_1/c$	N14.2.2 $GM2^+$	3	$2/m$	$A_g \oplus A_g \oplus B_g$
0.240	$Er_2Cu_2O_5$	$Pna2_1$	N33.9.5 GM2 $\oplus$ GM3 $\oplus$ GM4	3	$mm2$	A2 $\oplus$ B2 $\oplus$ B1
0.268	Tb_2MnNiO_6	$P2_1$	N4.2.1 GM2	3	m	$A' \oplus A' \oplus A''$
0.269	Tb_2MnNiO_6	$P2_1/c$	N14.2.2 $GM2^+$	3	$2/m$	$A_g \oplus A_g \oplus B_g$
0.287	$SrCo(VO_4)(OH)$	$P2_12_12_1$	N19.9.3 GM2 $\oplus$ GM3 $\oplus$ GM4	3	222	B1 $\oplus$ B3 $\oplus$ B2
0.292	$NiTe_2O_5$	$Pnma$	N62.9.42 $GM2^+ \oplus GM3^+ \oplus GM4^+$	3	mmm	$B1_g \oplus B3_g \oplus B2_g$
0.316	$DyCrWO_6$	$Pna2_1$	N33.9.6 GM2 $\oplus$ GM4 $\oplus$ GM4	3	222	B1 $\oplus$ B2 $\oplus$ B2
0.318	Tm_2CoMnO_6	$P2_1/c$	N14.2.2 $GM2^+$	3	$2/m$	$A_g \oplus A_g \oplus B_g$
0.326	$Nd_2Sn_2O_7$	$Fd\bar{3}m$	N227.15.3 $GM5^+$	3	$m\bar{3}m$	$T2_g$
0.339	$Nd_2Hf_2O_7$	$Fd\bar{3}m$	N227.15.3 $GM5^+$	3	$m\bar{3}m$	$T2_g$
0.340	$Nd_2Zr_2O_7$	$Fd\bar{3}m$	N227.15.3 $GM5^+$	3	$m\bar{3}m$	$T2_g$
0.342	Tb_3Ge_5	$Fdd2$	N43.9.4 GM2 $\oplus$ GM3 $\oplus$ GM4	3	$mm2$	A2 $\oplus$ B2 $\oplus$ B1
0.349	Nd_2NiO_4	$P4_2/ncm$	N138.6.1 $GM5^+$	3	$4/mmm$	$A1_g \oplus E_g$
0.352	$TbFeO_3$	$Pnma$	N62.3.21 $GM3^+ \oplus GM4^+$	3	mmm	$A_g \oplus B3_g \oplus B2_g$
0.419	$Er_2Ge_2O_7$	$P4_12_12$	N92.12.9 GM4 $\oplus$ GM5	3	$\bar{4}2m$	B2 $\oplus$ E
0.427	$Sm_2Ti_2O_7$	$Fd\bar{3}m$	N227.15.3 $GM5^+$	3	$m\bar{3}m$	$T2_g$
0.440	$SrCuTe_2O_6$	$P4_132$	N213.15.1 GM4	3	432	T1
0.450	Nd_5Ge_4	$Pnma$	N62.3.12 $GM2^+ \oplus GM4^+$	3	mmm	$A_g \oplus B1_g \oplus B2_g$
0.478	$SmCrO_3$	$Pnma$	N62.9.42 $GM2^+ \oplus GM3^+ \oplus GM4^+$	3	mmm	$B1_g \oplus B3_g \oplus B2_g$

Non-coplanar magnetic materials with non-zero spin texture $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$ (continued).

BCSID	Chemical formula	PSG	SSG	d_M	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
0.479	$SmCrO_3$	$Pnma$	N62.3.10 $GM2^+ \oplus GM3^+$	3	mmm	$A_g \oplus B1_g \oplus B3_g$
0.488	$YbMnO_3$	$P6_3cm$	N185.12.5 $GM4 \oplus GM5$	3	$\bar{6}2m$	$A1'' \oplus E'$
0.489	$YbMnO_3$	$P6_3cm$	N185.12.5 $GM4 \oplus GM5$	3	$\bar{6}2m$	$A1'' \oplus E'$
0.490	$YbMnO_3$	$P6_3cm$	N185.6.2 GM6	3	622	$A1 \oplus E1$
0.530	$SrCuTe_2O_6$	$P4_132$	N213.15.1 GM4	3	432	T1
0.544	Mn_2FeReO_6	$P\bar{1}$	N2.1.1 $GM1^+$	3	$\bar{1}$	$A_g \oplus A_g \oplus A_g$
0.545	Mn_2FeReO_6	$P\bar{1}$	N2.1.1 $GM1^+$	3	$\bar{1}$	$A_g \oplus A_g \oplus A_g$
0.578	$NaBaFe_2F_9$	$P2_1/c$	N14.3.5 $GM2^+ \oplus GM2^+$	3	$2/m$	$A_g \oplus B_g \oplus B_g$
0.652	$HoMnO_3$	$P6_3cm$	N185.12.3 $GM3 \oplus GM5$	3	$\bar{6}m2$	$A2' \oplus E'$
0.658	$BaCuTe_2O_6$	$P4_132$	N213.15.2 GM5	3	$\bar{4}3m$	T2
0.696	$SmCrO_3$	$Pnma$	N62.3.10 $GM2^+ \oplus GM3^+$	3	mmm	$A_g \oplus B1_g \oplus B3_g$
0.697	$SmCrO_3$	$Pnma$	N62.3.21 $GM3^+ \oplus GM4^+$	3	mmm	$A_g \oplus B3_g \oplus B2_g$
0.715	$HoCrWO_6$	$Pna2_1$	N33.9.5 $GM2 \oplus GM3 \oplus GM4$	3	$mm2$	$A2 \oplus B2 \oplus B1$
0.726	$CsMn_2F_6$	$Pnma$	N62.3.12 $GM2^+ \oplus GM4^+$	3	mmm	$A_g \oplus B1_g \oplus B2_g$
0.727	$CsMn_2F_6$	$P2_1/c$	N14.3.5 $GM2^+ \oplus GM2^+$	3	$2/m$	$A_g \oplus B_g \oplus B_g$
0.740	$Dy_3Ga_5O_{12}$	$Ia\bar{3}d$	N230.15.3 $GM5^+$	3	$m\bar{3}m$	$T2_g$
0.741	$Er_3Ga_5O_{12}$	$Ia\bar{3}d$	N230.15.3 $GM5^+$	3	$m\bar{3}m$	$T2_g$
0.743	$Ho_3Al_5O_{12}$	$Ia\bar{3}d$	N230.15.3 $GM5^+$	3	$m\bar{3}m$	$T2_g$
0.744	$Tb_3Al_5O_{12}$	$Ia\bar{3}d$	N230.15.3 $GM5^+$	3	$m\bar{3}m$	$T2_g$
0.745	$Ho_3Ga_5O_{12}$	$Ia\bar{3}d$	N230.15.3 $GM5^+$	3	$m\bar{3}m$	$T2_g$
0.746	$Tb_3Ga_5O_{12}$	$Ia\bar{3}d$	N230.15.3 $GM5^+$	3	$m\bar{3}m$	$T2_g$
0.853	$HoVO_3$	$Pna2_1$	N33.3.2 $GM2 \oplus GM3$	3	$mm2$	$A1 \oplus A2 \oplus B2$
0.862	$Eu_2Ir_2O_7$	$Fd\bar{3}m$	N227.15.3 $GM5^+$	3	$m\bar{3}m$	$T2_g$
0.870	Pr_2NiIrO_6	$P2_1/c$	N14.3.5 $GM2^+ \oplus GM2^+$	3	$2/m$	$A_g \oplus B_g \oplus B_g$
0.874	Nd_2NiIrO_6	$P2_1/c$	N14.3.5 $GM2^+ \oplus GM2^+$	3	$2/m$	$A_g \oplus B_g \oplus B_g$
0.875	Nd_2NiIrO_6	$P2_1/c$	N14.3.5 $GM2^+ \oplus GM2^+$	3	$2/m$	$A_g \oplus B_g \oplus B_g$
0.898	Mn_3IrSi	$P2_13$	N198.15.1 GM4	3	23	T
0.899	Mn_3IrGe	$P2_13$	N198.15.1 GM4	3	23	T
0.916	$Cd_2Os_2O_7$	$Fd\bar{3}m$	N227.15.3 $GM5^+$	3	$m\bar{3}m$	$T2_g$
0.941	Er_2O_3	$Ia\bar{3}$	N206.15.1 $GM4^+$	3	$m\bar{3}$	T_g
0.942	$Er_2Ge_2O_7$	$P4_12_12$	N92.12.9 $GM4 \oplus GM5$	3	$\bar{4}2m$	$B2 \oplus E$
0.943	$Yb_2Ge_2O_7$	$P4_12_12$	N92.6.1 GM5	3	$4mm$	$A1 \oplus E$
0.944	$Yb_2Ir_2O_7$	$R\bar{3}m$	N166.6.1 $GM3^+$	3	$\bar{3}m$	$A1_g \oplus E_g$
0.945	$Yb_2Ir_2O_7$	$Fd\bar{3}m$	N227.15.3 $GM5^+$	3	$m\bar{3}m$	$T2_g$
0.950	$LaErO_3$	$Pnma$	N62.9.42 $GM2^+ \oplus GM3^+ \oplus GM4^+$	3	mmm	$B1_g \oplus B3_g \oplus B2_g$
0.954	$Nd_2Ir_2O_7$	$Fd\bar{3}m$	N227.15.3 $GM5^+$	3	$m\bar{3}m$	$T2_g$
0.958	$Mn_3Si_2Te_6$	$C2/c$	N15.2.2 $GM2^+$	3	$2/m$	$A_g \oplus A_g \oplus B_g$
1.0.17	$CaBaCo_2Fe_2O_7$	$P31m$	N157.6.1 GM3	3	32	$A1 \oplus E$
1.0.23	$Dy_3Ru_4Al_{12}$	$Cmcm$	N63.2.2 $GM2^+$	3	mmm	$A_g \oplus A_g \oplus B1_g$
1.0.52	$Tb_{14}Ag_{51}$	$P\bar{6}$	N174.10.1 $GM2 \oplus GM3GM5$	3	6	$B \oplus {}^2E1 \oplus {}^1E1$
1.75	$BiMn_2O_5$	Pm	N6.9.88 $C1 \oplus C1 \oplus C2$	3	$2/m$	$A_u \oplus A_u \oplus B_u$
1.89	$DyFe_3(BO_3)_4$	$P3_121$	N152.12.4 $A1 \oplus A3$	3	$\bar{3}m$	$A2_u \oplus E_u$
1.92	$HoFe_3(BO_3)_4$	$P3_121$	N152.12.4 $A1 \oplus A3$	3	$\bar{3}m$	$A2_u \oplus E_u$
1.152	Ce_3NIn	$P4/mmm$	N123.12.63 $M1^+ \oplus M5^-$	2	$4/mmm$	E_u
1.161	$PrFe_3(BO_3)_4$	$R32$	N155.12.4 $T1 \oplus T3$	3	$\bar{3}m$	$A2_u \oplus E_u$

Non-coplanar magnetic materials with non-zero spin texture $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$ (continued).

BCSID	Chemical formula	PSG	SSG	d_M	Sym of $\tilde{\boldsymbol{S}}(\tilde{\boldsymbol{k}})$	Representation
1.235	$Ba(TiO)Cu_4(PO_4)_4$	$P42_12$	N90.12.20 Z2 $\oplus$ Z5	3	$4/mmm$	$A2_u \oplus E_u$
1.267	$Dy_2Co_3Al_9$	$Amm2$	N38.9.393 Z1 $\oplus$ Z2 $\oplus$ Z4	3	mmm	$A_u \oplus B3_u \oplus B2_u$
1.274	$DyFeWO_6$	Pc	N7.9.15 C1 $\oplus$ C1 $\oplus$ C2	3	$2/m$	$A_u \oplus A_u \oplus B_u$
1.279	$Ho_2Cu_2O_5$	$P2_1$	N4.9.7 B1 $\oplus$ B1 $\oplus$ B2	3	$2/m$	$A_u \oplus B_u \oplus B_u$
1.299	$GdMn_2O_5$	$Pmc2_1$	N26.9.228 Y1 $\oplus$ Y3 $\oplus$ Y2	3	mmm	$A_u \oplus B3_u \oplus B2_u$
1.300	$GdMn_2O_5$	$Pmc2_1$	N26.9.228 Y1 $\oplus$ Y3 $\oplus$ Y2	3	mmm	$A_u \oplus B3_u \oplus B2_u$
1.710	$BaFe_2Se_3$	Pm	N6.9.88 C1 $\oplus$ C1 $\oplus$ C2	3	$2/m$	$A_u \oplus A_u \oplus B_u$
2.3	$HoNiO_3$	$P2_1$	N4.3.1 GM2 $\oplus$ GM2	3	2	A $\oplus$ B $\oplus$ B
2.32	$Dy_3Ru_4Al_{12}$	$P6_3/mcm$	N193.6.1 $GM5^+$	3	$6/mmm$	$A1_g \oplus E2_g$
2.55	$Sr_2Fe_3Se_2O_3$	Pm	N6.9.33 B1 $\oplus$ B1 $\oplus$ C1	1	$2/m$	B_u
2.62	$TbCrO_3$	$Pmn2_1$	N31.9.36 GM4 $\oplus$ Y1 $\oplus$ Y3	1	222	B2
2.76	$Sr_2Fe_3Se_2O_3$	Pm	N6.9.33 B1 $\oplus$ B1 $\oplus$ C1	1	$2/m$	B_u
2.101	TbSbTe	$P2$	N3.9.62 C1 $\oplus$ C1 $\oplus$ C2	3	$2/m$	$A_u \oplus B_u \oplus B_u$
2.102	TbSbTe	$P2$	N3.9.62 C1 $\oplus$ C1 $\oplus$ C2	3	$2/m$	$A_u \oplus B_u \oplus B_u$
3.16	$Gd_2Ti_2O_7$	$P\bar{4}3m$	N215.15.4 R5	3	$m\bar{3}m$	$T2_u$

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